

# WEAVING IT ALL TOGETHER: INTER AND TRANSDISCIPLINARY CO-DESIGN OF OCEAN SCIENCE FOR A SUSTAINABLE AND EQUITABLE FUTURE - A CASE STUDY FROM GHANA

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## INTRODUCTION

There is a global call to identify simplified yet coherent potential visions and pathways towards more sustainable and equitable ocean futures<sup>1</sup>. In order to deliver “the science we need for the ocean we want” and develop relevant responses to intractable global challenges such as plastics pollution, resource overuse and climate change, we cannot work in silos.

Findings from One Ocean Hub indicate a need to adopt a socio-ecological systems approach to gain a holistic understanding of ocean sustainability challenges. To do this we need to work across disciplines (interdisciplinarity) and with collaborators beyond academia to co-create knowledge (transdisciplinarity)<sup>2</sup>. Over the past five years, the

Hub has drawn on inter and transdisciplinary approaches and methods in Ghana, Namibia and South Africa to co-create responses to ocean governance challenges.

This poster demonstrates the use of the Three Horizons Approach<sup>1</sup> as a framework and practice to develop potential future visions and pathways with Ghanaian researchers and collaborators (Hub partner country) in response to three co-identified cross-cutting threats: climate change, resource overuse and plastics pollution (Figure 1 and 2). We consider this pilot as moving us forward in developing an approach to integrate diverse knowledges to enable sustainable and equitable ocean governance.

## METHODOLOGY: THE THREE HORIZONS APPROACH

### A practice for collaborating across disciplines and sectors

We employed the Three Horizons Approach<sup>1</sup>, a simple yet effective framework that helps participants dialogue and work through complex and intractable problems as well as with uncertain futures.

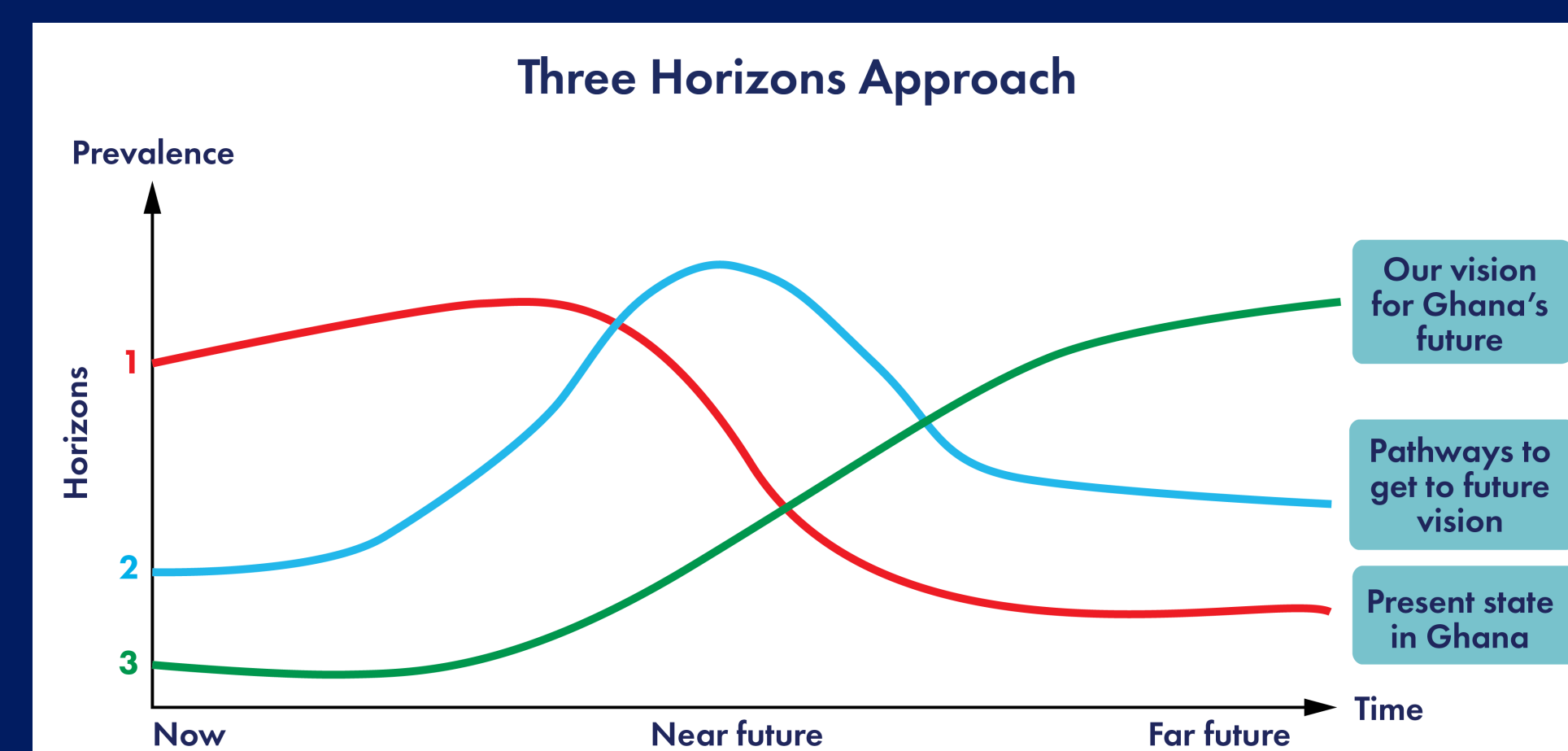


Figure 3: Three Horizons Approach adapted to the ocean governance context in Ghana<sup>1</sup>. Horizon 1 represents current coastal challenges in Ghana. Horizon 2 represents a vision of a transformed future for Ghana. Horizon 3 represents the necessary actions, emerging paradigms, ideas and innovations ('seeds') emerging from the present for the desired future. The horizontal axis represents time stretching from the present to the far future. The vertical axis indicates the prevalence of each pattern in a relative way.

- 1 In person workshops (interdisciplinary) co-identifying key threats to Ghana's ocean. Thematic analysis of academic knowledge.
- 2 Collaborators co-identified challenges in relation to triple threats (Workshop 1/Horizon 1).
- 3 Collaborators co-developed three future visions in response to each threat (Workshop 2/Horizon 3).
- 4 Civil society and NGO practitioners, local fisher associations and government authorities invited to review and add to Horizons 1 and 3 as well as co-identify 'seeds' for Horizon 2 (Workshop 3/Horizon 2).
- 5 The final workshop consolidated the visions into a holistic picture of the present, future and potential pathways to the desired future (Workshop 4).

## FINDINGS

### A co-developed vision of Ghana's ocean future:

To reach a consolidated vision for Ghana's future, we accounted for present challenges (Horizon 1), co-developed a desired future vision (Horizon 3) and co-identified potential pathways to reach that future (Horizon 2). Finally, we co-developed a consolidated future vision for Ghana: “Ghana is resilient to climate change, protecting biodiversity and culture and has well managed fisheries” (Figure 5).

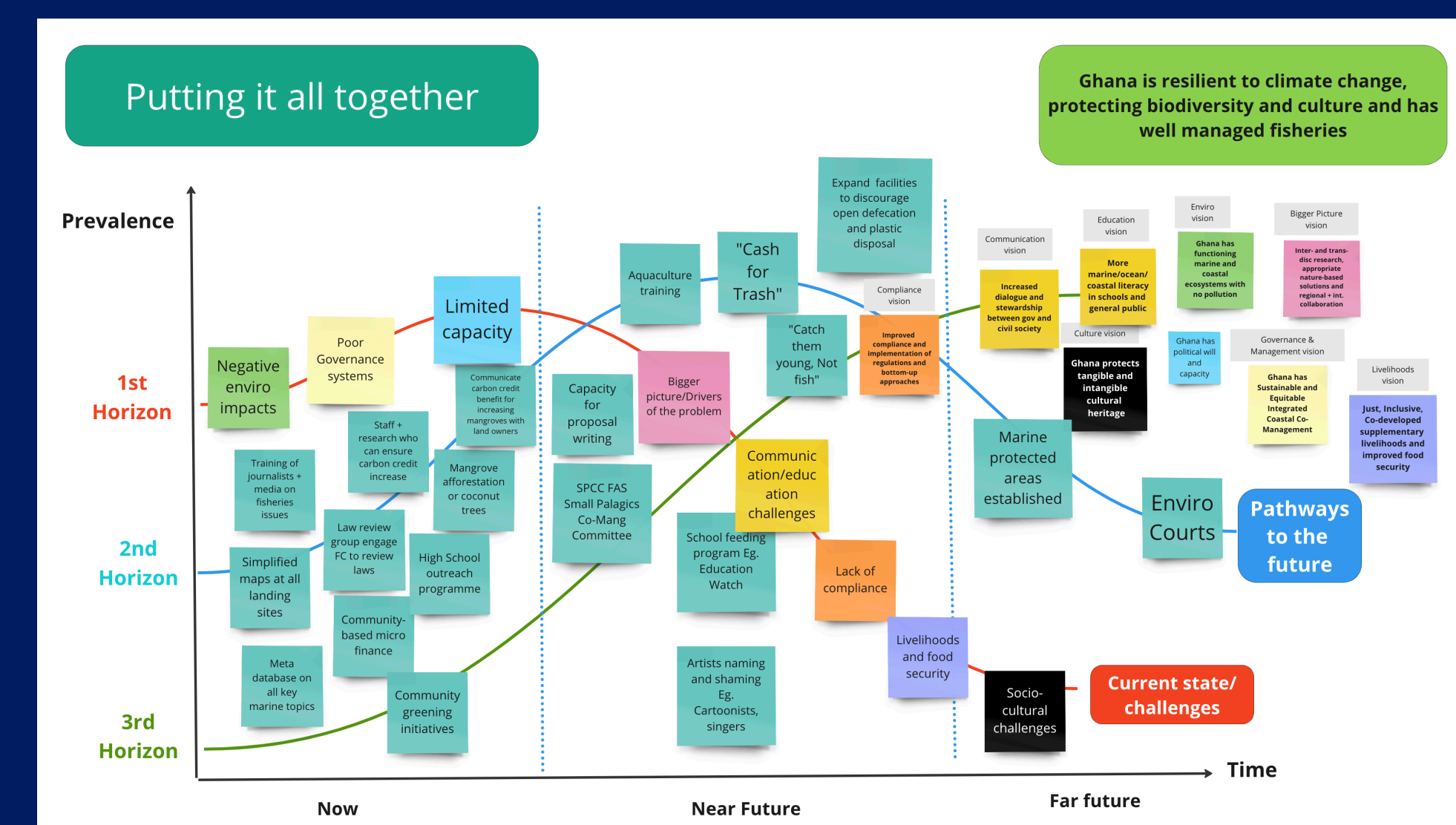


Figure 5: Weaving it all together: a consolidated picture of Ghana's present ocean and coastal challenges (Horizon 1), a desired future for her ocean and coastal communities (Horizon 3) as well as the potential 'seeds' or pathways as catalysts to obtain this future (Horizon 2)

## References:

- [1] Sharpe, B., A. Hodgson, G. Leicester, A. Lyon, and I. Fazey. 2016. Three horizons: a pathways practice for transformation. *Ecology and Society* 21(2):47. <http://dx.doi.org/10.5751/ES-08388-210247>
- [2] Strand, M., Ortega-Cisneros, K., Niner, H.J., Wahome, M., Bell, J., Currie, J.C., Hamukuaya, H., La Bianca, G., Lancaster, A.M., Moseka, N. and McDonald, L., (2022).

## TOOL FOR TRANSDISCIPLINARITY

### As per current definitions of transdisciplinary research<sup>2</sup>, this pilot process allowed us to:

1. Address complex, multi-faceted challenges by considering Ghana's triple threats across time
2. Build relationships and engage with collaborators outside of academia, specifically with practitioners



Figure 1: We worked closely with Hub researchers from Ghana from disciplines spanning environmental law, economics, biology, geography, anthropology and the arts as well as with local practitioners from government, local fisher associations and NGOs in Keta, Ghana, 6 October 2023 (Photo credit: Nina Rivers).

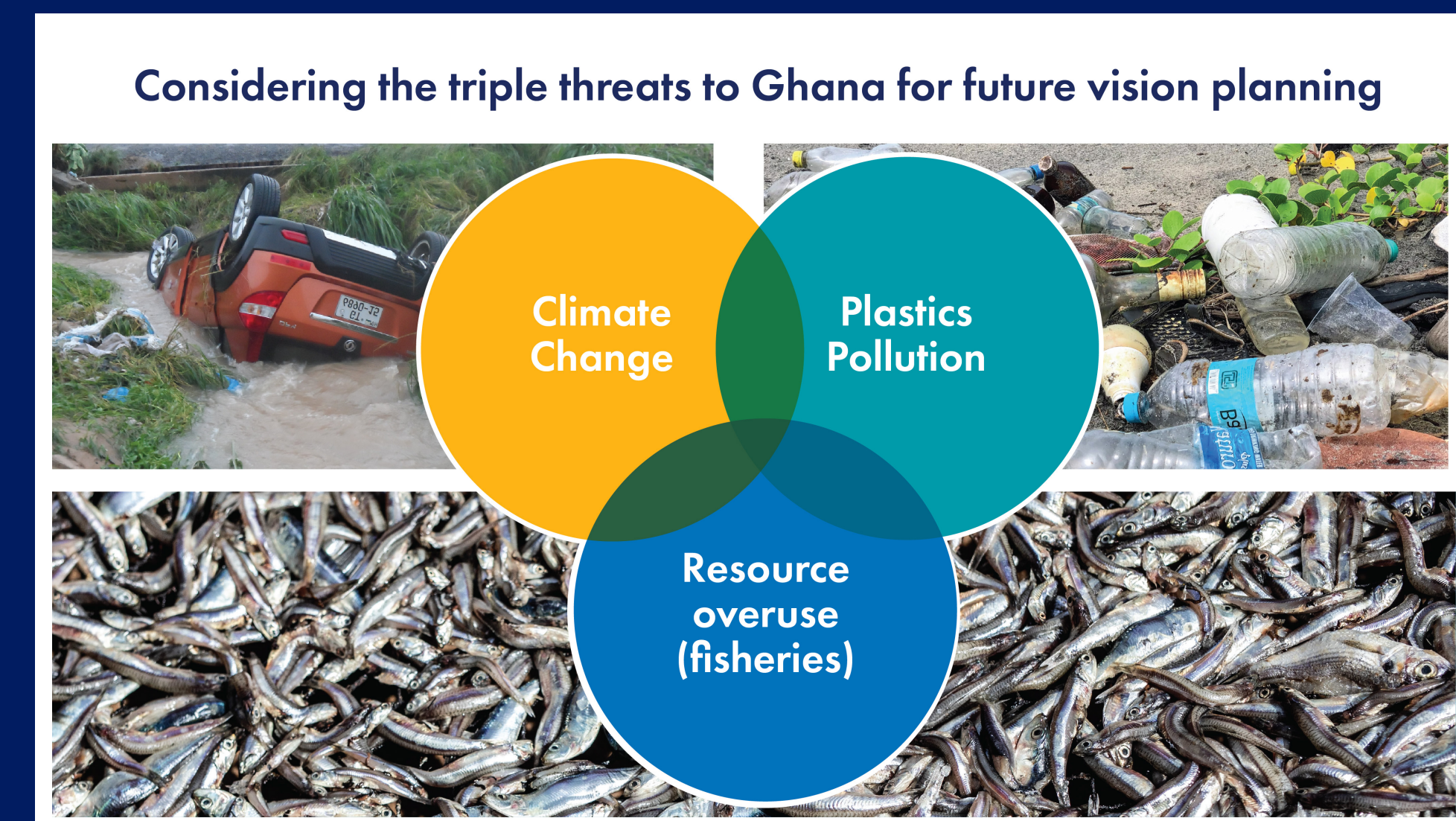


Figure 2: The co-identified triple threats to Ghana's ocean and coast: climate change, resource overuse and plastics pollution (Photo credits - right to left: Michael Abotsi (Dreamstime.com), John Cameron (Unsplash), Nessim Stevenson).

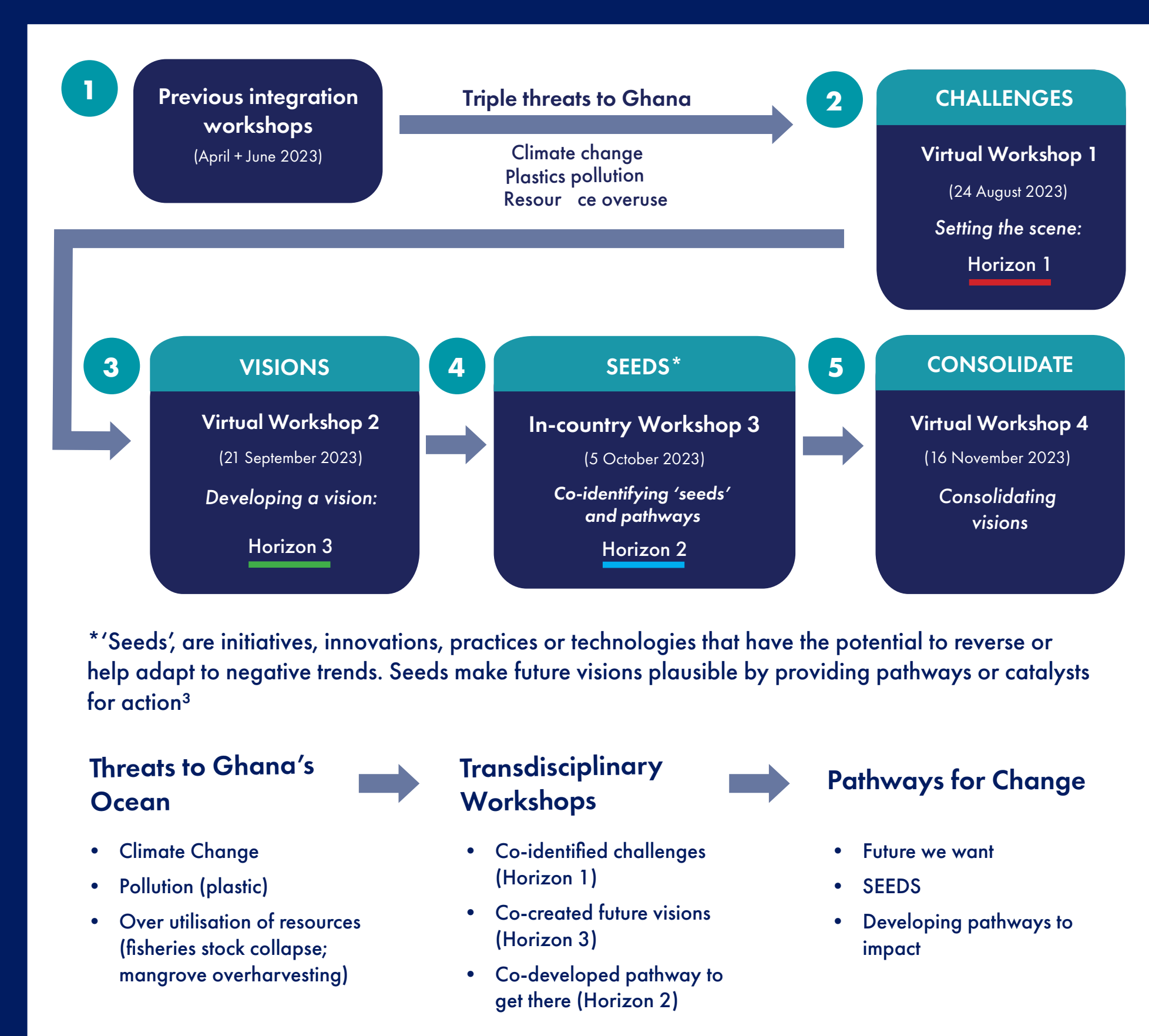


Figure 4: Three Horizons pilot process with OOH researchers from Ghana (August-November 2023).

from a local NGO, local fishers, national government authorities as well as local researchers

3. Be flexible, adaptive, and inclusive as supporting non-academic collaborators to effectively contribute their perspectives and knowledge was essential to the design of the process.

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[3] Bennett, E. M., Solan, M., Biggs, R., McPhearson, T., Norström, A. V., Olsson, P., ... Xu, J. (2016). Bright spots: Seeds of a good Anthropocene. *Frontiers in Ecology and the Environment*, 14(8), 441–448. <https://doi.org/10.1002/fee.1309>