Review of: "Unlocking Natural Capital in the Megadiverse Colombian Pacific Basin: Navigating Challenges and Governance Gaps"

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Potential competing interests: No potential competing interests to declare.

The topics of Natural Capital (stock and loss measures) and Environmental Service Valuation are very relevant and quite acute for Latin American Countries. The link between natural capital and environmental services, on one hand, and agricultural and cattle activities' growth, on the other, is also key but quantitative and spatial analysis to inform policy debates is hardly available in Latin America. For these reasons, I believe this paper can make an important contribution to the policy debate; but the methodological approach, the data, the quantitative results and their interpretation need to be presented in a clear and precise way.

Main comments and suggestions:

a. In Phase 3 only terrestrial biodiversity loss is evaluated. A justification for neglecting the loss of marine biodiversity is missing; in particular given that many coastal biomes and coastal/marine ecological services (e.g. climate protection – fisheries) are valued and included in phase 2. Does it have to do with the limited categories of "land use" considered (either agriculture-cattle related or "natural")?
b. In 2.2.3 (Phase 3) the concept of "elasticity" is not precise in economic terms. The equations 6 and 7 indicate a ratio (comparison) between one percentage change (in ecosystem service i) and another percentage change (total land conversion of a given biome to different agriculture-cattle uses). The economic notion of elasticity refers to the sensitivity of one behavioural variable (e.g. % change in the demand of a product) as a response to a 1% change in another variable (e.g. price of the product). The key of the elasticity concept is that it measures the magnitude of the response triggered by the second variable, given its causal effect on the first variable. Here, ecosystem service change is compared with spatially related land use change but no economic function linking the two variables is provided (and thus, the economic meaning of "elasticity" is missing here).
c. In 2.2.3 (Phase 3) the extent and cause of RNC loss estimated using GLOBIO4 models (global change scenarios) is not clearly presented. Is that RNC loss only due to other factors (e.g. climate change) not including land use change related to expanding economic activities? Or does the model show the combined impact of climate change and land use change due to economic activities? Please explain.
d. Coastal ecosystems/biomes are included in ES valuation but changes in marine biodiversity and impact of non agricultural activities are not considered to evaluate RNC or NC loss . Is it because they are located in protected areas? More information should be added in this discussion for three reasons. First, because coastal areas

(mangrove) ES are quite important in monetary terms (according to the estimates provided in supp.materials 9 and 10). Second, mangroves provide, among others, the ES of “climate protection”, and thus this service must be measured when assessing RNC loss in global change scenarios (GLOBIO4 estimates). Third, direct activities (such as fishing) should be considered as having an impact on coastal ES, why isn´t it taken into account?

e. Governance issues (e.g. What makes protected areas so vulnerable in the region? Should local governments be involved in protecting biodiversity?) are not deeply analyzed in the paper. They probably deserve a deeper case study analysis of their own.

Minor (edition) comments and suggestions:

In 2.2.1 the valuation monetary unit Int$2020 is introduced but its meaning is not clearly explained (in particular, whether 2020 is the date of estimation or the reference year for constant currency values should be stated).

Diferent notation should be used when referring to Environmental Services (i) and Biomes (j). The use of BIOMEREMNANTi and ESi in Equation 5 is confusing.

NC loss estimates presented in section 5 should indicate the time period involved (the loss is measured by comparing ES change between which start date and which final date?)

Valuation of RNC is conditional on the number of ES that can be valued. Please mention explicitly in the conclusions how many (which) ES are valued and compare that figure with the total number of ES considered.