- **Ecosystem health impact**: Ecosystem sustainability and ecosystem health are usually used as metaphors to describe the mechanisms that maintain functional and diverse systems and the condition of an ecosystem, respectively. Ecosystem sustainability and condition can vary as a result of many disturbances like fire, flooding, drought, extinctions, invasive species, climate change, mining, overexploitation in fishing, farming or logging, chemical spills, and a host of other reasons. ROBHOOT focus on novel discovery solutions for ecosystems under a varying degree of disturbances. ROBHOOT introduces a case study for overexploited ocean ecosystems when highly heterogeneous social groups with different interests exploit limited and shared resources. Thus, ROBHOOT is a technology designed to provide novel discovery solutions paths for ecosystem sustainability, improving the underlying discovery paths that allow draw novel connections between ecosystem sustainability and ecosystem health. This feature aligns to the EU Reflection paper towards a Sustainable Europe by 2030 focusing on the need of investing in sustainable growth and spur action by goverments, institutions and citizens, leading the way for the rest of the world using the UN's Sustainable Development Goals (SDGs). Specifically, ROBHOOT can be seen as an horizontal enabler for the sustainability transition to make Europe sustainable by 2030. It introduces evolutionary biology- and artificial intelligence-inspired solutions to benefit ecosystem health and people's lives and work. By being able to process large amounts of heterogeneous data instantaneously, artificial intelligence and evolutionary-biology inspired solutions have the potential to significantly increase productivity in environmental sustainability and ultimately make informed decisions to enhance food security [1].

- **Building leading research and innovation capacity across Europe**: This consortium brings together excellent partners from the fields of computer science, machine learning, deep learning networks, neurobiology, complex systems, experimental biology, biology and evolutionary ecology and in particular evolutionary biology-inspired federated networks both from a theoretical and an experimental point of view, Physics, theory and applications of complex systems in social networks and one highly innovative science-based reproducibility, automation, reporting and communication focusing on sustainability solutions. Many of the components of the consortium are first-time participants to FET under Horizon 2020 (Section 4). The use of advanced evolutionary biology-inspired and complex networks-based analyses to characterize and predict novel discovery in systems formed by heterogeneous and evolving groups and interactions combined with the implementation of intelligent learning discovery in federated networks and the development of a reproducible and automated protocol user friendly interface go much beyond the current state-of-the-art in science-based discovery technologies. All consortium partners exhibit a long-standing experience in interdisciplinary research across the boundaries of the individual disciplines (Figure 3). The subsection on related projects shows that this consortium is at the leading edge of innovation and interdisciplinarity (Tables 3.1a-c). A significant value proposition of the project is to increase the research on large-scale sustainable federated networks where many heterogeneous agents share resources embedded in complex ecosystems. This will produce valuable information and data about how federated networks work under broad set of socio-ecological scenarios, similar to natural ecosystems consoritiums where many paths produce coexistence of heterogneous populations and high biodiversity (refs ++). It is important to consider that all ecosystems facing many human pressures are all across the world and discovery technologies facilitating the solutions in large-scale federated networks could inspire new developments improving our understanding of sustainability at global scale. For in-home, we also expect an explosion of discovery knowledge approaches and future publications, which will place Europe at the top of sustainability in federated networks.

  Moreover, in WP3, we propose the generation of a web-based sustainability discovery portal that will allow researchers, NGO, managers and the public to train students in the discovery process to manage over-exploited ecosystems, allowing to scale up the number of people participating in the sustainability process by an order of magnitude thus mobilising forward thinking researchers