

JOURNAL OF GREATER MEKONG STUDIES

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JOURNAL OF GREATER MEKONG STUDIES

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FOREWORD

It gives me great pleasure to introduce to our readers to this fifth edition of the Journal of Greater Mekong Studies. On behalf of the entire editorial team here at the Cambodian Institute for Cooperation and Peace (CICP), I would like to thank the Embassy of the United States for its continued financial support for the journal and its strong support for CICP in the further development of the journal as a fully independent, open access space for regional and global analysts to explore the key issues that confront the Greater Mekong Subregion and its constituent states.

Over the course of 2021 and 2022, we are very excited about expanding our readership, our editorial board, and moving forward into an "open submission/call for papers" format in order to bring in a wider range of voices and perspectives as the journal seeks to achieve its goal of becoming. Building on our own institutional values, we are particularly looking forward to giving renewed attention to the continued "gender gap" in international relations/Greater Mekong Studies and actively working to reach out, as part of the editorial process in all future volumes, to women scholars whose voices have been historically marginalized in the field.

In this edition, I am deeply grateful to all of our authors for their careful exploration and analysis of a wide range of topics. Where in the past we have taken a more "thematic" approach – with particular editions focusing on specific topics – in this edition we have "opened the doors" as it were to a particularly broad set of topics. Just to highlight a few of these – Sanchita Chatterjee from the Mekong Institute takes a deep dive into the realities of the new Regional Comprehensive Economic Partnership (RCEP) and the implications thereof for supply chains in the region, a topic that has been the source of considerable debate over the course of the last year. On the question of the river and its tributaries and their development – our contributors have run the gamut of issues. Mak Sithirith examines how the changing flow of the Tonle Sap and how it has affected the livelihoods of local communities; Tom Fawthrop looks at the question of supporting biodiversity and fisheries on the Mekong and the phasing out of hydropower; while Nguyen Minh Quang of Can Tho University brings to the fore the important question of the role of "citizen science" in the mitigation of environmental problems in Mekong.

Furthermore, from climate change to the question of EBA removal in Cambodia to the role of BRI – we are very proud that this edition has "something for everyone" and will help to move forward scholarly discussion of the pressing issues of the day.

Ambassador Pou Sothirak Executive Director, Cambodian Institute for Cooperation and Peace

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THE ESSENCE OF THE MEKONG-U.S. PARTNERSHIP H.E. Amb. Pou Sothirak Executive Director, CICP	11
REGIONAL VALUE CHAINS AND THE RCEP AGREEMENT: IMPLICATIONS FOR THE MEKONG COUNTRIES POST-COVID-19 Sanchita Chatterjee Team Leader and Program Specialist	15
Trade and Investment Facilitation Department, Mekong Institute	
OF LENDING AND LONG-TERM LIABILITIES: CHINA, CAMBODIA, AND THE VAICO IRRIGATION PROJECT <i>Chen Heang and Michael Renfew</i> Future Forum	27
UPSTREAM OPERATIONAL DATA IS NEXT STEP IN MEKONG GOVERNANCE <i>Roney Tyler</i> Southeast Asia Regional Editor China Dialogue & The Third Pole	35
CITIZEN SCIENCE MATTERS: THEORY INTO PRACTICE, AND PROMISES FOR Addressing Environmental Problems in the Mekong Riparian Countries Dr. Nguyen Minh Quang, James Borton, and Kieu Thoan Thu Can Tho University & Mekong Environment Forum	41
REDEFINE DIGITAL TRANSFORMATION TO SPEED UP POST-COVID-19 ECONOMIC RECOVERY IN CAMBODIA Dr. Henry Chan Visiting Senior Fellow, CICP	55
CLIMATE CHANGE IN THE MEKONG SUBREGION: IMPACT AND RESPONSES OF CAMBODIA Dr. Raimund Weiss Senior Research Fellow, CICP	61
SUPPORTING BIODIVERSITY AND FISHERIES OF THE MEKONG: New Thinking and the Phasing Out of Hydropower on the Lower Mekong <i>Tom Fawthrop</i>	67

Freelance Journalist & Film-Maker

WHY CAMBODIA?: 79 FACTORS IN EU INCOHERENCE IN WITHDRAWAL DECISIONS FOR TRADE PREFERENCES Dr. Daniel Schmücking

Country Director Konrad Adenauer Foundation's (KAS) office in Cambodia

TONLE SAP LAKE AND WATER SECURITY:

CHANGING THE REVERSE FLOW AND IMPLICATIONS FISHERIES AND LIVELIHOODS

Dr. Mak Sithirith Water Governance Specialist

103



H.E. Ambassador Pou Sothirak *Editor-in-Chief, JGMS Executive Director, CICP*

In addition to being the Executive Director of the Cambodian Institute for Cooperation and Peace (CICP) since 2013, Ambassador Pou Sothirak also serves as Advisor to the Royal Government of Cambodia as of February 2014.

He was appointed as Secretary of State of the Ministry of Foreign Affairs and International Cooperation of Cambodia from September 2013 to January 2014. He was a Visiting Senior Research Fellow at the Institute of Southeast Asian Studies (ISEAS) in Singapore from January 2009 to December 2012. He also served as Cambodian Ambassador to Japan from April 2005 to November 2008. He was elected Cambodian Member of Parliaments twice during the national general election in 1993 and 2003. He was appointed as Minister of Industry Mines and Energy of the Royal Government of Cambodia from 1993 to 1998. He graduated from Oregon State University in the U.S. in March 1981 with a Bachelor Degree in Electrical and Computer Engineering and worked as an engineer at the Boeing Company in Seattle, Washington from 1981-1985.

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Dr. Bradley Jensen Murg

Lead Editor, JGMS Distinguished Fellow & Senior Advisor, CICP

Dr. Bradley J. Murg is Associate Professor of Political Science and Dean of the Faculty of Economics and Administrative Sciences at Paragon International University. Additionally, Dr. Murg holds positions as Distinguished Fellow and Senior Advisor at CICP; Senior Research Advisor at Future Forum;

and Distinguished Fellow at the Royal University of Law and Economics. His work, supported by grants from the Social Science Research Council and the International Research and Exchanges Board, focuses on contemporary international relations in Southeast Asia; the political economy of foreign aid; and the Greater Mekong Subregion as a whole. Dr. Murg graduated Phi Beta Kappa from Emory University with a B.A./M.A. in philosophy, received an MSc. in economic history from the London School of Economics, and his M.A. and Ph.D. in political science from the University of Washington.



Ms. Pich Charadine Lead Editor, JGMS Deputy Director, CICP

PICH Charadine is currently the Deputy Executive Director the Cambodian Institute for Cooperation and Peace (CICP) in charge of Research, Training and Publication and serving as the Coordinator of the Global Center for Mekong Studies (GCMS-Cambodia Center, a Track II think tank network of Lancang-Mekong Cooperation).

Ms. Pich obtained her Bachelor of Arts in Political Science and International Relations with High Honors from Zaman University (Cambodia) and holds a Master of Arts in Dialogue Studies (concentrated on political dialogue) with Merit from Keele University (United Kingdom). She was nominated to the 2019 US Department of State International Visitor Leadership Program (IVLP) on ASEAN-Nations of the South China Sea – Sovereignty and Rules-based Order. She was also the Visiting Fellow at the China Institute for International Studies (CIIS) in 2018 and Visiting Scholar at China Foreign Affairs University (CFAU) in 2019.

She has written and published on various issues concerning Cambodia's political development and its subsequent foreign policy implications. Her focus is on Sino-Cambodia relations (particularly political economy dilemma, foreign aid policy, and economic statecraft), ASEAN Regional Framework and ASEAN-China Partnership, Cambodia's politics and foreign relations, and Mekong sub-regional cooperation, especially on Mekong-Lancang Cooperation.



Ms. Sanchita Chatterjee

Team Leader and Program Specialist, Trade and Investment Facilitation Department Mekong Institute

Ms. Sanchita Chatterjee is currently working as the Team Leader and Program Specialist of Trade and Investment Facilitation Department, Mekong Institute and a trade policy specialist by training and professional experience. Ms. Chatterjee has published and made presentations widely on

the topics of free trade agreements, especially the Regional Comprehensive Economic Partnership, analysis of tariffs and trade barriers, trade in services, investment, intellectual property rights, public procurement, trade facilitation, global value chains, and economic cooperation. Ms. Chatterjee received her degree in economics from Delhi School of Economics, India and is an alumnus of Harvard Kennedy School Executive Education.

Chen Heang



Junior Researcher & Project Coordinator Future Forum

Chen Heang earned a Bachelor's degree in International Relations from the University of Cambodia in 2019. He was a Young Research Fellow 2020 at Future Forum and his research of interest is Cambodia's Strategic Location Under China's Sea Power Projection. He contributed some opinion piece articles

to both local and regional news outlets, radio talk shows, and public conferences. Before joining Future Forum, he had experience in NGOs and private institutes. He has participated in numerous conferences across ASEAN including IR, diplomacy, development programs, and also attempted some competition in Cambodia. Heang was awarded an Academic Excellence Award for the last two years in a row in his BA academic year and was the runner-up in the Cambodia-China Diplomatic Relations Quiz on National TV. In addition to his academic background, he earned the first Dan of black-belt as a Karate Practitioner in 2015 and also won two medals in the Shotokan Karate-Do Championship Competition at Olympic Stadium.



Michael Renfew Program Manager Future Forum

Michael works with Future Forum as the Program Manager; overseeing the think-tank's project, publication, and output arms. He is a PhD candidate with the University of Glasgow working on international trade and FDI in the context of trade agreement characteristics, with a focus on the ASEAN region. Michael holds a master's degree in economic development

from the University of Glasgow (Scotland). He began his association with Cambodia in 2016 as the Communications Volunteer at local youth-development NGO Youth Star Cambodia, of which he is currently chairperson.



Tyler Roney Southeast Asia Regional Editor China Dialogue & The Third Pole

Tyler Roney is the Southeast Asia regional editor for China Dialogue and The Third Pole, covering environmental related stories in biodiversity, sustainability, and hydropower projects in the Greater Mekong Subregion of Thailand, Cambodia, Laos, Myanmar, and Vietnam.



Dr. Nguyen Minh Quang

Geopolitics Researcher, Can Tho University Co-Founder, Mekong Environment Forum (MEF)

Nguyen Minh Quang is a geopolitics researcher at Can Tho University and co-founder of the Mekong Environment Forum (MEF). His research interests include dispute management (South China Sea disputes), environmental security issues in the Lower Mekong Subregion, Vietnam politics and Education

for Sustainability. He has (co-)authored a number of book chapters and articles published by Springer, Routledge, and ISI/Scopus-indexed journals. Quang is also contributing to The Diplomat and East Asia Forum. A scholar-practitioner of interdisciplinary studies, Quang is keen to combine his intellectual capacity with his desire to serve for his sustained goal of advancing environmental justice and security, grassroots climate action, and democracy in science in the Lower Mekong Delta.



Dr. Henry Chan *Visiting Senior Fellow, CICP*

Dr. Henry Chan completed his university degree in Engineering from The University of the Philippines, MSc in Biopharmaceutical from The University of New South Wales and PhD in Management from Singapore Management University. He is a businessman turned to scholar work with

extensive experiences in agriculture, hotel management, manufacturing, banking, and investment. Dr. Chan is the senior visiting research fellow of Cambodia Institute for Cooperation & Peace. His research interest is Chinese economic development, 4th Industrial Revolution technology & ASEAN economic development. He is an op-ed writer for China Daily, Manila Times and active in conferences and seminars on topics ranging from climate change, international geopolitics to digital transformation.



Dr. Raimund Weiss Senior Research Fellow, CICP

Dr. Raimund Weiss is Dean of the Faculty of Economics and Administrative Sciences (EAS) and Assistant Professor of Political Science and International Relations at Paragon International University. Additionally, he is a Board Member of the Paragon International University Research Committee and Senior Research Fellow with CICP. He has been engaged in research on Cambodia

since 2000 when he first visited the country and has been publishing articles, reports, and studies on varied-thematic issues. Dr. Weiss graduated from the University of Innsbruck/Austria with a M.A. and a Ph. D in Political Science. Before moving full-time into the education and research sector, he worked for election observer missions of the Organization for Security and Cooperation in Europe (OSCE) and the EU in post-conflict and developing states of Europe, the Caribbean, Africa, South- and Southeast Asia.



Tom Fawthrop *Freelance Journalist & Film-Maker*

A London-born author, journalist and film-maker, Tom Fawthrop has extensively covered the developing world, working in Southeast Asia since 1979. He has witnessed many of Asia's key historical events including the 'Peoples Power' in the Philippines that toppled the Marcos dictatorship (1986), the rebirth of Cambodia after the Khmer Rouge and UNTAC the UN's peacekeeping operation (1991-3) and the destruction of Dili, East

Timor 1999, in the wake of a UN referendum on Indonesia's annexation and their bid for self-determination.

A regular SE Asia contributor for the Guardian/ the Economist in the United Kingdom, Tom has also worked as a filmmaker during his many years living in Phnom Penh, Cambodia; Manila, the Philippines and Chiang Mai, Thailand. His main focus has been on the immense importance of the Mekong to 70 million people, who depend on the vast range of benefits derived from a healthy free-flowing river, and damage being done by a cascade of dams.

His films on the Mekong include Where Have All the Fish Gone? Killing the Mekong Dam by Dam & A River Screams for Mercy. His Eureka documentary is called The Last Undammed River, which is based on another major river in the region, the Salween aka in Myanmar the Thanlwin River that has so far resisted the long reach of hydropower.

He is also a research associate with the Regional Center for Social Science and Sustainable Development (RCSD) CMU Chiang Mai University

Dr. Daniel Schmücking



Country Director Konrad Adenauer Foundation's (KAS) office in Cambodia

Daniel Schmücking was born in 1982 in Germany. He studied political science and sociology at the Friedrich Schiller University in Jena (Germany) and the Palacky University in Olomouc (Czech Republic). His professional and scientific focus is on political communication and election campaigns. He worked as a

campaigner for the Christian Democratic Union (CDU). In his dissertation he devoted himself to the topic of the effects and development of negative political advertising in Germany. As part of his doctoral studies, he spent time at the University of Maryland (USA) and the University of California (USA). He taught at universities in Jena (Germany), Erfurt (Germany) and Budapest (Hungary). From 2015-2017, he headed the Konrad Adenauer Foundation's (KAS) office in Mongolia. Since the beginning of 2018 he has been country director of KAS in Cambodia. In the beginning of 2021, he went on a special mission to become the campaign manager of CDU for the elections in the free state of Thuringia.



Dr. Mak Sithirith *Water Governance Specialist*

Mak Sithirith obtained his Ph.D. in Geography from the Department of Geography, the National University of Singapore in 2011. In 2014 he pursued a post-doctoral fellow on transboundary water governance and climate change impacts in the Lower Mekong Basin at the UNESCO-IHE Institute for Water Education in the Netherlands.

He has more than 25 years of work's experience in program management, research, and policy engagement in the development sector including environment, fishery, water, and the Mekong related issues with numbers of institutions such as EU, CDRI, WorldFish, ADB, and UNDP. His research interests are river basin development and management, specifically within the Tonle Sap and Lower Mekong basins, natural resource politics and governance, water security and aquatic resources governance. He has published a number of publications related to water governance, fisheries, Tonle Sap and Mekong.

THE ESSENCE OF THE MEKONG-US PARTNERSHIP*

H.E. Amb. Pou Sothirak** Executive Director Cambodian Institute for Cooperation and Peace *******

In recent years, the Greater Mekong Subregion has experienced an unprecedented flourishing of bilateral activity and the establishment of myriad new institutions seeking to resolve the wide range of challenges confronting the subregion while supporting its growth, sustainable development, human security, and – most importantly – the long-term viability of the Mekong River. Unless we act now to come up with new solutions based on trust, good faith and enhanced cooperation among the lower basin states and all external development partners and work cooperatively to safeguard the Mekong River's delicate natural ecosystem, we will not be able to strike the right balance between the maintenance of national interests and the promotion of region-wide benefits in the development of each member country. If we fail to collaborate, we will have to bear collective responsibility for widespread societal and environmental deterioration throughout the entire Mekong Basin.

There are an increasing number of initiatives and mechanisms where external powers engage Mekong countries with certain similarities in terms of infrastructure advancement, human resource development, and poverty reduction; however, they differ in the modeling of their development policies towards the Mekong subregion as each of these frameworks function separately with the Mekong countries in an uncoordinated way. They hardly bring other relevant stakeholders to the table to discuss project design or implementation. They do not share their concerns or jointly address water related transboundary challenges and therefore lack a spirit of collaboration among external donor, restricting their ability to open up to more inclusive approaches and seek out new opportunities for state actors to engage collaboratively in assisting the five Mekong countries to meet their development needs in sustainable and holistic ways. This tendency tends to spawn mutual distrust and misunderstanding, and the breeding of greater animosity makes Mekong regional-wide cooperation nearly impossible. Without appropriate coordination, competition is sure to increase friction among states and conflicts may arise that threaten peace and security of this region.

^{*} In the interest of full transparency, the Cambodian Institute for Cooperation and Peace is a partner institution of the Mekong-US partnership and listed as such on the Partnership's webpage: https://mekonguspartnership.org/partners/

On a certain level, such an intense global interest in the subregion and the concomitant support provided is a point of pride, i.e., a recognition of its importance in global chains of production, the deep respect held for the river and its dependent communities by the international community, and the centrality of the subregion in the future Asian development. At the same time, this laser-like focus on the subregion also depicts its distinct, central role in a changing geopolitical environment, one marked by increasing Sino-American rivalry and a perceived competition for hegemony between great powers. It is within this broad context and against these distinct narratives that the question of the role and meaning of the Mekong-US Partnership ("The Partnership" or "MUSP" as it is commonly referred to in policy circles) is explored herein.

It is appropriate to say that the United States' engagement in the Mekong is on the rise. Thus, MUSP receives new meaning after its launch in September 2020. Collaboration between the U.S. and the five mainland Southeast Asia is now broader, deeper, more strategic, and better resourced, reflecting the importance attached by the U.S. to the Mekong subregion and Washington's commitment to the Mekong partners. With the MUSP in place, the U.S. aspires to be a good partner to Cambodia, Laos, Myanmar, Vietnam and Thailand and firmly committed to the autonomy, economic independence, good governance, and the sustainable growth of Mekong partner countries. According to David R. Stilwell, U.S. Assistant Secretary, Bureau of East Asian and Pacific Affairs, "*the United States is committed to supporting the countries of the Mekong Region to ensure the river remains healthy and vibrant, sustaining generations far into the future.*"¹

Defining the essence of any institution is always a challenge – particularly one as expansive as MUSP. However, moving beyond contemporary frames and press releases and taking a deeper, historical perspective – the most central modifiers for MUSP are "continuity and collaboration." While launched in September 2020, MUSP builds upon Washington's prior Lower Mekong Initiative (LMI), an initiative that over the course of 11 years provided \$3.5 billion in support from USAID and the U.S. Department of State to Cambodia, Laos, Myanmar, Thailand, and Vietnam. The United States is by no means a "new entrant" into the subregion and MUST's laundry list of strategic initiatives both builds off of and expands upon prior support to the subregion and Washington's significant footprint in areas as diverse as health, infrastructure, energy, and humanitarian assistance, just to name a few.

At the same time, the LMI was established during an albeit recent, although quite different period in the history of the subregion. Global attention and interest in the region while significant were not nearly as deep as they are today. At the same time, the challenges confronting the sustainability of the river at the time were different. According to the Mekong Dam Monitor, a joint project of the Stimson Center and Eyes

¹ See Opening Remarks by Assistant Secretary Stilwell Indo-Pacific Conference on Strengthening Transboundary River Governance https://kh.usembassy.gov/opening-remarks-for-assistant-secretarystilwell-indo-pacific-conference-on-strengthening-transboundary-river-governance/

on the Earth, it was only in mid-2012 that the deep and severe impacts of the upstream damming of the river began to alter the flow of the river severely and threateningly, with concomitant impacts on sediment flow rates, salinization, and fish stocks that have become only more severe as time has passed.² The models developed, with a very high level of confidence, depict the genuinely dangerous situation that the river today confronts – and with those dynamics altered, institutions such as LMI have also need to adapt (in this instance maintaining continuity of presence and support but in the form of MUSP) in order to meet new needs and even greater challenges.

At the same time, and perhaps even more essential is the question of "coordination." Development work and multi-national engagement in general has long been bedeviled by this question, i.e., institutions with similar goals working without clear focal points for collaboration; straightforward and shared commitments to common goals (and the mechanisms to achieve them); and even, at times, working at cross purposes leading to outcomes antithetical to mooted goals and significant negative externalities. It is in this area that MUSP is notable for making a much-needed leap forward – both in terms of its development of partnerships as well as its recognition of the importance of a "bottom-up" approach to the future of the subregion, one that engages a wide range of actors and makes a clear commitment to ASEAN and the principle of ASEAN Centrality.

While it would be fundamentally incorrect to ignore the reality – openly stated by MUSP – that it is consistent with Washington's Indo-Pacific vision and fits within that framework, the amount of space created for real, fresh collaboration cannot be ignored. While continued support for and partnership with the Mekong River Commission (MRC) is to be expected in light of Washington's long-running support for the MRC and the vital role it serves in the governance of the Mekong – several other areas of collaboration are very much worthy of note.

First is MUSP's approach to engage closely and develop complementarities with the Ayeyawady-Chao Phraya-Mekong Economic Cooperation Strategy (ACMECS) – a point emphasized and underscored in 2021 by various ACMECS officials. At the same time, there is a clear upgrading of collaboration between Tokyo and Washington in the form of the Japan-U.S.-Mekong Power Partnership (JUMPP), with a joint statement having been issued setting out expanded cooperation in the areas of energy sector governance capacity building and private sector investment in the energy sector – supporting both ACMECS and ASEAN Power Grid programming. The Mekong Water Data Sharing Initiative – comprising partnerships with over 60 government and civil society partners is also a welcome initiative and underscores Washington's emphasis on bottom-up initiatives. This is further supported by the growing number of subregional civil society partners with whom MUSP is deepening relationships. MUSP has already

² See the flow models at Mekong Dam Monitor: https://www.stimson.org/project/mekong-dam-monitor/

announced a series of "Partnership Policy Dialogues" at the track 1.5 level taking place over the course of 2021-2023.

As other institutions focused on the Mekong examine their own engagement and models, MUSP sets a somewhat higher bar in developing concrete engagement with subregional institutions and moving away from "top-down," state-to-state models that are either unwilling or unable to give seats at the table to civil society and grassroots actors that maintain both a vital stake in the future of the river and have much needed on-the-ground knowledge that is able to support efficacy and efficiency in programming and programmatic decision-making.

Washington was heavily criticized – across the board in Southeast Asia - during the Trump administration for its "go it alone" approach and perceived slights to ASEAN and long-standing bilateral partners, MUSP (while noting its establishment during the prior administration) provides the United States with a fresh opportunity to "shuffle the deck" and to demonstrate its both its continued commitment to the Greater Mekong Subregion as well as to take the lead in developing new modalities of cooperation and collaboration at the bilateral and multilateral levels. If implemented correctly – and, as noted above, the path so far has been quite positive – there is a genuine possibility to break the logjam of fragmentation among the competing (a term used advisedly, if cautiously) subregional institutions and to facilitate a new era of subregional cooperation.

At the same time, in light of the realities of "continuity," it is important to recognize that MUSP as an institution has set out a programmatic agenda that does not seek to replace any other actor, but as others have noted, ensures a place for the United States in supporting the subregion and engaging with all other bilateral and multilateral Mekong partners, at the state and civil society levels. However, the jury is still out as to whether it will be seen as such by other actors, some of whom have strongly framed MUSP as an exclusionary initiative – although such a framing is understandable in light of the goals and national interests of certain actors in seeing the U.S. exit the subregion entirely.

While the questions of collaborative focal points, trust building, and confidence building measures and their development will inevitably be of interests to scholars working in the area of international relations – for the states of the Greater Mekong Subregion they are not simply theoretical, rather they are existential to all concerned. The tens of millions of people of the subregion look forward to both observing and actively shaping – through their governments, civil society, academics, and think tanks – the future of MUSP and its programming.

REGIONAL VALUE CHAINS AND THE RCEP AGREEMENT: IMPLICATIONS FOR THE MEKONG COUNTRIES POST-COVID-19

Sanchita Chatterjee*

Team Leader and Program Specialist Trade and Investment Facilitation Department, Mekong Institute

The Mekong countries - Cambodia, Lao PDR, Myanmar, Thailand and Viet Nam - are interlinked through formal and informal trade and investment, various agreements, frameworks and initiatives to enhance cross-border trade and investment such as border special economic zones, Greater Mekong Subregion economic corridors and Cross-border Transport Facilitation Agreement, and newer initiatives such as promotion of cross-border e-commerce and digital economy (MI, 2020; ADB, 2018; ADB, 2015; ADB, 2021b).

The five Mekong countries are also a party to the Regional Comprehensive Economic Partnership (RCEP) agreement. The RCEP agreement was signed in November 2020 by the 10 Members States (MS) of the Association of Southeast Asian Nations (ASEAN) and five dialogue partners with whom the ASEAN has preexisting free trade agreements (i.e. Australia, China, Japan, Republic of Korea (ROK) and New Zealand). The resurgence of the COVID-19 pandemic in mid-2021 in the RCEP parties, however, has delayed the the entry into force of the RCEP agreement (Thanjavelu et al, 2021; EIU 2021).

The RCEP was signed after the pandemic began, which has had widespread negative effects on the economies around the world, including in the Mekong countries. Table 1 shows Cambodia, Lao PDR and Thailand suffered contractions, and Myanmar and Viet Nam experienced declines in growth of their gross domestic products (GDPs) in 2020. Myanmar is expected to suffer a GDP contraction in 2021 too. Economic declines have adversely affected cross-border trade and investment flows between the Mekong countries and may bring in lasting changes in their regional and global value chains (R-GVCs). The Mekong countries have deployed economic recovery efforts as part of their national recovery plans and within the overall framework of ASEAN Comprehensive Recovery Framework (ACRF) (IMF, 2021; ASEAN, 2021).

^{*} Ms. Sanchita Chatterjee is currently working as the Team Leader and Program Specialist of Trade and Investment Facilitation Department, Mekong Institute and a trade policy specialist by training and professional experience.

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Country	2019	2020	2021	2022
Cambodia	7.0	-3.5*	4.2*	6.0*
Lao P.D.R.	4.7	-0.4*	4.6*	5.6*
Myanmar	6.8	3.2	-8.9*	1.4*
Thailand	2.3	-6.1	2.6*	5.6*
Vietnam	7.0	2.9*	6.5*	7.2*

Table 1Percentage Change in Gross Domestic Product, Constant Prices

Source: International Monetary Fund, World Economic Outlook Database, April 2021 * Estimated figures

The RCEP is expected to aid in post-COVID recovery, among other ways, by aiding in structural transformation of industries of the RCEP parties through R-GVCs. Particularly, less developed RCEP parties such as Cambodia, Lao PDR and Myanmar are expected to benefit as their companies would undertake measures to undergo digital transformation and pandemic-induced adjustments in R-GVCs, such as re-shoring, back-shoring and near-shoring (Thanjavelu et al, 2021; ADB, 2021a).

Against this background, the paper examines the following questions:

- 1) The degree to which the Mekong countries are linked to the other RCEP parties through trade in goods through R-GVCs as existing linkages would determine the impact of the RCEP.
- 2) Whether the strength of existing R-GVC linkages between the Mekong countries could revive the economies from the adverse impact of COVID-19.

Overall Trends in Trade and Trade in Value Added

Cambodia, Lao PDR and Myanmar are relatively less important players than Thailand and Viet Nam in overall trade between the RCEP parties. China by far is the largest trading partner of the Mekong countries, followed by the ASEAN and has experienced the greatest increase in bilateral trade. Within this, Viet Nam has increased its trade with China by a huge margin: by 540% – from US\$ 30 billion in 2010 to US\$ 192 billion in 2020 (Figure 1).



Figure 1 *Trade between the Mekong countries and the RCEP Parties in 2010 and 2020*

In R-GVCs, goods for intermediate consumption (or intermediate goods) are traded between countries - often several times when value is added to goods in every stage in different countries - before these are transformed into goods for final consumption (UN, 2016). Higher trade in intermediate goods gives rise to greater value added and is an indication of high degree of R-GVC linkages for an economy. However, higher trade in intermediate goods may not imply greater gains from trade, as this section would explain.

Mekong countries' trade in intermediate goods with the RCEP countries more than doubled between 2010 and 2020, with exports increasing at higher percentages than imports. Within this, trade in intermediate goods between the Mekong countries and China, ROK and the ASEAN increased by approximately three times, two-and-a half times and almost one-and-half times, respectively. Whereas trade in intermediate goods between the Mekong countries and Australia fell between 2010 and 2020 and with the other RCEP countries increased by less than 20%. The Mekong countries, other than Thailand, increased their exports and imports with China, ROK and the ASEAN. Import of intermediate goods by Cambodia from Japan and Australia, and by Lao PDR from Australia increased by enormous percentages.

Reporter/ Partner	Flow	China	Japan	ROK	Australia	New Zealand	ASEAN	RCEP
	Import	1138.2	120.7	415.2	-51.3	67.9	151.8	420.8
Viet Nam	Export	491.5	117.9	500.6	226.0	-1.8	100.3	299.7
	Trade	671.9	119.1	481.4	47.3	18.0	114.1	337.5
	Import	33.5	5.9	14.7	-13.0	34.6	2.4	12.0
Thailand	Export	159.2	-27.1	5.3	-51.5	-5.2	13.0	14.5
	Trade	76.3	-17.4	8.7	-31.9	18.6	5.1	12.3
	Import	636.4	147.6	310.6	952.1	-5.0	-4.4	129.0
Myanmar	Export	359.8	221.6	23.2	52.0	254.7	150.6	222.1
	Trade	443.4	197.6	35.6	59.5	190.6	65.2	180.4
	Import	510.3	15223.8	206.5	13600.5	-9.7	719.7	713.3
Cambodia	Export	470.5	430.5	25.9	272.1	68.4	119.9	184.2
	Trade	473.0	837.7	39.2	637.4	60.9	181.3	233.4
Lao	Import	207.8	147.4	54.0	7008.6	168.2	225.9	220.9
People's	Export	532.6	66.2	-50.9	-0.2	-4.0	122.1	160.1
Dem. Rep.	Trade	274.2	94.2	-22.1	507.2	63.3	171.9	193.6
All	Import	263.4	39.1	181.0	-22.8	38.9	36.2	106.3
Mekong	Export	350.3	0.1	280.2	4.9	-2.3	56.3	123.1
countries	Trade	306.5	12.6	252.3	-10.1	19.1	45.2	114.7

Table 2Percentage increase in Trade in Intermediate Goods between 2010 and 2020

Source: UNCOMTRADE

OECD TIVA database provides data on trade in value added classified by their origin, demand and exports. Though the latest statistics from the database dates to 2015, since supply and value chains take years to establish and change, the analysis of OECD TIVA data would provide an accurate approximation of the current situation. Figure 2 illustrates value added from the Mekong countries and China as percentages of value added from the world in domestic demand of the RCEP parties (data on Lao PDR and Myanmar are not available). These are a measure of backward linkages between the RCEP parties and, the Mekong countries and China. Backward linkages (when products from other countries are used in production in a certain country) contain foreign value added content and forward linkages (when products from a country is used in other countries) contain domestic value added.

The RCEP parties had the highest degree of backward linkages with Thailand, followed by Viet Nam among the Mekong countries However, the highest backward linkages the RCEP parties, including the Mekong countries, had were with China (25% for Viet Nam and 27% for Cambodia). Viet Nam and Thailand had relatively less backward linkages with the Mekong region (less than 4% shares in their domestic demand). Cambodia had relatively more backward linkages with the other Mekong countries.

Figure 2





Source: OECD TIVA Database

Calculating the origin of goods in trade between the RCEP parties, it can be seen that greatest percentages of goods originated in Thailand (3 to 23%) followed by Viet Nam (2 to 10) (Figure 3). China, followed by the ASEAN and Japan, used the largest proportion goods produced in the Mekong countries, among the RCEP parties. This demonstrates China's relatively high degree of backward linkages with the Mekong countries. However, the RCEP parties' backward linkages with the Mekong countries were still quite small compared to that with China (28-42%) and the ASEAN (18-24%) (Chatterjee, 2021).

Figure 3

Percentage of Goods Originating in the Mekong Countries in RCEP countries exports to other RCEP countries, 2015



Source: OECD TIVA Database

Whereas China established itself as the leading RCEP partner in R-GVCs, its gains from trade in goods in R-GVCs were modest. One way of measuring gains from trade in R-GVCs is by calculating the ratio of forward to backward linkages, as it indicates relative value added accrued to an economy (Banga, 2013). As Table 3 shows, Australia and Japan relatively gained more from trade in goods in R-GVCs than China. China, however, relatively gained vis-à-vis the Mekong countries and Thailand vis-à-vis Viet Nam. Overall though Cambodia, Thailand and Viet Nam did not relatively gain from trade in goods in R-GVCs.

	ASEAN	Australia	China	Japan	Cambodia	Republic of Korea	New Zealand	Thailand	Viet Nam
ASEAN		0.39	0.7	0.36		0.91	1.11		
Australia	3.17		4.1	3.22	2.00	6.84	1.33	3.88	4.23
China	1.77	0.24		0.52	6.67	0.98	0.95	2.29	6.51
Japan	3.32	0.31	1.9		2.00	4.54	0.89	5.83	4.17
Cambodia	1.81	0.50		0.34		0.50	0.53	1.17	4.71
Republic of Korea	1.27	0.15	1	0.22	1.43		0.61	1.84	4.73
New Zealand	1.09	0.75	1.1	1.13	3.33	1.72		1.16	2.67
Thailand	0.85	0.26		0.17	0.91	0.54	0.86		2.75
Viet Nam	0.48	0.24		0.24	0.22	0.21	0.41	0.36	

Table 3Ratio of Forward to Backward Linkages in GVCs, 2015

Source: OECD TIVA Database

Sectoral linkages

In this section the sectoral linkages of R-GVCs of the RCEP countries are examined by analyzing the percentage value added in exports of particular industries of the Mekong countries from goods originating from the RCEP parties. Overall, goods originating from China contributed the greatest value added in Thailand (in computer & electronics, machinery and automotive- Table 4), Cambodia (textiles, computer & electronics, machinery and all manufacturing industries – Table 5) and Viet Nam (textiles, computer & electronics, machinery, and all manufacturing – Table 6) indicating high backward linkages these industries from the Mekong countries had with China.

Machinery and automotive industries of Thailand had relatively high backward linkages with Japan, computer & electronics, and machinery from Cambodia with the ASEAN and computer & electronics, and machinery from Viet Nam with ROK as well. Backward linkages among the Mekong countries, however, were weak.

Table 4

Percentage of Value added in	Exports from	Selected	Industries in	Thailand	of Goods
Originating in the RCEP cou	ntries				

Thailand	Textiles	Food	Computer & Electronics	Machinery	Automotive	All Manufacturing
Australia	0.39	0.45	1.12	2.75	1.68	1.46
Japan	1.91	1.18	5.93	9.72	10.27	5.49
Korea	0.74	0.40	2.20	2.35	1.89	1.56
New Zealand	0.06	0.16	0.04	0.08	0.06	0.08
Cambodia	0.07	0.26	0.15	0.08	0.10	0.11
China	6.41	2.61	14.64	13.91	11.26	9.17
Thailand	77.69	83.51	52.52	46.79	53.28	59.59
Viet Nam	0.36	0.28	0.35	0.50	0.52	0.40
Other ASEAN than Thailand	2.43	2.16	6.03	4.48	4.66	4.49

Table 5

Percentage of Value added in Exports from Selected Industries in Cambodia of Goods Originating in the RCEP countries

Cambodia	Textiles	Food	Computer & Electronics	Machinery	Automotive	All Manufacturing
Australia	0.00	0.25	0.77	0.86	0.38	0.34
Japan	0.08	0.99	2.34	2.75	6.12	1.38
Korea	0.59	0.72	2.54	2.71	3.63	1.46
New Zealand	0.00	0.04	0.04	0.03	0.02	0.03
Cambodia	79.85	80.66	62.34	60.94	62.84	65.11
China	14.49	5.07	10.26	10.01	9.07	16.27
Thailand	0.58	2.16	6.88	7.29	4.49	3.08
Viet Nam	1.31	0.98	1.40	2.20	1.00	1.52
Other ASEAN than Cambodia	2.18	5.28	10.76	11.88	7.00	6.26

Table 6

Viet Nam	Textiles	Food	Computer & Electronics	Machinery	Automotive	All Manufacturing
Australia	0.44	1.04	0.64	1.55	0.01	0.87
Japan	2.81	2.11	4.49	6.84	1.89	3.54
Korea	5.11	2.72	10.73	8.29	2.29	5.57
New Zealand	0.06	0.20	0.03	0.04	0.00	0.08
Cambodia	0.19	1.01	0.02	0.05	0.00	0.30
China	19.38	6.58	21.19	22.42	2.55	15.91
Thailand	1.69	1.58	1.03	1.51	0.93	1.63
Viet Nam	53.85	62.36	37.67	36.51	90.53	51.77
Other ASEAN than Viet Nam	3.85	5.40	5.62	4.68	1.23	4.77

Percentage of Value added in Exports from Selected Industries in Viet Nam of Goods Originating in the RCEP countries

The takeaways from this analysis are as following:

- China is the largest trading partner of and had the greatest degree of R-GVC linkages with the Mekong countries by various measures. However, the Mekong countries had a relatively high degree of backward linkages with China, which in turn implies, the Mekong countries have gained less from their linkages with China. China's close R-GVC linkages with the Mekong countries is an outcome of strategies have been adopted by China and the ASEAN (including the Mekong countries) over the years to forge closer economic relations. (Chatterjee, 2021)
- In comparison, the Mekong countries are relatively less linked among themselves through R-GVCs. Though the RCEP parties' backward linkages with Thailand were higher than that with the other Mekong countries, RCEP-Thailand trade in intermediate goods has grown by lesser percentages than that of RCEP-Cambodia or RCEP-Viet Nam. Therefore, Thailand is becoming a less important player in R-GVCs of goods in the RCEP. Further, Thailand's gains from trade in goods in R-GVCs have been insignificant, except vis-à-vis Viet Nam.
- As compared to Thailand, Viet Nam has been less linked with R-GVCs. Though Viet Nam too has not gained from trade in goods in R-GVC linkages, its share

in trade in intermediate goods has significantly increased, indicating Viet Nam becoming a more important player in R-GVCs involving goods in the RCEP.

- Cambodia is an interesting case as it has relatively high backward linkages with Thailand and Viet Nam but backward linkages of the RCEP parties with Cambodia is weak. Cambodia imports of intermediate goods especially from Japan and Australia have substantially increased. It is not clear whether Cambodia will gain from its increased participation in R-GVCs because if it is engaged in simpler processing of goods, very little benefits will accrue to its economy (Li et al, 2019). The case of Lao PDR may be similar to Cambodia as Lao PDR's import of intermediate goods too have greatly increased, particularly from Australia.
- Computer & electronics, machinery and automotive industries of the Mekong countries had high backward linkages with the RCEP parties. Except in a few cases, food and textiles had relatively less R-GVC linkages. This corroborates with findings of other studies on the industries that tend to be more integrated through R-GVCs (World Bank, 2020).

To conclude, the RCEP may not bring immediate gains for the Mekong countries because 1) its entry into force has been delayed while the countries are reeling from economic declines due to COVID-19 and, 2) linkages and gains from trade in goods in R-GVCs the Mekong countries had with the other RCEP parties have been weak. While the Mekong countries have become important players in trade in intermediate goods, it is not clear whether this would bring gains for their economies as till now their backward linkages with the other RCEP parties have been strong, which do not lead to gains from trade for the economies. For the Mekong countries to gain from trade in goods in R-GVCs, forward linkages should be strengthened.

The ACRF recognizes there is a need to rethink R-GVCs and increase intra-ASEAN trade and investment to increase supply chain resilience. The findings of the current paper too suggest a re-think and re-building of R-GVCs to increase gains from trade in R-GVCs for the Mekong region. Specific attention should be provided to the industries which have been traditionally more integrated with R-GVCs. Further, efforts must be made to ensure, in particular Cambodia, Lao PDR and Myanmar, do not become destinations for simple processing. By adopting suitable strategies to restructure their economies and attract the kinds of investment that lead to higher gains from trade from R-GVCs, these countries should be moved up the value chains.

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OF LENDING AND LONG-TERM LIABILITIES: CHINA, CAMBODIA, AND THE VAICO IRRIGATION PROJECT

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An Overview: Agriculture, Irrigation, and Investment

Agriculture continues to play a significant role in the Cambodian economy and in the livelihoods of myriad Cambodian households. According to the Cambodia Inter-Censal Agriculture Survey (2019), there were 1,726,000 agricultural holding households in the kingdom, of which 61% grew or raised agriculture and livestock for personal consumption and 39% for sale. The burden of responsibility on this sector has of course increased in part due to the complex societal, economic, and health effects of the Covid-19 pandemic; whereby, the number of households returning to some form of agricultural practice for support or subsistence has increased (Angkor Research Cambodia and Future Forum, 2020). More to this point, and in terms of personal income, over two-thirds of households are dependent on agricultural income to at least match their other household income streams.

In 2020, the agriculture sector alone accounted for 22.84% of the kingdom's GDP¹. Alongside the kingdom's robust average economic growth rate of 7.7% over the past decade, the agricultural sector has paralleled with its own halcyon expansion of 5%, between 2004 and 2013, (World Bank, 2015) before continuing a rather more modest trajectory of 1% per annum thereafter (Lao, 2019). One interpretation here is that the high growth that benefited from the introduction of new technology, favourable weather conditions, improved regional integration, and rapid land expansion (ibid) – incentivised by increasing international commodity prices (World Bank, 2019) – made way for slow growth lumbered by extreme weather and a slowdown in agricultural productivity. In particular, the following factors have been attributed to the slowdown: poor infrastructure related to irrigation; inadequate transport networks; and slow adoption and assimilation of best-technological practice (World Bank, 2015).

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¹ Data from World Bank (2021)

It is in the former of these three features that this commentary provides discussion. Irrigation and the development of irrigation systems are inevitably vital for Cambodian agriculture and farmers, and investment therein is a necessity. In fact, irrigated agriculture is measured to be, on average, at least twice as productive per unit of land as agriculture left to rain alone. The role of irrigation goes even beyond the ability to maximise crop yields (and the food security and rural development goals this supports), and into the arena of maximising net benefits around ecosystem protection and environmental repair (FAO, WorldFish, and IWMI, 2020).

Cambodia does of course feature an abundance of freshwater resources, notably The Mekong River and the Tonle Sap Lake. Remarkably, however, 95 percent of the water in the country is used by agriculture (MoWRAM, 2012). An overabundance of water in the wet season is juxtaposed by an increasing shortage in the dry season where the kingdom has been particularly vulnerable to severe drought playing out under shifting climate change patterns. The interplay of flood and drought results in damaged agriculture and adverse effects of household health and income (Sithirith, 2017). Specifically, flooding and drought are associated with losses to agricultural production at 62% and 36% respectively over the past 20 years (GSSD, 2017).

In recognition of the effects, and in proactivity to address, the Royal Government of Cambodia has prioritised climate financing through a combination of domestic and external financial resources (ibid). Regarding the former, the Government budget funds around one quarter of climate-related public expenditures, with a strong focus on irrigation and climate-resilient road networks. In addition, external financing has continued to grow from partners including China, Japan, and the EU.

Given the underpinning importance that irrigation plays in supporting Cambodia's agricultural development, and in mitigation of the adverse effects of seasonal and global climatic shifts, large-scale irrigation projects (particularly those incurring government expenditure) need to be carefully considered. Particularly with respect to the source and conditionality of any financial support, and the composition of the contracting parties such that projects are in line with international standards around sustainability, value for money, and the avoidance of negative externalities. Moreover, in pursuit of these ideals, the principle of transparency must be held paramount to ensure that stakeholders have the ability to undertake informed, monitored, and reviewed actions towards a more prosperous sector benefiting from targeted and suitable investment.

However, where public investment and development meet there are oftentimes governance gaps experienced in the expedition of economic benefit accrued from the address of a social or developmental issue. Cambodia is no different in this context. It is therefore helpful to objectively examine the role of public investment cases in this space to help policy makers understand the interplay between development and liability in this space.

Of interest, and motivation to this commentary, a development in this evaluative space has been made with the launch of the Belt and Road Initiative Monitor: a resource developed by civil-society organisations based in Southeast Asia and the Pacific to track and promote transparency surrounding regional BRI projects (BRI Monitor, 2021)². The Vaico Irrigation Case Study discussed below has been developed into a report for this resource and produced by Cambodian think-tank Future Forum³.

Vaico Irrigation Project

The Vaico Irrigation project is a case in point. This initiative has been described as Chinese Official Assistance (ODA) or simply as "Chinese aid" to Cambodia since its inception (ODA Database, 2021). The project was funded by the Chinese Exim Bank, via a US\$200 million concessional loan, implemented over two development phases (AIDDATA, 2021). Built across the eastern provinces of Svay Rieng, Kampong Cham, and Prey Veng, the first phase was fully completed in 2018, while the second phase is intended to finish by the end of 2021 (ODA Database, 2021).

Since China provided concessional loans, not grants to the Vaico Irrigation project, Cambodia's government has to repay the loan with a fixed interest rate of 2 percent over an amortization period of 13, according to CDC's ODA Database. Surprisingly, one of the three budget packages set out by the Council for the Development of Cambodia (CDC), part II of phase II, USD 35,199,143, was later listed as a non-concessional loan according to an update to CDC's ODA database made in April 2021. If this is the case, the kingdom no longer enjoys the low interest rate and the project cannot be considered as ODA.

At the same time, Chinese support for the Vaico irrigation project qualifies as fully "tied aid, i.e., official grants or loans that limit procurement to firms from the donor country (OECD, 2021). To be more precise, recipients of tied aid do not have the ability to search for the best cost provider; rather the pool of potential suppliers is limited to firms from the donor country to construct or implement the projects. This is a barrier for recipient countries to ensure value for money and can result in higher project construction and/or maintenance costs. Vaico Irrigation is not alone as one of China's tied aid projects. Comparing CDC's ODA database among various Cambodia development partners,

² The BRI Monitor is an open-source resource platform can be found at https://www.brimonitor.org/

³ Future Forum is an independent think tank generating new policy thinking for a new Cambodia, with a mission to nurture a community of young thinkers, develop positive policy solutions and engender critical debate.

China stood out as the only 100% tied aid provider over the last decade - a disconcerting pattern to say the least. The challenges are magnified by serious questions raised as to the overall efficacy and sustainability of the initiative.

The first completed phase of the project was reviewed by journalists at *The Mekong Eye*, a publication based in Bangkok. They found that the Vaico irrigation project had not yet managed to irrigate a single hectare for more than a year after completion. In July 2018, at the height of the wet season when the canals should have been at peak flow, so little water was observed in the canals that they could not deliver irrigation to fields as prescribed - leading these journalists to severely question their effectiveness.

This outcome is not surprising to many researchers. An independent evaluation by the Asian Development Bank (ADB) from 1998 to 2008 raised concerns over the lack of tailoring projects to Cambodia's unique hydrological system, citing it as a major cause of the failure of large-scale irrigation projects to date. This study also urged Cambodia to move to smaller-scale projects that account for geomorphological nuances for better effectiveness. A local think tank, the Cambodia Development Research Institute's (CDRI), shared similar concerns in a 2017 paper over the casual design of irrigation projects and their lack of accommodation of Cambodia's hydrological and geological realities. Their study showed that 1,547 of 2,525 irrigation schemes did not function, 807 partly functioned, and only 149 functioned well. These projects primarily sought to renovate pre-existing irrigation systems from the Angkorian or Pol Pot period, which often failed to tackle water shortage issues. The same paper also pointed out the poor management by a large range of stakeholders without clearly defined roles. At the outset of analysis of the Vaico project, it would have been logical to assume Vaico would encounter similar challenges to previous, failed large-scale irrigation projects. The questions as to why this project moved forward seemingly in direct contradiction to an abundance of prior data on the topic require answers.

Pathways Forward

Vaico Project's pattern could be categorized as a "white elephant project" in that the expenditure did not result in the outcomes anticipated and projects of this sort were previously red flagged by other institutions as likely to be problematic. By contrast, so far as this project concerns public procurement, Chinese investment, in this case, appears to be above board with respect to utilising the government procurement system. The Vaico irrigation project demonstrates that there is room for public procurement stakeholders to more critically assess overseas financial assistance and to better identify whether the projects funded are in the Kingdom's best interest.

With respect to public procurement practice, to make irrigation projects effective, responsible entities should be proactive in conducting local or community consultancy

and studying local conditions for both hydrological and geographical nuances (i.e, land, water). Responsible entities in this regard would be considered to be civil-society operations and educational institutions whose remit would be to provide an objective review principled in an agreed methodological framework. In addition, all stakeholders need to be engaged in clearly defined roles in order to evaluate the development and planning of irrigation mechanisms to accommodate the realities on the ground.

When we consider the kingdom's historical success with irrigation systems it must be considered that local actors are well placed to identify the needs of the system in the face of its buffeting factors. As captured in his report on land and water investment for the FAO in 2002 (and still of relevance today), H.E. Chann Sinath outlined that "from time immemorial, water management has been a primary concern for the Khmer people". In light of irregular rainfall patterns, a variety of successful irrigation and growing methods have been developed from floodplain farming to bunded field farming. A continued push by experts and consultants to seek expertise from the 'developed' abroad fails to recognise a historical expertise embedded in the culture and practice of Cambodian day-to-day living. It is perhaps time to recognise that there are spaces in which the capacity has not only been built, but is far more intuitive than its promoted alternative. The relevance to public procurement and financing here is that community networks are likely to be far more effective in meeting the needs of agricultural development aggregated to the national level. More research will need to be conducted in this space of course.

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UPSTREAM OPERATIONAL DATA IS NEXT STEP IN MEKONG GOVERNANCE

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As the end of 2021 approaches, Thailand has seen dry season sandbanks in the wet season, farmers in Tonle Sap have fretted over the length of the flood pulse, and Vietnam continues to contend with salination and erosion — all at least in part attributable to upstream hydropower dams on the Mekong mainstream. Even as last year was marked by greater sharing of data on the Mekong from the Lancang-Mekong Cooperation (LMC) mechanism, the Mekong River Commission (MRC), and various NGOs, the wet season was still marred by controversy over retention and rainfall levels.

Occasionally, Chinese authorities will issue a notice that a dam will reduce or increase flow for a period of time but that doesn't allow downstream countries an opportunity to parse potentially important operational data and prepare downstream, a continuing hazard for conservation work, the ecology, and riparian communities.

While 2020 saw Cambodia put a complete moratorium on mainstream dam construction until 2030, for much of the Greater Mekong Subregion the damage has been done. As competition for the river's resources grows — from the drought induced power shortages to the increased effort required to catch fish — more importance will likely be placed on how China shares operational data on the Lancang.

The Politics of Data

In September, China — as well as Myanmar — joined the MRC to investigate the reasons for droughts and floods that have been hitting the region, following on from the toll from the destructive 2019 droughts and years of unseasonal hydrological highs and lows. This is just the latest in a line of concessions and cooperative efforts from China to try to mitigate the effects of upstream hydropower dams, preceded by data sharing from the LMC on China's side of the border earlier this year.

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One of the more recent platforms for understanding the effects of the upstream hydropower dams has been the advent of the Mekong Dam Monitor (MDM), created by the US-based Stimson Center and Eyes on Earth. Using cloud-piercing satellite data, local hydrological measurements, and the "wetness index", the MDM is providing valuable data and warnings to downstream businesses, fishers, and NGOs to assist in protecting livelihoods and animals 48 hours in advance of an event in Thailand's Golden Triangle.

After years of requests, hydrological data on the Mekong may be said to be at least somewhat transparent, but the operational data from China's upstream dams remains a mystery, available only at China's sufferance.

As the dry season ended in July, the MRC communicated via the Dry Season Hydrological Conditions in the Lower Mekong River Basin: November 2020-May 2021 report the need for greater sharing of operational data, following yet another year of dry season lows (MRC, 2021). "For the sake of better management of the basin and of good faith cooperation, both Member Countries and China should notify any planned major changes in the operation of hydropower projects and share that information with the MRC Secretariat," An Pich Hatda, the MRC Secretariat's chief executive officer, said in a statement regarding the report.

"China does provide hourly river level data from a gauge at Jinghong below the Jinghong dam and another gauge at Man'an, But that's river level not operational data," says Brian Eyler of the Stimson Center. "If you know how to read the Jinghong gauge data however it essentially tells you how the Jinghong dam is hydropeaking but the data can be deceiving."

As an example, Eyler pointed to an event in early October, when the data seemed to suggests the Jinghong reservoir dropped and released water, but the Jinghong Dam had actually increased its reservoir volume according to satellite images — meaning the rise in river level came from upstream dam releases passing through Jinghong dam as its reservoir level raised.

China finds itself issuing denial after denial regarding its use of the river's resources, and it has been a great source of contention for downstream environmental groups and governments, who see China's "state secret" lack of operational transparency as a bar to further sustainable development.

The Jinghong Dam has been a particular point of contention in Thailand and the Golden Triangle where the river has been known to rise more than three meters in short periods. The hydrological monitoring station at Chiang Saen in Thailand is the first on the Mekong outside of China, and is a bellwether for the rest of the Lower Mekong Basin. This, however, could all be aided or avoided by real-time data sharing of operational data from China, which would give greater advanced warning, more information on river flow, and help protect wildlife and downstream agriculture.

Hydropeaking Problems

Operational notifications, such as those that occurred with the Jinghong Dam for the month of August, can help downstream communities plan and prepare for unseasonably high or low river levels, but the effects felt downstream of hydropower dams on the Lancang can be felt in the Golden Triangle in a matter of hours.

Nuozhadu, Xiaowan, and Huangdeng, which are storage dams, mean longer-term planning for the Mekong, but hydropeaking dams such as Jinghong can mean drastic changes for downstream residents. Hydropeaking meets local energy demand spikes, often during the daytime or peak production hours. Downstream, though, the effect can tragically upset local ecologies, including plants, land mammals, birds, and fish.

"In general, hydropeaking has a high impact on ichthyoplankton and juvenile age classes, which are exposed to the risk of high drift rates (during upramping events) and stranding (during downramping events)," according to the MRC, citing "Response of Fish Communities to Hydrological and Morphological Alterations in Hydropeaking Rivers of Austria" among others. Juvenile fish in particular are vulnerable to barotrauma induced by hydropeaking operations (MRC, 2017). Hydropeaking-induced flow modifications have been found as far downstream as Phnom Penh (Yoshida et al., 2020), and pose challenges for reproductive output, with some studies showing that rhithron fish around Kratie (Cambodia) may face extinction in the region.

In line with operational related erosion, conservation efforts with plants and animals are hindered by unplanned dam operations. Studies in 2020 found varying responses to hydropeaking for different plant species, with flood-intolerant species the most strongly affected, with erosion playing a major role in the survival of a number of species (Bejarano et al., 2020), including Mimosa pigra.

As cited by the MRC, more data is needed to assess the overall effects of quick releases from upstream dams on downstream ecology, but previous reports have also found drastic effects on phytoplankton, due to water temperature and nitrogen and phosphate levels on the DaNing river in China (Zhang et al., 2010).

Beach-nesting birds in the Mekong catchment area also remain vulnerable to the vicissitudes of operations on the Mekong's upstream, particularly unseasonable flooding which will see egg-filled nests inundated and destroyed (IUCN, 2013). Organizations such as the Buengkan Rak Nok in Northern Thailand have been marking

and caring for birds' nests in the region and have recorded flooded birds' nests due to unnatural hydropower operations for the last several years.

Power Shortage

Beyond issues of ecology and **erosion**, more reliable operational data from China's upstream dams could help alleviate power worries caused by an overreliance on hydropower. In the shadow of COP26 and a renewed international turn against coal-fired plants, places like Phnom Penh have growing energy needs that cannot be met by unreliable hydropower flows.

Hydropower supplied accounted for almost half of the 9,000 GWh of generated energy in 2018 in Cambodia and about one-third of the 12,000 GWh generated in 2019, according to the Electricity Authority of Cambodia, and the 2019 droughts resulted in severe power shortages. Concerns about continued growth can lead to destructive short-term installations, such as the recent generators built for a heavy fuel plant in Kandal Province in Cambodia to support power starved Phnom Penh (Keeton-Olsen, 2021).

Multilaterally shared operational data across the Mekong could help in the prediction and cooperation of drought-based shortages, preventing Cambodia from turning more toward coal and fossil fuels.

Laos, similarly, finds itself ever more susceptible on the vicissitudes of operations upstream, with plans to construct hydropower dams on the Mekong mainstream at nine different locations in the country, some of which have been shelved. Though less susceptible to drought-driven power shortages, the Lao PDR is far less developed than its neighbors in Thailand and Cambodia and is heavily reliant on hydropower both as a source of income and power. Adding to these problems are continued concerns about the massive ecological effects for the hydropower cascade on the Nam Ou, which, due to its elevation, supplies a great deal of sediment and flow downstream.

While more accurate and more transparent data has long been the goal of transboundary governance, the next step is that of operational data, of which China shares almost none. Operational data can paint a clearer, safer, and more useful picture for those downstream.

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CITIZEN SCIENCE MATTERS: THEORY INTO PRACTICE, AND PROMISES FOR ADDRESSING ENVIRONMENTAL PROBLEMS IN THE MEKONG RIPARIAN COUNTRIES

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Abstract

The promise of economic growth has spurred Mekong countries to rapid urbanization and to the damming of the Mekong River. But across the region two of the most pressing challenges facing riparian nations converge: biodiversity degradation and environmental insecurity. These problems are human-induced, cross-cutting in nature, and accelerating in pace and severity as urban areas swell. Businesses and citizens will be in danger from 'double crises' should human stressors intersect with climate change effects such as extreme weather conditions and geophysical disasters. While strong policy planning and technological innovations are essential in managing environmental insecurity issues, little evidence demonstrates the success of topdown policies and solutions. Starting with the view that citizen science and participatory research initiatives have great potential to address environmental problems and promote sustainability from the ground up, this conceptual paper aims to explain why citizen science matters for a low-carbon future in the Mekong region. Based on a literature review and semistructured expert interviews, this paper highlights the importance and unique impacts of citizen science in the science, policy, and sustainability education spheres. These impacts are reflected in two country cases (the United States and Belgium). Results reveal that citizen science is transforming research, educating and informing the public, and decentralizing and informing policy. The results further provide promises for addressing environmental problems in Mekong countries where environmental degradation seems to be rising. The paper concludes with a discussion as to how citizen science should be embedded in local environmental governance as it revolutionizes our understanding of environmental challenges and promotes evidence-informed policy making.

Keywords: citizen science, Mekong environmental problems, sustainable development, environmental governance

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Introduction

In recent years there has been an increasing popularity of "citizen science" in environmental, ecological, and climate change forums worldwide. Even in times of global crises, such as Covid-19, numerous curious people across and within countries stay connected via the internet and contribute useful data for science (Dinneen, 2020). In some pharmaceutical and biotechnology think tanks and universities, scientists are employing citizen science tools and strategies to harnessing the power of the crowd to generate robust and diverse data sets for predicting outbreaks, understanding infectious mechanisms and symptoms, and validating treatment models that might have been otherwise unavailable (Samuel, 2021; Dinneen, 2020).

Advances in science and technology, primarily rising Internet penetration and the ubiquity of smartphones, have fostered citizen science. The cooperation between researchers and local communities becomes less challenging thanks to easy data collection on mobile apps that facilitates the engagement. Current citizen science tools are designed on the basis of strict data management standards applied for both input and output, including data quality assurance, data infrastructure, data documentation, data governance and open-data access norms. Some widely known citizen science platforms include Scistarter, iNaturalist, OpenStreetMap, BioCollect, CitSci.org, Citizen Science Alliance, NASA's GLOBE Observer, PlantNet, Open Development Mekong, Zooniverse and many others. Citizen science platforms are web-based infrastructures or portals that enable multiple functions including, identifying real time projects; displaying data and information; providing guidelines and tools; and offering lessons, examples, and scientific outcomes (Liu et al., 2021).

Furthermore, multiple citizen-science organizations are banding together to form a worldwide group – the Citizen Science Global Partnership. This network seeks to promote and advance citizen science for a sustainable world. Launched in December 2017, it assists in monitoring progress towards the United Nations' Sustainable Development Goals (SDGs) and brings together citizen science researchers and practitioners with advisory boards representing policy, business, and community-based perspectives.

Globalization and international scientific cooperation have promoted the presence of citizen science in policy advocacy within nations, regionally, and globally. Recent research by the National Aeronautics and Space Administration (NASA) and the United Nations (UN) have stressed the role of citizen science in "democratizing science" and making scientific research more accessible. Community contributions to data collection are rapidly becoming more important and popular to researchers, think tanks, government agencies, and NGOs. The broader use of citizen science has great potential to contribute to research in biodiversity, environmental studies, climate change,

biogeography, agro-forestry-fishery, disaster and pandemic prevention and control to name but a few. Many governmental agencies in countries like Australia, Canada, Ireland, Japan, Scotland, and the United States have institutionalized citizen science. Crowd-sourced data are being used by the UN bodies for humanitarian activities, disaster response, and implementing SDGs (Sherbinin et al., 2021; Irwin, 2018).

The fresh surge of interest in citizen science across societies has resulted in an inevitable shift towards multi-actor and bottom-up governance of environment that enables and encourages public participation in collecting and sharing information of all kinds, and in the policy making and evaluation process (Sherbinin et al., 2021; Quang and Borton, 2020). It seems likely that breakthroughs in environmental governance – nationally and globally – will increasingly occur through citizen science initiatives that support the society's growing demands for more participatory decision-making through interaction between government policy-making agencies and non-state actors, including scientists and citizen science communities (European Commission Joint Research Centre, 2018; Lepenies and Zakari, 2021; Schade et al., 2021; Van Oudheusden and Abe, 2021). However, efforts to define and strengthen the role of citizen science within this shifting architecture of governance, and in environmental governance, are still at an early stage (Froeling et al., 2021).

By acknowledging that the promise of economic growth draws the Mekong riparian countries to urbanization, this narrative review aims to understand the potential of citizen science in the Lower Mekong countries where environmental security challenges are threatening to undermine their new-found strengths and where digital infrastructure is available for public participation in scientific work. Although citizen science is not the only participatory approach in environmental research and governance, it can generate crowdsourcing data more quickly, enhance the sustainability of research projects more effectively, and disseminate research findings wider than other existing participatory approaches (Froeling et al., 2021). This paper first conceptualizes citizen science from a historical perspective to trace the origin of citizen science and explore its nature as an approach to scientific research. The second section discusses the importance of citizen science in terms of policy, science, and public awareness. Two country cases are briefly presented to provide empirical evidence to the impacts of citizen science in environmental governance. The last section analyses some promises for citizen science in the Mekong countries and prompts a call for mainstreaming citizen science in environmental action in the region as a bottom-up approach to addressing environmental challenges.

Conceptualizing Citizen Science

Although citizen science has only recently attained global attention, there is a long history of citizens supporting scientific research. Wells W. Cooke, a member of the American Ornithologists' Union, was arguably the first scientist to develop research programs that allowed for public participation in the United States in the late 19th century (Palmer, 1917; National Geographic, 2012). Cooke built a network of volunteers in North America, mainly farmers and conservation agents, to collect data related to the patterns of bird migration and bird population figures which was recorded on cards. Those data cards are being digitalized and recorded into public database for historical analysis (National Geographic, 2012). His efforts to empower public participation in research activities triggered the birth of citizen science in the world.

Cooke's successful community-based bird research programs inspired the practice of citizen science in bird research and conservation for decades afterwards. The increasing availability of the Internet in the West in the late 1990s facilitated data collection and sharing without geographical constraints. This enabled scientists and organizations to employ Cooke's public participatory research methodology in ecological and environmental research and the conservation of rare plants and animals (National Geographic, 2012). Given the advances of public participation in research, "citizen science," "open science" or "community science" are terms used interchangeably to label scientific research activities that involve ordinary citizens. "Citizen science" has been more formally used over the last decade. Environmentalists, climate change scientists, and urban planners, among others, have actively encouraged local public participation to collect field-based data.

As such, "citizen science" refers to community-based scientific research. Community members, from kindergarteners to senior citizens, are empowered and encouraged to collect and contribute information, knowledge, and data to enrich and test scientific theories (National Geographic, 2012; Quang and Borton, 2020; Irwin, 2018). Viewed in that light, citizen science is widely conceptualized as the public participation and collaboration in scientific research. In other words, the term "citizen science" is best described as the collaboration of scientists and volunteers to broaden the scope of research and enhance the compiling of scientific data (McKinley et al., 2017).

Citizen science distinguishes itself by these characteristics: the participation of citizens are voluntary, local communities are one of the major beneficiaries of the research, and citizen science and crowdsourcing data are updatable and linkable, allowing for further research at different levels and scopes – local, subnational, national, and international. The mobilization of citizens fosters an active stewardship toward their land, water, and other natural assets.

The public's participation and collaboration in scientific research is classified into three dimensions as follows: contributors (citizens who act as data collectors), collaborators (citizens who are employed to collect and analyse or interpret data), and co-creators (citizens who participate in research stages, from problem identification, question defining, to research design, to data analysing and visualization) (Keyles, 2018; Irwin, 2018). Co-creators are "citizen scientists" who are well-trained to lead and introduce mobile research tools to their communities in citizen science projects. They are local change agents.

Why Is Citizen Science Important?

Citizen science has proven important due to its positive impacts on science, education, and policy (Keyles, 2018). Researchers are the primary beneficiaries of communitydriven science. Standardized and globally crowdsourced data enable researchers to access data sources with low effort and cost. In early 2020, the popular people-powered research platform Zooniverse successfully recruited approximately 200,000 participants for its image-based animal classification project. With more than five million classifications within a week, the end result was equivalent to that of 48 years of research (Samuel, 2021). On the participant side, data and information sharing itself helps communities enrich their scientific knowledge and better understand the challenges facing them, inspiring positive behavioural changes (Keyles, 2018; Quang and de Wit, 2020).

Collective perceptual changes together with real-life experiences and rich data provide significant policy information for local authorities. For example, community data on seasonal air pollution trends enable the authority to proactively adjust emission sources by, for example, relocating factories and cutting coal-fired power. Data on endangered animals tracking allow early warning and accelerated conservation plans (Glauser, 2018). In addition, community-contributed data, including indigenous knowledge and experience that cover new viewpoints or field evidence, ensure that research and policy match local contexts. Citizen science is a bottom-up approach and aims at effective decentralized policymaking. However, finding a workable level of decentralized decision-making power in terms of resource management or water rights has proven a challenge in several places, including the Mekong countries, when laws and regulations do not always permit decentralized management actions. Consequently, the governments face mounting pushback from citizens who resent the damage wrought by pollution-intensive industries.

Citizen science is becoming increasingly popular, with more ambitious and broader connections (Irwin, 2018). The boom in citizen science data in a wide range of fields likely results in big data – creating a solid foundation of the knowledge economy and key pillars for a transparent society and sustainable development in many countries.

Big data is understood as data sets that are so large, that they become difficult to analyse and manage with traditional means (Dalby et al., 2021).

Finally, citizen science offers an opportunity to build public trust in science and authorities (Wynne, 2006; Sandhaus et al., 2019). Some scientists have placed their trust in the possibility of clearing public doubts with community collaboration (Irwin, 2018; Samuel, 2021). Consequently, investing in citizen science is not only an investment in science-community partnership but also in public trust and support. The governments of Australia, the United States, the United Kingdom, and some other European countries have become aware of the benefits of citizen science and have intensified investment in strategic community science programs for environmental protection, climate resilience, public health, and policy review (see also CSIRO, undated; NASA, undated; UK Research and Innovation, 2021).

Addressing Environmental Problems through Citizen Science: Case Studies

Advanced science and technology help actualize community science-led ideas and generate practical impacts in addressing environmental problems. A number of mobile apps have been developed to expedite the public research process. Also, the increase of open science projects surged to 800 in 2019 from 200 in 2010, revealed by statistics from crowd-sourced data platform, SciStarter, at Arizona State University, in Tempe, Arizona. Community-controlled science has been applied in various fields, namely air and water quality monitoring, plastic pollution, animal migration tracking, and observational astronomy (CSIRO, undated; NASA, undated; UK Research and Innovation, 2021). The following case studies show how citizen science is used and the perspectives it offers for specific riparian and urban environmental problems.

Mississippi River Plastic Pollution Initiative (the United States)

In 2018, policymakers and governments of cities along the Mississippi River were committed to reducing plastic waste in the basin by 20% by 2020. To make the goal possible, the United Nations Environment Programme (UNEP), the National Geographic Society, and the University of Georgia have launched the Mississippi River Plastic Pollution Initiative. The community science-led project records data and generates a plastic pollution map along the riverbank and in riverside communities, empowering policy makers and stakeholders to make proper decisions. Debris Tracker mobile app simplifies steps like tracking plastic waste, taking photos with automatic locations, classifying them into types (industrial or household use, nylon, bottles, etc.), counting debris on-site, and uploading to public database.

Debris Tracker is also a popular community science-driven software for global plastic waste tracking. The open database stores roughly three million observations on plastic trash collected by a network of more than 50,000 volunteers. Its convenience and

significance enable the app's continued popularity and user loyalty. As a result, the Debris Tracker generates new daily downloads from increasing numbers of land and ocean stewards from the largest producers of plastic waste like China, India, Indonesia, and the United States.



Figure 1. Debris Tracker app screen and features. Source: DebrisTracker.org

"Street Science" (CurieuzeNeuzen) in Belgium

Filip Meysman, a biogeochemist at the University of Antwerp in Belgium, conducted an air quality monitoring project in Flanders, Belgium in May 2018. With the support of the Flanders Environment Agency and local media, the air quality measurement campaign drew approximately 20,000 urban participants who paid EUR10 each to install devices on their windows (of the first floor) that faced the street. The month-long project ended with the results from 17,800 spots measured by 99% of sensors installed. The data enabled the team to measure nitrogen dioxide (NO₂) concentrations at 'nose height' — a level of the atmosphere that can't be discerned by satellite. The community contributions generated reliable data on the air pollution situation in Flanders.



Figure 2. CurieuzeNeuzen – a successful air pollution measurement project using citizen science data in Belgium. Source: CurieuzeNeuzen.org

Dawn of Citizen Science in the Lower Mekong Subregion

The Lower Mekong Subregion, a transnational region in mainland Southeast Asia, spans five countries: Myanmar, Laos, Thailand, Cambodia and Vietnam. While it has survived the trauma of wars, the region now faces mounting environmental threats from climate change, upstream dams, deforestation, and declines in biodiversity, food security and water resources. Since Conservation International places this rich biodiverse basin as one of the five most threatened hotspots, merely the ranks of professional scientists, researchers, and policy experts may not prove sufficient to solve the basin's dire and escalating environmental problems.

With more dams planned for the Mekong River and rapid industrialization continuing, there are increasing ranks of technocrats and policymakers who recognize the potential benefits of greater connectivity to promote openness and transparency in decisionmaking. This environmental awakening has been on a fast growth trajectory with the advent of new technology and smartphone apps to monitor the environment. Katherine Rowland, a journalist, wrote in *Nature* about the capacity of citizen science to empower local citizens. She explains, "The next generation of citizen science attempts to make communities active stakeholders in research that affects them, and uses their work to push forward policy progress" (Rowland, 2012). Thus, citizen science action represents an attention shift in the region, enabling local NGOs and international development partners to mobilize local voices and democratize science in response to the widening transboundary injustices occurring along the Mekong.

Citizen science projects have been available in the Lower Mekong countries for at least a decade. In Vietnam, some small-scale collective research projects into illegal sand mining in the Red River and air pollution were carried out in Hanoi. Meanwhile, a group of students and young journalists who were trained to collect data and report environmental news in the Cham Islands attempted to clean up plastic waste and restore the local ecosystem to enable sustainable community-based tourism.

In the Mekong Delta, the Mekong Environment Forum (MEF) based in Can Tho City has held a number of impactful citizen-science projects in recent years in the disasterprone areas of the Mekong Delta. The Mekong Security Atlas has been recognized by local provincial governments, international non-government organizations (NGOs) and international water organizations. Supported by the Earth Journalism Network, it was established in March 2019 and built an open-access web-GIS citizen platform that enables citizen scientists to contribute datasets and report about environmental issues. Locals, including environmental practitioners, students, provincial government representatives and experts were encouraged to identify major issues threatening their livelihoods and ecosystems in their communities and then post their stories, observations, suggestions, and photos/video clips about the issues. The platform serves as a gateway for marginalized groups to engage in reporting environmental and natural resource-management issues that threaten their communities. MEF has trained a number of students, women, and provincial government representatives from diverse backgrounds and different universities in Southern Vietnam.

In an example of citizen science in Thailand, teams of students and environmentalists from 13 provinces in the central, western, and eastern parts of Thailand brought together by Sommuck Jongmeewasin, an environmental management lecturer at Silpakorn University International College (SUIC) in Bangkok, successfully investigated and developed a database of 40 illegal dumps of hazardous industrial waste previously unreported by government agencies (Borton and Phenrat, 2021).

Concluding Remarks: A Need to Mainstream Citizen Science in Environmental Action

The Lower Mekong Subregion is in need of community science projects to better address its environmental challenges, such as climate change, resource degradation, wildlife trade, sea and river pollution, natural disasters, and pandemics. Although citizen science has not been formally institutionalized and recognized by the riparian governments, many state agencies such as those in Vietnam have begun to receive feedback regarding policy (Borton, 2018). Furthermore, the advances of social media and open-data sharing, together with the growing rate of smartphones and Internet users, work as an important digital platform supporting the growth of citizen science across the region. For example, with Vietnam's professional ranks of software developers and the increasing interest in digital-age technology, there are greater opportunities to draw upon the talents of young citizen scientists who are watchful environmentalists. For that reason, guiding and directing the public in community science forums helps enrich their scientific knowledge, curbs fake news-related consequences, and avoids wasting open data resources.

Throughout the region, the incubators for the power of citizen science are visible. Although in the most hardscrabble villages, access to a smartphone remains beyond the reach of many, field-based workshops still succeed in bringing information to locals. Based on the experiences of past and current citizen science workshops in Thailand and Vietnam, as well as those planned for the future, there is compelling reason to believe that students and the broader public are increasingly helping to mitigate the environmental challenges in rural and urban areas. For Mekong countries, one of the most pressing issues is environmental pollution and the immediate need to mitigate and adapt to climate change, an issue that overlaps with the SDGs of combatting global issues and promoting sustainability.

Local governments can and should take a leadership role in embracing the benefits in citizen science as part of an overall educational initiative. The purpose is to engage young citizens to help bolster the country's environmental protection enforcement and monitor rapidly growing anthropogenic stressors. A rollout of citizen science workshops in schools would foster a participatory turn in science policy and lead to a democratization of science by turning science from a closed to an open activity (Heigl et al., 2019). These trained citizen scientists can support the efforts of local government agencies to work closely with the public to complete data collection on a wide range of issues from transboundary environmental degradation and water crises, to monitoring food systems and preserving agricultural biodiversity through seed exchanges, to tracking tidal flooding and air pollution in cities. Citizen science is cost-effective in the promotion of sustainability in resource-limited economies.

In order to meet national SDGs, policy planners realize that there is an urgent need to improve society's awareness of sustainability issues and to mobilize all citizens, just as they have done in response to the current pandemic. The success in the implementation of the 2030 Agenda for a better, safe, and secure future for all people requires a complete 'buy-in' from all. The key is to train more student volunteers and citizen scientists since it is an important vehicle in democratizing science and promoting the goal of universal and equitable access to scientific data and information. Going forward, institutions and think tanks, alongside select NGOs like the Mekong Environment Forum (MEF), should establish a task force to explore the potential contributions of citizen science to local governments' efforts to meet the SDGs.

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REDEFINE DIGITAL TRANSFORMATION TO SPEED UP POST-COVID-19 ECONOMIC RECOVERY IN CAMBODIA

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Most of us learned the word 'lockdown' when China first announced on January 22 last year that Wuhan and adjacent cities would be sealed off internally and externally starting January 23. The residents were told to stay at home and venture out only to get essential supplies. Even though Wuhan was reopened after 76 days as the pandemic subsided, countries around the world locked down one after the other. The isolation and containment strategy to fight Covid-19 paralyzed the world. As a result, economic output in terms of GDP plunged double digits in many countries in the second quarter of 2020. The world had never experienced such a fast, synchronous social and economic activity shutdown in its history, and a sense of Armageddon was going around.

The Pandemic revealed the Importance of Digital Infrastructure

Digital technology helped the world to get back to normal. People quickly adopted a new way of life through work-from-home arrangements, buying daily necessities by egrocery shopping and delivery, conducting meetings by remote conferencing, and attending schools through remote education. Patients who avoided visiting doctors in person found online consultations to meet basic healthcare needs, while concerts, celebrations, and graduations all went online. People found new ways of restoring social and economic life to some semblance of normalcy by digital means.

Many activities conducted face-to-face suddenly becoming remote out of necessity to minimize close-range infection. Disruptive digital technology suddenly became the norm and transformed life. Many shifts toward digitalization likely will stay when the pandemic is over because these activities can be run cheaper and more conveniently over the internet. Our new norm will be a hybrid way of life combining pre-pandemic face-to-face activities with a remote and digital new way of doing things. Many experts opined that the pandemic sped up digital technology adoption by at least five years, and that a new digital economic transformation is happening.

The new digital technologies became the first major industry to recover in the pandemic, and a new competitive landscape is emerging globally. The shift to a more knowledge-

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based economic development model with digital connectivity at the core is gaining traction globally. Moreover, there is an emerging trend of dual-track recoveries that favour countries with good digital capability and work against most developing countries whose comparative advantage is cheap labour.

Aside from the economic implications of digitalization post-Covid-19, the pandemic likewise demonstrated the deep social divide within many countries. The rich households and high-income jobs worldwide benefit from digitalization more than the poor and front-line manual labour. A broadband connection became a distinguishing mark between haves and have-nots. There is consensus around the world that digital investment helps narrow the wealth and income gap.

For example, the EU committed more than 200 billion euros to its member states in the EU Digital Compass program to improve digital connectivity, human resources training, and the digital economy's manufacturing base. The EU has put this digitalization program on the same footing as its climate change program to become the focus of post-Covid-19 recovery. Moreover, the EU program set numerical time-bounded hard targets on the plan. The US likewise is working on a ten-year USD 60 billion infrastructure program to provide broadband internet connectivity to its rural underserved population. The involvement of Western governments in accelerating digitalization is an important philosophical change. It signals that fast-tracking digitalization is critical to national development, and the effort cannot be left to the private sector alone. The repercussions of this perception shift will also change how developing countries handle digitalization in the post-Covid-19 world.

All countries noted the importance of digitalization in helping economic and social life return to relative normalcy during the pandemic. It is now a consensus that everyone needs a digital upgrade. As of the last count, 170 countries worldwide have published a national digital strategy.

The Pandemic's Disruption of Cambodia's Economy

The pandemic disrupted the rapid economic growth trajectory the Cambodian economy held since the 1990s. The country officially joined ASEAN in 1999 and the World Trade Organization in 2004; these moves marked the country's return to the global economic system. From 1999-2019, the country sustained an average real growth rate of 7.8 percent, making it one of the fastest-growing countries during the period. A surging garment industry and booming tourism lifted the country from a low-income country to lower-middle-income status in 2015.

In 2020, Cambodia registered negative growth of -3.1 percent as one of its key industries, tourism, suffered from the global pandemic lockdown. In addition, the emergence of the Covid-19 delta variant in Cambodia this year hurt the recovery. As a result, the latest projection of growth in 2021 has lowered to 1.9 percent from an earlier projection of 4 percent in April. Nevertheless, although the economy is expected to rebound to recovery growth, tentatively estimated at 5.5 percent next year, permanently returning to the high-growth path is uncertain. Moreover, the global economic environment faces many uncertainties such as big-power rivalry induced deglobalization, supply chain realignment and looming budget-cuts of many countries after hefty pandemic-related spending.

Simply relying on the traditional growth drivers such as tourism and textiles in the post-Covid-19 era is unlikely to return the country to the high-growth era. The pandemic revealed many weaknesses of the economy and likely derailed the country's aspiration to become an upper-middle-income country by 2030. The defining annual per capita income level for the upper-middle-income country in 2022 is USD 4095, and Cambodia is around USD 1600 now. To hit the 2030 target calls for growth not only exceeding what had been achieved in the past but doing it substantially better. A digital transformation strategy can provide a way to restore Cambodia's growth momentum.

A Good Digital Transformation Strategy will help in Economic Recovery

The pandemic once again highlights two major problems facing most countries on their digital transformation. The first is a digital infrastructure deficiency, and the second is a shortage of digital talents. These problems are particularly notable in developing countries, including Cambodia.

For many developing countries, the pandemic revealed the inadequacy of their present digital infrastructure. Their earlier communication focus was on voice communication, meeting the latest digital demand for social networks such as Facebook, and e-commerce such as ticketing or banking. However, the infrastructure is not mean for the broadband required for activities such as work-from-home, distant interactive education, teleconferencing, and telemedicine. Moreover, most developing countries governments and businesses had not sufficiently digitalized to allow continuous, unhampered operations during the pandemic. As a result, many economic activities were affected, and the poverty rate shot up.

The priority in any digital transformation plan is to improve the broadband digital connectivity in the country, but how to do it depends on the existing condition in the ground.

Present Digital Connectivity in Cambodia

As of June 2021, records from the government show that the number of internet (mobile & fixed) users in Cambodia is 17.6 million, about 105.6% of the population. The number of mobile phone subscribers SIM cards is 20.5 million, or 122.8% of the population. The number of fixed telephone lines is around 44 thousand. Three mobile companies, Viettel (Cambodia), Smart Axiata and CamGSM, account for over 95% of users.

The poor state of Cambodia's fixed landline network means there is a need to upgrade the fibre optic network, but this is unlikely given the lop-sidedness of subscriber numbers in favour of mobile connection. Therefore, the economically and socially sensible plan is to concentrate on the mobile network, and the enhanced mobile broadband function of 5G is the technology of choice.

However, one should also note that there are functions that fixed-line broadband network performs much better than mobile networks, such as higher data volume handling, better security, and greater reliability. Therefore, upgrading fibre-optic fixedline broadband network connections for heavy users such as the government, schools and certain enterprises remains important. The Cambodian government recently signed a contract with Cambodia Fibre Optic Communication Cable Network to build a new high-speed fixed-line broadband backbone.

Today, the country uses 2G/3G/4G/4.5G in its mobile network. The June 2021 data shows that around 16% of network users are 2G, 8% are 3G, and 76% are 4G. In addition, the popularity of social media in Cambodia, particularly Facebook (which claimed almost 12 million users in Q1 2021 or 70% of the population), has pushed demand toward 4G networks. Now, more than 90% of the country is covered by the 4G network. Smart Axiata has announced that it plans to shut down the 3G network in 2021 & repurpose the residual frequency spectrum used for 3G to 4G.

The internet user in Cambodia stays in the slow speed lane. Data from Speedtest Global Test shows the mobile download speed as of August is 23.71 Mbps, rank 104 among 140 countries, with the global average being 56.74 Mbps. Cambodia's fixed broadband download speed is 25.82 Mbps, rank 120 among 180 countries with the global average being 110.24 Mbps.

Other ASEAN countries share the general state of Cambodia's telecommunication industry. They are also mobile system focused and concentrate on consumer internet applications such as social media, e-commerce, and financial transactions. Out of three distinguishing technological improvements of 5G over the earlier 4G generation, namely enhanced mobile broadband (emBB), massive machine-type communications (mMTC), and ultra-reliable low latency communications (uRLLC), only the first feature

of enhanced mobile broadband appears important in the immediate future. The others, mMTC and uRLLC, are important in more advanced applications such as big data collection, artificial intelligence in smart cities, and smart manufacturing. For these there is no immediate need in many developing countries, including the majority of ASEAN members.

Experience from Indonesia and Malaysia on 5G Rollout

Indonesia and Malaysia are the fast movers in 5G among ASEAN developing member countries. They have made some decisions that can help Cambodia in strategizing its own investment in 5G digital connectivity.

Indonesia is rolling out 5G connection initially by 2.3-2.5 GHz mid-band. It will reassign 700MHz next year from 2G to 5G network once the 2G license period ends and add the 3.5 GHz to the 5G network once satellite spectrum repartitioning is done. The country will initially focus on the mid-band and low band non-standalone (NSA) system in its 5G deployment. This technological choice significantly lowers the cost of the 5G rollout compared to the mm-wave and standalone (SA), and make 5G benefits accrue to the majority of the population much faster.

The Malaysian government decided to build the 5G network itself instead of merely assigning the frequency to allow private telecommunications to build the 5G network. The government will then lease its 5G network to the private telcos. The idea is to lessen the financial burden of the telcos and accelerate the 5G rollout. The current internet demands in Malaysia, focusing likewise on social media and e-commerce, can largely be met by 4G and 4.5 G networks, so the monetization of a 5G investment is uncertain. By taking over the 5G investment, the government will let private telcos concentrate their investment on 4G to achieve an improved 4G combined with 5G national network coverage.

The most digitally savvy member of ASEAN, Singapore, had a similar exercise on a fibre broadband rollout years ago. Then, the government laid the network through a national broadband company and authorized the telcos to be value-added-resellers. The plan is a resounding success, and the optic broadband network has 1.5 million subscribers today covering more than 25% of the population and is counted among the highest in the world.

The GDP of Cambodia is around USD 26 billion, and only limited resources are available for a telecommunication build up. Investment in digital connectivity must be careful to minimize wastage and avoid technology obsolescence. The Indonesian and Malaysian decision deserve a close look as Cambodia creates its new digital transformation roadmap.

Digital Talent is Critical to the Success of Digital Transformation

Many countries suddenly found out that they were short on digital talent during the pandemic. Therefore, in the *Digital Compass 2030* program, the EU makes developing a digitally skilled population and training more highly skilled digital professionals the first of the program's four objectives. They set up numerical targets to achieve at least 80% of all EU adults having basic digital skills by 2030. In 2030, there should be 20 million employed ICT specialists in the EU with convergence between women and men, compared to 7.8 million in 2019.

The Cambodian government set up the following information systems related to Covid-19 during the pandemic: a QR code system, a contact tracing app, a vaccine record app, a quarantine app, a tele-doctor app, a Covid-19 hospital & facilities app, and the lockdown pass. However, these systems did not meet the expectations. The Secretary of State of the Ministry of Post & Telecommunication of Cambodia (MOPT), Puthyvuth Sok, attributed the problem to lack of common standard & platform, inefficient data management, poor analysis & reporting, and incomplete functionalities. These issues are related to digital talent and human capital more than physical infrastructure.

Cambodia has a young population with generally high digital skills, learning attitude, and ability. Among ASEAN countries, Indonesia has a vibrant industrial sponsor ecosystem to train digital talents cheaply. Cambodia can learn from the Indonesian setup and ramp up digital talent training quickly.

Redefining Digital Transformation in Cambodia

Crisis often reveals erstwhile overlooked social and economic structural weaknesses. The digital deficiencies problem is worldwide, and many countries are looking for new means of pushing digital transformation in their countries. Hopefully the digital investment program will not suffer budget cuts in the post-pandemic era after everyone runs a substantial pandemic deficit. There is broad social support for digital transformation worldwide, and Cambodia can learn from its peers on how best to redefine digital transformation and implement measures to use it to boost its post-Covid-19 economic recovery.

CLIMATE CHANGE IN THE MEKONG SUBREGION: IMPACT AND RESPONSES OF CAMBODIA

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Abstract

In November 2021, the 26th Climate Summit named the Conference of Parties (COP 26) will be held in Glasgow, Scotland. Climate change is already negatively impacting the Mekong subregion due to extreme weather events like heat waves, droughts, and floods, and stress on water resources and aquacultures. Climate change is also threatening Cambodia's Tonle Sap, the largest sweet water lake in Southeast Asia. Cambodia is a party to the UN Framework Convention of Climate Change (UNFCCC) and ratifier of the Paris Agreement. It is against this background that the study explores Cambodia's climate policy with the following questions: What is Cambodia's position on climate change ahead of the Glasgow summit? What contributions can Cambodia make to mitigate and adapt to climate change? The study concludes that the results of Cambodian climate politics are advanced climate policy instruments and ambitious climate policy objectives. When Cambodia and the international community stay strongly committed to effective climate action, Cambodia can stay on track to become a climateresilient and low carbon sustainable model of development.

Cambodia's Climate Policy in Context

In recent years, climate action appears to have become very urgent. Climate politics and climate mitigation and -adaptation policies have accelerated. Since the signing of the Paris Agreement in 2015, 190 states have ratified the treaty. Public expectations are rising ahead of the next climate summit. The international community of states has committed to concerted efforts meeting the objectives of the Paris Agreement that is to reduce greenhouse gas (GHG) emissions to halt global warming by 2100 at 2 °C above pre-industrial levels, and to make efforts to limit the temperature rise to 1.5 °C. Developed countries have pledged to spend USD 100 billion annually to developing countries to support their efforts to meet the challenges of climate change and its negative impacts (UN Climate Change 2021).

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According to the International Panel on Climate Change (IPCC), human-induced global warming has increased by 1.0 °C since industrialization and "expects with high confidence that temperature will rise by 1.5 °C between 2030 and 2052 if it continues at the current rate" (IPCC 2018). Global warming has changed the climate, making the Asia-Pacific a 'region at risk' (ADB 2017). Particularly, the Southeast Asian region is vulnerable to the negative impacts of climate change (Indra 2017). According to the Global Climate Risk Index, Cambodia was ranked 14th among the most negatively impacted countries worldwide (Global Climate Index 2021). The frequency and intensity of extreme weather events have increased over the past two decades including more floods, droughts, windstorms, and seawater intrusion that have resulted in the loss and damage of lives and livelihoods, economic decline, and degradation of natural resources. The Nation Council for Sustainable Development (NCSD) found in 2016, that of a total of 1.621 communes, 17.5% of communes (288) were 'highly' vulnerable and 27.28% (449 communes) 'quite' vulnerable to negative impacts of climate change. The NCSD projects when no measures are taken: "Climate Change might reduce the country's absolute GDP by 0.4% in 2020, by 2.5% in 2030, and up to 9.8% in 2050" (NCSD 2020).

Cambodia's Climate Policy Objectives

Cambodia has committed to mitigate and adapt to climate change. Cambodia has since 1995 been a party to the UNFCCC, signed and ratified the Kyoto Protocol in 1997, and also signed and ratified the Paris Agreement 2015 (PA). The PA requires all states to develop National Determined Contributions (NDCs) to reduce GHG emissions and to take measures to adapt to climate change. The NDCs need to be reported to the UNFCCC in five-year intervals. The first NDC reporting is due this year just ahead of the 26th Conference of Parties (COP 26) in Glasgow. Cambodia has complied with the report and review process of the PA and has set ambitious climate policy objectives. In its reports to the UNFCCC that include "Cambodia's Initial National Communication to the UNFCCC 2002", "Cambodia's Second National Communication to the UNFCCC 2015" as well as Cambodia's "Intended National Determined Contribution 2015" and "Updated National Determined Contribution 2020", Cambodia's government stated, "to be committed to combating climate change and accelerating the transition to a climate-resilient, low-carbon sustainable model of development" (NSCD 2020).

Cambodia's Climate Policy Instruments

To achieve these objectives, Cambodia's government has created a complex institutional policy network. In 2006, the National Climate Change Committee (NCCC) was created, and in 2015, together with the National Council for Green Growth, merged into a new body, the National Council for Sustainable Development (NCSD). The NCSD is chaired by the Minister of Environment (MoE) with the Prime Minister as its honorary chair. The NCSD is an inter-ministerial, cross-sectoral and multi-disciplinary body that

comprises 36 ministries and agencies and 25 provincial and capital governors. The body is under the direct oversight of the Executive Committee with 12 members from key ministries and chaired by the MoE.

The NCSD work is supported by the Cambodian Climate Change Alliance Program that is funded and implemented by international donors, civil society organizations, and government agencies on the national, provincial, and local levels. The Clean Development Mechanism (CDM), a financial instrument to support climate action in developing countries, is coordinated by a designated National Authority that is overseen by the MoE. Key ministries' coordination has improved with the formation of a Department of Climate Change, and a technical advisory inter-ministerial body, the Climate Change Technical Working Group. Both have been assessed to be "fully functional and properly structured" (Garcia et al. 2019).

The new institutional policy network has developed strategic and action plans to respond to climate change. They include the 'Cambodia Climate Change Strategic Plan 2014-2023' and the 'National Strategic Plan for Green Growth 2013-2030'. In addition, key ministries have developed sectoral Climate Change Strategic Plans and Climate Change Action Plans of which 14 ministries as of 2019 have approved the plans and are implementing them. To finance climate action, Cambodia's government approved in 2014 a Climate Change Financing Framework that has been endorsed for effectively monitoring and reporting climate finance (Garcia et al. 2019). The plans and actions indicate Cambodia is moving towards greening its development, mitigating and adapting to climate change in compliance with the UNFCCC and PA, and ensuring that the climate policies match with the government development priority, poverty reduction, and the United Nations Sustainable Development Goals.

Achieving Cambodia's Climate Policy Objectives

The Cambodian government has ambitious climate mitigation targets but emphasizes that they can only be achieved "under conditional international support" (NCSD 2020). Cambodia bears no responsibility for climate change as the country has been a carbon sink until 1994, and since 2000, only a small net carbon emitter. A carbon sink country emits less GHG emissions than it absorbs, the opposite of a net carbon emitter (MoE, Kyoto University 2016). Also, in Southeast Asia, Cambodia is a small net carbon emitter. Indonesia, Thailand, Vietnam, Malaysia, and the Philippines collectively accounted for 90% of all GHG emissions in the region in 2010 (ADB 2015). Cambodia is currently emitting 125,1 MtCO2e per year (0,03% of global GHG emissions). MtCO2e refers to metric tons of carbon dioxide equivalent. However, recent studies project that Cambodia's net GHG emissions will likely rise in the future because of socio-economic growth that will increase energy consumption, transportation and waste, and the use of land and forests (MoE/Kyoto University 2016). Forestry and land use (FOLU) with 61%

have the largest share of GHG emissions per year in Cambodia, followed by agriculture (21.2%), energy (12%), Industry (7.9%), and waste (2.1%). According to the NDC report 2020, Cambodia's government aims to reduce GHG emissions by 2030 to 64,6 MtCO2e per year. FOLU will have the largest emission reduction potential with 59.1%, followed by energy (13.7%), agriculture (6.2%), industry (5.9%), and waste (0.6%) (NCSD 2020).

The NCSD outlines three scenarios of how GHG emissions could be reduced until 2030. In the first scenario, most GHG emissions are reduced by FOLU (92%), but this could only be achieved when forest cover is increased to 60% of Cambodia's land area. That would mean reforestation of 18% of the total land area. Cambodia's forest coverage has declined from 57% in 2010 to 42% in 2020 (NCSD 2020). In the second scenario, most GHG emission reductions would come again from FOLU (59.9%), but energy (21.3%), agriculture (9.6%), and industry (9.1%) would play a significant role. In this scenario, the challenge would be to have sufficient technical and financial capacities to ensure simultaneous GHG emission reductions over many sectors. This scenario seems to be the most realistic one. In the third scenario, energy would be prioritized (45.5%), followed by agriculture (20.6%), industry (19.5%), FOLU (12.5%), and waste (0.6%). The third scenario is challenged by the growing energy demand of Cambodia. It cannot be met with hydropower as previously planned and thought of as a renewable energy source. This is due to concerns over potential negative social and environmental impacts and shifting weather patterns (droughts) caused by climate change making hydropower unviable. The Cambodian government has put a moratorium on large hydropower dams on the Mekong River mainstream until 2030. Instead, Cambodia is relying on four new coal power plants, plans to develop liquid natural gas plants, and imports of electricity from Laos' coal power plants. Hence, it is unlikely that the energy sector can be the main GHG emissions reducer even though measures are taken to improve energy efficiency in the industrial and building sector, and Cambodia has pledged to extract 25% of power from renewable energy sources like wind, solar, and biomass by 2030 (NCSD 2020, Ford 2021).

Cambodia also will need financial and technical capacities for climate adaptation minimizing the negative impacts of climate change, the country is already experiencing. Cambodia's government has adopted the "National Adaptation Plan", the "National Adaptation Program of Action", and climate adaptation policies in the NDC report 2020. Also, a National Committee for Disaster Management has been established to respond to extreme weather events. Several climate adaptations projects have been or are currently implemented with the financial and technical support of international donors through the Climate Change Alliance Program, the Green Climate Fund, and other measures. They include among others the Rural Investment and Government Project, the Cambodia Community Based Adaptation Program, the Local Government and Climate Change Project, Strengthening Resilient Livelihoods, and the Agriculture Service Program for Innovation, Resilience, and Extension. (Garcia et al. 2019).

The NDC report 2020 lists a total of 87 measures that will be implemented until 2030 in the focus sectors agriculture, water resources, forestry, coastal zones, and human health. They include among others the development of climate-resilient rice-, horticulture- and food crops, an early warning system for extreme weather events, climate risk analysis for infrastructure, development of climate-resilient rubber clone varieties, irrigation systems, the construction of climate-resilient buildings, and measures to contain seawater intrusion. As of 2019, projects have been implemented in 60 (32%) of nationwide 185 districts (Garcia et al. 2019).

Conclusion

Cambodia's climate politics outcomes are positive. Advanced climate policy instruments have been developed and ambitious climate policy objectives formulated. Cambodia's climate policies are not only focusing on adaptation measures to respond to negative impacts of climate change but also aim to contribute to mitigating climate change by reducing GHG emissions. Cambodia can achieve its climate policy objectives to become a climate-resilient and low carbon sustainable model of development when two conditions are met. It will depend to a significant extent on the developed countries' commitment to providing for the financial and technical capacities. As outlined in the study, neither climate mitigation nor climate adaptation policies can be effectively implemented by Cambodia without international technical and financial support. Likewise, it will depend to an equal extent on Cambodia's government if they stay firmly committed to the climate policies and objectives.

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SUPPORTING BIODIVERSITY AND FISHERIES OF THE MEKONG: New Thinking and the Phasing Out of Hydropower on The Lower Mekong

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The amazing eco-system of the Mekong has been battered by from multiple threats: large dams, climate change and the increasingly extreme weather that have inflicted a devastating series of droughts since 2019. Upstream dams in China have again been holding back water according to the Mekong Dam Monitor causing the disruption of the monsoon flow and playing havoc with the all-important flood-pulse so critical to maintaining the river's position as the world's largest inland fisheries. The lowest water levels ever recorded, have devastated fish stocks, livelihoods, and agriculture especially in areas around the Tonle Sap and in the Mekong delta.

Brian Eyler director of the Stimson Foundation's Southeast Asia program has developed the Mekong Dam Monitor (MDM) to closely monitored water resources is gravely concerned about the future of the Great Lake: "Now Tonle Sap is on life support, with little evidence of reversal and flooding around the lakeside."

The miracle of the Mekong, where the pulsating force of the monsoon-driven river every ear pushes its tributary to back up and reverse its flow into the great Tonle Sap Lake in Cambodia, has again been disrupted and obstructed by dams, drought, and climate change. "This is a terrible disaster for the whole Mekong region," Thai academic Chainarong Setthachua declared: "If we lose the Tonle Sap we lose the heart of the biggest inland fisheries in the world."

A great deal of water missing from the river is due to upstream dam restrictions. Eyes on the Earth's Natural Flow Model estimates 25% of natural flow is missing from the mainstream at Chiang Saen, Thailand and 16% is missing Vientiane, Laos. MDM has further reported the water levels are all-time low around the Tonle Sap Lake during this year's rainy season in late August and September 2021, when the lake should be expanding by up to 60% of its dry season water levels.

If nature is ever to make a comeback Ian Cowx, director of Hull University's International Fisheries Institute (HIFI), explained that the biggest long-term obstacle to the recovery of fisheries does not come from climate change and this drought, but rather

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from the dams upstream." He also stated: "All fish species are adapted to periods of droughts and floods, [the] big issue here is the reduction in flows caused by Chinese dams, the Lower Sesan 2 dam [on a Mekong tributary in Cambodia], and the loss of the Hou Sahong channel because of Don Sahong dam."

A further impact from water shortages and droughts has resulted in the biggest drops in hydropower generation recorded for decades. During drought and heavy rain, hydropower plants often come to a standstill. In a prior interview with the JGMS, Brian Eyler observed that "With less water in the Mekong for longer periods of time, dams are struggling to generate electricity reliably." Citing the poor performance of a dam launched on a Mekong tributary: "The Lower Sesan 2 (in Cambodia) opened for business at the beginning of the dry season in 2019 and performed much worse than expected, leading to six months of rolling blackouts in Phnom Penh. These longer dry seasons have long been predicted by climate scientists."

The Lower Sesan 2 in Cambodia was built at the confluence of the two rivers and has proved to be one of the worst trade-offs imaginable, yielding huge environmental losses of the Sesan river ecosystem. Before the dam came into operation, the rivers contributed 9% to the fish stocks of the Mekong. It uprooted the lives of 5,000 people – whose were required to relocate with continued question as to compensation. All these important losses in exchange for a poorly performing dam, that apparently could only deliver electricity for six months of the year has caused significant anger and bitterness. The Mekong River Commission (MRC) responded that in their view: "The cause of the recent record low flows on the mainstream upstream from Vientiane was an exceptional drought, and after the delayed onset of the monsoon rains downstream of Vientiane, flows were within the dry season thresholds."

However, the MRC Secretariat's observation about "exceptional drought" perhaps misses the point, as it is widely reported that water shortages are increasingly becoming the new norm and not exactly "exceptional." If these longer dry seasons persist in the Mekong, it may call into question the reliability of hydropower as a prime source of energy and strengthen the search for better alternatives such a solar and wind renewable.

Is Hydropower truly Clean and Renewable?

One of the most beguiling claims of the global hydropower industry is that it offers "clean green and renewable" energy alternative, in contrast to dirty coal and fossil fuels. The IPCC's recent warning that we are running out of time to curb climate change emboldened the International Hydropower Association (IHA) at their Congress in September, to ramp up their public relations pitching hydropower as needed more than
ever, if we are to drastically cut greenhouse emissions from fossil fuels and apply a brake on global warming.

Still, to return to the main question here, are dams really so "green and clean"? While it is true that dams do not clutter the sky with carbon dioxide fumes, there are however other greenhouse gases that the powerful hydropower lobby would prefer not to talk about, as it runs counter to their "clean and green" narrative.

Dam reservoirs often produce copious amounts of another greenhouse gas that poisons our climate – methane. The Global Methane Assessment for the UN Environment Program (UNEP) report specifically calls out methane as a key contributor to the climate crisis, and suggests "strong, rapid and sustained reductions" of emissions to prevent further damage to our fragile planet. Methane emissions from human activity account for about 25 percent of all global warming: less than carbon but far more potent. ICPP scientist, Philip Fearnside, has documented_large dams, especially those located on tropical rivers like the Amazon, are "methane factories," emitting in some cases more greenhouse gases than coal-fired power plants.

Researchers found that rotting vegetation in the water means that the dams emit about a billion tons of greenhouse gases every year. This is comparable to the aviation industry, which emitted over 900 million tons of greenhouse gases in 2018. The methane issue undermines the dam lobby claims that they are the "green and clean solution" to the urgent need for the world to switch from fossil fuels.

The Luang Prabang Dam: Heritage vs. Hydropower

It is hard to imagine a worse place to build a huge dam then just upstream from the UNESCO World Heritage site, dedicated to the conservation of the original ancient capital of Luang Prabang, an iconic center of Lao history and culture for the last 800 years. The dam-site also sits precariously near to an active earthquake fault line only 8.6 km away and just 25 kms from the world heritage city, nestled between mountains and the confluence of two rivers, the Mekong and the Nam Khan.

Dr Punya Churasiri, formerly head of seismology studies at Chulalungkorn University's Geology Department in Bangkok notes: "We worry about what could happen and the possibility of damage to the world heritage site." Northern Laos is an active seismic area that has registered a series of recent earthquakes and a mild 4.7 on the Richter scale hit Luang Prabang district in July 2021. More worrying was a 6.1 earthquake on November 11, 2019, that hit Northern Laos with its epicenter not far from the Mekong's Xayaburi dam. Dr. Churasiri who has experience of northern Lao concluded: "This Luang Prabang dam is high risk." What many local people in the world heritage city fear is that a huge dam so close to the population of Luang Prabang dam, could trigger another dam disaster like the recent Xepian Xenam-noi in 2018. That dam break resulted in villagers swept away by the flood, 14,440 people suffered their homes destroyed, and 71 confirmed dead.

The MRC and the Promotion of Sustainable Hydropower

Under the Mekong River Commission's PNCPA consultation process, a technical review is carried out on all Mekong mainstream dam projects. MRC experts who reviewed the dam project proposal in 2019 pointed out that if there is an accident, "The city of Luang Prabang will be flooded. Dam safety, flood management and notifications to downstream communities are matters of extreme importance for any major dam development. The potential to impact a UNESCO World Heritage site further emphasizes the need to adopt the very highest standards of dam safety and emergency warning for this project"

Recommendations are made to the dam developers, within a narrow technical framework of, how best to mitigate the environmental damage and ensure dam safety. The MRC lacks any regulatory powers and member states have no veto power. While the MRC likes to consider all stakeholders are included in their consultations, no invitation was extended to UNESCO's World Heritage Centre, despite their mandate to protect the site. The PNCPA process was flawed from the outset over the issue of negligence and failure to consider the need for a Heritage Impact Assessment (HIA).

The Xayaburi Dam became first dam project on the lower Mekong in 2011 and therefore the first test case of the workings of the MRC consultation process. The Inter-State Mekong River Commission had recommended compliance with World Bank guidelines on dam safety. In reviewing the Xayaburi project, the MRC's technical review in March 2011 concluded that the dam was not in compliance. "The recent earthquake near Xayaburi emphasizes the need for an independent review of the project according to international safety standards."

A 2020 response from the MRC secretariat to the author, revealed that an Independent Dam Safety Review Panel for the Xayaburi dam project review of the Design Report had not been established by the Lao government and Ch. Karnchang the Thai construction company. This is not very reassuring for all the Lao people who live in seismically active Xayaburi Province which suffered a recent earthquake in 2019.

Dr Charusiri, who specializes in remote-sensing techniques in the study of earthquake faults, was at one-time a consultant for the Thai company. He expressed concerns about the Thai company Ch.Karnchang's approach to dam safety. "The Xayaburi dam-site

poses a potential danger, there is an active fault, and it is located close to the dam-site." The active fault is within a 100 km radius of the dam.

In response to a wide spectrum of opposition to the Xayaburi project from riverine communities and scientists in Cambodia, Thailand and Vietnam and also contested by two MRC member states (Cambodia & Vietnam), the Thai developer Ch.Karnchang came up with a new design and more elaborate fish pass technology. However, WWF and many other NGOs were not so impressed with the additional mitigation. Dr Jian-Hua Meng WWF's hydro-power consultant observed:

"All the structural modifications(the mitigation) are still based on guesses and assumptions drawn from experiences from European rivers, but it does not work to transplant this to tropical rivers. It is a very high stakes gamble to go ahead."

Serious doubts about dam safety and guidelines for fisheries have never been resolved in the case of Xayaburi dam, but that has not proved to be any obstacle for the Thai corporation and their international partner in their promotion of their sister project – the Luang Prabang dam hot on the heels of the Xayaburi dam beginning operations in 2019.

UNESCO, HIA, and Luang Prabang

UNESCO's World Heritage Center (WHC) in June 2021, recommended the government of Laos halt all construction activities, until a full heritage impact assessment had been carried out. Any large dam built close to a UNESCO-designated World Heritage zone could result in possible de-listing, as it would change the river flow and undermine the natural assets also covered by Luang Prabang 1995 UNESCO Agreement. "If a site is put on the danger list and no action or willingness on the part of the host government takes place to remedy the situation, then the site would be delisted," the UNESCO official said

Nonetheless, a glimmer of hope in this battle between heritage and hydropower has recently emerged. At the recent International Hydropower Association (IHA) congress in September the hydropower industry pledged, no more dam construction inside UNESCO-listed heritage sites. This was welcomed by WWF while adding "it does not go far enough." Although the Luang Prabang project lies just outside the protected zone, a UNESCO expert clarified that serious damage could still be inflicted on the natural assets of the river that flows by the zone. A dam would inflict serious erosion to the riverbanks, thus disfiguring and defacing the unique river-scape. The 1972 UNESCO Convention on protection of world heritage sites specifically refers to development projects and activities that are planned for implementation within or around a World Heritage property.

Looking behind the Mantra of Sustainable Hydropower

The MRC record of support for damming the lower Mekong, albeit qualified by the caveat of the sustainable hydropower, has alienated many NGOs and Mekong communities who feel their voices have been excluded. Not only does the MRC assume that all dams no matter how negative their impacts, can be mitigated, but it has also closed down the option for ventilating dissident views, or any kind of anti-dam position. Many NGOs including International Rivers and other environmental NGOs, now make a habit of boycotting these stakeholder forums.

The discourse of sustainable hydropower argues a well-mitigated 'nicer dam' that does not inflict too much damage on the ecosystem. It is a position that offers great comfort and solace to dam developers, investors, and banks under fire from environmentalists and scientists.

The perception that the MRC relies too much on claims made by developers, was reinforced when their former CEO, Pham Tuan Phan, said the Xayaburi dam had "become a model for all Mekong mainstream dams, helping fish species to move upstream and downstream' even before the dam had been completed." However, this rosy view of Lao dam development has been strongly disputed by many Mekong experts who have rejected fish ladders, sediment, and_flushing schemes as unproved technology, with little or no track record of success on a tropical river.

Although the MRC likes to stress its guidance to member states is solely based on science, yet their uncritical allegiance to the unproven claims of sustainable hydropower indicates otherwise.

How Rivers and Eco-services should be at the Heart of Mekong Policy

The alarming manifestations of extreme weather – wildfires melting icebergs greenhouse gases have triggered a number of scientific reports, linking these disastrous trends to man's rapacious destruction of nature, harm to rivers and the over-exploitation of natural resources. It seems the world has become so addicted to technological solutions as a fix-it for every problem, that the potential of nature-based solutions has too often been pushed to the margins of debate, over how to combat climate change and also on how to reduce environmental malaise of the Mekong. Yet no one can conjure up a technology fix to restore the wonders of the Mekong and the flood pulse the fuels Tonle Sap tributary to reverse course.

A United Nations Environment Program (UNEP) science report revealed "the restoring and protecting nature is one of the greatest strategies for tackling climate change" but not just for the obvious reason that it sucks carbon out the air. "Forests, wetlands, and other ecosystems act as buffers against extreme weather, protecting houses, crops, water supplies and vital infrastructure."

Healthy free-flowing rivers have a unique role to play according to Michele Thieme, a freshwater scientist at the World Wildlife Fund. Ms Thieme explained: "The usual avenues for addressing and adapting to climate change - like ramping up clean energy sources-typically overlooks one powerful solution." She added: "The most effective climate action plans will account for this and incorporate rivers into their plans for a climate-resilient futures." The conclusion is that by saying "No" to more dams, we can give nature a chance, and bring back a healthy river with more sediment and the revival of wild- capture fisheries.

Still, the debt-ridden Lao government and the dam developers are still intent on installing more hydropower on the lower Mekong. Prospective projects at Pak Beng, Pak Lay, Luang Prabang and Sanakham are all in the pipeline. Given all of the evidence that hydropower is not sustainable due to the decimation of fisheries, and the blocking of sediment, surely the beleaguered Mekong needs a recovery program, rather than more dams.

Civil society and many scientists have long supported a moratorium on all dams scheduled to be built on the mainstream of the Lower Mekong. When the Mekong was in much better shape back in 2010, a MRC commissioned a consultant study "The Strategic Environment Assessment of Hydropower Impacts on the Mekong," recommended a 10 year moratorium on dam-building in the mainstream of the river. Among the 4 member states: Lao strongly rejected it, Cambodia welcomed it, and Vietnam was the only player who endorsed it. Thailand was aligned with the Lao view when it was first released. Since then, two Mekong dams: the Xayaburi and the Don Sahong are now in operation in Laos and two dam projects sited in Cambodia, the Stung Treng and the Sambor, have been suspended for 10 years in response to environmental problems.

In response to this author's question, "Is there a need to re-visit looking at that moratorium, as part of a river recovery program?" - the MRC secretariat responded, "Placing a moratorium on dam construction in the Mekong River system is not the purpose of the 1995 Mekong Agreement, and the MRC Secretariat is only empowered to support the Agreement, providing our objective and scientific advice and recommendations to the Member Countries."

That answer is surprising in the context of Article 7 of the 1995 Mekong Agreement which requires member states "To make every effort to avoid, minimize and mitigate harmful effects that might occur to the environment." Clearly if the MRC wanted to recommend a suspension of dam-building it would be covered by the words "*every effort*"

to avoid ". However, the MRC chooses the option of "minimize and mitigate harmful effects."

Mekong specialist Dr. Philip Hirsch, emeritus professor of Geosciences at University of Sydney observed "After 30 years of studying dam impacts, I have yet to come across one [dam], whose impacts have been well-mitigated. Let's start with dams that are already there, before using 'anticipated mitigation' as a pretext for going ahead with new projects." Surely, we must ask why should there be any more dams, when large dams have already left such a gigantically destructive footprint on the river?

Renewable Energy

A range of innovations are driving down the costs of solar photovoltaics (PV) and wind, allowing them to comprise larger portions of reliable power grids. The renewable revolution means that Mekong Basin countries now have low-cost, low-carbon alternatives to hydropower development.

Many investors in the Mekong region energy sector now view solar and wind power as competitive with hydropower in price, and renewables win hands down in terms of the time it takes to install them. In a world of increasing natural disasters, climate change and loss of biodiversity, large hydropower dam projects should be assessed with ever greater care and scrutiny. If that were to happen, then more solar and wind would readily pave the way towards the phasing out of hydropower, as essential move in the direction of saving the Mekong.

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WHY CAMBODIA?: FACTORS IN EU INCOHERENCE IN WITHDRAWAL DECISIONS FOR TRADE PREFERENCES

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Abstract

On 11 February 2019, the European Union (EU) announced that it would launch a procedure to temporarily suspend trade preferences for Cambodia (European Commission [EC], 2019). At this date the potential withdrawal of the "Everything But Arms" (EBA) preferences became the most relevant topic in the Cambodia-EU relations. A strong debate about the impact, the meaning and the responsibility of the decision started, as EBA is critically important to the Cambodian economy and especially for the garment industry and its millions of workers. The EU beginning the official withdrawal procedure was a very bold step that had never before happened to any other country benefitting from EBA. It had not even happened to those who clearly have worse human rights records. This and the potential negative effects on the vulnerable population caused suspicion that the EU might have double standards in trade decisions for least developed countries and led many observers to the question: Why Cambodia?

This article will find factors that led to the decision to launch the withdrawal procedure for Cambodia. To find them, we look into the academic literature, newspaper articles and official statements. First, we explain what EBA preferences are and why countries receive them, what kind of requirements beneficiary countries must fulfil and if there have been similar cases like Cambodia in the past. Next we review the academic literature on EU's trade policies in Generalised Scheme of Preferences (GSP) to find already examined factors that influence the decision making in the EU that go above the official standards and lead to incoherent decisions. As Cambodia is so far a unique case, we elaborate in more detail what happened to Cambodia. Then we examine the similarities and differences between Cambodia and the similar-looking case of Myanmar, another EBA beneficiary. At the end we summarise the different factors and discuss further need for research on EU trade decisions towards least developed countries.

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EBA and the EU's Generalised Scheme of Preferences

EBA is part of the EU's GSP. Since 1971, the EU's GSP has assisted developing countries in their efforts to reduce poverty, promote good governance and sustainable development. By providing preferential access to the EU market, the GSP helps developing countries generate additional revenue through international trade. Countries which are classified as 'upper-middle income' and above by the World Bank are excluded from GSP preferences (European Commission, 2016). To accommodate developing countries' trade, development and financial needs effectively, the GSP provides three different preference arrangements: a general GSP arrangement and two special arrangements:

- The general arrangement ('Standard GSP') grants duty reductions for 66 per cent of all EU tariff lines to countries of low or lower-middle income, which do not benefit from other preferential trade access to the EU market. There are currently 30 Standard GSP beneficiaries (EC, 2016, p. 2).
- The Special Incentive Arrangement for Sustainable Development and Good Governance ('GSP+') grants complete duty suspension for essentially the same 66 per cent tariff lines as the Standard GSP for countries especially vulnerable in terms of their economies' diversification and import volumes. In return, beneficiary countries must ratify and effectively implement 27 core international conventions. These conventions cover human and labour rights, environmental protection, and good governance. There are currently 13 GSP+ beneficiaries (EC, 2016, p. 3).
- The special arrangement 'Everything But Arms (EBA)' grants full duty-free, quota-free access for all products except arms and ammunition for countries classified by the UN as 'Least Developed Countries'. There are currently 49 EBA beneficiaries (EC, 2016). Other than for Standard GSP and GSP+, countries do not lose EBA status by entering into a free trade agreement with the EU (EC, 2020d). EBA entered into force on 5 March 2001 (EC, 2001).

The EU can temporarily withdraw trade preferences in exceptional circumstances, notably in cases of serious and systematic violation of principles laid down in the human rights and labour rights conventions listed in the GSP regulations (EC, 2018). Any EU member state or any natural or legal person which can show an interest in withdrawal can bring violations to the attention of the European Commission, which is empowered to start an investigation. As Clara Portela and Jan Orbie write:

This investigation can last over one year. If the Commission concludes that withdrawal is advisable, it submits a proposal to the Council, (...) Decisions to withdraw trade preferences should take into account 'available assessments, comments, decisions, recommendations, and conclusions of the relevant

supervisory bodies' including the International Labour Organization (ILO). After the suspension has been decided upon, the beneficiary is given another six months to rectify the breach or to show its commitment to do so before the suspension takes effect (Portela & Orbie, 2014).

For EBA, which has been in effect now for more than 18 years, there is no case of withdrawal in the past; not even a formal withdrawal procedure was launched. In this, Cambodia is unique. But there are three cases where trade preferences were withdrawn under the GSP and GSP+ schemes (see table below). Complaints have been made regarding other countries: in 1997, Pakistan was accused of allowing child labour, and China, which was a GSP country at the time, was accused of labour rights violations, although these accusations did not lead to investigations. In 2008, the Commission launched an investigation into El Salvador, a GSP+ beneficiary, with respect to its compliance with ILO Convention 87 on freedom of association, but decided not to withdraw preferences. In 2012, an investigation was launched into another GSP+ country, Bolivia, for failure to implement the UN Single Convention on Narcotic Drugs, but GSP+ status was maintained (Zamfir, 2018).

Country Subject to Withdrawal	Violations of Human/Labour Rights Leading to Withdrawal of Preferences
1997 Myanmar/Burma, GSP	Forced labour
2007 Belarus, GSP	ILO Conventions on freedom of association and
	on collective bargaining
2010 Sri Lanka, GSP+	International Convention on Civil and Political
(downgraded to GSP)	Rights; Convention against Torture; Convention
	on the Rights of the Child

Table 1: Previous Cases of Withdrawal of Trade Preferences

Source: European Parliament, 2018

One of the reasons for this small number of cases is given in a briefing for the European Parliament (2018):

Suspension of preferences under GSP has been applied in only a few cases and, when it happened, did not have an immediate and clear impact on the human rights situation. In practice, the EU has privileged a strategy of incentivising gradual progress through dialogue and monitoring, rather than withdrawing preferences.

Despite this, three countries received the attention of the European Commission in the biannual report covering the period from 2018 to 2019 (EC, 2020d). In an effort to address the problems in Cambodia, Myanmar and Bangladesh, the Commission

launched a period of 'enhanced engagement' with the three countries, involving intensified dialogue and monitoring, which for Cambodia included a fact-finding mission in July 2018. For Myanmar and Bangladesh, this process is still ongoing, whereas for Cambodia, it has moved on to the next stage: on 11 February 2019, the EU launched the procedure to suspend the country's EBA trade privileges. A six-month monitoring and evaluation period ended in August 2019; the Commission had until November 2019 to issue a report on the situation. Depending on developments in the country, the Commission decided by February 2020 to suspend Cambodia's EBA privileges in part. Suspension would finally come into effect six months later, by August 2020 (more about Cambodia in chapter 3, European Parliament, 2019).

The decision-making procedure of withdrawing EBA is a delegated act, which means that the European Commission is the main decision maker. The European Council and the European Parliament can object to the decision. Once the Commission has adopted the act, Parliament and Council generally have two months to formulate any objections. If they do not, the delegated act enters into force. The Council of Ministers decides by qualified majority vote. The European Parliament decides by majority of its members (Zamfir, 2018).

The EU is inconsistent in applying sanctions towards countries that are the subject of serious ILO criticism, e.g. Belarus was not the gravest case of labour rights violations. The procedure for granting and withdrawing trade preferences lacks transparency. This criticism applied especially to the situation before the new GSP regulation. The EU has been reluctant to apply sanctions in many cases (EC, 2014). A universal standard of a withdrawal procedure is missing. EBA beneficiaries are not treated equally by the EU. There is no universal procedure for withdrawal, even if some factors have to be in place, such as human and labour rights violations. GSP suspension is not targeted and might affect groups that are not responsible for the violations (Portela, 2016). Therefore, the EU is still reluctant to use trade sanctions as a response to human rights violations. But what are the reasons for this different treatment? There are several arguments for the decision making in the EU that will be elaborated in the following section.

Factors for Withdrawing Trade Preferences

Not much research has been done so far on conditions for EU withdrawal of trade preferences towards least developed countries. Therefore, this paper will be mainly in line with the academic paper discussing the incoherence of EU's decision making under the GSP scheme. Portela and Orbie focused their 2014 paper on sanctions under the EU's GSP. They asked if those decisions are coherent with EU's Common Foreign and Security Policy (CFSP) and why? They concluded that:

GSP suspension seems to come about when CFSP sanctions are in place and the ILO has set up a Commission of Inquiry that has condemned the beneficiary for failure to apply core standards. In the absence of both factors, the EU refrained from suspending GSP. The EU's manifest reluctance to apply GSP sanctions is only overcome when both conditions are met (Portela & Orbie, 2014, pp. 63-76).

They expected incoherence in their paper and were surprised by the coherence. With CFSP and GSP they analysed different instruments of EU's foreign trade policy and did not compared different cases under the GSP scheme. Here we can expect another level of incoherence or unexpected coherence. This has to be discovered by comparing countries that were able to keep their trade preferences to those countries which lost them, as this paper will later do in the cases of Myanmar and Cambodia – both beneficiaries of EBA under threat of withdrawal. Portela and Orbie don't differentiate between GSP, GSP+ and EBA cases. There was no need as no EBA beneficiary had lost trade preferences before. And even if there are differences in the schemes, we still follow their line of not differentiating. The terms the 'EU trade preferences' or 'trade beneficiaries' are used. We do differentiate between complete withdrawal, as in the case of Myanmar and Belarus, and incomplete withdrawal. An incomplete withdrawal might be a downgrade like in the case of Sri Lanka or a partial withdrawal as in the current case of Cambodia.

Laura Beke and Nicolas Hachez analysed the EU's GSP as an instrument to promote human rights, sustainable development and good governance. They criticise the GSP in terms of transparency, double standards and implementation. On the question of whether GSP conditionality is likely to induce change in beneficiary countries, the withdrawal for Myanmar in 1997 and the later reinstatement in 2013 shows that withdrawal is not a very powerful lever to induce beneficiaries to 'effectively implement' the best standards and to adopt the best practices. The effect of the withdrawal of trade preferences will be rather limited if it is not accompanied by other economic or political sanctions; trade measures from other key trading partners; and active support from the private sector (Beke & Hachez, 2015).

Portela and Orbie (2014) also discussed the problem of the small number of cases and what it means for the research design. Therefore, they used an explorative and inductive approach. With Cambodia, another case comes into the sample, which gives the opportunity to test their hypotheses, but also gives room to further explore different factors that influence the decision making in the EU. However, when repeating their research design, the number of cases is still low. Therefore, this paper can create a different angle if a country that lost trade privileges is compared with a country that did not. We do this later in this article with Myanmar and Cambodia. This change of perspective brings more substance in the understanding of EU's decision making.

When it comes to the concrete factors for a withdrawal of trade preferences, Portela and Orbie (2014) assume that "Although the complete withdrawal from GSP has always followed foreign policy sanctions, the inverse relationship does not apply. (...) Thus, CFSP sanctions seem to be a necessary but not a sufficient condition for GSP withdrawal." It was not a necessary condition for Sri Lanka as it was merely downgraded to GSP. GSP+ is different as beneficiary countries must ratify and effectively implement 27 core international conventions. For the complete withdrawal of trade preferences certain requirements have to be in place. As Portela and Orbie (2014) write:

Firstly, an authoritative condemnation by the ILO facilitates the imposition of GSP sanctions. (...) Secondly, condemnations of the CFSP have not led to GSP sanctions when considerable commercial or strategic EU interests were at stake in the target countries due to resistance by a 'blocking minority' in the Council. (...) Thirdly, the EU is wary of withdrawing GSP unless the connection between the violation at hand and government action is manifest (Portela & Orbie, 2014, pp. 63-76).

The distinction between a complete (full) withdrawal and an incomplete (partial or downgrade) withdrawal of trade preferences will be important when we later look into the Cambodian case.

Another aspect not mentioned in Portela and Orbie's paper is the leverage the EU has concerning trade with these countries. There is evidence that the EU is just using the withdrawal procedure for countries who feel the economic pain. According to the European Commission:

The EU constantly monitors the human rights and labour rights situations of all GSP beneficiary countries. However, it must be emphasised that trade-related tools are only one way to address these issues. The EU makes use of several different avenues to engage with its partners, including human rights dialogues, diplomatic consultations, the Sustainability Compact (in the case of Bangladesh), Partnership and Cooperation Agreements (PCAs), amongst other tools. The choice of which tool to use is also informed by the level of bilateral trade between the EU and the partner country (EC, 2019).

If there is little trade under EBA, it is not a powerful tool for the EU as can be seen in Table 2 below. Even if the human rights situation in countries like Eritrea is much worse than in other countries, limited trade means an EBA withdrawal is not an option for the EU Commission.

Selected Beneficiaries	EBA	Freedom House Score in 2020	Value of Preferential Imports to the EU by EBA Country (Thousand EUR in 2016)
Cambodia		25	4,571,947
Myanmar		30	971,484
Central African Reput	blic	10	16,544
Eritrea		2	13,108
Laos		14	234,482

Table 2: Value of Preferential Imports to the EU from Selected EBA Countries with Low

 Freedom House Scores

Source: Freedom House, 2020; European Commission, 2018

Which explains to a certain point why an EBA withdrawal procedure was never before launched. It is a double-edged sword for the EU as the economic and political impact of withdrawal will be high. The three countries that currently receive an enhanced engagement from the EU are in the top four of the biggest beneficiaries of EBA. In 2018, the largest share of EBA imports came from Bangladesh (66 per cent), followed by Cambodia (18 per cent), Mozambique (four per cent), and Myanmar (four per cent). All other 45 countries combined have a share of just eight per cent (EC, 2018).

The overview of the current academic literature on EU trade preferences and the factors for their withdrawal gives us the following hypotheses to test, formulated as if-then hypotheses. The independent variable (the if cause) explains the dependent variable (outcome). We work with three different outcomes of withdrawal of trade preferences: no withdrawal, incomplete withdrawal (downgrade and partial) and complete withdrawal.

Hypothesis 1: If the EU has strategic or commercial interests, trade preferences are not withdrawn.

Hypothesis 2: If the EU has economic leverage, trade preferences are at least incompletely withdrawn.

Hypothesis 3: If there is a connection between human and labour rights violations and government action, trade preferences are at least incompletely withdrawn.

Hypothesis 4: If foreign policy sanctions are in place, trade preferences are completely withdrawn.

Hypothesis 5: If an ILO inquiry is in place, trade preferences are completely withdrawn.

The Cambodian Case

The main focus of this chapter is on testing the hypotheses from the academic literature on the Cambodian case. But first we elaborate in more detail on the events in Cambodia that led to the EU's decision to get a better understanding of the case. The withdrawal procedure seems to be triggered by the declining democracy, press freedom and civil justice.

Cambodia received international attention when the largest opposition party, the Cambodian National Rescue Party (CNRP), was dissolved under dubious accusations by the Cambodian Supreme Court in 2017. Since then the opposition leader Kem Sokha was first put in jail and then under house arrest. On 29 July 2018, Cambodia held elections for its sixth National Assembly. The Cambodian People's Party (CPP) beat all its rivals by winning every seat in Parliament and securing Hun Sen another term as prime minister, who is ruling the country since 1985. The election outcome was not entirely surprising given that the CNRP had been dissolved. With the de facto abolition of critical media, the CPP's significant competitive advantage in the election campaign and political pressure against the opposition and voters, there can be no talk of free and fair elections. At the same time, stricter laws for political parties and NGOs were established, followed by the introduction of a lèse-majesté law. Several independent media outlets had to close or were sold to investors that are close to the Cambodian government. Altogether, there was a lot of frustration in the western world about the decline of democracy in Cambodia, as the country received considerable western support after the Paris Peace Agreement.

The human and labour rights situation in Cambodia is still better compared to neighbouring countries and to other EBA beneficiaries, but the EU was disappointed about the direction of the country's development. This was made clear by George Edgar, the former EU Ambassador to Cambodia, in a farewell interview:

Cambodia in many ways has had, over the years, a good record in terms of democratic processes, the environment for civil society, press freedom and labour rights. However, developments, particularly in the latter part of 2017, were seen as a significant step backwards, and that is why there has been a particular focus on Cambodia in this context (Chheang, 2019).

In the same direction goes the argumentation by former EU Trade Commissioner Cecilia Malmström in an interview with Radio Free Asia after the EU signed a free trade agreement with Vietnam:

They are two different things because when we gave these trade privileges to Myanmar and to Cambodia, it was well understood that these countries are by no means perfect democracies, and we're not punishing them. But it says in the legal text that if they are going backwards, if the situation is not moving in the right direction, we can take action (Malmström, 2019).

To keep its EBA status, the EU expected Cambodia to:

ensure a political environment in which opposition parties, civil society, trade unions and media can operate freely, and to address other issues including though an inclusive and transparent compensation related to Economic Land Concessions, particularly in the sugar sector (EC, 2019).

And to a certain point Cambodia did, but there were two different levels of reaction. One was the backdoor diplomacy where the Cambodian government was looking for compromise. The other was the public reaction where a "strong man" persona and hostile language was used; Cambodia's Prime Minister Hun Sen said that he would not give up the country's independence and sovereignty for trade privileges. The signs are therefore more confrontational. The public hostility made the situation for the EU complicated.

The idea of trade preferences is to eradicate poverty and promote human rights. As Russell Martin wrote in his discussion of EBA and Cambodia:

At the same time, the EU's capacity to support positive developments in both areas depends on good bilateral relations. The EU's decision needs to strike the right balance between these priorities. Some Cambodian civil society organisations point out that, while the EU's human rights concerns are valid, suspending EBA would directly affect people's livelihoods by putting textile workers (most of them women) out of work. It would also hurt the EU's bilateral relations with Cambodia, pushing the country further into China's sphere of influence (Russell, 2019).

Assuming that the economic development and protection of vulnerable groups is important for the Cambodian government, the stakes are high for the Cambodian economy as duty-free textile and footwear exports to the EU are 11 per cent and 17 per cent of the total exports, respectively. This competitive advantage under EBA has fuelled an export boom: Cambodia's exports to the EU (mostly shoes and clothing), have grown by 630 per cent since 2008, and now make up 39 per cent of the country's total exports. This in turn has helped to keep the economy growing at a steady seven per cent a year, and to lift one-third of the country's population out of poverty between 2007 and 2014. Suspending the EBA could put some of these achievements at risk by making the country's exports less competitive. Around two million Cambodians depend on the textile industry, including 750,000 employees (Russell, 2019). Sri Lanka, which is also highly dependent on textile exports to the EU, shows how severe the economic consequences of the loss of trade preferences can be for a country. During the seven years in which the country was suspended from GSP+ (2010-2017), around 10,000 workers (four per cent of the sector's workforce) lost their jobs; at the same time, Sri Lankan textile exports continued growing (by 18 per cent), but much more slowly than competitors with EBA or GSP+ trade preferences (such as Pakistan, +67 per cent). In GDP terms, the loss has been estimated at around one per cent per year. Judging by this precedent, forecasts of over half of Cambodian textile workers losing their jobs are probably over-pessimistic, but on the other hand, the country is almost certain to miss out on growth potential (Russell, 2019).

In the meantime, Sam Rainsy, the exiled opposition leader of the dissolved CNRP, has tried to push and lobby for the withdrawal of EBA, as one of his statements shows:

On behalf of the Cambodian citizens from all walks of life that the CNRP continues to speak for, I would like to confirm to the European Union that the response it is considering to address the totalitarian drift in Cambodia – namely a suspension of the EBA programme – is acceptable and appropriate in our eyes (Sam, 2019).

The strategy was two-fold, to lobby in the EU and to provoke hostile reactions from the Cambodian government.

A useful connection for EU lobbying existed in the framework of the international party alliance of Liberal International, of which the Swedish Liberalerna, the party of former Trade Commissioner Cecilia Malmström, and the CNRP are both members (Liberal International, 2020). This is important, because within the EU the trade commissioner is the ultimate figure for decisions on trade preferences. The existing networks were used well by Sam Rainsy. He attended the International Liberal Executive Committee on 5-6 July 2019 in London amongst other members of Liberalerna. In an urgent resolution adopted at the meeting, the Liberal International "welcome[ed] the EU decision to launch a suspension procedure of Cambodia's EBA trade preferences [....]" (2020). After the EU election in 2019, Phil Hogan from Ireland was nominated on 10 September 2019 as new trade commissioner (BBC, 2019). His party, Fine Gael, is member of another international party alliance, the Centrist Democratic International, of which the ruling CPP in Cambodia is also a member (Centrist Democratic International, 2020). Until the decision was made in February 2020, the CPP did not use this connection between the parties.¹ They used only the official and diplomatic channels. And the official delegation never met with Phil Hogan directly. When he was appointed as commissioner, the process on the EBA withdrawal was already quite advanced. This could also be the

¹ Several background talks with high officials from the Ministry of Foreign Affairs of the Kingdom of Cambodia, Ministry Interior of the Kingdom of Cambodia, CDI delegates and European Diplomats.

reason for his hesitation to use non-official channels with the CPP. It overall seems that the EU was lobbied more successfully by the CNRP.

Even as the CNRP in exile has no real power anymore after their dissolution, they still have the power to create provocations via social media and to get a reaction from the Cambodian government. Many of Rainsy's campaigns can be seen as PR campaigns, such as the foundation of the Cambodian National Rescue Movement, or betting with Hun Sen about Kem Sokha's release, which has contributed to Sokha's continued arrest (Niem & Nachemson, 2018). The usually hostile and violent reaction leads to the public perception that the Cambodian government is not very democratic. This cumulated in Sam Rainsy's announcement that he would return to Cambodia on 9 November 2019. The fear of returning was correspondingly great in the government, because from the government's perspective it endangers political stability. Therefore, arrests and attacks on CNRP supporters occurred in advance. At least 48 supporters of the opposition were arrested in 2019. The increased number of political prisoners worsened the prospect of a positive EU decision regarding the official withdrawal process for trade preferences under the EBA scheme. In the end, Rainsy did not come back to Cambodia. The loosening of Kem Sokha's house arrest after the failed return and the release of the political prisoners were important symbols for the EU's decision, even if the EU always made it clear that the opposition party should be completely rehabilitated.

The full rehabilitation did not happen. Kem Sokha was released from jail but only under de facto house arrest in September 2018, the CNRP remains banned as a party, and Hun Sen's defiant January 2019 warning that the opposition will be 'dead' if the EBA ends are clear signs that he has no intention of tolerating political pluralism (Russell, 2019). Besides public hostility, the Cambodian government did make some concessions; e.g. there was a way that the 118 banned CNRP politicians got their political rights back (Hutt, 2019). Some possible improvements came just too late; for example, the trial against Kem Sokha began at the beginning of 2020 and did not finish before the EU decision, or the amendment of the Law on NGOs is an ongoing process. With the spike of Covid-19, Sokha's trial was postponed indefinitely in early 2020 without any signs that there will be a result (Human Rights Watch, 2020). Even a meeting between Hun Sen and Kem Sokha at a funeral did not lead to more dialogue between the contenders (Hutt, 2020). As the EU saw no sustainable improvements or steps to allow the opposition to function in any meaningful way, it announced on 11 February 2020 that it would partially withdrawal the EBA status for Cambodia. It stated:

The withdrawal amounts to around one-fifth or €1 billion of Cambodia's yearly exports to the EU. Unless the European Parliament and the Council object, this will take effect on 12 August 2020 (EC, 2020e).

Despite the rhetoric in EU's press release, such as the statement by Josep Borrell that "[t]he European Union will not stand and watch as democracy is eroded, human rights curtailed, and free debate silenced", the decision was moderate and gave room for further dialogue with Cambodia (EC, 2020e).

Hypothesis 1: If the EU has strategic or commercial interests, trade preferences are not withdrawn.

The hypothesis is proven. The EU has neither commercial nor strategic interests in Cambodia, mainly because of geographical situation of Cambodia and its small market. The strategic interest of the EU is to have a free and open Indo-Pacific (Kugiel, 2019). To counterbalance the Chinese influence in the region, the main partner for the EU is ASEAN and the big and economically important countries within ASEAN. Cambodia is seen as a spoilsport because of consensus-based decision-making procedures in ASEAN, but not a positive player for the EU. Cambodia took sides with China in the South China Sea ruling and against the rule-based world order (Hutt, 2016). Current rumours of a Chinese military base in Cambodia is making the situation worse (Page & et al, 2019). In the perception of the EU, Cambodia is moving from a poor, neutral country struggling with the democratic development to a one-party, Chinese satellite state. This perception was accelerated when Cambodia focused on negotiating a free trade agreement with China, instead of solving the issues with the EU (The Star, 2020). At the same time Cambodia is not a problem solver for the EU in their big problems like refugees or terrorism like, for example, Pakistan has been in the past (Beke & Hachez, 2015).

The commercial interest of the EU in Cambodia is limited. Cambodia is the EU's 56th largest trading partner (accounting for 0.2 per cent of the EU's total trade) (EC, 2020b). The only Cambodian export relevant for the EU was excluded from the list affected by the partial EBA withdrawal. Cambodia is EU's biggest bicycle supplier (Hor, 2018). EU foreign direct investment (FDI) in Cambodia is rather small. In 2017, the EU was the fourth greatest contributor of FDI in Cambodia (eight per cent of total).²

Hypothesis 2: If the EU has economic leverage, trade preferences are at least incompletely withdrawn.

The hypothesis is proven. Of total Cambodian exports, 38.2 per cent go to the EU. The EU is the biggest importer of Cambodian goods and the effects on the Cambodian labour market are huge (Directorate-General for Trade of the EU, 2020; Russell, 2019).

² Eurocham Cambodia

Hypothesis 3: If there is a connection between human and labour rights violations and government action, trade preferences are at least incompletely withdrawn.

The hypothesis is proven. As the European Commission wrote:

The Commission found serious and systematic violations of principles of the – International Covenant on Civil and Political Rights (ICCPR) by Cambodia – more specifically, the rights to political participation and to freedoms of expression, peaceful assembly and association. [...] Given the nature of the rights infringed, duration, scale, and the impact of Cambodian authorities' actions and omissions, the Commission found serious and systematic violations of the principles laid down [....] (EC, 2020f).

The position that the government is responsible for the violations is also shared by international human rights organisations (Human Rights, 2020).

Hypothesis 4: If foreign policy sanctions are in place, trade preferences are completely withdrawn.

The hypothesis is proven, as there was no foreign policy sanction from the EU applied to Cambodia and the trade preferences were only partially withdrawn (EC, 2020c). Therefore, the Cambodian case looks similar to Sri Lanka. (See Table 3 below.) The difference between the two cases is that Sri Lanka was downgraded from GSP+ to GSP where Cambodia partially lost its EBA status. GSP+ has higher demands and is for countries that are already better developed. A full withdrawal of the EBA status is much more harmful. The US instead has imposed sanctions on individual businessman and a senior government official with close links to Cambodian Prime Minister Hun Sen, accusing them of corruption (Prak, 2019). There was no coordinated approach from the US and EU.

Country and Outcome	CFSP Measures	GSP Sanctions
Myanmar (Complete Withdrawal)	 1990 first imposition of sanctions July 1996: Presidency statement October 1996: Parliament resolution October 1996: now sanctions 	 June 1995: complaint received January 1996: investigation launched December 1996: withdrawal proposed March 1997: adoption by Council

Table 3: Chronology of CFSP and GSP Sanctions Against Selected Beneficiaries

Belarus	• 2000 first imposition of	•	January 2003: complaint
(Complete	sanctions		received
Withdrawal)	• September 2004: new	•	December 2003: investigation
	sanctions		launched
	• April 2006: new sanctions		August 2005: Commission
	• October 2006: new sanctions		report
	• December 2006: adoption by		June 2006: withdrawal
	Council		proposed
Sri Lanka	No sanctions	•	October 2008: investigation
(Incomplete			launched
Withdrawal)		٠	October 2009: Commission
			report
		٠	February 2010: adoption by
			Council
Cambodia	No sanctions	٠	February 2019: investigation
(Incomplete			launched
Withdrawal)		٠	December 2019: Commission
			report
		٠	February 2020: adoption by
			Council

Source: Clara Portela & Jan Orbie, 2014; European Commission, 2020

Hypothesis 5: If an ILO inquiry is in place trade preferences are completely withdrawn.

The hypothesis is proven. There was no ILO inquiry against Cambodia before the withdrawal of EBA, but it was also withdrawn partially (International Labour Organization [ILO], 2017). Even if the working conditions in Cambodia are far from perfect, they are worse in other countries benefitting from EBA. An assessment of all the labour conditions in the world by the International Trade Union Confederation shows that Cambodia is among the top 42 worst countries for workers. The countries mentioned in the list of 10 worst countries for workers show the incoherence of the EU. Some countries are not eligible for EBA because they are too rich (Algeria, Colombia, Guatemala, Kazakhstan, Saudi Arabia and Turkey), others are in a GSP scheme (Bangladesh, Cambodia, the Philippines) others have a free trade agreement with the EU (Egypt) (International Trade Union Conference [ITUC], 2018).

Table 4: Chronology of Selected	Countries Wi	th/Without ILC	Inquiry and	Withdrawal
Outcomes				

	Country	ILO Inquiry
Outcome		
Complete Withdrawal	Myanmar, Belarus	Yes
Incomplete Withdrawal	Cambodia, Sri Lanka	No

Source: ILO Commissions of Inquiry

Cambodia vs. Myanmar: Similar Cases with Different Outcome

To compare the case of Myanmar, a country that did not lose trade preferences, with the case of Cambodia, a country that partially lost them, creates a different angle. Even if the EU was carefully observing the situation in Myanmar, and also send a fact-finding mission and discussed the EBA status, at the end trade preferences were not withdrawn. This change of perspective brings more substance in the understanding of EU's decision making. It also gives the chance to get a better understanding of necessary and sufficient conditions for a withdrawal of trade preferences.

It is quite surprising that the cases had different outcomes as there are many similarities between Cambodia and Myanmar: Both are in the top four of benefiting the most from EU trade preferences under the EBA scheme; both will face a severe economic impact if EBA is withdrawn (Harneit-Sievers, 2020); both are in South-East Asia and are members of ASEAN, both have a strong garment sector, both are "hard line autocracies" (Bartelsmann Transformation Index, 2020); in both countries is press freedom in a "difficult situation" (Reporters Without Borders, 2020); both countries have almost the same poor score in the Freedom House Index (Freedom House, 2020); in both countries is the EU one of the top three export markets; and both are mentioned in the biennial report on GSP under the headline "enhanced engagement with certain EBA beneficiaries". Finding the differences between the countries will help us to find further conditions for withdrawing trade preferences. By using the research design of comparative politics, Myanmar and Cambodia are the most similar cases based on John Stuart Mill's Method of Difference.³ We are looking for the differences in the cases to find the independent variable, which explains the different outcome (dependent variable: withdrawal of trade preferences). The hypotheses formulated after the literature review help us to find criteria which make a comparison possible.

In Myanmar **foreign policy sanctions** are in place (EC, 2020c, pp. 118-120). In April 2018 the EU also launched an enhanced arms embargo and embargo on equipment that can be used for internal repression, and a framework for targeted restrictive measures

³ A system of logic: ratiocinative and inductive, being a connected view of the principles of evidence, and the methods of scientific investigation.

including asset freezes and travel bans against senior officers of the Myanmar military, the border guard, and police officials responsible for serious and systematic human rights violations in Rakhine State (Directorate-General for Trade Trade, 2020c). In Cambodia and Myanmar there was no **ILO Inquiry** in place (ILO, 2017). Less significant but still of importance is the **trade leverage** of the EU in Myanmar; 14.5 per cent of all exports from Myanmar go to the EU. The EU is the third-biggest importer of goods from Myanmar behind China and Thailand, and Myanmar's third-biggest trading partner (Directorate-General for Trade, 2020b).

Unlike in Cambodia, there is no absence of **strategic or commercial interests**. As the European Commission (2020) has written:

EU industry in Myanmar is present in telecom, logistics, manufacturing, and services. A recent business survey showed that, despite the current political situation, EU industry sees potential in the country especially in sectors of wholesale, retail, banking, and insurance. The country is attractive thanks to its growing middle class, young population, economic reforms, and regional perspective (Directorate-General for Trade, 2020c).

There is hope for further investment by European companies in view of forecasted economic growth rates of seven per cent with a comparably big market of 53 million potential consumers. There is a strong will by the EU to further support the young transformation process which might lead to the first fully democratic elections in November 2020 (Knirsch). The geostrategic interest of the EU is to hold China as an overpowering neighbour in order to at least slow down its geostrategic penetration towards the Indian Ocean, with planned ports and potential military bases at the coast of Myanmar (Knirsch). Another interest is related to the EU's engagement in the peace process (20 armed conflicts). Jobs lost because of a potential EBA withdrawal could create illegal jobs elsewhere (illicit economy, trade, drugs, militias). The EU would destabilise the country (Knirsch).

As the sanction list of the EU shows, there was a **connection** between human rights violations and government action (EC, 2020c). Also, the independent international fact-finding mission on Myanmar established by the Human Rights Council stated, "The crimes in Rakhine State, and the manner in which they were perpetrated, are similar in nature, gravity and scope to those that have allowed genocidal intent to be established in other contexts" (United Nations, 2018).

	Cambodia	Myanmar
Foreign Policy Sanctions	No	Yes
ILO Inquiry	No	No
Trade Leverage	Yes	Yes
Absence of Strategic or	Yes	No
Commercial Interests		
Government Connection	Yes	Yes
C A 11		

Table 5: Factors for Trade Withdrawal - Comparison Cambodia and Myanmar

Source: Author

The comparison of both countries shows that the conclusions of Portela and Orbie have to be adopted. There are two necessary conditions for the withdrawal of trade preferences: trade preferences are withdrawn if the EU has economic leverage and if there is a connection between the human and labour rights violations and government action. There is one sufficient condition: Trade preferences are withdrawn if the EU has no strategic or commercial interests. The inconsistencies in the EU's withdrawal decisions become even more striking if we consider the level of human rights and labour rights abuses. In one EBA country, a genocide is happening and the EU has not launched a formal withdrawal procedure. In another country it is launched because the biggest opposition party was dissolved.

Further Factors for EU's Decision Making - to Be Tested

The EU seems to be aware of these inconsistencies and tries to find arguments for the individual treatment of trade beneficiaries. In the official statements by the EU defending the withdrawal procedure in Cambodia there are mainly three arguments used, and there are no big differences between Council, Parliament and Commission (Council of the European Union, 2018). First, human rights are important for EU's trade decisions. Former Trade Commissioner Cecilia Malmström has said, "As I have underlined many times as Commissioner for Trade, our EU trade policy must be led by our values. Accordingly, when we are faced with blatant disregard for those values, the EU must act" (EC, 2020a). Second, the human rights situation in Cambodia is worsening. Again, Cecilia Malmström: "In Cambodia, meanwhile, we are seeing very troubling developments with a clear deterioration of human rights and labour rights, without convincing improvements in sight" (EC, 2020a). Third, the human rights allow a factor in Myanmar is worse, but it is just a question of time until a withdrawal of EBA also happens to Myanmar, Malmström acknowledges:

A recent report from a United Nations fact-finding mission calls for the prosecution of top military leaders for genocide and crimes against humanity. With Cambodia, we are a step further in the process. Many of the issues here date

back several years, and in some cases the country has gone backwards (EC, 2020a).

The different treatment leads to the question of how important human rights and labour rights are in the EU's trade policy. They play a role in rhetoric and also are considered in free trade agreements and in the GSP scheme. Usually trade agreements are used to try to improve the human rights situation via dialogue. But severe punishments like sanctions or the withdrawal of trade preferences happen very seldom, as shown in chapter one. Table 6 shows that Malmström's argument about timing is complicated. The Rohingya crisis started earlier and was more severe than the CNRP dissolution. The time between the fact-finding mission and launch of the withdrawal procedure in Cambodia was around six months. The time since the fact-finding mission in Myanmar has already been more than two years. EU's argument about the timing loses power every day that no formal withdrawal procedure with Myanmar is launched. It seems that in Myanmar, many further things have to happen for the EU to decide to withdraw trade preferences. It's important that journalism is not further restricted, that the government plays a constructive and active role in the return of the Rohingya and that the elections are transparent and fair (Knirsch).

	Cambodia	Myanmar
Year EBA status was given	2001	2001
Event that caused the	November 2017 CNRP	Since August 2017
public attention	dissolution	Rohingya crisis
Enhanced engagement	January 2018	January 2018
Fact-finding mission	5 to 11 July, 2018	28 to 31 October 2018
Announcement to launch	5 October 2018	Not yet
withdrawal procedure		
Launch of withdrawal	11 February 2019	Not yet
procedure		
Announcement for	12 February 2020	Not yet
Withdrawal		
Exports to EU,	2018: 5.4 €bn	2018: 2.3 €bn
Imports from EU	2018: 0.8 €bn	2018: 0.6 €bn

Table 6: Chronology of EBA Status of Cambodia and Myanmar

Source: European Commission, 2020

Something which is difficult to measure and to isolate is the human factor in the decision making. Diplomacy, personal meetings, and public reactions on the side of the EU and beneficiary play a role, but it is not to measure within our setting. Nevertheless, there are some hints we should keep in mind. There is the *reaction of the beneficiary*. While Cambodia reacted very hostilely to the EU claims, Myanmar reacted more focused on

dialogue. The government has recognised that it must respond and, in particular, improve the situation in Rakhine State. However, from the EU's point of view, little has happened so far and yet the EU Commission stated in February 2020: "Myanmar has shown a constructive attitude and engagement on the issues of concern raised by the EU" (Deutsche Welle, 2020). This point is very important. Since the EU is generally not interested in sanctions and withdrawal procedures, it is very prone to partner countries signalling the will to cooperate. Which might explain why Myanmar received more time and may even avoid a withdrawal process.

Different reactions also lead to *different perception* of certain countries in the EU. As the EU draws a (too) negative picture of Cambodia, it is also still describing the government of Myanmar as a "quasi-civilian government embarked on a substantial process of reform" (EC, 2016). This "better image" of Myanmar, disregarding all of its human rights violations, also influenced the decision to not (yet) withdraw any trade preferences.

Another factor might be the *lobbyism* in the EU. Cambodia's opposition was well connected to the Liberals in Europe. The same is true for the National League for Democracy of Aung San Suu Kyi in Myanmar, which has observer status at the Council of Asian Liberals and Democrats, a member of the Liberal International. And overall, the positive image of Aung San Suu Kyi helped to successfully lobby EU diplomats (Knirsch).

There seems to be another *inconsistency between trade and aid decision*. For example, EBA was partially withdrawn for Cambodia but the EU still provides official development assistance. Also, the aid decisions by EU's Member States look incoherent. For example, after the dissolution of the CNRP in Cambodia, Sweden stopped its support of decentralisation in Cambodia with the argument that without an opposition there will not be democratic decisions among the local authorities. The EU and Germany, however, continued the support for decentralisation (Prak, 2017).

There is need for further research in EU's decision making towards trade beneficiaries. Further research should focus on the different treatment between the different schemes GSP, GSP+ and EBA; the inconsistencies between the EU's trade policy and its Member States' development aid; and how bilateral diplomacy and negotiations play a role in EU's decisions to withdraw trade preferences.

Conclusion

This paper provides a better understanding of the conditions leading to EU's withdrawal decision. The case of Cambodia proved to be exceptional. It is the first EBA withdrawal in history, and the previously assumed conditions leading to the withdrawal decision had to be adapted for Cambodia. A factor for the withdrawal is the

trade leverage. The EU does not react to human rights and labour rights abuses if there is no trade, as examples like Eritrea show. There needs to be a connection between the human and labour rights violations and government action. But we also found out that the EU does not withdraw trade preferences if it has commercial or strategic interests. For a partial (incomplete) withdrawal an ILO inquiry or foreign policy sanctions don't have to be in place. As the case of Myanmar shows, foreign policy sanctions do not necessarily lead to withdrawal of trade preferences.

Table 7: Summary of Hypotheses

Trade preferences are not withdrawn if...

...there are no human rights or labour rights violations in the beneficiary country

... the EU has a commercial or strategic interest

... the EU has no trade leverage

Trade preferences are partially withdrawn if...

...there is a connection between labour rights and human rights abuses by government action

... if the EU has trade leverage

Trade preferences are fully withdrawn if...

... there was an ILO inquiry and foreign policy sanctions before

Source: Author

With the limited number of withdrawal cases it is still too early to see a pattern behind EU decisions, but the decisions made so far are inconsistent. There is no universal procedure and the decisions to withdrawal are made on an individual basis. The reputation of the EU is harmed if similar cases are treated differently. If the EU does not launch a withdrawal procedure to Myanmar, this would make EU's incoherence even more obvious. The lesson will be that a genocide is acceptable, but the forced dissolution of an opposition party is not. To avoid this perception, universal and clear standards for EBA withdrawal are needed, otherwise the EU will lose credibility as a global human rights advocate. The next step should be coordination within the EU and its Member States, but also with other democratic and developed countries like the US, Japan or South Korea. The EU should also consider if countries have to apply for all trade preferences like in the GSP+ scheme. That would bring countries to apply human and labour rights standards.

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TONLE SAP LAKE AND WATER SECURITY: CHANGING THE REVERSE FLOW AND IMPLICATIONS FISHERIES AND LIVELIHOODS

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Abstract

The reverse flow from the Mekong to Tonle Sap Lake (TSL) is a critical water security issue. It keeps the heart of the Mekong River Basin, Tonle Sap Lake, beating and sustains the functionality of the lake to pump floods in and out to make the geo-body of the Mekong healthy. Recent changes in the reverse flow from the Mekong to TSL have undermined this. This paper uses a literature review and hydrological data on the Tonle Sap collected from Mekong River Commission (MRC) to analyze changes in the reverse flows and impacts on lake's water security and productivity. It concludes that the future of TSL is uncertain but under threat. Further, the current trends of development within the region and within the country will continue to affect the reverse flow and TSL functionality. Without intervention, in the long run the reverse flow will be significantly changed or disappear. National and regional mechanisms must coordinate efforts to protect the Mekong, its flows, and TSL.

Keyword: water security, reverse flow, volume, inundated area, flood duration, productivity.

Introduction

The reverse flow from the Mekong to Tonle Sap Lake (TSL) is a key water security issue. It sustains the functionality of the lake to pump floods in and out, maintaining the Mekong geo-body. Recent changes in the reverse flow from the Mekong to TSL have undermined this functioning.

A key concept relating to securing the 'flow' is 'environmental flow.' The World Bank defines 'environmental flow' as "the quality, quantity, and timing of water flow required to maintain the components, functions, processes, and resilience of aquatic ecosystems which provide goods and services to people" (Davis and Hiji, 2003).

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Central to the concept of environmental flow is an appreciation of the importance of flow regimes. River flow has been described as a "master variable" that controls biotic abundance and distribution in river systems. Ecological integrity is said to be primarily affected by the characteristics of the natural flow regime. One might expect that environmental flows are therefore a representation of natural characteristics. However, environmental flows are not 'natural' inasmuch as they are hydrologically altered and regulated, though the ecological outcome is usually intended to equal a natural system (Davis and Hiji, 2003).

The Tonle Sap's flood pulse is dependent on water flowing in both directions between the Mekong River and Tonle Sap. Sithirith (2015) discusses the secured flow and the secured volume of water/flood from the Mekong necessary to keep TSL productive and sustainable. He argues that securing this flow is a key element in TSL governance. The 1995 MRC Agreement signed by the four Lower Mekong countries (Laos PDR, Thailand, Cambodia, and Vietnam) recognizes the importance of secured flow to TSL (MRC, 1995). 'Secure the volume,' meanwhile, means to secure the area, in terms of the surface, height, and depth of the water. In the case of Tonle Sap, this means having sufficient water in the lake to allow the living and non-living ecosystem elements to exist in harmony, to maintain the productivity of the lake, and to provide food security to the local people. If the needed water volume is not secured (e.g., because of floods or droughts), disaster is likely to follow (Sithirith et al., 2016).

This paper will use a literature review in combination with hydrological data on the Tonle Sap collected from Mekong River Commission (MRC) to analyze recent changes in the reverse flows and impacts on lake's water security and productivity.



Figure 1. Map of the Study Area
Tonle Sap Lake and the Reverse Flow

During May and June when the Southwest monsoon arrives, the water level in the Mekong River increases gradually, but does not increase noticeably until July and August when it significantly rises. During September and October, water in the Mekong River is at its maximum level in Kratie province. Annually, the Mekong River releases an estimated 475 km³ to the China Sea (Kummu *et al.*, 2008; Lamberts 2013).

The volume of water flowing downstream floods the areas along the Mekong and the Mekong Delta in Cambodia and Vietnam. The Mekong River reverses its flow into Tonle Sap Lake via Tonle Sap River. The Lake owes its uniqueness to the natural phenomenon of reverse water flow, with approximately half of an annual pulse absorbed by the lake area from the Mekong River during the wet season (May to October). Tonle Sap Lake absorbs a volume of water from the Mekong River in the wet season, reducing the flood in Mekong Delta in Cambodia below Phnom Penh and in Vietnam (Kummu *et al.*, 2008). This creates a vast natural reservoir in which the Tonle Sap becomes a 'bladder' of the Mekong basin helping to reduce flooding downstream (Bakker, 1999; Nikula, 2005; Kummu, *et al.*, 2008).

Apart from absorbing water from the Mekong River in the wet season, the Tonle Sap Lake also releases water from the lake to the Mekong River in the dry season. This happens due to the level of the Mekong water quickly dropping to a point below the level of Tonle Sap Lake, creating a condition for water to flow from the Tonle Sap Lake to the Mekong and then to flow down to the China Sea. It slowly subsides through January and February and continues to gradually recede during March and April. Outflow water from the floodplain and the lake increases the flow of water in the lower Mekong River, improving the condition of the Mekong estuary after saline intrusion during the dry period. The water released from this storage can also be used to irrigate the dry season crop in many parts of the Mekong Delta. In this sense, the Tonle Sap Lake is considered by many Khmers to be the 'backbone of their struggling nation's agricultural system.'

Anders Poulsen describes the Tonle Sap as 'the pulsating heart' of the Mekong and goes on to argue that the reverse flow is what keeps the heart beating. If the heart stops, the system dies (Nikula, 2005:13; Kammu *et al.*, 2008). Seasonal variations in the lake's area and depth are remarkable. The size of the lake varies, from approximately 160 km long and 35 km wide during the dry season, to 250 km long and almost 100 km wide during the peak of the flood season (Kummu and Sarkkula, 2008).

The Tonle Sap is a unique ecosystem with an enormous hydrological, biological, nutritional, and cultural value to Cambodia and the lower Mekong region. The TSL system is driven by an annual reverse flow, which creates a six-fold increase in water

level and a five-fold increase in surface area (Kummu et al., 2014). The Asian Monsoon regime, which brings approximately 65% of the total annual rainfall to the Mekong Basin between July and October, contributes to the reverse flow to TSL (MRC, 2005). More than half of the annual flow into the Tonle Sap comes directly from the Mekong via the Tonle Sap River (53.5%), 34% from 11 tributaries in the Tonle Sap catchment, and 12.5% from rainfall precipitation (Kummu et al., 2013). The Mekong is also the source of 72% of the suspended sediments entering the Tonle Sap (Kummu et al., 2008). These nutrients, regular natural flows in the lake, enough water volume, and good water quality keeps the heart and the geo-body healthy, maintains biodiversity, and ensures high productivity in freshwater fisheries.

TSL keeps beating as the heart because the Mekong River keeps reversing its flows to TSL via Tonle Sap River. However, the Mekong River Basin has been heavily dammed. These dams have increased the dry season flows and reduced the wet season flow. The wet season flows, particularly the reverse flow to TSL, has been critically low in the last three years (2019-2021). These have raised concerns about the future of TSL, and the livelihoods of river-dependent communities.

Hydropower Dams and the Changing Flow

The total annual volume of water the Mekong River discharges into the South China Sea is estimated at about 475 km³. The long-term average reverse flow to TSL is 43km³, which is about 9% of the Mekong's annual volume charge. The flows of the Mekong River and the reverse flows to the Tonle Sap have been modified by the construction of hydropower dams and other infrastructures, extending from China down to Laos, Thailand, Vietnam, and Cambodia, on the mainstream and tributaries of the Mekong.

The Tonle Sap Lake is the largest and most productive inland lake in Southeast Asia (Allen et al., 2012; UNESCO, 2018). Water sources for the lake include the Mekong River (54%), the lake's tributaries (34%), and precipitation (Kummu et al., 2014). The lake expands in the wet season due to inflows (reverse flow) from the Tonle Sap River and lake tributaries and shrinks in the dry season due to the outflows through the Tonle Sap River. Inundation of the vast lake floodplains during the inflow period enables many fish species to gain temporary access to large areas for breeding, rearing, and foraging, allowing enormous fishery operations essential for food security, livelihoods, and economies in Cambodia (Poulsen et al., 2002). The total duration of the reverse flows is about 120 days, and the acceptable reverse flow volume is about 43 km³ (average of 1996–2005) (MRC, 2016). In 2020, the reverse flows into the lake occurred intermittently during the wet season. The first instance started on 7 July and ended on 15 July, with a total volume of just 0.21 km³. This initial reverse flow onset in 2020 was significantly delayed, about two weeks later than in 2019 and 40 days later than a 1997–2017 average as shown in Figure 6. The second instance occurred in the last week of July. The major

reverse flows occurred in August 2020, resulting in a total accumulated reverse flow volume of some 12 km³. Two more reverse flow events occurred in late September and the third week of October. The reverse flow finally stopped in the last week of October. The total volume of the reverse flow in 2020 was only 18.89 km³ or about 44% of the acceptable annual volume of 43 km³ (average condition for 1997–2005). As a result, at the end of October 2020, the Tonle Sap Lake experienced extremely dry conditions with reverse flows at their lowest records since 1997.

The damming of the Mekong River and its tributaries has decreased the wet season flow downstream. The number of hydropower dams had been reported to have increased from 136 dams in 2012, to 158 dams in 2014, and then to 231 dams in 2021. Chinese dams have been reported to have increased from six dams in 2009, to seven dams in 2015, and then to eleven dams in 2019 (Lauri et al., 2012; Räsänen et al., 2017; Sithirith, 2021).

The water storage capacity of hydropower dams on the Mekong River Basin has increased from 7.9 km³ in 1990, to 10.6 km³ in 2005, and then to 29.9 km³ in 2010 (MRC, 2009; Arias et al., 2013; Piman et al., 2013). A further increase was seen in 2012 to 107.8 km³ (Lauri et al., 2012) and then to 130 km³ in 2021 (Sithirith, 2021). This is equivalent to 27.4% of the 475 km³ average annual discharge from the Mekong (Adamson et al., 2009), reducing the annual volume discharge to 345 km³.

Water Security and the Future of Tonle Sap Lake

The reverse flow of water from the Mekong to TSL is fundamental to the water security of TSL. Changes in the reverse flow would affect the volume of water flowing to TSL, and then the lake's ability sustain its functions and productivity. It will also affect the formation of inundated areas that are used by fish and other creatures to breed, to lay eggs, and to grow. Further, it will affect the availability of nutrients for fish and living animals in the lake. This section examines the recent changes in TSL in relation to the changes in the reverse flow.

The Reverse Flows

The reverse flow of the Tonle Sap refers to the flow from the Mekong River to TLS via Tonle Sap River in the wet season. The reverse flow from the Mekong River to the Tonle Sap Lake starts in late May every year and continues until October. Hydropower dams could reduce the wet season flow downstream and increase flows in the dry season. The reverse flow could also be affected, and therefore TSL.

According to an MRC report (2020), the long-term average (LTA) annual reverse flow from the Mekong to TSL is about 43km³. In addition, Kummu et al. (2014) estimated the reverse flow from the Mekong to TSL and concluded that about 42km³ of water volume

flows annually from the Mekong River to TSL, ranging between 30km³ in 2006 and 54km³ in 2002. The reverse flow to TSL constitutes about 50.3% of the total volume of water in TSL in the wet season and about 9% of the total flow volume of the Mekong River to the South China Sea.

The reverse flow to TSL has changed since 2019, and the trend continues in 2020 and 2021. In 2019, the reverse flow did not start until the first week of August, three months late. The total reverse flow to TSL was estimated at about 18.89km³, critically lower than the long-term average discharge (LTA) in TSL. In November 2019, water levels in the lake started dropping, went below critical levels in December, and continued falling in January and February 2020.

The low water levels in early 2020 have affected the lake's condition. Although there was rain in April 2020, the reverse flow to TSL again did not start until the early weeks of August, and the volume of the reverse flow was even lower than in 2019, around 14km³. In 2021, the reverse flow again started late, in August.

The delay in the reverse flow of water from the Mekong River to Tonle Sap Lake happened due to the low water level in the Mekong River. This reveals that the Tonle Sap Lake (TSL) is being affected by low inflows from the Mekong River and insufficient rainfall in the surrounding sub-catchments.



Figure 2. Water Level in Tonle Sap Lake at Kampong Loung (Source: MRC, 2021)

Reverse flow has a close connection to overall water levels in TSL. Between the periods of 1925–1935 and 1996–2002, the annual maximum water level in Tonle Sap Lake declined by 0.52 m (Campbell et al., 2006). However, due to more dams built in the upper Mekong River between 2000 and 2020, hydropower operations have caused more prominent changes in water levels and flood duration in TSL, with water level changes up to +0.6 m and 0.75 m during the dry and wet seasons, respectively. Disruptions caused by hydropower will be most intense during dry years, with higher water levels during the dry season between May and June (+0.87 \pm 0.17 m), and lower water levels at the peak of the wet season in October (-0.4 \pm 0.5 m) (Arias et al., 2014).

Between 1997 and 2006, the average water level in Tonle Sap Lake in the dry season was 1.32m, varied between 1.2m in 2002 and 1.48m in 2000. As described by many reports, hydropower dams could increase dry season flows. Between 2018 and 2021, water levels in TLS increased to around 2m. However, water levels in the dry season reduced to lower than one meter in 2020. This raises a concern about the future of TSL if water levels continue to be lower in the coming years.

Changing the Volumes

Normally, water flows into TSL peak in October. However, the peak flood in 2018 was in September. The volume of water by month throughout 2018 was smaller than the average volume of 1997-2019, except in September. The volume of water by month in subsequent years (2019, 2020 and 2021) continues to decline.

In 2019, water volume in TSL in January and February was at 60% of average volume. In March and April 2019, water volume in the lake increased to 74% and 81% of the average, respectively. Despite this, water levels in the Mekong River Basin were still low, and so the reverse flow did not take place in late May, but instead in August. Water level and volume in August 2019 reached the lowest point in TSL's history at about 7.62 km³, almost the size of the lake in the dry season. In November 2019, water levels in the lake dropped rapidly and the volume of the lake reduced to 48% and 40% of the average in November and December, respectively.

The water level continued to drop significantly in the early 2020 to below the critical level, particularly in January and February 2020. Despite some rain, water levels in the Mekong River Basin were still low in these months, and so the reverse flow did not take place until August. Water volume in the lake in August 2020 was even lower than 2019, with a total volume of about 6km³. Water flow in TSL continued to rise after October and it peaked in November 2020. This put the lake in a critical condition, affecting the lake's productivity and human security provision.

For the first six months of 2021, water volumes in the lake constituted about 60-80% of the lake's average volume. However, in August, the size of the lake constituted only 32% of lake's average volume (which is about 8.75km³), larger than the lake's volume in 2020. This happened due to the late arrival of reverse flows and less rain during the months of June, July, and August. Despite this, the lake is in critical condition, and some areas around the lake are becoming dry, impacting fisheries and biodiversity.

The Inundated Areas

The permanent lake area is estimated at around 2400 km² during driest month with a water level of 1.44m (Kummu and Sarkkula, 2008). The average maximum floodplain size is 10,800km² (excluding the permanent lake area) with water level of 9.09 m (Kummu and Sarkkula, 2008). The average flooding period is estimated at about 258 days. According to Kummu and Sarkkula (2008), hydropower dam building has increased water levels in the dry season in the Mekong River, resulting in an increase in permanent lake area of TSL of between 400 and 1000 km² (17%–40%). During the wet season, the peak water level would decrease and thus reduce the inundated area between 7% and 16%.

Between 1997 and 2019, the size of the permanent lake in the dry season was about 2,853 km² at water levels of 1.65-2m. In the same period, in the wet season, the average size of the lake increased to 11,318km² at heights of 8-9m, which 4 times larger. The reduction of the reverse flow volume between 2019 and 2021 has affected the inundated areas of TSL. The size of the dry season lake has been reduced significantly between 2017 and 2020 by 3.34%, and the inundated area of TSL in the wet season by 24.34%.

In 2018, the size of the dry season lake was reduced by 2.16% and the wet season lake size was reduced by 0.28%. The flood duration was only 214 days, down from the 258-day average. The situations got worse between 2019 and 2021. In 2019, the dry season and the wet season lake sizes were reduced by 7% and 27% respectively, and the flood duration was reduced to 153 days. In 2020 between July and October the inundated areas around the lake were reduced by 40% and flood duration was reduced to 122 days.



Figure 3. Monthly Change of the Flooded Area (FA) of Tonle Sap Lake (Source: MRC, 2021)

These flow alterations threaten the sensitive ecosystems in the Tonle Sap River, Tonle Sap Lake, its floodplain, and its forest and protected areas by changing the flood-pulse system of the lake. Arias et al. (2014) also argue that under climate change conditions, hydropower operations could make even more drastic changes to flooding duration and the flooded areas of TSL.

Conclusion

Reverse flow from the Mekong to TSL is key to the water security of TLS and also the sustainability of the lake's functions and productivity. The flow and the reverse flows of the Mekong have been altered as result of the construction of dams in the upper Mekong regions. It has affected the reverse flow to TSL. Climate change will have further impacts on the altered flow and reverse flows of the Mekong to TSL. This will increase water insecurity issues for the lake in the future.

The future of TSL is uncertain, but certainly under threat. The current trends of development within the region and within the country will further affect the reverse flow problem. Hydropower dams built in the upper Mekong are not the only factors – filling the lake and rivers linking the Mekong River and TSL contribute to changing flows and reverse flows to TSL as well. Without intervention, in the long run the reverse flow will be likely be significantly changed, or ended.

Further study is needed to explore possibilities of reversing this trend and keeping the reverse flow of the Mekong to TSL viable. It will need to coordinate action at national and regional levels, utilizing different mechanisms to support these efforts. Cambodia must act at all levels to protect the reverse flow of the Mekong to Tonle Sap.

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Source: https://www.researchgate.net/figure/Map-of-the-Mekong-River-Basin_fig3_255661258

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