Systematic Review Protocol

Title
The effect of Marine Protected Areas on marine resource governance and community empowerment in the Philippines: A systematic review protocol

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marine management, governance, ownership, community empowerment, human development

Background
The establishment of marine protected areas (MPAs) is a widely used strategy for coastal and marine resource management. It is a known, used and an achievable mode of protection particularly in the Philippines [1]–[3]. MPAs have been practiced in the country over the last four decades with the first marine sanctuary established in 1974. As of 2020, the Philippine MPA Database (http://www.mpa.msi.upd.edu.ph/) has listed information for a total of 1,923 MPAs. However, many of these are still "paper parks" that are not actively managed. Based on the legal framework of protected areas in the Philippines, the governance structure is a mixture of centralized and decentralized site management[4]. Governance of MPAs in the Philippines is usually categorized into two levels: nationally managed under the National Integrated Protected Areas System (NIPAS) Act of 1992, and locally managed under the Local Government Code (LGC) of 1991 and the Fisheries Code of 1998 [1], [5]. Most of the MPAs in the Philippines were established through municipal and city ordinance. These are co-managed through the municipal or city governments, the local community and other sectors in the locality (e.g., NGOs, private organizations, etc.). Considering the amount of effort put towards MPAs, the country has both successful implementations as well as those that are far behind target [6], [7]. There is growing recognition that stakeholder participation, community acceptance, harmony and ownership are essential elements of the success of conservation initiatives. However, evaluation on the impact of MPAs has primarily paid attention to economic and conservation specific objectives. The proposed systematic review will attempt to assess the impact of MPAs in the Philippines with focus placed on its effect on governance and empowerment. This aims to capture and understand the opportunities and shortcomings in governance and empowerment that MPAs bring to managers and communities.

Theory of change or causal model
Empowerment-oriented MPA interventions strengthen wellbeing while aiming to relieve problems, provide opportunities, and connect with experts as collaborators instead of authority figures [7].While MPAs limit human interference in marine resources to ensure the wellbeing of the ecological system, at the same time they support the social systems [5], [8]. Although often viewed in an ecological and biophysical context, marine resource management is a socially driven approach where decisions for the management rely on both ecological and social elements. There is growing

recognition that stakeholder participation, community acceptance, harmony and ownership are essential elements of the success of conservation initiatives.

Stakeholder engagement

This review will be conducted with the engagement of the Palawan Council for Sustainable Development Staff (PCSDS) and the Office of the Provincial Agriculturist (OPA). PCSDS and OPA are oversight agencies for Palawan's Marine Protected Areas Network. Stakeholder will be asked to provide grey literatures and reports that might be used in the review. They will also provide advice and comments on various parts of the review as it progresses.

Objectives and review question

This systematic review aims to answer the following question: "What is the effect of the Marine Protected Areas on marine resource governance and empowerment in the Philippines?"

Definitions of the question components

The components of the question according to "PICO" structure are listed below: Population: Coastal in the Philippines (including communities living within 5km of the coastline & on islands) Intervention: Marine Protected Area (any marine ecosystems, including reefs, coral reefs, sea grasses, mangroves for example, and any marine resources) Comparator: geographical (non MPA sites including sites with an alternative intervention), temporal (sites before MPA designation), or no comparator. Outcomes: Marine resource governance and community empowerment (marine resources encompassing both commercial and non-commercial species)

Search strategy

This review follows a systematic map, which identified 34 documents that describe the link between site protection and governance and empowerment in the Philippines. Since the last evidence search in June 2019, additional studies are expected to be available and update searches, outlined below, will be undertaken. (conservation OR conservancy OR management OR polic* OR regulat* OR protect* OR "sustainable use*" OR enforcement OR certification OR improvement* OR mpa OR "marine refuge" OR sanctuar* OR reserv* OR "no$take$zone") AND (coast* OR marine* OR beach* OR Fisheries OR seas OR sea OR reef* OR ocean* OR mangrove* OR seagrass* OR estuar* OR fishing OR shore*) AND (wellbeing OR "well$being" OR empower* OR participat* OR educat* OR identity OR Stewardship OR Co-management OR Governance OR resilience OR recover) AND (communit* OR people* OR human* OR fisher* OR village*)

Bibliographic databases

We will search for studies from June 2019 to the present in 4 databases, Medline (via Ovid), Web of Science Core Collection, SCOPUS and Environment Complete. Although Global Health via Ovid was included in the original systematic map searches, we will not use it here because it is unlikely to include relevant information on our outcome of interest. Since majority of research in the Philippines is published in English, the language to be used for database searches will be English. Strategies used together with the date of the search will be recorded. The information for each search will be collated in an Appendix for the systematic review report. Target dates of literature search (June 2019-present), because we include studies from a previous, comprehensive systematic map, where searches were up to June 2019.

Web-based search engines

We will search Google Scholar using the Advanced search to identify additional literature. We will incorporate the first 1000 hits with those retrieved bibliographic database searches for title and abstract screening. We will adapt the search string from the database searches to reflect the search functionality (limited number of characters) for Google Scholar. Search strategies will be recorded

in an Appendix to the final report.

Organisational websites
An additional 11 international and 11 Philippine-specific organizational websites listed below will be searched for any relevant evidence. These websites were identified in the systematic map by researchers in the UK and SE Asia region (including Western Philippines University) and other stakeholders. The search strings will be adapted from database searches to reflect the search functionality of each website. The information for each search will be collated in an Appendix for the systematic review report. Websites from Philippines specific organisations will be searched in Filipino • Biodiversity Support Program (USAID) • Commonwealth Scientific and Industrial Research Organisation (CSIRO) • International Pole and Line Foundation • RAMSAR • UNEP – World Conservation Monitoring Center (UNEP-WCMC) • UNESCO • United Nations Development Programme (UNDP) • United Nations Environment Programme (UNEP) • United States Agency for International Development (USAID) • USAID Development Experience Clearinghouse • World Bank • Carlos P. Romulo Library - Foreign Service Institute • Coral triangle initiative • Malampaya Foundation • Palawan Council for Sustainable Development • Philippine Commission on Women • Philippine Institute for Development Studies • Pilipinas Shell Foundation • Western Philippines University Reports • The Palawan Scientist • Palawan State University • Socio-Economic Research portal for the Philippines (SERP) Thesis repositories will be searched • 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 • Erasmus thesis repository

Comprehensiveness of the search
We will used scoping to test the new search strategy for databases with a wider date range for sensitivity and specificity. We tested in Scopus and Web of Science Core Collections, in an aim to retrieve the studies identified by the systematic map, and the strategy was successful in retrieving all of these studies from the two databases that were originally found and relevant to our research question from the systematic map. No further action was deemed necessary

Search update
We do not plan to update the searched as we aim to publish within 18 months of the search strategy

Screening strategy
Initial screening of the studies will be undertaken based on the information contained in their titles and abstract, against the study inclusion criteria described below. Next, the full text of potentially relevant articles will be evaluated based on the inclusion criteria. Each article will be assessed by at least one trained reviewer from a pool of up to six reviewers. In each stage of this screening, the reviewers will be instructed to lean towards inclusion when they are uncertain whether it should be included or not e.g. when the abstract is deficient, unavailable or where there is missing information. A second reviewer will double screen a subset of articles (c. 10%) and carry out a consistency check to maximize the consistency of applying the inclusion criteria. A list of studies excluded based on full-text assessment will be provided in an appendix of the final systematic review report together with the reasons for exclusion, for transparency. A record of the whole screening process will be presented in the systematic review report.

Eligibility criteria
Relevant population Individuals, households or communities, living or working within coastal areas in the Philippines, defined as those adjacent to and heavily dependent on or impacted by the sea, in economic, socio-cultural or ecological terms. Studies must clearly state a focus on the relevant population. Relevant intervention Establishment, adoption, or implementation of MPAs. We define

“MPA” according to the World Conservation Union (IUCN) as any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment. Classifications of interventions are based upon the International Union for Conservation of Nature (IUCN) typology of protected areas. Relevant comparator Absence of intervention between sites, and/or over time, or comparison with another intervention. Studies both with and without comparators are eligible. Relevant outcome Marine resource governance and empowerment. Structures and processes for decision making including both formal and informal rules; includes participation and control in decision making, accountability, justice, transparency of governance. Classifications of outcome are based upon the IUCN typology of governance types. Relevant types of study design Primary research study measuring effects of a program, activity or policy using observational or experimental data collected for the study. Quantitative studies will be eligible. Where studies contain qualitative and quantitative data, and separate the quantitative data, these studies will be eligible. Systematic reviews and other reviews of evidence, theoretical articles, commentaries, editorials are not eligible.

Consistency checking
10% of articles (either stratified by source or random sampling) will be double screened for consistency of decisions, at both the title and abstract stage, and the full text stage. Any disagreement in a study’s relevance will be resolved via team discussion until a consensus for inclusion is reached. We will use Cohen’s kappa coefficient and percentage agreements to measure the level of agreement between reviewers . Where necessary, additional details and notes will be added to the inclusion criteria to avoid future conflicts. A training set containing several studies (10%) that fulfil the inclusion criteria will be used as a study sample for the reviewers to discuss any relevant issues before proceeding with the rest of the retrieved studies from the screening.

Reporting screening outcomes
A list of studies excluded based on full-text assessment will be provided in an appendix of the final systematic review report together with the reasons for exclusion, for transparency. A record of the whole screening process will be presented in the systematic review report, in the form of a ROSES diagram

Study validity assessment
Studies that have passed relevance assessment described above will be subjected to critical appraisal using quality assessment criteria adapted from the Joanna Briggs Institute. Based on these criteria, studies will be categorized as with high, moderate, low validity or unclear. We will assess the overall validity of each study and make an overall appraisal into one of the four categories. Full details of this for each study will be available in the final report.

Consistency checking
Each study will be appraised by two reviewers. Any disagreement will be resolved via discussion with a third reviewer until a consensus is reached.

Data extraction strategy
Data will be extracted from relevant studies into a spreadsheet. Data to be extracted includes the following domains: Identification of the study, Methodological characteristics, Findings and Conclusions. Where additional details to meta-data coding is deemed useful, we will extract this, and we will also extract the detailed outcome data for each study. For studies containing both qualitative and quantitative data, we will extract only the quantitative data. The data extraction sheet may be subject to alteration as evidence searches progress, and it may become necessary to, for example, complete additional data fields. A record of all data extraction will be kept and be provided as an

appendix to the systematic review report.

Meta-data extraction and coding strategy
Information will be coded for the following categories: • Bibliographic information • Geographical location • Intervention • Outcome • Comparator type • Data type

Consistency checking
Data will be extracted by a single reviewer and a subset (minimum 10%) checked by a second reviewer. Any discrepancies will be resolved by a discussion in the manner described for the screening process.

Potential effect modifiers/reasons for heterogeneity
For each study, any factor which might distort the outcome, which may be mistaken for an impact of the MPA will be recorded. For this information, we rely on each study report. Several potential effect modifiers that may contribute to heterogeneity in the outcome of marine resource governance and community empowerment will be considered and recorded for all the studies included in this review. Some effect modifiers are listed below: • The income of the country (GDP) • Types of fisheries of the locality • Recent geological and meteorological hazards of the local community (e.g. typhoon, volcanic eruption) • Surrounding Land Use • Territorial Challenges /Sharing across multiple user groups • Political Background The list is not exhaustive and we expect to record more types of effect modifiers as we examine the studies.

Type of synthesis
Following the data extraction processes, we will synthesize available qualitative and quantitative evidence that measures governance and empowerment outcomes. We anticipate mostly finding qualitative evidence, and plan for a narrative summary and narrative review of qualitative evidence.

Narrative synthesis methods
We are likely to conduct a narrative synthesis for this review, based on the type of data we anticipate finding. We will include tabulated coded data, detailed outcome data, and graphs to present the findings across studies. The exact type of visualisations will vary depending on the type of studies we retrieve.

Quantitative synthesis methods
We do not expect to find data appropriate for quantitative synthesis, but should data allow, we will undertake meta-analyses. Meta-analyses will be undertaken according to standard methodologies, and using random-effects models. We will summarize findings across studies in a narrative synthesis, using a series of summary tables and figures.

Qualitative synthesis methods
We anticipate subgrouping our data in terms of categories, either the intervention categories, or the outcome categories, depending on which fits the data best and is best able to tease apart the links and differences between the studies.

Other synthesis methods
n/a

Assessment of risk of publication bias
We do not expect much quantitative data and thus do not expect to be able to create a funnel plot, but will narratively investigate the possible influence of publication bias to the best of our ability.

Knowledge gap identification strategy
Our categorisation of intervention and outcome categories should enable us to identify knowledge gaps, on the basis of relative amount of evidence across the categories.

Demonstrating procedural independence
Should any review author have been involved in the production of any included study, they will not be involved in any part of the review work which involves that study

Competing interests
The authors declare no financial or non-financial conflict of interest.

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Author's contributions
LJG first authored this protocol with LC and JE reading and approving the final version.

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