# Practice-research collaboration initiated by the exchange of questions

Hochstrasser, Tamara and Renou Wilson, Florence

UCD School of Biology and Environmental Science and
Earth Institute, University College Dublin, Ireland.

## Abstract

While best practice guidelines and screening tools add expertise to the assessment process, expert knowledge is required to fully understand assumptions and the domain of application of these tools. Stakeholder engagement during impact assessment leads to better outcomes in terms of uptake of scientific advice for decision making. In Ireland, the expertise is held at research institutes and universities, but it is often not accessed in practice, because of the difficulty in locating the right expert and time/monetary restrictions for consultation. In order to overcome these barriers in the UNESCO Dublin Bay Biosphere, we have created the ECOBROKER.ie website that allows practitioners to post questions and issues that they would like to have input on from experts. This allows researchers to see what the concerns of practitioners are and offers opportunities to clarify questions and if needed co-create tools for decision support. Co-creation of decision support tools enhances the completeness, detail and integration of the knowledge that contributes to making the most scientifically informed decisions. Furthermore, co-creation allows the practitioners to communicate the decision-making context in which they are using the tools, and researchers to fully disclose any assumptions made in creating the tool. The website serves as an early match-making service (a marketplace for research ideas) that brings questions from practice into the research domain and allows for more targeted decision support from experts. Furthermore, professional networks across sectors/disciplines can be built, that will enable learning from experience and monitoring of interventions.

The Ecobroker.ie website was created to enable the exchange of research questions between practitioners and researchers. Early collaboration enhances the usefulness of decision support.

**Keywords**: Science-policy interface, Knowledge exchange, Transdisciplinary tools, Sustainability science, Marketplace for research ideas, UNESCO Biosphere Reserves

## Introduction

How can we make sure that the best expertise is used in decision making? This is an ongoing concern (Mader et al. 2021). Reports have been written and briefings held but the uptake of scientific information in decision making is still slow, particularly at local levels of government and in environmental impact assessment of smaller infrastructure projects. Furthermore, there is evidence that data collected during monitoring are often not fully analysed and the lessons learned not fed back into the decision-making process (González et al. 2020b). The complaint often is that the information is not accessible to the practitioner in a format that can be understood and/or cannot be integrated with the work practices of the practitioner. While the written format has been improved to tackle this issue (e.g. González et al. 2020a), the use of these reports in practice is still limited, indicating that maybe a different approach is needed.

In order to identify what different approach we could use we need to look at how scientists are gaining insights that allow them to evaluate different scenarios for intervention. Pickett et al. (2007) tell us that scientific understanding progresses by examining current understanding regarding (1) its completeness, i.e. if the current understanding captures all the relevant factors and processes that could affect a certain situation, (2) regarding its detail, i.e. if the current understanding addresses particular factors and processes with enough precision and specific information, and (3) regarding its integration, i.e. if current understanding from different disciplines is taken into consideration in appropriate ways. A usable evidence base for practitioners can thus be formulated by developing understanding in these three ways. In impact assessment the completeness is the first issue that is being addressed – especially in the scoping stage of the assessment. This step is specifically aimed at assuring that all the relevant factors are considered. During impact analysis often more detail is added as there may be surveys conducted. The reporting phase is when integration of knowledge is undertaken so that a good evidence base for decision making can be created. However, decision makers are still not involved with this process and the uptake of recommendations from impact assessment varies. Furthermore, because of short time scales the level of detail often suffers as data from long-term monitoring are not effectively used. While a solid evidence base is acquired by adding completeness and detail to the knowledge as well as integration between disciplines, they are insufficient to overcome the lack of uptake of scientific information in practice.

Uptake of scientific information often depends on the engagement of the practitioner with the source of information. Vedeld et al. (2020) define four levels of engagement in the context of decision support services for farmers: a one-way interaction e.g. in the form of a webpage; a two-way interactions e.g. in the form of call centres or interactive websites; co-design of the service and some co-production of knowledge; and a multi-way interactive professional network that includes social learning. The usefulness of the decision support service to the farmers increases with location and system specificity of the knowledge. Higher engagement of farmers and extension agents in the design and production of the services is therefore beneficial to increasing the usefulness of the services. Engagement throughout the impact assessment process is also recommended in best practice (O'Faircheallaigh 2010). As in the example of decision support for farmers, the decision support for development projects provided in impact assessment gains in specificity and relevance with the engagement processes. Engagement with the decision makers is therefore a crucial element to successful decision support.

Societal problems are often referred to as ‘wicked’ problems nowadays (UN 2019). Such problems affect a wide range of people and are characterized by being unsolvable by one (group of) stakeholder(s) alone. Furthermore, the interests of the different stakeholders may be in conflict or at least of different priority for each group. ‘Wicked’ problems need a collaborative and adaptive approach for solving them, as there may be unexpected effects of interventions and often conflict and social resistance to innovative approaches need to be overcome (Biesbroek et al. 2014). The UNESCO Man and the Biosphere (MAB) programme (https://en.unesco.org/mab) has recognized the importance of collaborative and adaptive approaches for sustainable management and use of biodiversity. Apart from mandating partnerships across local government, communities and business within the Biosphere Reserve, it mandates collaboration with universities to provide academic input for continued societal learning (Box 1). As such the UNESCO Biosphere Reserves provide an ideal institutional framework within which wicked problems can be tackled collaboratively by a wide variety of stakeholders. However, while mandating that there be collaboration with universities, the programme has not fully elaborated how this collaboration should occur and it is often

done in an ad-hoc case-by-case fashion, where a common interest is identified by personal initiative of either the researchers or the decision maker.

The objective of this work was to develop within Dublin Bay UNESCO Biosphere (DBB), a professional network for collaborative, social learning in particular with regard to biodiversity management in the DBB. The work was conducted in a three-pronged approach: 1) develop a common language and conceptual framework around the collaboration 2) develop tools for effective, easy and transparent communication and 3) disseminate best practice examples of effective collaboration.

Box. 1. Benefits of research-practitioner collaboration UNESCO Biosphere Reserves as highlighted by Jennifer Roche (Dublin Bay Biosphere coordinator, personal communication, October 2016):

- Cross-disciplinary networking for researchers and policymakers
- Funding/co-funding for research closely aligned with the objectives of Dublin Bay Biosphere
- Non-financial support e.g. staff time, hosting events/workshops/training courses, publicity e.g. calls for Citizen Science volunteers, opportunities to communicate research to new audiences
- Letters of support for relevant funding applications/awards
- Links with UNESCO World Network of Biosphere Reserves (669 worldwide) and associated research consortia
- Potential to incorporate research into local policy and planning
- Contribute to the formulation of policy strategies and action plans through participation in the consultation process on these documents.

## Methods

To address our objective, we held an initial scoping workshop on past experience of joint research collaboration at the DBB Conference: People and Nature in October 2016. This was followed up by a design phase, which consisted of a series of meetings between autumn 2018-2019, where a working group of researchers and members of local government met and discussed their experience with collaboration between government and academia. Examples of similar initiatives were examined (e.g. https://www.atlanticarea.eu/idea) and great care was taken not to duplicate efforts. Funding was provided by the UCD Earth Institute for creating a website that could support the collaboration. The website was up and running in spring of 2019 and a workshop was held in January 2020, which summarized the experience with the webpage and highlighted a case study after one year of collaboration.

## Results and Discussion

*Framing of the research collaboration*

Many of participants at the scoping workshop already had experience with collaboration between practitioners and researchers – some had specific experience with collaboration with UNESCO Biosphere Reserves. The benefits of such collaborations that were mentioned were that they help to identify opportunities beyond the usual professional practice of collaborators and that evidence for decision making becomes more accessible, including the direct

assessment of different options identified by practitioners (e.g. the different design features of a sea wall). Furthermore, a network that would maintain communication channels open over time would increase the capacity of both researchers and practitioners to react to funding opportunities as they become available and would provide a central repository for the exchange of research results. Overall, the scoping workshop participants were very positive about enhancing collaboration between researchers and practitioners and thought that this (if done on an equitable basis) could only be beneficial and would allow to tackle some long-standing issues and 'wicked' problems. In the design phase it became clear that initiating a website as a new networking platform will be most beneficial if it minimizes the effort required to interact with. There was a strong desire to aim at a repository for research outputs, but some of these (e.g. https://smartdublin.ie/, https://www.epa.ie/pubs/reports/research/) exist already and the main focus was on fostering collaboration. It was deemed that the sharing of outputs could be improved if relationships are forged early in projects in a transparent manner. Development of the website required participants in the design phase to develop a common language (https://ecobroker.ucd.ie/ecobroker-language/). This was to allow people to understand how they could participate in the network and what the website was intended to facilitate. Throughout the design phase much discussion was held about the benefits of an exchange platform for research ideas versus a platform for exchanging research outputs. The '*market place for research ideas*' is an essential tool for transdisciplinary work, because early collaboration during a project helps all parties involved to tailor the project to the particular context in which decisions need to be made and implemented (https://naturalsciences.ch/co-producing-knowledge-explained/methods/td-net_toolbox/research_marketplace). The fact that many of the practitioners involved in the design phase were already engaging in this practice (e.g. by sending emails to particular academics once a year) helped people to understand how such a market place of research ideas would work and it was agreed that having such a platform that would be specific to Irish issues and research questions would be beneficial.

*Tools for effective research collaboration*

It was agreed that a website that would function as a platform for listing research ideas would help to enhance research collaboration. As research ideas are posted they are categorized by thematic groups to facilitate the discovery of relevant research ideas. These thematic groups were mapped into the institutional arrangements of local government to facilitate the accessibility of the website to practitioners who were envisaged as the main proponents of the research ideas. It was also decided that there would be no specific protocol as to how the research collaboration would be formed except that it would be strongly recommended to contact the proponent of the research and establish an initial collaborative agreement that would specify what resources would be put into the project by each partner and how the outcomes of the research would be shared. The initial step of providing a website was to be followed up by further workshops to promote the website. Furthermore, it was mentioned that this should be complemented by some social media group that would help with the dissemination of information, which is currently happening through email to participant lists compiled through the website.

*Dissemination of best practice examples*

During the networking regarding this website and the initiation of the professional network many projects were discovered that ranged from large international projects funded by the EU through the Horizon 2020 programme, to research projects at the National level that managed to leverage funding through non-traditional funding pathways, to student projects addressing

monitoring needs of local authorities. All of the projects were reporting that the initial phase of networking to set up the collaboration was taking significant amounts of effort and time and was heavily dependent on already existing professional networks. In addition, the terms of the collaboration were often not clear enough and expectations e.g. regarding recognition of input to the collaboration and research output sharing were not met as a result. However, some examples highlighted that the outputs and impacts from the project reached far beyond what could have been achieved without the collaboration. For example, a project on tuberculosis in badgers led to scientific publication of data collected by practitioners, that would not have been possible otherwise, which in turn help to leverage funding and support for a vaccination programme for badgers (Mullen, E. and Marples, N., January 2020, personal communication).

*Conclusion and outlook*

While the website is up and running, there clearly needs to be continued engagement around the website for it to be used to its full potential. A direct prospect of funding opportunities that could be identified through the website would also help to increase engagement. However, the start of collaboration at the stage of the formulation of the research idea is well supported as an effective tool to assure impact of the research and societal problem solving especially when the research is initiated by practitioners (Steger et al. 2021). Early engagement improves the evidence base by collaboratively identifying all the factors and processes that are important to the problem at hand (i.e. increase the completeness of the understanding). Furthermore, collaboration helps to refine the evidence base by being able to draw on a range of expertise and resources for data collection. It also leads to better integration as the framing of the problem is specifically tailored to the context and agreed upon. The latter is crucial for high impact of the research and for uptake of research findings in practice. Early engagement with stakeholders can thus overcome the gap between science and practice and improve uptake of scientific evidence in decision making.

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