



ABSTRAK AGRICULTURE AND EXTENSION BERSUMBER DARI PANGKALAN DATA SCIENDIRECT

KEMENTERIAN PERTANIAN REPUBLIK INDONESIA

BADAN PENYULUHAN DAN PENGEMBANGAN SUMBER DAYA MANUSIA PERTANIAN

BALAI BESAR PELATIHAN KESEHATAN HEWAN

KATA PENGANTAR.

Informasi memberikan dampak positif bagi perkembangan pengetahuan dimana setiap orang dapat mengakses sumber informasi yang dapat menambah khasanah ilmu pengetahuan. Untuk mengelola koleksi informasi tersebut diperlukan aplikasi yang membantu untuk mengelola informasi, baik yang open source maupun closed source.

Abstrak Indikatif jurnal dengan Subjek AGRICULTURE AND EXTENSION ini disusun dalam rangka menyediakan layanan teknis kepada para pejabat fungsional widyaiswara yang fokus terhadap AGRICULTURE AND EXTENSION. Abstrak Indikatif Subjek AGRICULTURE AND EXTENSION sangat baik disitasi sebagai acuan untuk keperluan riset maupun kegiatan layanan jasa pada unit perpustakaan Balai Besar Pelatihan Kesehatan Hewan (BBPKH) – Cinagara.

Abstrak Indikatif Subjek AGRICULTURE AND EXTENSION ini diambil dari pangkalan data sciencedirect yang dapat di akses. Melalui teknis penelusuran lanjutan. Tulisan Ilmiah ini memiliki kelengkapan mutakhir karena di terbitkan sejak tahun 2015-2025. Selain telah terindeks Scopus, dan Web Of Sciences, Emerging Source Citation Index Clarivate Analytics, Google Scholar. Jurnal ini memiliki tingkat sitasi yang tinggi di Google Scholar.

Perpustakaan BBPKH Cinagara

Jl. Snakma Cisalopa Desa Pasir Buncir Kecamatan Caringin Kabupaten Bogor.

Email: Perpustakaan.bbpkhcinagara@gmail.com

Web: <https://kikp.pertanian.go.id/bbpkh>

82. RED versus REDD: Biofuel policy versus forest conservation / Dixon, Peter; van Meijl, Hans; Rimmer, Maureen; Shutes, Lindsay; Tabeau, Andrzej. *Economic Modelling*82. ISSN: 0264-9993 (2016) v.52 Issue. p.366-374. 52

Url: <https://www.sciencedirect.com/science/article/pii/S0264999315002618>

DOI: 10.1016/j.econmod.2015.09.014

Abstract: We examine the interplay between Renewable Energy Directives (RED) and the United Nations Programme to Reduce Emissions from Deforestation and Forest Degradation (REDD) using a scenario approach with a recursive–dynamic global computable general equilibrium model. A methodological issue addressed in the paper is the specification of the supply of agricultural land in the face of restrictions over its availability, as arises under REDD. By giving magnitudes to the effects of REDD and RED, our simulations provide a defense against environmental skeptics who, in the absence of such estimates, can dismiss these policies as being exorbitantly expensive. Although REDD and RED are in tension with respect to land use, the paper shows that they could be implemented simultaneously without significant global problems for food supply. The paper does however pinpoint some regional problems. Implementation of RED and REDD would cause large increases in food prices in Indonesia and Southern Africa. The methodology used in this paper, if implemented at a more detailed level, could be the basis of working out compensation packages that would be needed to make pervasive RED and REDD policies politically feasible.

Keyword: REDD; Computable general equilibrium; Land use changes; Land-supply function; Renewable Energy Directives

83. Deforestation on the Indonesian island of Sulawesi and the loss of primate habitat / Supriatna, Jatna; Shekelle, Myron; Fuad, Habiburrahman A.H.; Winarni, Nurul L.; Dwiyahreni, Asri A.; Farid, Muhammad; Mariati, Sri; Margules, Chris; Prakoso, Bimo; Zakaria, Zuliyanto. *Global Ecology and Conservation*83. ISSN: 2351-9894 (2020) v.24 Issue. p.e01205. 24

Url: <https://www.sciencedirect.com/science/article/pii/S2351989420307460>

DOI: 10.1016/j.gecco.2020.e01205

Abstract: Sulawesi is an important island for primates. All 17 species that are found there are endemics. The island also includes contact zones between species of macaques (genus *Macaca*) where hybrids may arise. Sulawesi continues to be deforested, especially in the lowlands most suitable for estate crops and other agricultural products. We carried out an island-wide review of the current extent and rates of deforestation, and the impact this is having on the habitat available to all primates and within macaque hybrid zones. The provinces of West Sulawesi and Southeast Sulawesi suffered the highest rate of deforestation. *Macaca ochreata* in Southeast Sulawesi and *Tarsius pelengensis* on Peleng island in Central Sulawesi have lost the most habitat at 14%, followed by *M. hecki* and *M. tonkeana*. Forest loss also occurred in all macaque contact zones. The greatest losses occurred at contact zones between the western population of *M. tonkeana* and *M. ochreata*. Corn, coffee, cocoa, and oil palm are commodities that are spreading throughout the island. The extent of deforestation in the hybrid zones is alarming, particularly as none of them are represented in protected areas. To help address these problems, a careful integration of conservation and development is suggested,

including making trade-offs explicit, and conducting transdisciplinary research on social-ecological systems at the interface of policy and management at local scales.

Keyword: Deforestation; Hybrid zones; Macaques; Sulawesi; Tarsiers

84. Community forest management in Indonesia: Avoided deforestation in the context of anthropogenic and climate complexities / Santika, Trully; Meijaard, Erik; Budiharta, Sugeng; Law, Elizabeth A.; Kusworo, Ahmad; Hutabarat, Joseph A.; Indrawan, Tito P.; Struebig, Matthew; Raharjo, Sugeng; Huda, Imanul; Sulhani; Ekaputri, Andini D.; Trison, Soni; Stigner, Madeleine; Wilson, Kerrie. *Global Environmental Change* 84. ISSN: 0959-3780 (2017) v.46 Issue. p.60-71. 46

Url: <https://www.sciencedirect.com/science/article/pii/S0959378016305933>

DOI: 10.1016/j.gloenvcha.2017.08.002

Abstract: Community forest management has been identified as a win-win option for reducing deforestation while improving the welfare of rural communities in developing countries. Despite considerable investment in community forestry globally, systematic evaluations of the impact of these policies at appropriate scales are lacking. We assessed the extent to which deforestation has been avoided as a result of the Indonesian government's community forestry scheme, Hutan Desa (Village Forest). We used annual data on deforestation rates between 2012 and 2016 from two rapidly developing islands: Sumatra and Kalimantan. The total area of Hutan Desa increased from 750km² in 2012 to 2500km² in 2016. We applied a spatial matching approach to account for biophysical variables affecting deforestation and Hutan Desa selection criteria. Performance was assessed relative to a counterfactual likelihood of deforestation in the absence of Hutan Desa tenure. We found that Hutan Desa management has successfully achieved avoided deforestation overall, but performance has been increasingly variable through time. Hutan Desa performance was influenced by anthropogenic and climatic factors, as well as land use history. Hutan Desa allocated on watershed protection forest or limited production forest typically led to a less avoided deforestation regardless of location. Conversely, Hutan Desa granted on permanent or convertible production forest had variable performance across different years and locations. The amount of rainfall during the dry season in any given year was an important climatic factor influencing performance. Extremely dry conditions during drought years pose additional challenges to Hutan Desa management, particularly on peatland, due to increased vulnerability to fire outbreaks. This study demonstrates how the performance of Hutan Desa in avoiding deforestation is fundamentally affected by biophysical and anthropogenic circumstances over time and space. Our study improves understanding on where and when the policy is most effective with respect to deforestation, and helps identify opportunities to improve policy implementation. This provides an important first step towards evaluating the overall effectiveness of this policy in achieving both social and environmental goals.

Keyword: Indonesia; Peatland; Community forest management; Hutan Desa; Impact evaluation; Spatial matching

85. From governance to government: The strengthened role of state bureaucracies in forest and agricultural certification / Giessen, Lukas; Burns, Sarah; Sahide, Muhammad Alif K.; Wibowo, Agung. Policy and Society85. ISSN: 1449-4035 (2016) v.35 Issue. 1p.71-89. 35

Url: <https://www.sciencedirect.com/science/article/pii/S1449403516000047>

DOI: 10.1016/j.polsoc.2016.02.001

Abstract: Private institutions for third-party (eco-)labelling of food and wood products has been a lively field of empirical research, peaking in the conception of certification as a “non-state market-driven governance system,” which is gaining rule-making authority domestically and internationally as a private governance institution and a transnational regime. Recent findings, however, suggest that state actors also play a decisive role in private certification governance. Questions relating to who within the state, however, so far remain unaddressed. Very recent empirical trends in the fields of timber and palm oil certification in Indonesia suggest that it is distinct public bureaucracies who start reclaiming certification authority through state-led mandatory schemes, challenging the private and transnational certification institutions in support of government-driven international certification regimes. Against this background, the objective of this paper is to substantiate the trend from transnational private to international state-driven governance by analyzing the role of distinct state bureaucracies in the emergence, diffusion, and reshaping of private natural resource governance systems. To achieve these objectives, we develop our propositions by combining insights from political certification studies, regime theory, as well as bureaucratic politics theory. Methodologically, we employ a qualitative case study design on recent developments in forest, timber, and palm oil certification systems in Argentina and Indonesia. Our results substantiate the observation that distinct state actors play a key role in private governance systems and, in the case of Indonesia, even re-claim labelling authority from private institutions by attempting to outcompete them through employing their exclusive regulatory power. The results further indicate a strong, self-interested support from domestic state bureaucracies to state-driven international rather than to transnational certification regimes, supporting the temporary governance hypothesis. We discuss and conclude on our results in light of literatures on private governance, policy sectors as well as international relations theory on the emergence of international and transnational regimes.

Keyword: Indonesia; Bureaucratic politics; Argentina; FLEGT; Forest certification; FSC; Illegal logging; International regimes; ISPO; PEFC; Power struggle; RSPO; Rubber certification; SVLK; Transnational regimes

86. How much land is available for sustainable palm oil? / Tapia, John Frederick D.; Doliente, Stephen S.; Samsatli, Sheila. Land Use Policy86. ISSN: 0264-8377 (2021) v.102 Issue. p.105187. 102

Url: <https://www.sciencedirect.com/science/article/pii/S0264837720325254>

DOI: 10.1016/j.landusepol.2020.105187

Abstract: Current consumption of palm oil accounts for one third of the growing world demand for vegetable oil. Amidst the burgeoning industry, huge ecological costs have been accrued within just three decades due to the rapid oil palm expansion in many parts of the world. Many oil palm plantations are linked to deforestation, biodiversity losses, land use change emissions, among other ecological problems. Total replacement of palm oil could result in even greater adverse environmental

consequences as alternative crops will require more land. To satisfy the growing demands in a sustainable manner, any new plantations must be located in environmentally-benign lands. This study identifies and quantifies the potentially available lands in Malaysia and Indonesia through a novel fuzzy GIS-based land suitability analysis. Three maps were generated: biophysically suitable land, based on optimal conditions for oil palm cultivation, excluding peatlands and existing protected areas; environmentally suitable land, further excluding forest cover; and potentially available land, further excluding existing plantations and other land uses. About 4.5 million hectares of available land for new plantations have been identified that could provide 1.3 million tonnes per year of sustainable palm oil. However, most of these areas are fragmented and scattered throughout the entire archipelago, which could pose economic and socio-political hurdles to developers of sustainable palm oil. With affordable and fairer certification schemes, sustainable oil palm plantations can be achieved by smallholders on these potentially available lands. Yield improvement and biodiversity restoration of existing plantations should be the focus through revitalised sustainable agriculture and strategic forest conservation policies, respectively. The maps provide valuable policy insights into the possibility of future sustainable oil palm plantations and a starting point for on-the-ground assessment and further verification.

Keyword: Oil palm plantation; Biodiversity loss; Environment-food-energy-water nexus; Fuzzy land suitability; Sustainable land use

87. Assessment of food-related nitrogen and phosphorus footprints in Indonesia / Wirasenjaya, Farah; Dhar, Aurup Ratan; Oita, Azusa; Matsubae, Kazuyo. Sustainable Production and Consumption87. ISSN: 2352-5509 (2023) v.39 Issue. p.30-41. 39

Url: <https://www.sciencedirect.com/science/article/pii/S2352550923000830>

DOI: 10.1016/j.spc.2023.04.011

Abstract: As an agricultural country with a large population, Indonesia has a high demand for food and agricultural nutrients. Nitrogen (N) and phosphorus (P) are two crucial agricultural nutrients that are especially important to the food sector. However, N and P emissions from food production and consumption result in several environmental problems and pose a threat to human health. Therefore, an assessment of the N and P loss to the environment from the food sector is necessary to form a baseline for achieving a reduction in these emissions over time. In this study, we evaluated food-related N and P footprints in Indonesia using a modified N-Calculator and P-Calculator. This study aimed to provide quantitative evidence to help achieve sustainable N and P management for food production in Indonesia. The calculated food N footprint in 2013 was 13.7 kg-N capita⁻¹ year⁻¹ and that of P was 2.1 kg-P capita⁻¹ year⁻¹. These footprints increased from 1961 to 2013 owing to dietary changes and low nutrient use efficiency in the agricultural sector. The food N and P footprints are predicted to reach 15.9 kg-N capita⁻¹ year⁻¹ and 2.3 kg-P capita⁻¹ year⁻¹ in 2030 unless concrete measures are taken to reduce them. Fertilizer application and urbanization trends need to be managed to help reduce the N and P footprints of food. Stakeholder cooperation between academics, researchers, government, farmers, and the general public will be essential to carry out successful policies and practices designed to optimize nutrient management in Indonesia.

Keyword: Indonesia; Bottom-up approach; Fertilizers; Food sector; Nutrient management

88. Forest loss in Indonesian New Guinea (2001–2019): Trends, drivers and outlook / Gaveau, David L.A.; Santos, Lucas; Locatelli, Bruno; Salim, Mohammad A.; Husnayaen, Husnayaen; Meijaard, Erik; Heatubun, Charlie; Sheil, Douglas. *Biological Conservation* 88. ISSN: 0006-3207 (2021) v.261 Issue. p.109225. 261

Url: <https://www.sciencedirect.com/science/article/pii/S0006320721002779>

DOI: 10.1016/j.biocon.2021.109225

Abstract: The rich forests of Indonesian New Guinea are understudied and threatened. We used satellite data to examine annual forest loss, road development and plantation expansion from 2001 to 2019, then developed a model to predict future deforestation. No previous studies have attempted such a detailed assessment of past and future deforestation. In 2019, 34.29 million hectares (Mha), or 83% of Indonesian New Guinea, supported old-growth forest. Over nineteen years, 2% (0.75 Mha) were cleared: 45% (0.34 Mha) converted to industrial plantations, roads, mine tailings, or other uses near cities; 55% (0.41 Mha) cleared by transient processes including selective natural timber extraction, inland water bodies-related processes, fires, and shifting agriculture. Industrial plantations expanded by 0.23 Mha, with the majority (0.21 Mha; 28% of forest loss) replacing forests and reaching 0.28 Mha in 2019 (97% oil palm; 3% pulpwood). The Trans-Papua Highway, a ~4000 km national investment project, increased by 1554 km. Positive correlations between highway and plantations expansion indicate these are linked processes. Plantations and roads expanded rapidly after 2011, peaked in 2015/16, and declined thereafter. Indonesian government allocated 2.62 Mha of land for the development of industrial plantations (90% oil palm 10% pulpwood) of which 74% (1.95 Mha) remained forest in 2019. A spatial model predicts that an additional 4.5 Mha of forest could be cleared by 2036 if Indonesian New Guinea follows similar relationships to Indonesian Borneo. We highlight the opportunities for policy reform and the importance of working with indigenous communities, local leaders, and provincial government to protect the biological and cultural richness still embodied in this remarkable region.

Keyword: Deforestation; Oil palm; Indonesian New Guinea; Plantations; Satellite.; Trans-Papua Highway

89. The public health implications of the Paris Agreement: a modelling study / Hamilton, Ian; Kennard, Harry; McGushin, Alice; Höglund-Isaksson, Lena; Kiesewetter, Gregor; Lott, Melissa; Milner, James; Purohit, Pallav; Rafaj, Peter; Sharma, Rohit; Springmann, Marco; Woodcock, James; Watts, Nick. *The Lancet Planetary Health* 89. ISSN: 2542-5196 (2021) v.5 Issue. 2p.e74-e83. 5

Url: <https://www.sciencedirect.com/science/article/pii/S2542519620302497>

DOI: 10.1016/S2542-5196(20)30249-7

Abstract: Summary Background Nationally determined contributions (NDCs) serve to meet the goals of the Paris Agreement of staying “well below 2°C”, which could also yield substantial health co-benefits in the process. However, existing NDC commitments are inadequate to achieve this goal. Placing health as a key focus of the NDCs could present an opportunity to increase ambition and realise health co-benefits. We modelled scenarios to analyse the health co-benefits of NDCs for the year 2040 for nine representative countries (ie, Brazil, China, Germany, India, Indonesia, Nigeria, South Africa,

the UK, and the USA) that were selected for their contribution to global greenhouse gas emissions and their global or regional influence. Methods Modelling the energy, food and agriculture, and transport sectors, and mortality related to risk factors of air pollution, diet, and physical activity, we analysed the health co-benefits of existing NDCs and related policies (ie, the current pathways scenario) for 2040 in nine countries around the world. We compared these health co-benefits with two alternative scenarios, one consistent with the goal of the Paris Agreement and the Sustainable Development Goals (ie, the sustainable pathways scenario), and one in line with the sustainable pathways scenario, but also placing health as a central focus of the policies (ie, the health in all climate policies scenario). Findings Compared with the current pathways scenario, the sustainable pathways scenario resulted in an annual reduction of 1·18 million air pollution-related deaths, 5·86 million diet-related deaths, and 1·15 million deaths due to physical inactivity, across the nine countries, by 2040. Adopting the more ambitious health in all climate policies scenario would result in a further reduction of 462 000 annual deaths attributable to air pollution, 572 000 annual deaths attributable to diet, and 943 000 annual deaths attributable to physical inactivity. These benefits were attributable to the mitigation of direct greenhouse gas emissions and the commensurate actions that reduce exposure to harmful pollutants, as well as improved diets and safe physical activity. Interpretation A greater consideration of health in the NDCs and climate change mitigation policies has the potential to yield considerable health benefits as well as achieve the “well below 2°C” commitment across a range of regional and economic contexts. Funding This work was in part funded through an unrestricted grant from the Wellcome Trust (award number 209734/Z/17/Z) and supported by an Engineering and Physical Sciences Research Council grant (grant number EP/R035288/1).

Keyword:

90. Mangrove management practices, policies, and impacts in New Guinea / Sillanpää, Mériadec; Friess, Daniel A.; Heatubun, Charlie D.; Cragg, Simon M.; Alei, Freddie; Bhargava, Radhika; Wahyudi; Hendri; Kalor, John D.; Purwanto; Marlessy, Cliff; Yudha, Ruhuddien Pandu; Sidik, Frida; Murdiyarso, Daniel; Lupascu, Massimo. *Biological Conservation* 90. ISSN: 0006-3207 (2024) v.296 Issue. p.110697. 296

Url: <https://www.sciencedirect.com/science/article/pii/S0006320724002593>

DOI: 10.1016/j.biocon.2024.110697

Abstract: Mangrove forests of the island of New Guinea are some of the largest and most diverse in the Asia-Pacific region. Located across Indonesia and Papua New Guinea, these forests are relatively undisturbed compared to the surrounding regions. However, mangroves here face rising pressures by coastal development (aquaculture, agriculture, and settlements) and natural resource extraction (forestry, oil and gas exploration, and unsustainable fishery practices). This study synthesises the current state of mangroves and compares differences in management practices and policies between Indonesian New Guinea and Papua New Guinea. Through a Driver-Pressure-State-Impact-Response framework analysis, we found that peripheral or watershed drivers such as logging upstream, agriculture (including oil palm), oil and gas, and mining, could cause substantial pressure on the mangroves. In Indonesia, there are rigid policies and practices regulating each driver. However, overlapping, and contradicting regulations often do not acknowledge other land uses within the same area, which limits policy implementation. Papua New Guinea's coastal regulations encounters similar difficulties, with additional issues of delegating decision making to local administrations. Management

practices such as national scale emissions accounting and Integrated Coastal Zone Management plans need to prioritize regulating the peripheral and internal drivers to maintain mangrove ecosystem services. Challenges for implementation include fragmented management, scarce capacity building and lack of data for decision making. Sustained funding for local coordination among managing agencies and data collection is key for a successful mangrove management.

Keyword: Indonesia; Blue carbon; DPSIR; Conservation; Natural resource management; West Papua

91. Codification to secure Indonesian peatlands: From policy to practices as revealed by remote sensing analysis / Widyatmanti, Wirastuti; Minasny, Budiman; Awanda, Disyacitta; Umarhadi, Deha Agus; Fatma, Zealandia Sarah Nurul; Mahendra, William Krista; Field, Damien J.. *Soil Security*91. ISSN: 2667-0062 (2022) v.9 Issue. p.100080. 9

Url: <https://www.sciencedirect.com/science/article/pii/S2667006222000466>

DOI: 10.1016/j.soisec.2022.100080

Abstract: Indonesian peatlands are facing severe environmental challenges due to unsustainable peatlands management. The Indonesian government has established various regulations in response to international and regional agreements on zero carbon and climate change mitigation and adaptation. The study reviews the chronological impact of peatland regulations on land use/land cover (LULC) conditions in Indonesia, in particular four major peatland areas in Sumatra and Kalimantan. Remote sensing data from 1990 to 2020 is used to generate LULC maps, recorded every 5 years, which were compared within the corresponding year in which regulations were established. The results show that the establishment of Indonesian peatland regulations coincided with the ongoing development of international climate change agreements. Historically, temporal image analysis shows massive land-use change between the years 1995–2010. Since 2010 the deforestation rate has slowed and continues to remain low. Improved peatland maps - identifying high carbon stocks with the minimum required accuracy to take action - remain a priority and can also be used to support sustainable development in Indonesia with more effective planning. The lack of detailed mapping of the capability and condition of peatlands is one of the factors that hinder effective policy development, therefore the implementation of digital soil mapping is recommended to support ongoing peatland security through codification.

Keyword: Climate change; Carbon stock; Codification; Land use policy; Peatland security; Remote sensing

92. Enforcement and compliance with the no-burning policy on villagers in Indonesia / Resosudarmo, Ida Aju Pradnja; Tacconi, Luca; Waluyo, Efendi Agus. *Forest Policy and Economics*92. ISSN: 1389-9341 (2023) v.151 Issue. p.102968. 151

Url: <https://www.sciencedirect.com/science/article/pii/S1389934123000631>

DOI: 10.1016/j.forpol.2023.102968

Abstract: Wildfires, including on carbon-rich peatlands, continue to haunt Indonesia every dry season. They have disastrous health, economic, environmental, and climate consequences. As a key measure to manage wildfires, laws strictly prohibit the burning of land and forests, targeting corporate and individual fire users. The literature suggests that weak law enforcement contributes to Indonesia's persistent wildfires but it lacks systematic analysis. Centred on villagers, this research examines 1) how enforcement of the burning prohibition plays out in practice, by analysing each step along the enforcement chain, and 2) how enforcement has shaped villagers' compliance with the fire rules, and implications for them. We interviewed villagers and enforcement agents and analysed court documents of the year 2019 fire cases. We focused on two fire-prone provinces with extensive peatlands, South Sumatra and Central Kalimantan. We found that some villagers have complied and ceased burning, while others have continued to use fire to maintain their livelihoods. Enforcement contributed to fire prevention, but may have also increased fire risks thus limiting the prevention effect. A multitude of challenges, including physical obstacles, resource constraints, and governance reduced enforcement effectiveness. Key to enforcement is legitimacy of the rule being enforced from the perspective of both enforcement agents and target actors. Investments are required to support viable alternative no-burning cropping methods. At the same time, public awareness raising and long-term education are essential for accidental fire prevention and the reduction of overall enforcement costs.

Keyword: Indonesia; Climate change; Forests; Compliance; Fires; Law enforcement

93. Priority Corridor Zone for Human-Tiger Conflict Mitigation: A Landscape Connectivity Approach in West Sumatra Region, Indonesia / Rahman, Henzulkifli; Hidayat, Rizki Atthorik; Nofrizal, Adenan Yandra; Wilastra, Indra; Nasution, Aulia Fajrin Ramadhani. *Journal for Nature Conservation* 93. ISSN: 1617-1381 (2023) v.76 Issue. p.126501. 76

Url: <https://www.sciencedirect.com/science/article/pii/S1617138123001723>

DOI: 10.1016/j.jnc.2023.126501

Abstract: Excessive fragmentation of natural landscapes has led to the depletion of tiger habitats in the wild, resulting in year-round human-tiger conflict (HTC) that inflicts physical, material, and psychological losses on both humans and tigers. This research aims to provide strategies for addressing HTC through priority corridor planning as a mitigation measure, using a landscape connectivity approach widely employed to tackle ecological issues. Additionally, we and Stakeholders endeavor to determine priority corridors by initially collecting temporal conflict data, indirect evidence of tiger presence, tiger disturbance data, as well as geospatial data from government agencies involved in conservation and planning. First, we identify ecological connectivity index areas, followed by spatial modeling of HTC potential and corridor analysis using graph theory models. Our last step involves conducting a focus group discussion with stakeholders to determine priority corridors. Our analysis reveals that 65% of connectivity index areas are still connected, followed by 20% with moderate connectivity and 15% with low connectivity. Another finding is that the highest potential for conflict occurs in areas on the edge of the outer conservation zone dominated by agricultural land and plantations, and after the FGD, 12 priority tiger corridors are identified, with these locations having the highest conflict history compared to other areas that need to be connected. Finally, our Pearson correlation test results show that out of 8 potential HTC variables with landscape connectivity, 7 variables have strong connections, and 1 variable shows a weak relationship. We hope

that the findings of this research will be valuable for both national and international governments and conservation NGOs as one of the mitigation solutions for HTC, contributing to sustainable development through conservation. Furthermore, our findings can serve as guidelines for local government and international conservation NGOs will formulate future policies regarding HTC mitigation and corridor implementation to ensure the sustainability of this endemic species in the wild.

Keyword: Corridor; Human-Tiger Conflict (HTC); Landscape Connectivity; Stakeholders; Tiger Conservation

94. Risky for the income, useful for the environment: Predicting farmers' intention to adopt oil palm agroforestry using an extended theory of planned behaviour / Hendrawan, Dienda; Musshoff, Oliver. Journal of Cleaner Production94. ISSN: 0959-6526 (2024) v.475 Issue. p.143692. 475

Url: <https://www.sciencedirect.com/science/article/pii/S095965262403141X>

DOI: 10.1016/j.jclepro.2024.143692

Abstract: Oil palm agroforestry provides potential benefits for promoting the environmental sustainability and resilience of smallholder plantations. However, its adoption remains limited, and there is no evidence of sociopsychological factors influencing farmers' adoption of oil palm agroforestry. This study applies an extended Theory of Planned Behaviour (TPB) to analyse smallholder farmers' intentions to adopt oil palm agroforestry. The study sampled 205 oil palm farmers from Jambi, Indonesia and applied partial least squares structural equation modelling, which is commonly used in studies involving TPB. The results showed that attitudes towards oil palm agroforestry and perceived behavioural control positively influenced farmers' intentions to adopt oil palm agroforestry. However, the influence of subjective norms was not statistically significant. Additionally, compared with its perceived environmental benefits, the perceived risks of adopting oil palm agroforestry had a stronger effect on attitudes and perceived behavioural control. The most crucial barrier to adopting oil palm agroforestry is the farmers' perception of its difficulty. The findings highlight that predicting farmers' intention to adopt oil palm agroforestry with the TPB is complex but also underscores the potential acceptance of oil palm agroforestry implementation in smallholder plantations. Policymakers should focus on reducing the barriers and consider smallholders' practical preferences when designing interventions to implement oil palm agroforestry. The results contribute to the development of sustainable oil palm policy schemes to maintain commodity competitiveness in the global market, where there is an increasing demand for sustainably produced goods.

Keyword: Oil palm; Smallholder farmers; Agroforestry; Structural equation modelling; Theory of planned behaviour

95. From rejection to recognition: Human rights, morality, and the future of Marijuana policy in Indonesia / Natalis, Aga; Sembiring, Adventi Ferawati; Handayani, Emy. International Journal of Drug Policy95. ISSN: 0955-3959 (2025) v.140 Issue. p.104817. 140

Url: <https://www.sciencedirect.com/science/article/pii/S0955395925001161>

DOI: 10.1016/j.drugpo.2025.104817

Abstract: Historical evidence suggests that cannabis has been integrated into Indonesian cultural practices since the 14th century, particularly in Aceh, where it was used for medicinal, ceremonial, and agricultural purposes. Over time, public perception of cannabis has shifted significantly—from acceptance to prohibition. The cases of Fidelis Ari Sudarwoto and Santi Warastuti have reignited national discourse on the legalization of medical cannabis as a means of alleviating human suffering. This essay explores the moral and human rights dimensions of Indonesia’s cannabis policy and proposes an alternative moral framework. The transformation of societal attitudes toward cannabis is influenced by increasingly restrictive legal structures rooted in the colonial era, alongside the role of religious values in shaping policy decisions. The Constitutional Court’s rulings—specifically decisions No 106/PUU-XVIII/2020 and No 13/PUU-XXII/2024—highlight the complex interplay between legal regulations, cultural practices, and ethical considerations. A reformative approach grounded in human rights, legal ethics, and scientific evidence is crucial for an objective assessment of the potential social benefits of cannabis.

Keyword: Human rights; Legal morality; Marijuana policy; Partial decriminalization

96. Can Geographical Indications Modernize Indonesian and Vietnamese Agriculture? Analyzing the Role of National and Local Governments and Producers’ Strategies / Durand, Claire; Fournier, Stéphane. *World Development* 96. ISSN: 0305-750X (2017) v.98 Issue. p.93-104. 98

Url: <https://www.sciencedirect.com/science/article/pii/S0305750X15002995>

DOI: 10.1016/j.worlddev.2015.11.022

Abstract: Summary This paper investigates the way Geographical Indications (GIs) are implemented by national and local governments in Indonesia and Vietnam. The two States are active at all stages of GI development, from the selection of the products candidates for GI registration to the supervision of the GI implementation. Thanks to the involvement of national experts from public agencies in the establishment of the Codes of Practices (CoP), they are able to push for the substitution of traditional local techniques with “good practices” (i.e., mostly those recommended by research centers worldwide). Thus, they put GIs at the service of agricultural modernization when GIs apply more conventionally to specific products based on traditional know-how. However, the implementation of the CoPs and thus the achievement of this objective of modernization depend on the perceived interest of producers in the whole GI dynamic. Indeed, the cases studied in Indonesia and Vietnam highlight the variable level of participation of local producers in the GI. In the four studied cases, the CoPs are mainly based on expert knowledge which differs from the actual practices of farmers and processors. Moreover, GIs are implemented in order to create or reinforce reputations rather than legally protecting preexisting ones. For these two reasons, producers’ motivation to invest in GI certification is weak, which makes difficult the necessary collective involvement. In both countries, the involvement of local governments in GI construction and management modifies the situation. Thanks to their knowledge of local situations and stakes, they are more likely than national experts to identify the most strategic supply chains at local level, enable participatory approaches in GI construction and facilitate the involvement of local producers in the GI managing group. But if competences have been given to local governments in the Indonesian and Vietnamese legal frameworks, the distribution of roles between central and provincial governments in GIs are not

clearly enough specified. The nature and the importance of local public intervention differ from one case to another. Finally, this paper recognizes the legitimacy of State intervention in GI development, at least as long as producers' awareness of GIs is still low. However, this State intervention should not only let enough space for producers in GI governance, but also design a frame for arousing their interest and adhesion and for facilitating their collective involvement. That may be facilitated by a concrete and clearly established decentralization of competences in national policies.

Keyword: Indonesia; agricultural modernization; Geographical Indications; governance; public intervention; Vietnam

97. Roots of resilience: Revealing social networks for enhancing social resilience in Indigenous Indonesian and Philippine ricescapes / Delina, Laurence L.; Afable, Sanny D.; Fuerzas, Ivey; Tam, Kim-Pong; Dharmiasih, Wiwik; Salamanca, Albert. *Climate Risk Management* 97. ISSN: 2212-0963 (2025) v.48 Issue. p.100711. 48

Url: <https://www.sciencedirect.com/science/article/pii/S2212096325000257>

DOI: 10.1016/j.crm.2025.100711

Abstract: A complex interplay of social, economic, political, and agricultural factors influences the resilience of Indigenous rice farming communities. This study specifically focuses on the social dimension, examining the crucial role that affective relationships play in fostering social networks that enhance the resilience of Indigenous farmers within the ricescapes of Indonesia and the Philippines. Employing thematic analysis of expert interviews and focus group discussions, complemented by Latent Class Analysis of survey data, we identify the social networks upon which farmers depend. This mixed methods approach enables us to uncover distinct subgroups within these networks that provide support for managing various challenges, assisting with farm tasks, offering financial assistance, and sharing agricultural knowledge. By delineating these subgroups, we advocate for the development of targeted policies that address the unique needs of each group. Recognising and understanding the significance of affective relationships in the formation of social networks is essential for strengthening the resilience of Indigenous farmers, empowering them to navigate contemporary challenges while preserving their cultural heritage.

Keyword: Social networks; Agricultural sustainability; Indigenous communities; Resilience; Ricescapes

98. Are national commitments to reducing emissions from forests effective? Lessons from Indonesia / Meehan, Fiona; Tacconi, Luca; Budiningsih, Kushartati. *Forest Policy and Economics* 98. ISSN: 1389-9341 (2019) v.108 Issue. p.101968. 108

Url: <https://www.sciencedirect.com/science/article/pii/S1389934118302934>

DOI: 10.1016/j.forpol.2019.101968

Abstract: For Indonesia to achieve its greenhouse gas emission reduction commitments, it will have to reduce emissions from deforestation, forest degradation and peatland degradation. The National

Action Plan for Greenhouse Gas Emissions Reductions was Indonesia's first comprehensive plan. It reflected Indonesia's emission reduction commitments to 2020, and the first phase ran from 2010 to 2014. This research evaluates its design and implementation. It assesses seven out of thirteen actions that were implemented to reduce emissions from forestry and peatland degradation. It is shown that only two actions had a direct, evidence-based link to emission sources. Three actions had some evidence of a link, albeit dependent on many factors. For the remaining two actions, focused on emissions from agriculture in peatland, there was no information to demonstrate clear and targeted implementation of the actions. The analysis also shows that the indicators listed in the National Action Plan were insufficient to demonstrate meaningful reductions of emissions. Part of the explanation for the problematic design of the actions is that many of them were pre-existing policies, aimed at achieving a variety of different objectives that were just rebadged as climate change actions.

Keyword: Peatland; Forest; Carbon emission reductions; Nationally determined contributions

99. Claiming the forest: Inclusions and exclusions under Indonesia's 'new' forest policies on customary forests / Myers, Rodd; Intarini, Dian; Sirait, Martua Thomas; Maryudi, Ahmad. Land Use Policy 99. ISSN: 0264-8377 (2017) v.66 Issue. p.205-213. 66

Url: <https://www.sciencedirect.com/science/article/pii/S0264837716313436>

DOI: 10.1016/j.landusepol.2017.04.039

Abstract: The hopes of customary communities in Indonesia have recently been bolstered by Constitutional Court assurances that they have the right to control customary forest. There are, however, several obstacles to making successful claims, and there are also many situations in which forest users and customary land claimants do not stand to benefit from the recent rulings. This policy review analyses the court decisions, politics around their implementation, and considerations of types of land claimants who are excluded from the current process. We highlight groups of forest and ex forestland users that are excluded from benefiting from the Constitutional Court decisions and are adversely affected by land use change and re-designation of land. These groups include those with claims over land in conservation areas, allocated to concessionaires for resource extraction, on land already issued to them through forest management rights, and those whose land has already been removed from the State forest land.

Keyword: Indonesia; Forest; Customary; Exclusion; Law

100. Innovation for whom? The case of women in cattle farming in Nusa Tenggara Barat, Indonesia / Valerio, Erika; Hilmiati, Nurul; Stella Thei, Ruth; Safa Barraza, Alejandra; Prior, Julian. Journal of Rural Studies 100. ISSN: 0743-0167 (2024) v.106 Issue. p.103198. 106

Url: <https://www.sciencedirect.com/science/article/pii/S0743016724000020>

DOI: 10.1016/j.jrurstud.2024.103198

Abstract: Rising beef demand in Indonesia, driven by population growth and urbanisation, presents an opportunity for local cattle producers to increase their domestic market presence. To create

sustainable and inclusive agrifood systems, investments in innovation and capacity-building are essential. Using a case study, this research examined the influence of gender dynamics on the adoption of cattle farming innovations in Indonesia. Despite substantial research on gender and innovation in developing countries, limited attention has been paid to this issue in the Indonesian context. To address this gap, we conducted focus group discussions and key informant interviews with female farmers and extension officers to identify the challenges that rural Indonesian women face in accessing cattle farming innovations. Our findings reveal that women's inclusion in innovation is constrained by multiple issues, such as the invisibility of their contributions, their limited influence in decision-making processes, and complex sociocultural and institutional factors that perpetuate the concept of gender harmony, which contributes to the subjugation of women. To promote gender equality and enhance rural well-being in Indonesia, we recommend for a comprehensive transformation of policy and institutional approaches to women's empowerment and the implementation of gender-transformative policies in the agricultural sector.

Keyword: Indonesia; Rural development; Agricultural innovation; Cattle farming; Gender equality

101. Local deforestation spillovers induced by forest moratoria: Evidence from Indonesia / Leijten, Floris; Sim, Sarah; King, Henry; Verburg, Peter H.. *Land Use Policy* 101. ISSN: 0264-8377 (2021) v.109 Issue. p.105690. 109

Url: <https://www.sciencedirect.com/science/article/pii/S0264837721004130>

DOI: 10.1016/j.landusepol.2021.105690

Abstract: Moratoria on commodities produced in deforestation-risk areas have been shown to be highly effective in reducing deforestation within targeted areas. Various studies have shown, however, that such policies are prone to large local spillover effects, i.e., non-trivial changes (reductions or increases) in the amount of deforestation in areas just outside the direct scope of the moratorium. Little is known about the direction and magnitude of local spillover effects that may have been induced by the Indonesian forest moratorium, an anti-deforestation policy enacted in 2011 that covers around a third of Indonesia's terrestrial area and that is of high importance in meeting international deforestation goals. Here, we empirically assess the evidence of spillover effects near the Indonesian moratorium boundaries, using several proximity metrics and a panel dataset spanning the years 2001–2018. Based on our negative binomial fixed effects regressions, we estimate that the moratorium induced 1324 km² of deforestation in areas located within 10 km of the targeted areas in the period 2011–2018, most of which occurred near conservation and protection forests. Evidence of spillover effects is also strong within concession areas slated for development. This suggests that companies may have shifted their planned production activities from areas targeted by the moratorium to neighbouring concession areas, resulting in additional forest loss. To minimize or halt such spillover effects, the scope of the Indonesian moratorium could be expanded to high-deforestation risk areas, such as forest areas outside mountainous regions, with relatively high GDP per capita and high agro-ecological suitability for oil palm plantations. In addition, a higher uptake of certification schemes and increased international finance would complement the moratorium, helping to reduce incentives to deforest both within and outside the moratorium areas.

Keyword: Indonesia; Deforestation; Concession areas; Moratoria; Spillovers

102. Transformation of Indonesian capture fisheries governance: Review and prospects / Suherman, Agus; Hernuryadin, Yayan; Suadela, Putuh; Furkon, Ukon Ahmad; Amboro, Tono. *Marine Policy*102. ISSN: 0308-597X (2025) v.174 Issue. p.106619. 174

Url: <https://www.sciencedirect.com/science/article/pii/S0308597X2500034X>

DOI: 10.1016/j.marpol.2025.106619

Abstract: As a maritime nation, Indonesia possesses vast potential in fisheries and marine resources. Proper management of these resources is essential to ensure they remain a source of food and economic prosperity for both present and future generations. This study aims to evaluate the evolution of governance practices and propose actionable strategies for future policy development. By analyzing historical and current governance frameworks, the research identifies the gaps and potential improvements needed for sustainable fisheries management. The research will closely analyze the effects of these regulatory shifts on the fishing industry, local fishers, and non-commercial fishing activities, with a particular emphasis on the creation of effective governance structures. The study begins by exploring the complexities and challenges unique to managing fisheries in Indonesia, which are more intricate compared to other countries. It also traces the history of fisheries management in Indonesia, detailing the development of its policies and the significant impact these policies have had on the growth of the fisheries sector. Based on the Indonesian Fisheries Law, the goal is to establish a well-structured and continuously improving fisheries management system. Key management systems and strategies in Indonesian fisheries are summarized in this study, along with their effects. The transformation in fishing governance, particularly through the adoption of zoning and quota systems, is expected to contribute to the sustainability of fish resources and economic growth. This research concludes that adopting a quota- and zone-based approach to capture fisheries management in Indonesia will be essential for regulating catches, thereby preserving fish stocks and supporting economic stability. However, due to the distinctive characteristics of Indonesian fisheries and the complex, often ambiguous nature of the sector, significant challenges remain. Moreover, there is an ongoing need to enhance data collection, scientific research, and collaboration among stakeholders.

Keyword: Sustainability; Governance; Fisheries policy; Indonesia fisheries history; Transformation

103. Finding a Neue Gemeinschaft in rural Indonesia: A discussion of forest community digital transformation / Mazyra, Thita M.; Nurrochmat, Dodik Ridho; Kolopaking, Lala M.; Satria, Arif; Dharmawan, Arya Hadi. *Forest Policy and Economics*103. ISSN: 1389-9341 (2023) v.148 Issue. p.102913. 148

Url: <https://www.sciencedirect.com/science/article/pii/S1389934123000084>

DOI: 10.1016/j.forpol.2023.102913

Abstract: Launching the Indonesia Digital Roadmap 2021–2024 will highlight the importance of preparing villages to succeed in supporting the sustainable transformation of forest communities. In this study, we investigate how digital technology has impacted forests. We discuss the causes of socioeconomic developments and how they can sustain forests. The introduction of online public services in villages has stimulated the enthusiasm of forest communities to become technologically

savvy. Entrepreneurs and development groups are becoming motivated as their demand for digital technology increases. The complex coordination between the digital leadership of multiple entities and institutional networks is required for these developments. The digital divide and other challenges are addressed to build sophisticated forest communities by creating a community with a digital mindset and providing local assistance through online public services. With digital technology previously unknown to forest communities, a new community was developed and transformed into a digitally-based forest community (Neue Gemeinschaft). However, to ensure the continuation of economic activity in forest communities, the local government's policy of implementing digital road maps in villages requires support. Therefore, forest village development can be sustainable with a significant impact. Livelihood and welfare enhancements still require a lengthy time frame. This finding further supports the idea that digital transformation policy is a valuable social innovation for designing forest community sustainability strategies. In addition, this transformation demonstrates the potential opportunity for forest communities to be swiftly equal to cities.

Keyword: Forest villages; Rural digital transformation; Well-being

104. Resource-based industrial policy in an era of global production networks: Strategic coupling in the Indonesian cocoa sector / Neilson, Jeffrey; Dwiartama, Angga; Fold, Niels; Permadi, Dikdik. *World Development* 104. ISSN: 0305-750X (2020) v.135 Issue. p.105045. 135

Url: <https://www.sciencedirect.com/science/article/pii/S0305750X20301716>

DOI: 10.1016/j.worlddev.2020.105045

Abstract: Processes of industrialisation have long been associated with labour productivity improvements, rising incomes, and ultimately economic and social development. The preferred policy strategy to achieve these development objectives, however, remain intensely debated. A specific policy strategy of resource-based industrialisation (RBI), involving pre-export value addition to raw materials, is frequently pursued by resource-rich countries in the global south. We apply the analytical framework of Global Production Network (GPN) theory, and its central notion of strategic coupling, to the case of cocoa processing in Indonesia. Our findings demonstrate that the apparent success of an RBI policy in encouraging growth of a domestic cocoa processing sector, primarily through the use of export restrictions, is highly dependent on industry-specific GPN dynamics. Through an assessment of downstreaming policies in Indonesia, this paper provides an explanation for the success and limitations of such industrial policies in the contemporary global economy. Industry outcomes are strongly influenced by Indonesia's position within a set of globally-connected networks and the alignment of national policy with the particular strategies of lead firms within these networks in a processes of strategic coupling. We further argue that the inherent importance of upstream supply within resource-based industrialisation demands further attention when applying concepts of strategic coupling to this particular policy framework.

Keyword: Indonesia; Chocolate; Cocoa; Global Production Networks (GPNs); Industrial policy; Resource-based industrialisation (RBI); Strategic coupling

105. Dynamics of local governance: The case of peatland restoration in Central Kalimantan, Indonesia / Januar, Rizky; Sari, Eli Nur Nirmala; Putra, Surahman. Land Use Policy105. ISSN: 0264-8377 (2021) v.102 Issue. p.105270. 102

Url: <https://www.sciencedirect.com/science/article/pii/S0264837720326089>

DOI: 10.1016/j.landusepol.2020.105270

Abstract: Since 2016, peatland restoration policy is implemented in Central Kalimantan province through facilitation and coordination by Peat Restoration Agency (Badan Restorasi Gambut [BRG]), with the goals of reducing the peat subsidence, greenhouse gas emissions, and vulnerability to fire of peat areas. After years of implementation, local peat fires persist, however, and knowledge is still lacking about the challenges and opportunities for supporting the restoration process. This study examines policy implementation from the perspective of regional stakeholders by unraveling the dynamics of stakeholder interactions associated with the policy process. It reveals that the current state of governance somewhat restricts the ability of restoration actors to adaptively address emerging policy challenges and proposes measures for addressing these challenges.

Keyword: Climate change mitigation; Central Kalimantan; Local governance; Peat fires; Peatland restoration

106. Pharmaceutical waste management legislations: Where do ASEAN countries stand in harmonization? A review of regulatory documents / Sapkota, Binaya; Pariatamby, Agamutu. Waste Management106. ISSN: 0956-053X (2025) v.195 Issue. p.107-128. 195

Url: <https://www.sciencedirect.com/science/article/pii/S0956053X25000479>

DOI: 10.1016/j.wasman.2025.01.039

Abstract: Although healthcare waste management (HCWM) legislations prevail in Association of Southeast Asian Nations (ASEAN), there appears a prominent gap in standalone pharmaceutical waste management (PWM) legislation making harmonization of PWM challenging in the region. This review is aimed to comprehensively overview the PWM-related legislations in ASEAN, comprising of 10 economically rising countries in Southeast Asia. The relevant regulatory documents, that were promulgated till August 31, 2024 and that were in English or officially translated in English, were extracted from PubMed/Medline, Scopus, Science Direct, Google Scholar, and respective country's government websites. The documents were considered suitable based on their relevance, accessibility, and timeliness. The policy analysis revealed that all Member States in ASEAN lack specific legislations on PWM, and are managing pharmaceutical waste (PW) within the umbrella legislation of HCWM or biomedical waste management. The review discussed implications of joint ASEAN legislations, relevant guiding principles of waste management, and international guidelines relevant to PWM such as Basel Convention, Stockholm Convention, and the status of their endorsement in ASEAN. Some ASEAN countries such as Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam have established infrastructures and regulatory setup for HCWM but still lack specific PWM legislations. ASEAN can foster harmonized legislative frameworks, facilities and technologies in PWM, raising public awareness and active participation to mitigate PW problem. The hard laws such as Acts, regulations, and ordinances are definitely aimed for PWM in ASEAN, but at least harmonized soft laws in the form of guidelines are imperative to harmonize PWM practice.

Keyword: Sustainability; ASEAN; Guiding principles; Harmonized regulation; Legislation; Pharmaceutical waste management

107. Perspective: Interventions to improve the diets of children and adolescents / Morris, Saul S.; Barquera, Simón; Sutrisna, Aang; Izwardy, Doddy; Kupka, Roland. *Global Food Security*107. ISSN: 2211-9124 (2020) v.27 Issue. p.100379. 27

Url: <https://www.sciencedirect.com/science/article/pii/S221191242030033X>

DOI: 10.1016/j.gfs.2020.100379

Abstract: Building on the Innocenti Framework on Food Systems for Children and Adolescents, this paper describes the significance of a food systems approach to improving children's diets. It summarizes the key learnings on effective intervention design from the papers in this special issue, focusing on the determinants in the framework: food supply chains, food environments, and behaviors of caregivers, children and adolescents. It lays out relevant policy and programmatic implications and organizes these according to the Nuffield ladder of public policy interventions. Country-level constraints to scaling key solutions in Mozambique, Mexico, and Indonesia are also described. The paper concludes with a call for greater urgency in addressing the influencers of children's diets and a more cross-sectoral approach to policy design.

Keyword: Adolescent; Child; Diet; Food supply; Nutrition; Public policy

108. An empirical estimate of the land footprint of nickel from laterite mining in Indonesia / Heijlen, Wouter; Duhayon, Chris. *The Extractive Industries and Society*108. ISSN: 2214-790X (2024) v.17 Issue. p.101421. 17

Url: <https://www.sciencedirect.com/science/article/pii/S2214790X24000194>

DOI: 10.1016/j.exis.2024.101421

Abstract: Nickel is one of the main industrial metals and an essential element for the energy transition towards renewable sources. The metal is increasingly sourced from surficial laterite-type deposits, especially in Indonesia where large investments have been made in its mining and processing infrastructure. The direct land use and land cover (dLUC) change associated with this kind of mine development is not accurately known, although this parameter plays an important role as a master variable in modelling of various environmental effects such as impacts on biodiversity, water quality and greenhouse gas emissions. We have measured the growth of the total land occupied by the booming Indonesian nickel industry over the last two decades and have linked the obtained dLUC change to the country's declared ore production. Our methodology is based on simple visual interpretation of mine areas using Google Earth Pro, allowing for easy verification. The analysis indicates a land transformation factor of 0.7 ± 0.1 m² per ton of nickel ore, which is up to 20 times larger than previous estimates. Our revision of this factor might be of importance in discussions about the socio-ecological impact of nickel mining in Indonesia and for management policies designed to mitigate its consequences.

Keyword: Indonesia; land footprint; land transformation factor; laterite mining; Nickel

109. How are healthy, working populations affected by increasing temperatures in the tropics? Implications for climate change adaptation policies / Masuda, Yuta J.; Castro, Brianna; Aggraeni, Ike; Wolff, Nicholas H.; Ebi, Kristie; Garg, Teevrat; Game, Edward T.; Krenz, Jennifer; Spector, June. *Global Environmental Change* 109. ISSN: 0959-3780 (2019) v.56 Issue. p.29-40. 56

Url: <https://www.sciencedirect.com/science/article/pii/S095937801830788X>

DOI: 10.1016/j.gloenvcha.2019.03.005

Abstract: Climate change and land use change are increasing average and extreme temperatures. Hotter temperatures can detrimentally affect workers' health and their economic productivity and livelihoods, especially in rural areas in industrializing countries that may be more vulnerable and less resilient. A growing literature has examined these factors at large spatial scales, yet few studies have done so at finer scales. Micro-level data from developing regions is needed to understand the extent of heat exposure, as well as current and future adaptation strategies of working, healthy, and rural populations. We fill this gap using objective environmental measurements from 3MTM QuestempTM 46 Heat Stress Monitors, as well as survey data from working, healthy, and rural communities in East Kalimantan, Indonesia. Our data contain two groups: those who work in only open areas, and those who work in both forests and open areas. We document workers' livelihood strategies, work schedules, perceptions of how temperatures impact their work, and future adaptation strategies for even hotter days. Ambient temperatures are 2.6–8.3 °C cooler in forests compared to open areas, indicating the temperature effects of deforestation can be immediate and significant. Those working only in open areas face up to 6.5 h of exposure to temperatures above the accepted Threshold Limit Value for worker well-being. Workers adapt to hotter temperatures by altering the timing of their work shifts and breaks, indicating our sample is already adapting to increasing temperatures from climate and land use change. We also find differential adaptation strategies between those working only in open areas compared to those working in both forests and open areas, suggesting current acclimatization may be a factor in how people adapt. Our results suggest the need for adaptation and mitigation policies tailored to the unique constraints of rural workers that specifically incorporate extant adaptation strategies.

Keyword: Climate change; Deforestation; Adaptation; Heat exposure; Human well-being; Livelihoods

110. Geospatial analysis of Indonesia's bankable utility-scale solar PV potential using elements of project finance / Langer, Jannis; Kwee, Zenlin; Zhou, Yilong; Isabella, Olindo; Ashqar, Ziad; Quist, Jacob; Praktijnjo, Aaron; Blok, Kornelis. *Energy* 110. ISSN: 0360-5442 (2023) v.283 Issue. p.128555. 283

Url: <https://www.sciencedirect.com/science/article/pii/S0360544223019497>

DOI: 10.1016/j.energy.2023.128555

Abstract: Geospatial analysis is useful for mapping the potential of renewables like solar PV. However, recent studies do not address PV's bankable potential for which project financing can be secured. This

paper proposes a framework that incorporates project finance into geospatial analyses to obtain the bankable potential of renewables. We demonstrate our framework for Indonesia, and compare the bankable potential with the socio-economic potential mostly used in literature. Using average inputs On average, the technical potential is 12,200 TWh/year and the socio-economic potential is 152.7 TWh/year if capped by 2030 demand (34% coverage). Considering PV's financing risks, PV's bankable potential is 16.0 TWh under current conditions if capped by 2030 demand (3.6% coverage). Both economic potentials are mainly in East Indonesia and absent on Java due to tariffs and land availability. For the bankable potential, the risk perception by banks and investors is another key influence. With a feed-in tariff of 11.5 US¢(2021)/kWh and temporary lift of import restrictions, the bankable potential is 23 TWh if capped by 2030 demand (5.2% coverage) and spreads to Java. For more widespread bankability, additional temporary measures are recommended until the PV's costs have decreased further and trust by financial institutions has increased.

Keyword: Indonesia; Economic analysis; Geospatial analysis; Monte Carlo simulation; Project finance; Solar PV

111. Assessment of coastal ecosystem services and its condition for policy management plan in East Nusa Tenggara, Indonesia / Tussadiah, Armyanda; Sujiwo, Aryo Sahid; Andesta, Indah; Daeli, Willy. Regional Studies in Marine Science111. ISSN: 2352-4855 (2021) v.47 Issue. p.101941. 47

Url: <https://www.sciencedirect.com/science/article/pii/S2352485521003339>

DOI: 10.1016/j.rsma.2021.101941

Abstract: As a developing and archipelago country, Indonesia is expected to assess its coastal ecosystem services to unleash Indonesia's coastal potential and to drive Indonesia's economic development. With this line of reasoning, it is indeed to apply the concept of Ecosystem Services (ES) and its condition to measure how much natural potential we have in coastal ecosystems. However, there has been no comprehensive framework on how ES and its condition are holistically conducted. For that purpose, we pioneered integrated research to assess the spatial distribution of the ES (coastal protection and recreation) across districts of East Nusa Tenggara province and its condition toward habitat by applying integrated InVEST (Integrated Valuation of Ecosystem Services and Trade-offs) models. InVEST model would acknowledge the potential ES that is available in the coastal ecosystem and its condition. Additionally, we also suggest the form of coastal management policy in East Nusa Tenggara that needs to be applied based on the available ES data. Our result indicated that West Manggarai and Southwest Sumba have the highest and lowest ES for coastal protection and tourism services. The HRA models showed that the condition of the coastal ecosystem in West Manggarai is at moderate risk; however, most of the seagrass is at high risk. The results suggested that conservation areas in West Manggarai intensified the existing ES provided there, whereas it also brings pressures to habitat conditions. Therefore, there is indeed to achieve an ideal coastal management practice in East Nusa Tenggara. It is also needed to consider ecological, social and economic aspects and involve all government levels to establish synergistic and inclusive policies. Simultaneously, it is also notable in paying attention to each area's carrying capacity that can affect ecological functions.

Keyword: Ecosystem services; Coastal protection; Habitat risk; Policy management plan; Tourism

112. Topographic restrictions on land-use practices: Consequences of different pixel sizes and data sources for natural forest management policies in the tropics / Putz, Francis E.; Ruslandi; Ellis, Peter W.; Griscom, Bronson W.. *Forest Ecology and Management*112. ISSN: 0378-1127 (2018) v.422 Issue. p.108-113. 422

Url: <https://www.sciencedirect.com/science/article/pii/S0378112717321072>

DOI: 10.1016/j.foreco.2018.04.001

Abstract: Much of the tropical forest that will escape conversion is on steep slopes. Land uses in steep areas disproportionately affect environmental processes, especially hydrology (e.g., peak flows, suspended sediment loads). We use data from East Kalimantan, Indonesia, to demonstrate why slope measurements used for planning and regulatory purposes should be based on digital elevation models (DEMs) constructed with small pixel data and ground-based or canopy-penetrating remote sensing, and not just mean slopes calculated for large areas with passive remote sensing. For five logging concessions, the proportion of the forest on slopes >40% (21.8°) ranged 35–85% with crown penetrating airborne lidar pixels of 1 m, but only 13–69% when pixel size was increased to 30 m. With passive satellite-based remotely sensed 30 m pixels, estimates of land on slopes >40% were even lower (11–56%). Policies based on DEMs with underestimated slopes contribute to the misuses of steep areas and the consequent deleterious in-forest and downstream impacts. The energy costs of forest operations increase with slope, which decreases the financial costs of compliance with environmentally motivated policies for the protection of steep terrain.

Keyword: Digital elevation models; Landslides; Natural forest management; Terraces; Tropical forestry

113. What drives smallholder tree growing? Enabling conditions in a changing policy environment / Arvola, Anne; Brockhaus, Maria; Kallio, Maarit; Pham, Thu Thuy; Chi, Dao Thi Linh; Long, Hoang Tuan; Nawir, Ani Adiwinata; Phimmavong, Somvang; Mwamakimullah, Reuben; Jacovelli, Paul. *Forest Policy and Economics*113. ISSN: 1389-9341 (2020) v.116 Issue. p.102173. 116

Url: <https://www.sciencedirect.com/science/article/pii/S1389934119301212>

DOI: 10.1016/j.forpol.2020.102173

Abstract: Attempts to encourage smallholder tree growing with policies and incentives have had variable outcomes, and earlier research and theories have identified various important factors in the enabling environment and in promotional policies. Outcome effectiveness of policies and incentives depends on the socioeconomic context where they are applied, the overall political and market environment, policy perseverance, and relevancy of incentives to target the actual hindrances for tree growing. A systematic analysis was carried out to complement previous qualitative research, and to clarify which factor combinations produce increased smallholder commercial tree growing in developing country contexts. We applied two-step Qualitative Comparative Analysis (QCA) to identify necessary and sufficient factors related to tree growing between 1990 and 2015 in Indonesian Java, Kalimantan & Sumatra, Lao PDR, Tanzania, Uganda, and Vietnam. Data were collected through field research in Tanzania and Lao PDR, and through a literature review covering all the countries. Strong tenure rights and demand were identified as necessary factors for tree growing and, in a few cases,

they were also the only sufficient factors needed to trigger tree growing. Well-functioning wood markets or a strong tree growing knowledge base combined with direct incentives played their role as sufficient conditions, as they were present in most cases when tree growing area expanded. Indirect incentives were insignificant as an enabling factor in our case countries. A key message to policymakers is that governments are in a central role: firstly, in ensuring tenure rights, and secondly as knowledge service and incentive providers to set up sufficient enabling environments for smallholder tree growing to take off.

Keyword: Tenure; Demand; Forest policy; Incentive; Qualitative comparative analysis; Time series; Wood markets

114. Ecosystem services under future oil palm expansion scenarios in West Kalimantan, Indonesia / Sharma, Sunil K.; Baral, Himlal; Laumonier, Yves; Okarda, Beni; Komarudin, Heru; Purnomo, Herry; Pacheco, Pablo. *Ecosystem Services*114. ISSN: 2212-0416 (2019) v.39 Issue. p.100978. 39

Url: <https://www.sciencedirect.com/science/article/pii/S2212041619301652>

DOI: 10.1016/j.ecoser.2019.100978

Abstract: This study analyzes the five primary ecosystem services and their trade-offs and synergies associated with future scenarios of oil palm plantations in West Kalimantan, Indonesia. Three plausible future scenarios were assessed: 1) business as usual, 2) conservation and, 3) sustainable intensification, based on current land-use policy and spatial planning and projected oil palm expansion. The spatial analysis tool in ArcGIS and the Integrated Valuation of Ecosystem Services and Trade-offs Tool (InVEST Tool) were used to analyze historical and future land-use change, valuation and trade-offs of ecosystem services. The sustainable intensification scenario generates a positive impact on carbon storages and water yield, although habitat quality nominally declines. In terms of total economic value of ecosystem services, the conservation scenario generates the highest value of ecosystem services, while the sustainable intensification scenario offers a compromise solution for future expansion of oil palm by ensuring the supply of ecosystem services comparable to conservation scenario but without significantly affecting palm oil yield in comparison to the business-as-usual scenario. A detailed study with better information on the economic values of ecosystem services can provide a better understanding of the social and environmental impacts of oil palm expansion.

Keyword: Ecosystem services; InVEST; Future scenarios; Oil palm expansion; West Kalimantan

115. Characterising policy responses to complex socio-ecological problems: 60 fire management interventions in Indonesian peatlands / Jefferson, Una; Carmenta, Rachel; Daeli, Willy; Phelps, Jacob. *Global Environmental Change*115. ISSN: 0959-3780 (2020) v.60 Issue. p.102027. 60

Url: <https://www.sciencedirect.com/science/article/pii/S0959378019302560>

DOI: 10.1016/j.gloenvcha.2019.102027

Abstract: Governance of complex socio-ecological problems such as climate change, deforestation, and chronic wildfires is becoming “messier”. Theory and case study evidence suggest that “messy”

institutional characteristics like non- government involvement and multi-level decision-making can improve social and environmental outcomes. However, these characteristics still lack systematic documentation, and there have been few efforts to systematically characterize and compare the interventions associated with them. We examined 60 fire management interventions (FMI) undertaken between 1999 and 2016 in response to Indonesia's disastrous peatland fires. We documented their institutional characteristics (i.e., lead sector, multi-level character) and compared their design across institutional types, focusing on design attributes associated with performance such as targeting to high-risk soil types, landholders, and time periods, and the use and design of incentives. We found gaps between scientific recommendations and practice when it came to intervention targeting. However, industry FMI were more likely to employ nuanced targeting among landholders. Government, industry, and civil society adopted differing intervention strategies, including notable differences in the design of incentives. These findings provide the groundwork for research comparing intervention outcomes between institutional types. They also highlight the need for further stock-taking to inform research in these areas.

Keyword:

116. National digital strategy development: Guidelines and lesson learnt from Asia Pacific countries / Priharsari, Diah; Abedin, Babak; Burdon, Steve; Clegg, Stewart; Clay, John. *Technological Forecasting and Social Change* 116. ISSN: 0040-1625 (2023) v.196 Issue. p.122855. 196

Url: <https://www.sciencedirect.com/science/article/pii/S0040162523005401>

DOI: 10.1016/j.techfore.2023.122855

Abstract: Adoption of information and communication technology (ICT) to create a digital ecosystem gives rise to substantial economic and social benefits. Therefore, many countries develop National digital strategies (NDSs) to establish objectives, policy priorities and outline necessary actions for implementation of digital transformation. However, given the digital divide between different economies, it is difficult to compare consistently the priorities of NDS across various countries. This paper is an effort to explicate various priorities on different country groups. Using a macro-analysis lens, this research project explored specific policies and regulations that are perceived useful in identifying strategies for strengthening ICT adoption for economic and digital growth. We surveyed members of Asia Productivity Organization (APO) from mid-2020 to 2021 and interviewed three member countries (Indonesia, Malaysia, and the Republic of Korea). Findings offer a guideline for countries to develop their NDS and discuss implications for policy makers in the Asia Pacific region.

Keyword: Economic growth; Asia productivity organization; Digital economy strategy; Digital ecosystem; Productivity

117. Opposing interests in the legalization of non-procedural forest conversion to oil palm in Central Kalimantan, Indonesia / Setiawan, Eko N.; Maryudi, Ahmad; Purwanto, Ris H.; Lele, Gabriel. *Land Use Policy* 117. ISSN: 0264-8377 (2016) v.58 Issue. p.472-481. 58

Url: <https://www.sciencedirect.com/science/article/pii/S0264837716300825>

DOI: 10.1016/j.landusepol.2016.08.003

Abstract: Demand for forestland for non-forest uses, mostly oil palm, has increased dramatically in the past few years and has become a chief driver of deforestation in Central Kalimantan. In this paper, we aim to shed light on how multiple levels of government create a facilitating environment for oil palm expansion. In our research, we employed three different methods: content analysis of key policy documents, participant observations, and expert interviews. We found that the technical complexities of formal procedures for the conversion of forest to oil palm are relatively easy to bypass. Contradicting laws and regulations have created a situation where the Ministry of Environment and Forestry (MoEF) and local governments have relatively equal legal mandates and authority over land-use and allocation. This is further complicated by the ambiguity of the decentralization policy. Enabled by the spatial planning law and the decentralization laws, local governments have aggressively issued plantation licenses for forest areas without the formal release of the forest from the Ministry of Forestry. The issuance of plantation permits has also been legitimized by other policies within central government, which have made oil palm a national priority.

Keyword: Deforestation; Oil palm; Decentralization; Conversion; Land-use; Spatial plans

118. Asymmetric power relations in multistakeholder initiatives: Insights from the government-instituted Indonesian National Forestry Council / Muttaqin, Tatag; Soraya, Emma; Dharmawan, Budi; Laraswati, Dwi; Maryudi, Ahmad. *Trees, Forests and People* 118. ISSN: 2666-7193 (2023) v.12 Issue. p.100406. 12

Url: <https://www.sciencedirect.com/science/article/pii/S2666719323000389>

DOI: 10.1016/j.tfp.2023.100406

Abstract: Waves of democratization, which occurred in Indonesia by the end of the 1990s, have provided opportunities to deepen and diversify broader civil society elements for engagement in formal public policymaking. In the forestry sector emerged a multistakeholder initiative of the National Forestry Council (Dewan Kehutanan Nasional/ DKN), which was envisioned to promote good forest governance by engaging the broader public in the formulation of strategies and policy options to foster intelligent forest management in Indonesia. The DKN was instituted to create a space for multistakeholder dialogues and learning, and was expected to become an influential body in national forest-related policy-making processes. Through the application of theories related to power relations in multistakeholder initiatives, this paper assesses whether the DKN functions as a deliberative and inclusive platform. The hope and expectation placed upon the DKN were sky-high. The DKN initially provided opportunities for the spectrum of public/governments, private sector organizations, and civil society groups to come together on the same table. It also drew support from many institutions at the national level and donor agencies. However, the DKN has later shown the unequal resources of participants and eventual asymmetric power relations. As a result, it fully facilitated deliberative processes due to the asymmetric power that subtly manifested through the stakeholders' interaction patterns, which were heavily driven by the government.

Keyword: Indonesia; Forest governance; Deliberative democracy; Multistakeholder initiative; Power asymmetry

119. Hundred fifty years of soil security research in Indonesia: Shifting topics, modes of research and gender balance / Hairiah, Kurniatun; Fiantis, Dian; Utami, Sri Rahayu; Nurbaity, Anne; Utami, Sri Nuryani Hidayah; Ginting, Frisa Irawan; Ariyanto, Dwi Priyo; Nurcholis, Mohammad; Minasny, Budiman; van Noordwijk, Meine. *Soil Security*119. ISSN: 2667-0062 (2022) v.6 Issue. p.100049. 6

Url: <https://www.sciencedirect.com/science/article/pii/S2667006222000168>

DOI: 10.1016/j.soisec.2022.100049

Abstract: In Indonesian development policy, soil security is primarily understood as part of food security, expansion of the plantation economy, and resettlement schemes rather than as soil-related Sustainable-Development-Goal concerns for health, water, energy, jobs, protection from disasters, changing climates, life in water and life on land. A recent paper reported a shift of Indonesian soil science towards equal participation by men and women. Here we explore a parallel change in focus. in the scientific analysis of (1) the ‘what/where/when’ of soil patterns, (2) the ‘how’ of soil processes and functions, (3) the ways soils can be managed and used, and (4) the ‘so what’ and ‘who cares’ of related to societal interests. We compared shifts in soil science research in literature from the colonial period, with the themes discussed in Indonesian soil science meetings of the past 40 years. Four research themes (patterns, processes, management, environment) were reflected in 29, 21, 49 and 2% of the 1406 publications in the 1890–1963 soil bibliography. In Indonesian soil science meetings of the past 40 years the themes formed 10, 28, 53 and 9% of the 1703 publications, respectively. Gender balance emerged in the past 20 years, with almost a 50:50 ratio of men and women as authors in 2019. However, women's participation is still uneven, with underrepresentation in the soil survey fieldwork and overrepresentation in laboratory-oriented soil process research. International publications about soils in Indonesia shifted earlier to these parts of the sustainable development agenda, but the national discussion followed the trend.

Keyword: Sustainable development goals; Bibliography; Soil conservation; Soil fertility; Soil survey

120. The Shallot Pricing in the View of Import Restriction and Price Reference / Wahyudin, Moh.; Maksum, Moch.; Yuliando, Henry. *Agriculture and Agricultural Science Procedia*120. ISSN: 2210-7843 (2015) v.3 Issue. p.132-136. 3

Url: <https://www.sciencedirect.com/science/article/pii/S2210784315000273>

DOI: 10.1016/j.aaspro.2015.01.026

Abstract: As per January - August 2013, the Government of Indonesia (GOA) has regulated a quota-based import restriction policy for importing shallot. This policy has produced an effect to the shallot price that rose significantly in spite inflation occurred. In order to control the inflation rate, on 2 September 2013 the government changed the import restriction policy, from quota based into price reference based as stated in a decree of the Director General of Domestic Trade No.118/PDN/KEP/10/2013. The price reference of shallot was counted at IDR 25,700/kg, and discounted at IDR 11,935/kg at the farmer level. The aim of this research is to determine the price reference of shallot import restriction that suit for protection of farmer profit of shallot farming. The method of analysis used in this research is Policy Analysis Matrix (PAM). The results shows that the implementation of price reference policy with the price at IDR 11,935/kg at farmer level has decreased

the farmer protection and profitability for 46% and 233%, respectively. This decreasing was caused by the price reference of shallot at the retailer level. It is discussed that the price reference of shallot should be increased at least to IDR 15,260/kg at the farmers level to achieve a higher rate of protection and profit that would be most beneficial to farmers.

Keyword: farmer; import restriction; price reference; profitability; protection; shallot

121. Response of ozone to current and future emission scenarios and the resultant human health impact in Southeast Asia / Fang, Tingting; Hu, Jie; Gu, Yefu; Sung, Joseph J.Y.; Yim, Steve Hung Lam. *Environment International* 121. ISSN: 0160-4120 (2025) v.197 Issue. p.109333. 197

Url: <https://www.sciencedirect.com/science/article/pii/S0160412025000844>

DOI: 10.1016/j.envint.2025.109333

Abstract: Recent evidence has shown the increasing trend of tropospheric ozone (O₃) in Southeast Asia. Mitigating O₃ pollution in Southeast Asia has become important and urgent. While the nonlinear O₃ chemistry makes policy-making complicated, the O₃ formation regime and O₃ response to different emissions have rarely been assessed in Southeast Asia. Furthermore, the O₃-attributable health impacts in Southeast Asia under future emission scenarios have yet to be quantified. Herein, we applied the regional chemical transport model with the High-order Decoupled Direct Method (HDDM) to simulate the O₃ sensitivity to precursor emissions in Southeast Asia, and then projected the health benefits under future Shared Socioeconomic Pathways (SSP) emission scenarios, providing policy suggestions for mitigating O₃ pollution and its health impacts. Our results show O₃ in urban areas (i.e., Singapore, Jakarta, Kuala Lumpur, Bangkok, and Ho Chi Minh City) was sensitive to both nitrogen oxides (NO_x) and volatile organic compounds (VOCs) emissions, and synergistic NO_x and VOCs control is thus essential. Suburban, rural, and sea areas were under a NO_x-limited regime, suggesting the high effectiveness of controlling NO_x over these areas. Compared with the health impacts in baseline year (2019), the annual total O₃-attributed premature mortality under the business-as-usual emission scenario (SSP245) is projected to reduce by 22 k (47 %) by 2050 due to the future NO_x emission reductions in power generation, industrial process, and transportation. Most of the health benefits will happen in Indonesia, Philippines, Vietnam, and Thailand. The sustainable emission scenario (SSP126) is projected to avoid 36 k annual O₃-attributed premature mortalities by 2050 due to its more stringent NO_x reductions in shipping, transportation, and industrial process. SSP370 and SSP585 are projected to increase the O₃-attributable premature mortality by up to 33 k because of the rising NO_x emissions.

Keyword: Southeast Asia; Health impact; O sensitivity; SSP emissions; Surface ozone (O)

122. IMPACT OF CLIMATE CHANGE ON COASTAL ECOSYSTEM AND OUTDOOR ACTIVITIES: A COMPARATIVE ANALYSIS AMONG FOUR LARGEST COASTLINE COVERING COUNTRIES / Zhang, Tiejun; Liu, Huarong; Lu, Yi; Wang, Qinglei; Loh, Yean Chun; Li, Zeyun. *Environmental Research* 122. ISSN: 0013-9351 (2024) v.250 Issue. p.118405. 250

Url: <https://www.sciencedirect.com/science/article/pii/S0013935124003098>

Abstract: Climate change and coastal ecosystems have become challenging subjects for world sustainability. Humans, animals, and other ocean habitats are primarily affected by the harmful changes in climate. Coastal ecosystems support biodiversity and a wide range of species that serve as habitats for many commercially important fish species and enhance human activities in coastal areas. By engaging in coastal outdoor activities, individuals can experience numerous physical and mental health benefits, foster environmental awareness. This study provided valuable insights into the importance of coastal outdoor activities and their potential to improve our quality of life. This study undertook a challenging subject where we graphically and econometrically analyze the relationship and linkages among coastal indicators with other climate-concerning factors. The study comprises the ordinary regression and comparative analysis among the four largest coastline countries in the world. The study took a sample from Canada, Indonesia, Norway, and the Russian Federation from 1990 to 2022. The data is selected on a convenient basis. Results declared that each country has its unique challenges and opportunities in mitigating adverse climate change and retaining a sustainable coastal ecosystem. The study surprisingly revealed that climate change insignificantly affects the coastal ecosystem in Indonesia and the Russian Federation while it inversely affects the coastal ecosystem in Canada and Norway, showed that climate change on average declines coastal production by 0.0041922 and 0.0261104 in Canada and Norway respectively. The detailed review is given in the results section; however, the pooling analysis proved that at the aggregate level, a one percent increase in climate change caused a 0.02266-tonne decline in coastal ecosystems in the four largest coastline nations. There is a need for policies tend to increase CAP activities by implementing practical marine protected areas. Furthermore, scientific research and monitoring will be beneficial in restoring coastal sustainability.

Keyword: Coastal aquaculture production; Coastal ecosystem; Marine protected areas; Outdoor activities; Total greenhouse gases

INDEKS PENGARANG

A

Abedin, Babak, 24
Afable, Sanny D., 12
Aggraeni, Ike, 19
Alej, Freddie, 7
Amboro, Tono, 15
Andesta, Indah, 21
Ariyanto, Dwi Priyo, 26
Arvola, Anne, 22
Ashqar, Ziad, 20
Awanda, Disyacitta, 8

B

Baral, Himlal, 23
Barquera, Simón, 18
Bhargava, Radhika, 7
Blok, Kornelis, 20
Brockhaus, Maria, 22
Budiharta, Sugeng, 3
Budiningsih, Kushartati, 13
Burdon, Steve, 24
Burns, Sarah, 4

C

Carmenta, Rachel, 23
Castro, Brianna, 19
Chi, Dao Thi Linh, 22
Clay, John, 24
Clegg, Stewart, 24
Cragg, Simon M., 7

D

Daeli, Willy, 21, 23
Delina, Laurence L., 12
Dhar, Aurup Ratan, 5
Dharmawan, Arya Hadi, 16
Dharmawan, Budi, 25
Dharmiasih, Wiwik, 12
Dixon, Peter, 2
Doliente, Stephen S., 4
Duhayon, Chris, 19
Durand, Claire, 11
Dwiartama, Angga, 17
Dwiyahreni, Asri A., 2

E

Ebi, Kristie, 19
Ekaputri, Andini D., 3
Ellis, Peter W., 21

F

Fang, Tingting, 27
Farid, Muhammad, 2
Fatma, Zealandia Sarah Nurul, 8
Fiantis, Dian, 26
Field, Damien J., 8
Fold, Niels, 17
Fournier, Stéphane, 11
Friess, Daniel A., 7
Fuad, Habiburrahman A.H., 2
Fuerzas, Ivey, 12
Furkon, Ukon Ahmad, 15

G

Game, Edward T., 19
Garg, Teevrat, 19
Gaveau, David, 6
Gaveau, David L.A., 6
Giessen, Lukas, 4
Ginting, Frisa Irawan, 26
Griscom, Bronson W., 21
Gu, Yefu, 27

H

Hairiah, Kurniatun, 26
Hamilton, Ian, 6
Handayani, Emy, 11
Heatubun, Charlie, 6, 7
Heatubun, Charlie D., 7
Heijlen, Wouter, 19
Hendrawan, Dienda, 10
Hendri, 7
Hernuryadin, Yayan, 15
Hidayat, Rizki Atthoriq, 9
Hilmiati, Nurul, 14
Höglund-Isaksson, Lena, 6
Hu, Jie, 27
Huda, Imanul, 3
Husnayaen, Husnayaen, 6
Hutabarat, Joseph A., 3

I

Indrawan, Tito, 3
Indrawan, Tito P., 3
Intarini, Dian, 13
Isabella, Olindo, 20
Izwardy, Doddy, 18

J

Jacovelli, Paul, 22
Januar, Rizky, 17
Jefferson, Una, 23

K

Kallio, Maarit, 22
Kalor, John D., 7
Kennard, Harry, 6
Kiesewetter, Gregor, 6
King, Henry, 14
Kolopaking, Lala M., 16
Komarudin, Heru, 23
Krenz, Jennifer, 19
Kupka, Roland, 18
Kusworo, Ahmad, 3
Kwee, Zenlin, 20

L

Langer, Jannis, 20
Laraswati, Dwi, 25
Laumonier, Yves, 23
Law, Elizabeth A., 3
Leijten, Floris, 14
Lele, Gabriel, 24
Li, Zeyun, 28
Liu, Huarong, 28
Locatelli, Bruno, 6
Loh, Yean Chun, 28
Long, Hoang Tuan, 22
Lott, Melissa, 7
Lu, Yi, 28
Lupascu, Massimo, 7

M

Mahendra, William Krista, 8
Maksum, Moch., 26
Margules, Chris, 2
Mariati, Sri, 2
Marlessy, Cliff, 7
Maryudi, Ahmad, 13, 24, 25
Masuda, Yuta J., 19
Matsubae, Kazuyo, 5
Mazya, Thita M., 16
McGushin, Alice, 6
Meehan, Fiona, 13
Meijaard, Erik, 3, 6
Milner, James, 7
Minasny, Budiman, 8, 26
Morris, Saul S., 18

Murdiyarso, Daniel, 7
Musshoff, Oliver, 10
Muttaqin, Tatag, 25
Mwamakimbullah, Reuben, 22
Myers, Rodd, 13

N

Nasution, Aulia Fajrin Ramadhani, 9
Natalis, Aga, 11
Nawir, Ani Adiwinata, 22
Neilson, Jeffrey, 17
Nofrizal, Adenan Yandra, 9
Nurbaity, Anne, 26
Nurcholis, Mohammad, 26
Nurrochmat, Dodik Ridho, 16

O

Oita, Azusa, 5
Okarda, Beni, 23

P

Pacheco, Pablo, 23
Pariatamby, Agamutu, 18
Permadi, Dikdik, 17
Pham, Thu Thuy, 22
Phelps, Jacob, 23
Phimmavong, Somvang, 22
Prakoso, Bimo, 2
Praktiknjo, Aaron, 20
Priharsari, Diah, 24
Prior, Julian, 14
Purnomo, Herry, 23
Purohit, Pallav, 7
Purwanto, 7, 24
Purwanto, Ris H., 24
Putra, Surahman, 17
Putz, Francis E., 21

Q

Quist, Jaco, 20

R

Rafaj, Peter, 7
Raharjo, Sugeng, 3
Rahman, Henzulkifli, 9
Resosudarmo, Ida Aju Pradnja, 9
Rimmer, Maureen, 2
Ruslandi, 21

S

Safa Barraza, Alejandra, 14
Sahide, Muhammad Alif K., 4
Salamanca, Albert, 12
Salim, Mohammad A., 6
Samsatli, Sheila, 4
Santika, Truly, 3
Santos, Lucas, 6
Sapkota, Binaya, 18
Sari, Eli Nur Nirmala, 17
Satria, Arif, 16
Sembiring, Adventi Ferawati, 11
Setiawan, Eko N., 24
Sharma, Rohit, 7
Sharma, Sunil K., 23
Sheil, Douglas, 6
Shekelle, Myron, 2
Shutes, Lindsay, 2
Sidik, Frida, 7
Sillanpää, Mériadec, 7
Sim, Sarah, 14
Sirait, Martua Thomas, 13
Soraya, Emma, 25
Spector, June, 19
Springmann, Marco, 7
Stella Thei, Ruth, 14
Stigner, Madeleine, 3
Struebig, Matthew, 3
Suadela, Putuh, 15
Suherman, Agus, 15
Sujiwo, Aryo Sahid, 21
Sulhani, 3
Sung, Joseph J.Y., 27
Supriatna, Jatna, 2
Sutrisna, Aang, 18

T

Tabeau, Andrzej, 2
Tacconi, Luca, 9, 13
Tam, Kim-Pong, 12
Tapia, John Frederick D., 4
Trison, Soni, 3
Tussadiah, Armyanda, 21

U

Umarhadi, Deha Agus, 8
Utami, Sri Nuryani Hidayah, 26
Utami, Sri Rahayu, 26

V

Valerio, Erika, 14
van Meijl, Hans, 2
van Noordwijk, Meine, 26
Verburg, Peter H., 14

W

Wahyudi, 7
Wahyudin, Moh., 26
Waluyo, Efendi Agus, 9
Wang, Qinglei, 28
Watts, Nick, 7
Wibowo, Agung, 4
Widyatmanti, Wirastuti, 8
Wilastra, Indra, 9
Winarni, Nurul L., 2
Wirasenjaya, Farah, 5
Wolff, Nicholas H., 19
Woodcock, James, 7

Y

Yim, Steve Hung Lam, 27
Yudha, Ruhuddien Pandu, 7
Yuliando, Henry, 26

Z

Zakaria, Zuliyanto, 2
Zhang, Tiejun, 27
Zhou, Yilong, 20