ROBHOOT discover data interactions combining fisheries, stakeholders, and technology data, the data knowledge discovery graph, as a first step towards the discovery process. ROBHOOT also infer the technological and environmental changes and the processes underlying the empirical patterns, the causal knowledge discovery, to provide the existing sustainability status in a human-disturbed ecosystem. Altogether, this project will lay the foundation for future sustainability studies. Discovery of novel evolutionary-inspired algorithms for biodiversity maintenance have been hardly investigated in this context so far. Therefore, several predictors related to biodiversity, technological and social times series analysis will be tested and further developed to enable robust prediction of sustainability. The discovery of new solutions not observed in the empirical data, but containing plausible scenarios for maintaining species-rich and sustainable ecosystems, will be the basis for estimation of the severity of overfishing and sampling bias when many groups enter in commercial conflict of interest... Such a targeted sustainability proxies would be of great interest not only for the biodiversity maintenance but also from an economic and social point of view, as it would save costs for future generations. Sustainability challenges are related to the development of future sustainable societies, which according to (Organization...) **Keep elaborating**

- **Potential for future social or economic impact or market creation**: Collapse of ecosystems can lead to serious long term economic and ecological disfunctionalities (refs +++). However, there are not well established metrics for the characterization of sustainability in complex ecosystems. Our approach accounts for heterogeneous sources of data, the (evolving) mechanisms underlying technological, environmental and social changes required to make ecosystems sustainable and novel rules that could impact positively the maintenance of biodiversity by developing cooperative forecasting strategies among the many (international) groups involved. Such a risk assessment would not only be of great interest to the groups exploiting the resources, but also from an economic and ecological point of view, as having less bias in the field data provides more accurate measures from the observed time series for planning fish stocks for a large number of species. Finally, ROBHOOT contributes towards knowledge-inspired societies in need of radically tackling new societal and global environmental challenges: it provides reproducible and transparent methods for making sustainability goals achievable and reproducible across many sectors and economies.

  In the medium-term this technology may also have interesting applications in public and private industry. For example, access to discovery with cooperative forecasting might suggest new paths and solutions that are key to generate rapid and robust scenarios when facing complex problems including global sustainability challenges (i.e., global health, ecosystems degradation, biodiversity loss, etc). First, evolutionary biology-inspired AI algorithms deciphering open-ended search of interpretable mechanisms underlying the targeted complex systems for private and public industry facing highly heterogeneous data sources. Second, cooperative forecasting challenges existing fragmented responses to emergent global sustainability problems by compactly offering reproducible forecasting emerging from many-to-many human and machine cooperative discovery, and third, open-access explainable and automated information generation account for global data-arquitecture allowing individuals and companies to address scenarios of future strategies in highly fluctuating local and global market conditions.

- **Impact on transparency and reproducibility**: Decision making and governance at local, regional and global scales require access to transparent and reproducible information containing the interpretable factors and their plausibility to explain the empirical patterns. In this regard, the ROBHOOT consortium brings together excellent partners from the fields of computer science, neurobiology, complex system, biology, social sciences, evolutionary ecology and including one SME focusing on reproducibility, automation, visualization and reporting along its whole developmental life cycle (Dissemination plan below and Figure 3). At the same time, all groups composing the consortium exhibit a long-standing experience interdisciplinary research across the