German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig
Puschstraße 4, 04103 Leipzig, Germany

sDiv working group meeting report

”sMoste”

The main goal of SMoste working group has been to develop a theory concerning nature's contribution to people (NCPs) within the context of ecological networks, and optimizing its application to understudied and highly biodiverse regions where NCPs are crucial for local communities. In the second iteration of the working group meeting, iDiv PhD student Wentao Yu was added to our team, based on her expertise and research interests. We mostly concentrated on making progress on finishing two manuscripts, which were started during the first iteration of the meeting.

General atmosphere and sDiv support

The meeting consisted of a balanced mix of five in-person participants and two remote participants, which surprisingly worked well despite spanning two different time zones. The atmosphere was highly engaging, supportive, and productive. Regular check-ins and updates were conducted as participants woke up and rejoined the meeting, ensuring our thoughts and discussions were regularly summarized and synthesized. Speaking time was evenly distributed among participants, and the integration of remote participants ensured their active involvement in the discussions. The exceptional support from sDiv enabled the seamless execution of the hybrid meeting.

To kick off the workshop, leaders of projects arising from our first workshop presented a brief presentation on the progress and status of each project. Based on these presentations and ensuing discussions, we structured a to-do list for the workshop and for the future. An overview of the state of each project is as follows:

Project 1: Collection and analysis of food webs from India

General aim: To compile food webs for ecosystems from India, a highly diverse and understudied region. This will be valuable in and of itself, but will also underpin the application of the theory developed in Project 1.

Progress: We have been working with researchers in India to compile seasonal food web data (with NCPs). In specific the food web from the Tampara Lake has been completed and is the focus of the first manuscript. Progress was made on this manuscript between the first meeting and the present meeting in terms of data curation and analyses. The constructed food web is very diverse and well-resolved with 135 species and 1924 links (in the metaweb) over the three seasons. Each species has been annotated with natural history traits and NCPs associated with it. We analyzed several food web metrics and the stability of NCPs to understand how they change across seasons.

Balance between activities: 20% presentation by Anshuman, 30% discussion about analysis, 50% writing.

Next steps: A manuscript draft has been started and will be completed in over the next year.

Project 2: Integrating NCPs into foodwebs - concepts and methods

General aim: Develop a conceptual framework (beyond the current traditional one used in Project 1) and a how-to guide for integrating NCPs into food webs more holistically for deciphering feedbacks and dynamics.

Progress: During the first meeting, we recognized that before trying to put NCPs in food webs and study their motifs, we needed to more fully explore the ways that NCPs can and have been integrated into food webs. Thus, we have decided to write a synthesis article that brings together two bodies of literature: 1) that of NCP modeling, which is typically performed via landscape-based approaches or process-based approaches, and 2) that of ecological network modeling, which has not typically included NCPs as dynamic actors. This article will lay out a framework underpinning our remaining work and provide a blueprint for others in regards to how to set up a network-based representation of a social-ecological system for use in dynamic modeling. During this second workshop, we made significant progress in writing this manuscript.

Balance between activities: 20% presentation by Cian, 20% brainstorming, 20% figure development, 40% writing.

Next steps: We intend to submit to *Ecology Letters* this year, and have scheduled two writing workshops over the next few months to finalize the paper.

Project 3: Distribution of NCPs in food webs

General aim: To compare the participation and position of NCPs within ecological networks

Progress: During our first workshop, we began to discuss how to count motifs in which NCPs participated. Based on our insights from the concept paper, we realized that we need to extend the concept of motifs to include both positive and negative feedbacks from NCPs to species. This vastly extends the motif concept and also has relevance to counting motifs in multi-layer networks, which has as-yet not been fully addressed. In our second workshop, we further discussed an outline of a paper with the group, and decided to focus on theoretical modeling rather than counting NCP-species motifs in our empirical datasets given the lack of theoretical basis in regards to which NCP-containing motifs convey NCP stability and the mismatch between the high number of potential NCP-species motifs after our expanded conceptualization and the number of datasets we have.

Balance between activities: 70% brainstorming, 25% work on output, 5% writing

Next steps: We have begun a manuscript draft for this project. Each member of the group has been assigned tasks relating to data curation, network analysis, theory development, and writing. This is likely to be the primary focus of the next workshop.