From Land Use & Land Cover Data to the First Ecosystem Natural Capital Accounting Experimentation in the Republic of Guinea

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Key words: Cartography; Remote sensing; Keyword 1; Keyword 2; Keyword 3

SUMMARY

Since its involvement within the very first approach of Corine Land Cover exhaustive mapping as European information base at the service of sustainable development policies in the European Union

in the early 90s, IGNFI has been involved with many significant projects that are in line precisely with the objective of the 2023 FIG Working week to protect our World.

This paper will focus over the proposed Ecosystem Accounting of Natural Capital (ENCA) method that combine earth observation along with biosphere, water, biomass to ultimately define a total ecosystem capability value (TEC), that is currently under implementation in Guinea that will be describe in this article.

With the Kyoto Protocol (1997) and more recently the Paris Agreement at the UNFCCC COP21 (2015), atmospheric carbon accounting has been progressively introduced with the aim of raising awareness in national and international decision-making systems of the transition from fossil fuels to renewable energy sources. However, this carbon approach does not always consider ecosystems and their biodiversity despite their fundamental role in climate regulation (Weber, 2022). A global assessment of all natural resources and ecosystem services, known as natural capital, is necessary in a sustainable development perspective.

This valuation must then be taken into account in national accounting systems. The proposed Ecosystem Accounting of Natural Capital (ENCA) method consists of integrating three fundamental components of the biosphere, water, biomass and land cover, thus giving three accounts (ecosystem infrastructure accounts, ecosystem carbon accounts and water resources

accounts). Together, these three accounts define a total ecosystem capability value (TEC) that allows the capacity of the ecosystem to provide sustainable services to be measured and, above all, monitored in space and time.

For this purpose, Earth Observations provide easily interpretable visualisation and statistical outputs on natural capital performance in terms of ecosystem service provision of different habitats. Indeed, the establishment of these accounts requires accurate spatial baseline information on land cover / land use and its changes over different time intervals.

This information determines the main evolutionary trends that have occurred in a given area, such as artificialization, agricultural extension, deforestation or degradation of natural formations. This method also requires the integration of multiple spatial and statistical data on biomass, carbon, climate, soil, water, hydrographic networks, infrastructures, etc. Thus a large amount of geospatial and statistical data from various global and national open access databases are required and are cross-referenced with the land cover layers. This combination of analyses is performed on functional and statistical units called "socio-ecosystemic landscape units" (SELU) which are in fact the boundaries of small watersheds on which information on land use/ land cover and its changes, water resources and accessibility are best described.

Thus, several environmental indicators are defined from these combined geospatial data and allow to ultimately define the evolution of the total ecosystem capacity of a selected territory.