Towards a “multi-level” sustainability analysis in Pacific-Andes-Amazon transboundary catchments.

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Global change has economic, environmental, and social impacts on water, energy, and food resources that threaten the ways of living of several communities across the globe. Moreover, the identification of those impacts at the local level constitutes a fundamental step in the process of designing and implementing proposals for the sustainable management of natural resources. The definition of what sustainability means is another key step in that direction. Within theoretical debates, three concepts have been identified: weak, strong, and super-strong sustainability. The first proposes to understand nature as “natural capital”, which should be treated as any other factor of production and can be exchanged with other forms of capital. The second highlights the existence of “critical natural capitals” that need to be conserved no matter the economic cost. The third, finally, introduces cultural, religious, historical, and ethical considerations, proposing the concept of “natural heritage” as an alternative to “natural capital”.

We propose an analytical framework that integrates those different approaches to sustainability, combining spatial data analysis and participatory dialog with actors from local communities. With this methodology, we aim to identify strategies towards the sustainable management of water, energy, and food resources, in the Pacific-Andes-Amazon altitudinal transects of two transboundary catchments of Ecuador, Colombia, Peru, and Brazil (Mira-Mataje - 11,791 km², and Putumayo - 125,563 km²). We used remotely-sensed and globally available datasets alongside the spatially distributed assessment model Co$tingNature, to evaluate the natural capital. Then we quantified the interactions between natural capital, protected areas, and indigenous territories to identify critical areas for protection. Finally, we included the knowledge from leaders of Indigenous (Cofán, Awá, and Kamenzat), Mestizo-peasant, and Afro-descendant communities distributed along the altitudinal transects, regarding their natural heritage, and their perception of the challenges for its sustainable management.

We found a significant overlapping between critical natural capital and ancestral territories of ethnic communities and recognized some key anthropic intensive activities that challenge the conservation of those areas. We also identified the significant role that culture plays in the local communities’ efforts both to defend their territory and to find sustainable practices oriented towards the securing of collective welfare and the conservation of the environmental integrity of
their natural heritage.