

ACCELERATING INNOVATIVE PARTNERSHIPS BETWEEN ENVIRONMENTAL RESEARCH INFRASTRUCTURES AND THE PRIVATE SECTOR

The extensive exploitation of ecosystems now threatens our food security, the stability of natural and managed ecosystems and global biodiversity. Environmental Research Infrastructures (ERI) have emerged to fill key gaps in our understanding of ecological processes, in response to the drivers of change such as extreme climate events, invasive species and land use changes. While ERI potential to transform the economy and underpinning decision-making patterns remains largely untapped worldwide, the private sector is encouragingly moving towards less conventional partnerships in an effort to address growing societal needs. Because ERI are still relatively new and aim to tap emerging economies, the means to establish the corresponding public/private partnerships likewise requires creative models of engagement we mean to present.

Understanding the socio-economic and cultural background of ERI

Governments cannot fail to address the economic and environmental dimensions of societal well-being, yet the underpinning planning and budgetary mechanisms are increasingly complex. A combination of political pragmatism, tensions and uneven national funding instruments therefore resulted in a fragmented research landscape. While ERI design, planning, construction and operational phases follow clear development pathways, this structure remains new to the environmental field, leaving key stakeholders wanting for the social context and culture to advance projects.

One strategy consists in developing a top-down approach to ERI governance to align their activities with governmental structures, legislation, planning documents, strategic roadmaps and ultimately secure formal, long-term commitments. ERI should in turn be encouraged to adopt corporate planning tools to define science scope, budget, identify and mitigate risk, resource load, internal roles and responsibilities, integrated resource loaded schedules and the performance metrics typically required by sponsors. This would help justify and delineate the scope of large governmental projects but depends on funding agencies overseeing the responsible use of public funds and the alignment of roadmaps and political mandates.

It remains ERI lack the appropriate resource diversification strategies and should be incentivized to partner with the private sector. Grants and loan mechanisms indeed support innovation partnerships with the private sector, such as the European Investment Bank's InnovFin program. The European Commission nevertheless recognizes the difficulty for ERI to apply for such loans, given the ERIC status limits their economic activity and therefore their ability to repay the bank.

Adopting new corporate engagement models for ERI

From a corporate viewpoint, environmental challenges are associated to the additional and often unforeseen costs they generate. Corporations thus rely on in-house cost mitigation solutions or external consultancies rather than scientific expertise. In an effort to bring these disparate communities together, governments resorted to public incentives for technological transfer and public/private partnerships, encouraging universities to become innovation incubators. Companies would typically partner with universities to tap into promising scientific advances they were unable to generate in-house, while universities accessed otherwise unavailable capital. While a proven sustainable model, its cost-return structure hinders the scaling of such functions.

An alternative arose in developing cyber infrastructures to deliver user-based analytical tools and adaptive capabilities. While clearly targeted at decision-making, this value-added model utilizes open data synthesis centers, capable of bringing diverse user communities together and harnessing their needs and capabilities into innovative processes. The resulting analytics are only critical within a 2-3-year planning window, both in terms of governments and municipalities managing public economics and growth models, but also for private enterprises to secure a competitive advantage. Beyond that point, partners would agree on the social imperative in making these products available to the public.

Public and private partnerships ultimately address the scalability issues of university incubators, by federating ERI, university, corporate and synthesis centers. Pilot projects still need to validate proof-of-concept and leverage lessons learned into an adaptive structure. Training and joint strategic planning could further remedy gaps in cultures, languages and approaches and ultimately foster innovation. Pooling such resources would advantageously yield further ecological understanding and return on investment by splitting research costs and duplicates. This macro-ecological approach not only determines design processes, it also guides researchers towards the most appropriate and cost-effective solution, thus echoing the corporate ethos. Through the resulting stress tests, scenario analysis, uncertainty and risk quantification models (amongst other decision-support tools), ERI effectively stand to provide the scientific backdrop to align sustainability and risk management.

Conclusion

Overcoming the current challenges to bridge science and private enterprises are underpinned by the strong sense of social responsibility of all parties to co-develop strategic products and services. The frontier to tackle future environmental problems as well as the needed structure between public and private enterprise is unknown, and requires creative solutions. Secondary to the strong societal imperative to tackle these issues, are also the cultural barriers that have to be overcome to link public and private enterprises together. Successful programmatic tools and organizational models do exist to help overcome these barriers that should be part of the explicit planning for any specific project. The benefit for ERI lies principally in building upon publically-funded, bottom-up science, whereas the added value of the use of public funds in developing market-driven solutions also builds economic resilience (rather than the detrimental impacts of environmental change alone).

ABOUT THE AUTHORS



A specialized biogeochemist, Dr. **Abad Chabbi** is currently a Director of Research at the French National Institute for Agricultural Research. His research centers on the linkage between soil carbon sequestration, nutrient availability and stoichiometry in the plant-soil system and their relations land use management and climate change. He additionally focuses on international and multidisciplinary projects, having led the [ExpeER](#) and [AnaEE](#) under the strategic European Commission framework.



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