Obstacles to knowledge co-production for early-career marine researchers

Addressing sustainability issues in marine social-ecological systems requires an **effective translation of scientific findings into action** and ideally involves the co-production of knowledge between researchers and non-academic stakeholders. **Knowledge co-production, meaning the collaborative integration of diverse perspectives and actors in the creation of context-specific knowledge**, often poses methodological challenges to Early Career Researchers (ECRs). We, a group of ECRs, together with the working Group *Anticipating and Transforming Coastal Futures* within the *German Comittee Future Earth,* are trying to understand the **specific challenges that ECRs face** in this field.

This survey is targeted at ECRs who would like to conduct, or have already conducted, scientific approaches aiming at the co-production of knowledge. For this reason, we would like you to help us by answering the following **questions concerning the research approach, motivation, obstacles & benefits of knowledge co-production** based on your experience or your current plans to conduct this kind of research. The results of this survey will be discussed in a workshop at the ICYMARE 2021 conference on September 23rd.

To continue, please read the data and informed consent policy and agree by ticking the box. You can then start the survey by clicking on "Next". There are 25 questions in this survey.

Personal Information

How old are you? *

❶ Choose one of the following answers
Please choose **only one** of the following:

◯ <20
◯ 21-25
◯ 26-30
◯ >30

What is your gender? *

❶ Choose one of the following answers
Please choose **only one** of the following:

◯ Female
◯ Male
◯ Non-binary
◯ Prefer/choose not to disclose

What is your current or most recent academic level? *

❶ Choose one of the following answers
Please choose **only one** of the following:

◯ Bachelor
◯ Master
◯ PhD
◯ PostDoc

What is your academic background/discipline for your Bachelor? *

❶ Check all that apply
Please choose **all** that apply:

☐ Natural Science

☐ Social Science

☐ Humanities/Arts

☐ Economics

☐ Management

☐ Other: [_____]

What is your academic background/discipline for your Master?

Only answer this question if the following conditions are met:
Answer was 'PostDoc' *or* 'PhD' *or* 'Master' at question '3 [PI3]' (What is your current or most recent academic level?)

❶ Check all that apply
Please choose **all** that apply:

☐ Natural Science

☐ Social Science

☐ Humanities/Arts

☐ Economics

☐ Management

☐ Other: [_____]

What is your academic background/discipline for your PhD?

Only answer this question if the following conditions are met:
Answer was 'PostDoc' *or* 'PhD' at question '3 [PI3]' (What is your current or most recent academic level?)

❶ Check all that apply
Please choose **all** that apply:

☐ Natural Science

☐ Social Science

☐ Humanities/Arts

☐ Economics

☐ Management

☐ Other: [_____]

Did you work in a non-academic sector before your research? *

❶ Choose one of the following answers
Please choose **only one** of the following:

◯ Yes

◯ No

What is your country of origin, country of employment/study and the target country of your research? *

	Country of origin	Country of employment/study	Target country of research

What type of funding did you receive for your study?
If possible, please specify the funder or funding program in the comment box.

*

❶ Comment only when you choose an answer.
Please choose all that apply and provide a comment:

☐ Institutional funding

☐ Scholarship

☐ Research grant

☐ Self-funded

☐ Don't know

Other:

Motivation behind the research approach

What is your motivation to co-produce knowledge together with non-academic stakeholders?

Please write your answer here:

Does your research (or do you plan to) address issues of sustainability (environmental, social, economic)?

If yes, please decribe the issue briefly in the text box.

*

Please choose **only one** of the following:

◯ Yes

◯ No

Make a comment on your choice here:

[   ]

Was your project designed/do you plan to design your project to fill a societal, political, or academic need? *

Please choose **all** that apply:

☐ Academic knowledge gap

☐ Societal need

☐ Industrial adaptation

☐ Business opportunity

☐ Community adaptation

☐ Policy impact

☐ Nature conservation

☐ Don't know/not applicable

☐ Other: [   ]

Characterising the research approach

Have you or do you plan to use methodologies for co-producing knowledge with non-academic stakeholders in your research? *

Please choose **only one** of the following:

◯ Conducted

◯ Planned/planning

Which specific methodology was employed or do you plan to employ (e.g. expert interviews, focus groups, participatory planning, artistic approaches (painting, story telling))?

Please write your answer here:

[   ]

Who do you engage or plan to engage with for co-producing knowledge? *

Please choose **all** that apply:

- [ ] Researchers from other disciplines
- [ ] Non-governmental organizations (NGOs)
- [ ] Local community members
- [ ] Indigenous people
- [ ] General public / civil society
- [ ] Industry
- [ ] Policy-makers
- [ ] Other: _____

At which stage in the research process do you engage or plan to engage them? *

Please choose **all** that apply:

- [ ] Problem identification
- [ ] Research design
- [ ] Data collection
- [ ] Processing/interpreting results
- [ ] Presenting findings to local stakeholders
- [ ] Acting on results, ensuring management/policy uptake
- [ ] Other: _____

After completion: Do you share or plan to share your findings with someone? *

Please choose **only one** of the following:

- ( ) Yes. With whom?
- ( ) No. Why not?

Make a comment on your choice here:

What tangible outputs does your research have or will provide for non-academic stakeholders?

Please write your answer here:

Obstacles to knowledge co-production for ECRs

Did you encounter any of these **personal obstacles** during the knowledge co-production process? Please rate them on a scale from *1 (not at all challenging)* to *5 (very much challenging).* *****

Only answer this question if the following conditions are met:
Answer was 'Conducted' at question '13 [RA1]' (Have you or do you plan to use methodologies for co-producing knowledge with non-academic stakeholders in your research?)

Please choose the appropriate response for each item:

	1 - not at all challenging	2	3	4	5 - very much challenging	No answer
Language or communication challenges between yourself and non-academic stakeholders	○	○	○	○	○	○
Language or communication challenges between yourself and researchers from other disciplines	○	○	○	○	○	○
Not learned required skills at university (e.g. facilitating stakeholder meetings)	○	○	○	○	○	○
Power dynamics between yourself and supervisor or other researcher(s)	○	○	○	○	○	○
Difficulties in adapting to a new scientific discipline	○	○	○	○	○	○
Ability to self-advocate in the face of institutional barriers or conflict situations	○	○	○	○	○	○
Challenges of simplifying complex scientific outputs	○	○	○	○	○	○
Finding journals that publish research articles on co-produced knowledge	○	○	○	○	○	○
Personal discomfort with engaging stakeholders (stepping outside your comfort zone)	○	○	○	○	○	○
Stress due to career uncertainty, including short-term employment contracts	○	○	○	○	○	○
Managing work-life balance	○	○	○	○	○	○
Discrimination (e.g. barrier to engage with stakeholders due to your background)	○	○	○	○	○	○

Did you encounter any of these **academic or institutional obstacles** during the knowledge co-production process? Please rate them on a scale from *1 (not at all challenging)* to *5 (very much challenging).* *****

Only answer this question if the following conditions are met:
Answer was 'Conducted' at question '13 [RA1]' (Have you or do you plan to use methodologies for co-producing knowledge with non-academic stakeholders in your research?)

Please choose the appropriate response for each item:

	1 - not at all challenging	2	3	4	5 - very much challenging	No answer
Academic expectations affecting methodological approach (e.g. pre-defined project deliverables, thesis deadlines)	◯	◯	◯	◯	◯	◯
Complexity of methods	◯	◯	◯	◯	◯	◯
Insufficient support (supervisory or institutional)	◯	◯	◯	◯	◯	◯
Institutional siloing limiting collaboration between institutions or disciplines	◯	◯	◯	◯	◯	◯
Meeting pre-defined departmental/institutional requirements that do not accommodate work with non-academic stakeholders	◯	◯	◯	◯	◯	◯
Lack of funding (e.g. limiting travel to case study area, convene stakeholder workshops)	◯	◯	◯	◯	◯	◯
Lack of flexibility due to funding requirements (e.g. time restrictions, funding does not support applied research)	◯	◯	◯	◯	◯	◯
Traditional measures of success not appropriate (e.g. output in form of research paper, rather than communication to non-academic stakeholders)	◯	◯	◯	◯	◯	◯
	◯	◯	◯	◯	◯	◯

Did you encounter any of these **engagement obstacles** during the knowledge co-production process? Please rate them on a scale from *1 (not at all challenging)* to *5 (very much challenging).* *****

Only answer this question if the following conditions are met:
Answer was 'Conducted' at question '13 [RA1]' (Have you or do you plan to use methodologies for co-producing knowledge with non-academic stakeholders in your research?)

Please choose the appropriate response for each item:

	1 - not at all challenging	2	3	4	5 - very much challenging	No answer
Difficulty understanding the (local) context and complexity of problems	○	○	○	○	○	○
Identifying relevant stakeholders	○	○	○	○	○	○
Insufficient personal influence and limited network to attract or encourage stakeholders	○	○	○	○	○	○
Establishment and maintenance of trust and relationship with stakeholders	○	○	○	○	○	○
Disinterest by the stakeholders as a result of previous negative interactions with researchers	○	○	○	○	○	○
Disinterest by the stakeholders as a lack of perceived value-added to the local context	○	○	○	○	○	○
Contradicting goals of stakeholders	○	○	○	○	○	○
Past conflicts within academia or with societal actors	○	○	○	○	○	○

If you are in the planning stage of your project: What obstacles do or did you encounter to design a research approach including non-academic stakeholders? What would have been necessary in order for you to successfully overcome this challenge?

Only answer this question if the following conditions are met:
Answer was 'Planned/planning' at question '13 [RA1]' (Have you or do you plan to use methodologies for co-producing knowledge with non-academic stakeholders in your research?)

Please write your answer here:

Please think as broadly as possible: Have you experienced any challenges that you feel are **specific to the early stage of your research career**? Please describe them briefly.

Please write your answer here:

Was there, or what would be, adequate support for ECR navigating participatory research (e.g. resources, mentoring, funding flexibility, etc.)? Please specify what was existing and what you would need/want in addition.

Please write your answer here:

Are there any other experiences, issues or challenges you would like to share, that are specific to co-producing knowledge with non-academic stakeholders?

Please write your answer here:

Thank you very much for completing the survey. If you are interested in the outcome of the survey you are welcome to join our workshop "Overcoming obstacles to knowledge co-production for early career marine researchers" at ICYMARE 2021 on 23rd of September 2021. You can register for the conference here (http://www.icymare.com/conference/registration/).

Submit your survey.
Thank you for completing this survey.