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Systematic Review Protocol

Title
What is the influence on socio-economic well-being of UNESCO biosphere reserves in Southeast Asia? A systematic review protocol

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Keywords
UNESCO biosphere reserves, conservation, Southeast Asia, human well-being, socio-economics

Background
This PROCEED submission follows the open access a-priori availability of the protocol at Zenodo, prior to commencing this review, on 27th October 2020. DOI: 10.5281/zenodo.4136658 The concept of Biosphere Reserves was introduced in 1975 (Jaisankar, Velmurugan, & Sivaperuman, 2018) by UNESCO in response to the need for conservation of biodiversity along with its sustainable use. Biosphere reserves comprise terrestrial, marine and coastal ecosystems for the purpose of preserving genetic diversity in representative ecosystems by protecting wild animals, the traditional life style of inhabitants and domesticated plant/animal genetic resources (Jaisankar et al., 2018). The nexus between conservation intervention and human development has been facing sizeable challenges due to the conflicting interests induced by rapid social and environmental challenges, such as climate change. This, therefore, raises the need for a thorough understanding of the relation between natural conservation and socio-economic development. The topic has gained increasing attention in the past decades, reflected in a number of secondary research articles published recently. Expanding on these reviews, our systematic review will contribute to enrich the understanding on the relationship between natural conservation and socio-economic development with a focus on UNESCO biosphere reserves. The intended users of our findings are practitioners, UNESCO reserve managers and policy makers. Though a recognised challenge for the management of UNESCO biosphere reserves is to harmonize the interactions between the environment and humans (Reed & Egunyu, 2013; UNESCO, 2010), the extent of trade-offs between the environmental protection that UNESCO biosphere reserves provide and the socio-economic wellbeing of communities dependant on the reserves has not been fully documented. In this review, we will build and expand on the searches by Eales et al. (2020) to search for relevant documents examining the effects of UNESCO biosphere reserves on socio-economic well-being in SEA countries.

Theory of change or causal model
The UNESCO model of natural conservation has been expected to bring about win-win outcomes for both biodiversity and socio-economic development. However, some research shows a lack of thorough understanding of conservation and socio-economic interactions (Bennett & Roth, 2015; Chaigneau & Brown, 2016; Woodhouse et al., 2015). Some conservation interventions, for example, the UNESCO biosphere reserves in Malaysia such as Tasik Chini have posed socio-economic

challenges to some local communities, such as a low-income traps, disparate livelihood alternatives, widespread symptoms of alcoholism/substance abuse and safety and cultural integrity issues of residential areas involving tourism development.

Stakeholder engagement
This review is conducted with the engagement of the Vietnam Man and Biosphere Program (MAB Vietnam) National Committee and UNESCO Regional Science Bureau for Asia and the Pacific. The stakeholders will suggest sources of grey literature and provide annual reports by UNESCO biosphere reserves in SEA and the reports by the Southeast Asian Biosphere Reserves Network (SeaBRnet). A scoping meeting was arranged between the review team and MAB Vietnam to discuss the potential factors affecting the success or failure of a UNESCO biosphere reserve and this has informed the development of this protocol.

Objectives and review question
“What are the impacts of activities undertaken in UNESCO biosphere reserves on socio-economic well-being in Southeast Asia?”.

Definitions of the question components
- Population: human populations in UNESCO biosphere reserves in Southeast Asia - Intervention: activities undertaken in UNESCO biosphere reserves - Comparator: not necessary (we consider studies with and without comparator). Where present, an eligible comparator is the same site before activities undertaken, or a site without activities (we will note whether the site was designated as a UNESCO biosphere reserve at the time of the comparator), or a site with activities but outside of a UNESCO biosphere reserve. - Outcomes: any measures of socio-economic status.

Search strategy
We will take both published and unpublished literature in English into account in this review. We will conduct searches in the following sources: bibliographic databases, web-based search engines and grey literature. We will also use the database from the systematic map in Eales et al (2020) to identify relevant literature from the extensive and comprehensive searching undertaken for that work. Search string (see below sections for details) In this review, we will not include Outcome terms into the search string, because when we tested the search with only terms related to UNESCO Biosphere Reserve sites in SE Asia, the number of articles was low enough to be manageable for screening. The rationale for focusing on names of UNESCO biosphere reserves, and the term “biosphere reserve” is that any intervention undertaken, should have been done with the understanding that the site was a UNESCO biosphere reserve, and that the intervention was aiming to meet the UNESCO goals. If an article reported research undertaken in a UNESCO biosphere reserve, but did not mention the search terms below, the intervention was highly unlikely to be under the management of UNESCO or aiming to meet the goals, and we are not including such research in our review. If outcome terms were added into the search, there is a danger of potentially missing articles, if authors used outcome terms which were not included in our search terms. We thus use the concepts of "Population" and "Intervention" in our search strings. The stakeholders from MAB Vietnam National Committee and UNESCO will provide and suggest unpublished data. We will undertake citation checking of primary studies identified as relevant to our systematic review. We will also search bibliographies of systematic maps or reviews and other evidence reviews that are focused on the topic area, time and resource permitting.

Bibliographic databases
We use the databases: Medline, Web of Science Core Collection, SCOPUS and Environment Complete. We will not impose any date cut-offs, and searches will not be limited by language. We will use the University of Exeter Institutional subscriptions to databases. Searches will be

undertaken for “topic words” rather than “full text”, to limit the number of irrelevant retrieved hits. All searches are in English. We note specificities of database search engines and account for this in our search strategies, for example, in SCOPUS, punctuation is ignored: “Berbak Sembilang” will retrieve “Berbak Sembilang” and “Berbak-Sembilang”. ("Tonle Sap" OR "Tonlé Sap" OR “Cibodas” OR “Komodo” OR “Lore Lindu” OR “Tanjung Puting” OR “Gunung Leuser” OR “Siberut” OR “Giam Siak Kecil-Bukit Batu” OR “Wakatobi” OR “Bromo Tengger Semeru*” OR “Taka Bonerate-Kepulauan Selayar” OR “Belambangan” OR “Berbak-Sembilang” OR “Betung Kerihun Danau Sentarum Kapuas Hulu” OR “Rinjani Lombok” OR “Tasik Chini” OR “Crocker Range” OR “Inlay Lake” OR “Inle Lake” OR “Indawgyi” OR “Puerto Galera” OR “Palawan” OR “Albay” OR “Sakaerat” OR “Hauy Tak Teak” OR “Haui Tak Teak” OR “Huai Tak Teak” OR “Mae Sa-Kog Ma” OR “Ranong” OR “Can Gio Mangrove” OR “Dong Nai” OR “Cat Ba” OR “Red River Delta” OR “Kien Giang” OR “Western Nghe An” OR “Mui Ca Mau” OR “Cu Lao Cham*” OR “Langbiang” OR “Boeng Chhmar” OR “Prek Toal” OR “Puerto Princesa Subterranean River” OR “Tubbataha Reefs” OR “Kaper Estuary” OR “Laemson Marine National Park” OR “Kraburi Estuary”) OR (“biosphere reserve*”)

Web-based search engines

We will perform an internet search by using following search engines: Google (www.google.com) Google Scholar (www.scholar.google.com) The search will be conducted using the following search terms: Population: name of one of 35 UNESCO biosphere reserves in SEA OR Intervention: (“biosphere reserve*”) The first 100 relevant search results in each engine will be considered for appropriate literature. We will not restrict the language of the search results. We will only look at the first 100, because from scoping exercises, we do not anticipate that many studies in this topic be present in grey literature outside of the specialist websites and repositories that we will search separately (below). All searches are in English.

Organisational websites

According to the consultant from MAB Vietnam National Committee, the following specialist websites of organizations are included to search for publications including grey literature: - https://unesdoc.unesco.org/ark: - https://jfit-for-science.asia/ - http://mabvietnam.net/ We will search 11 scholarly sites for relevant evidence, particularly theses and reports. The search string from the database searches will be adapted to reflect the search functionality of on each website. List of academic thesis databases searched for relevant studies: • Cybertesis • DART-Europe • DiVA • Ethos • NARCIS • National ETD • National Library of Australia Trove Service • NDLTD • Proquest Dissertations and Theses Global • Repositorio Cientifico de Acesso Aberto de Portugal • Theses Canada For all website and catalogue searches we will record the URL, the strategy or search terms used, the date the search was undertaken, the results, and the name of the reviewer undertaking the search. The information will be collated in an Appendix for the systematic review report. All searches are in English.

Comprehensiveness of the search

In order to check the comprehensiveness of the bibliographic database search, we have tested the search using some articles that has been pre-identified as relevant to our topic to make sure that they are retrieved by the search. Four of the five articles were retrieved by the initial search strategy in Web of Science Core Collections. The article by Dygico et al 2013 was not retrieved by our initial search strategy. We found that this was because the article referred to a named site (Tubbataha reefs) within the UNESCO biosphere reserve (Palawan), rather than the reserve itself. With this knowledge we retrieved a list of multi-internationally designated sites within UNESCO biosphere reserves from our stakeholder and modified our search strategy to include these. The

Search update

We will update the searches, closer to the time of publishing our full systematic review report if our

resources allow.

Screening strategy
The screening process will be conducted in two steps by one of two independent reviewers: (1) screening title and abstract and (2) screening full text of articles. First, the title and abstract of each article will be screened based on the study inclusion criteria. The articles meeting inclusion criteria will be obtained at full text and further screened against the criteria to establish the final data for reviewing. The articles that do not meet the criteria at full text will be excluded and we will provide a list of these with the reasons for exclusion of each article. Where authors of the systematic review have authored articles included within the review, they will not be involved in decisions regarding their own work.

Eligibility criteria
Types of study Empirical studies Types of population Study focuses on human populations in 35 UNESCO biosphere reserves in SEA countries including: Tonle Sap, Cibodas, Komodo, Lore Lindu, Tanjung Putting, Gunung Leuser, Siberut, Giam Siak Kecil - Bukit Batu, Wakatobi, Bromo Tengger Semeru-Arjuno, Taka Bonerate-Kepulauan Selayar, Belambangan, Berbak – Sembilang, Betung Kerihun Danau, Sentarum Kapuas Hulu, Rinjani Lombok, Tasik Chini, Crocker Range, Inlay Lake, Indawgyi, Puerto Galera, Palawan, Albay, Sakaerat, Hauy Tak Teak, Mae Sa-Kog Ma, Ranong, Can Gio Mangrove, Dong Nai, Cat Ba, Red River Delta, Kien Giang, Western Nghe An, Mui Ca Mau, Cu Lao Cham - Hoi An, Langbiang Types of intervention Study involves activities/programs/policies* * The activities/programs/policies undertaken must align with the stated functions of UNESCO biosphere reserves; having the aim of one or more of the following: • Conservation of biodiversity and cultural diversity • Economic development that is socio-culturally and environmentally sustainable • Logistic support, underpinning development through research, monitoring, education and training Types of comparator Where present, an eligible comparator before activities undertaken, a site without activities, or a site with activities but outside of a UNESCO biosphere reserve. We will include studies with no comparator Types of study Studies containing quantitative data (quantitative studies or mixed studies where quantitative data are reported separately) Types of outcome: Economic living standard Health Education Social relations Security and safety Governance Subjective well-being Culture and spirituality Freedom of choice and action Language English and any other languages within the capability of the review team.

Consistency checking
In order to ensure the inter-reviewer consistency, consistency checking will be applied at both title and abstract, and full text stages using a random sample of 10% of articles. Any questionable articles and conflicting opinion during screening process will be discussed by the two reviewers. If it is necessary, a third reviewer will be invited to resolve. Further details will be added to the inclusion criteria to clarify where there may have been previous ambiguity. Where there are any coding conflicts that may indicate the need to revisit other articles, these will be re-screened with the additional details for minimising conflicts.

Reporting screening outcomes
Eligible articles will be listed in tables and screening outcomes in ROSES diagram. The articles that do not meet the criteria at full text will be excluded and we will provide a list of these with the reasons for exclusion of each article.

Study validity assessment
We have adapted the checklists for quasi-experimental studies by the Joanna Briggs Institute to assess the potential bias of selected studies for full text review. The adaptations have been made to better fit the study designs we are likely to retrieve for this systematic review, using scoping to

guide the adaptations. The overall validity of the study will be classified into: High, Low and Unclear. Low validity and unclear studies will be included in our review and we will use subgroup analysis to determine the impact of low or unclear study validity. The studies will be assessed by at least one of two reviewers. We will use the study validity classifications in our synthesis, reporting the validity of studies alongside a narrative synthesis and where appropriate, undertaking sensitivity analyses in narrative and/or quantitative synthesis. Where authors of the systematic review have authored articles included within the review, they will not be involved in critical appraisal if their own work. We will also assess the validity of the evidence base as a whole, taking into account not only individual study validity, but also factors such as consistency of the evidence, and publication bias. We will be guided by tools such as GRADE, originally developed for studies in healthcare (Guyatt et al., 2008).

Consistency checking
Consistency checking based on a subset of 10% of studies will be applied, and any disagreements will be discussed and clarifications made to the critical appraisal checklist before continuing with the remaining study assessments. Following this, critical appraisal of all remaining studies will be cross checked by a second reviewer.

Data extraction strategy
An Excel spreadsheet for data extraction (meta-data and quantitative data) will be completed for each study and will report information including: - Study site/area/year of designation - Population e.g. sex, age, occupation - Intervention (type, description) - Study design - Duration of intervention - Measurement methodologies - Duration of outcome measurements - Outcome metrics - Other factors affecting the outcomes - Citation and details to contact authors - Linked studies The above list is not restrictive and will be added to, should further categories of data be useful to record. Data extraction will be conducted by at least one of two reviewers. If time and resources allow, we will contact authors of studies to request missing or additional information for data extraction.

Meta-data extraction and coding strategy
Meta-data includes: - Intervention (type, description) - Study design - Outcome metrics And will be extracted in the same way as data, with codes to be determined based on the characteristics of studies encountered.

Consistency checking
A sample extraction of 10% of the studies will be cross checked by two independent reviewers to address potential disagreement and seek for the agreement. Data extraction forms will be adapted and completion notes expanded on to provide further clarity.

Potential effect modifiers/reasons for heterogeneity
After consultation with researchers and based on previous research articles in this topic area, we have compiled a (non-exhaustive) list of factors that may influence the strength of effect: - Geographical location - The area of UNESCO biosphere reserve - The year of designation (before or after Seville Strategy in 1995) - Governance (leadership, building partnerships, government and stakeholder commitment, support and on-going support) - Participation and collaboration of local community, public, private stakeholders and NGOs - Characteristics of landscape and zonation - Funding for the reserves - Human resources of the reserves (staff experience, knowledge and availability) - Management plans and vision - Monitoring and evaluation frequency and indicators - Research integration (connection to research institutes) - Land use in the surrounding area before, during the designation As the review progresses, more effect modifiers may be identified.

Type of synthesis

Narrative synthesis. Quantitative synthesis if data allow.

Narrative synthesis methods
We will provide a narrative synthesis to determine which aspects of socio-economic wellbeing may be impacted by UNESCO biosphere reserves. We will tabulate information and use visualizations to describe information such as themes/trends, study groups (interventions, study design, study sites) and outcomes. We will narratively investigate the impact of the effect modifiers identified. We will identify knowledge clusters and knowledge gaps by comparing meta-data that has been tabulated or presented in a matrix. We will compare and contrast the practices with both positive and negative impacts of UNESCO biosphere reserves.

Quantitative synthesis methods
If possible, we will undertake a quantitative synthesis. The quantitative synthesis will calculate effect sizes using standardized techniques (Borenstein, Hedges, Higgins, & Rothstein, 2011), and explore heterogeneity using sensitivity analysis and/or subgroup analysis where the number of studies allow. Where we have sufficient studies, we will investigate the influence of publication bias using a funnel plot. We do not provide full details on the methodologies to handle more complex data sets or combining data sets because this will depend on each study we encounter. Full methods will be provided in the final report, along with justification for the methods we will use.

Qualitative synthesis methods
n/a

Other synthesis methods
n/a

Assessment of risk of publication bias
In a quantitative synthesis this will be assessed with funnel plots.

Knowledge gap identification strategy
We will identify knowledge gaps by comparing meta-data that has been tabulated or presented in a matrix.

Demonstrating procedural independence
Where authors of the systematic review have authored articles included within the review, they will not be involved in decisions regarding their own work.

Competing interests
The authors declare no conflict of interest.

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Author’s contributions
Phuong Thao Nguyen drafted the manuscript, Jacqualyn Eales and Duong Minh Lam provided manuscript editing and input.

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