Can Participatory Action Research Deepen the Understanding of Intersectionality in the Field of Biodiversity Research?

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Abstract: Halting biodiversity loss and reducing inequalities are targets of the Sustainable Development Goals (SDGs), which are not within reach. In 2022, the European Commission started to explicitly include gender with an intersectional perspective in their Horizon Europe working programme. In this paper, research is presented that tackles the very interlinkage of social inequalities in biodiversity studies. The first – conceptual – phase of an ongoing biodiversity project is analysed, explaining the knowledge co-creation process within a transdisciplinary, international team of researchers and practitioners, aiming to elaborate a methodological framework of intersectionality. Five intensive biodiversity case studies from Norway, Germany, Austria, Great Britain, and Switzerland, and their specific understandings of the concept of intersectionality are presented in detail and analysed with an action research approach. The outcome of this conceptual project phase is a report, which was further analysed regarding the development of approaches to include intersectionality in overall eleven biodiversity case studies, with a quantitative and qualitative content analysis. The main conclusion of this research is that intersectionality is a hard to grasp concept outside gender studies. Thus, it is on the one hand used as a synonym for terms like sociodemographic variables, and on the other hand closely related to diversity. It depends on the definition of diversity, whether these terms can be used almost interchangeably. This paper argues that the general focus of diversity – inclusion of all potential persons – is different to the focus of intersectionality, pointing towards discriminations at the crossroads of social or political categories. The latter is of specific relevance for environmental justice issues by addressing neglected, excluded or oppressed persons and their knowledges.

Key words: Intersectionality, Inequalities, Biodiversity, Food Justice, Sustainable Development Goals (SDGs), Co-Creation

1. Introduction

1.1 Policy Background: why Intersectionality Came Into Biodiversity Research

The world is not on track for achieving most of the targets of the Sustainable Development Goals (SDGs). For instance, SDG 15 aiming at protecting terrestrial ecosystems and halting biodiversity loss (https://sdgs.un.org/goals/goal15) is not within reach. Furthermore, it has been stated that the world-wide consequences of biodiversity loss on rising inequalities have to be addressed (Independent Group of Scientists, 2019).

In their new research funding programme, 'Horizon Europe', the European Commission (EC, the governing executive of the European Union) asks to explicitly include gender with an intersectional perspective in biodiversity research proposals since 2022:

> *"The proposals should explore intersectionality approaches and consider interlocking systems of power between gender and other social categories and identities such as religion, ethnicity and race (including migrants and refugees), social class and wealth, gender identity and sexual orientation and disability to better address access to and ownership of nature-based solutions."* (https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl6-2022-biodiv-01-09?tenders=false&callIdentifier=HORIZON-CL6-2022-BIODIV-01)

The project PLANET4B ("understanding Plural values, intersectionality, Leverage points, Attitudes, Norms, behaviour and social learning in Transformation for Biodiversity decision making"; 2022-2025; https://planet4b.eu/) received EC funding in 2022 after submitting a successful proposal to the aforementioned call, using the concept of intersectionality to tackle the interlinkage of social inequalities in biodiversity decision-making. The project team comprises universities, NGOs, research and other organisations from Austria, Belgium, Czech Republic, Germany, Hungary, Italy, Netherlands, Norway, Switzerland, and the UK.

1.2 Theoretical Background: Intersectionality and its Relation to Biodiversity

Kimberle Crenshaw (1989) first introduced intersectionality – based on previous work, such as bell hooks' (1981) book "Ain't I a Woman" – as an analysis of a legal case of discrimination of Black women in the US. Crenshaw

elaborated that frameworks using only one social or identity category are discriminating Black women because the intersections of race, sex, and class-discriminations are ignored. She argued that by re-centring the *"… discrimination discourse at the intersection … we may develop language which is critical of the dominant view and which provides some basis for unifying activity."* (Crenshaw 1989, p. 167)

Applying an intersectional approach to biodiversity means addressing issues of access to resources, differing impacts on diverse groups of actors, and analysing privileges of knowledge and legitimisation (Mangelsdorf et al., 2016). An intersectional perspective highlights potential intersections of discriminations for instance by asking whose access is limited for instance by educational or economic background, and if certain experiences and voices are under-represented. Thus, a critical reflection of knowledge production in biodiversity research includes also postcolonial criticism (Schurr & Segebart, 2012). Biodiversity research can include discourses of social justice, discrimination, postcolonialism, and the necessity to include various 'situated knowledges' (Haraway 1988) without using the term intersectionality. For instance, Cristina Yumie Aoki Inoue and Matías Franchini (2020) refer to "socio-biodiversity" and argue that relations between society and nature must be reconstructed by broadening our very notion of knowledge.

The authors of this paper are responsible for providing a process of co-creating knowledge on intersectionality in biodiversity within the transdisciplinary PLANET4B research team, which resulted in a methodological framework on intersectionality (Thaler & Karner 2023). Based on existing theoretical work (Crenshaw, 1989; Hancock, 2007; Walgenbach, 2012; Rice et al., 2019; Bauer et al., 2021), the authors defined the concept of intersectionality for the project and its team members as follows:

> *"Intersectionality highlights that race, gender, disability, sexuality, class, age, and other social categories are interrelated and lead to different levels of power and oppression influenced by forces like colonialism and neoliberalism." (Thaler & Karner 2023, p. 5).*

The PLANET4B team agreed to broach the issue of intersectionality in all eleven case studies, and ask whether a loss in biodiversity can potentially affect people at the intersections of social categories and identity markers differently. In the next section, it is explained how the authors co-created a methodological framework with the transdisciplinary team with five of the eleven biodiversity case studies, which are carried out within learning communities – as so called intensive case studies – in Europe.

2. Methodology

Two methods will be presented in this paper. First, a participatory action research (MacDonald 2012) started with the knowledge co-creation process in the PLANET4B project's conceptualisation phase, aiming to retrace the steps of including intersectionality in case studies. That includes this very paper, which has been distributed among the project team, as an intervention, which generates questions, conversations, and insights:

> *Participatory action research (PAR) is considered a subset of action research, which is the "systematic collection and analysis of data for the purpose of taking action and making change" by generating practical knowledge (Gillis & Jackson, 2002, p.264)." (MacDonald 2012, p. 35)*

Secondly, a content analysis will add insights on the impact of knowledge co-creation by assessing an outcome of this project's first phase with a gender perspective, a published report from Mendes and colleagues (2023) conceptualising all empirical biodiversity case studies and their integration of intersectionality.

2.1 Process Level: Participatory Action Research

During the kick-off meeting of PLANET4B in December 2022 the authors – in their role as task leaders to make 'intersectionality' applicable outside the gender scholars' community – introduced the concept of intersectionality and connections to biodiversity to the transdisciplinary consortium. Then, based on the literature overview on intersectionality with a focus on biodiversity, a series of online co-creation workshops were organised between February and March 2023. The purpose of the workshops was to co-create a shared understanding of intersectionality and a methodological framework, specifically to identify and include vulnerable groups of actors in five – so-called intensive – biodiversity case studies.

22 PLANET4B team members from twelve organisations participated in three online workshops. The main group consisted of members from five teams, who were supposed to work on intensive case studies together. Additionally, further interested researchers from the consortium attended and brought in expertise on

biodiversity research. The authors of this article had multiple roles, as gender experts they conceptualised and facilitated the co-creation process, as researchers of one of the five intensive case studies, the one based in Austria.

The levels of previous experiences with the concept of intersectionality differed very much among the participants. Individual members of two of five participating teams (from Austria, Germany, Norway, Switzerland, UK) were already familiar with feminist, post-colonial and/or social justice discourses and theories, while others were relatively new to the thematic area. This variety in gender knowledge (Wetterer 2009) came already to our attention when intersectionality was first discussed at the kick-off meeting in.

All three online workshops followed the following didactical elements (Thaler & Karner 2023a):

- introducing the participants
- interactive core-activities
- plenary discussions
- reflection and feedback phase

After these workshops, the five case study teams summarised findings from literature reviews and drafted their concepts, connecting intersectionality to their specific biodiversity research. One of the authors consulted the three teams without any previous gender studies expertise (face to face, by telephone and via e-mail) and accompanied all teams in the writing process alongside several feedback loops.

Between April and September 2023, the PLANET4B consortium exchanged theories of change and intervention methods and further planned their case study activities. In May 2023 the result of the knowledge co-creation process so far was published as a methodological framework on intersectionality (Thaler & Karner 2023).

Until October all case studies officially started their fieldwork by inviting relevant stakeholders and initiating local learning communities. At the end of October, the whole consortium met at another face-to-face meeting and reflected upon the actual relevant intersections of inequality applied to all eleven biodiversity case studies in the course of a fishbowl discussion moderated by one of the authors. Finally, in November 2023, a project report was published, comprising the conceptualisation of all eleven biodiversity case studies, and its application of the intersectionality approach (Mendes et al. 2023).

2.2 Impact Level: Content Analysis

One aim of the knowledge co-creation process was to support the transdisciplinary teams, who had no or little previous scientific gender knowledge, in order to prevent the application of everyday gender knowledge perpetuating stereotypes and biases (Wetterer 2009). Another goal was to co-create a practical methodological framework on intersectionality, which could be specifically used for the biodiversity case studies of PLANET4B (Thaler & Karner 2023).

An outcome of the first conceptualisation phase of the project PLANET4B is a published report on all eleven biodiversity case studies ("Learning Communities and sectoral Advisory Boards established for 5 intensive place-based and 6 extensive sector-based case studies", by Mendes et al. 2023), explaining planned activities within all case studies, and the application of intersectionality, especially in addressing actors, stakeholders and advisors.

With a quantitative and qualitative content analysis of this report (Mendes et al. 2023), the use of the intersectionality approach within the planned biodiversity case studies can be assessed (Mayring 2014), following the general research question:

How does the discourse on intersectionality within the PLANET4B team refer to the methodological framework on intersectionality as an outcome of the co-created gender knowledge of the participatory action research (described in Thaler & Karner 2023)?

3. Results

In this section, the results of both methodological steps will be presented. First, the participatory action research process itself – analysing the co-creation of knowledge on intersectionality in biodiversity generally, and integrating the methodological framework (Thaler & Karner 2023) using intersectionality in biodiversity case studies specifically. Second, the quantitative and qualitative content analysis of the PLANET4B report (Mendes

et al. 2023) to explore the application of the co-created gender knowledge in planning biodiversity case studies with an intersectional lens.

3.1 Process Level: Analysing the Co-Creation of the Methodological Framework on Intersectionality

The co-created methodological approach of using intersectionality in biodiversity case studies was the result of an iterative cycle. The initial literature review on intersectionality in biodiversity research informed the first co-creation workshop with transdisciplinary partners of five intensive biodiversity case studies (in the fields of inclusive nature recreation and outdoor activities, urban biodiversity and food, and biodiverse agriculture). Findings from partners' specific literature reviews were integrated in the following co-creation workshops, which led to improved case study concepts and literature reviews, and finally to a framework of "doing biodiversity case studies with an intersectional lens" (Thaler & Karner 2023, p. 17 ff.):

1. Reflexivity of researchers informed by intersectionality – useful questions to start are:
    a. Where do I stand?
    b. What are my privileges?
    c. Where are my connections to the case study?
    d. Where are my entry points?
    e. Who can help us connecting to human and non-human actors?
2. Approaching actors of biodiversity case studies using an intersectional perspective – useful questions to include actors are:
    a. Who are we doing research with?
    b. What knowledge is valued and how?
    c. Who are we missing and why?
    d. How diverse are the people we are missing?
3. Doing biodiversity case studies with an intersectional lens – useful questions for doing intersectional biodiversity research are:
    a. How are we deciding on research topics and questions?
    b. How can we enable research on eye-level with our actors/stakeholders?
    c. How can we use creative research methods to tap into undervalued knowledge?

3.2 Process Level: Analysing Draft Concepts Using Intersectionality in Biodiversity Case Studies

The participatory action research addressed specifically those biodiversity case studies[1], which are planned as intensive case studies establishing learning communities in concrete European regions and participated the knowledge co-creation process:

- Children with disabilities and outdoor recreation in Norway,
- ethnic minority communities and access to nature and the outdoors, in UK,
- urban youth, intersectionality, and nature in Germany,
- urban food for biodiversity and inclusion in Austria, and
- agriculture, religion and biodiversity, in Switzerland.

In spring 2023 the five teams initially planned their case studies and discussed the role of intersectionality within their biodiversity research (see Thaler & Karner 2023):

Helene Figari, Yennie Bredin and Vegard Gundersen (2023) planned to support and research a nature connection for children with disabilities in Oslo. During the first discussions of this case study, the basic idea was using recreation activities as starting point for biodiversity research. By asking, who has access to those recreation activities and who gets excluded, and then whose knowledge would be missing, if formerly excluded groups are not included, the focus of the Norwegian case started to shift towards children with disabilities. But, although green spaces are important for individuals' wellbeing and health in cities, children are mostly excluded in

[1] The following description of the five intensive biodiversity case studies focuses on the conceptualization of intersectionality. Details on the theoretical background and planned research and intervention methods are described in the case study chapters in the aforementioned report (Thaler & Karner 2023).

planning processes of recreation areas in cities. The assumption of the Norwegian case study is that at the intersection of age and (dis)ability a systematic exclusion leads to a specific disadvantage of disabled children in the decision making of recreation areas:

> *"Since children with disabilities tend to be excluded from outdoor recreation, we suspect that being both children and disabled also entails a double disadvantage when it comes to influencing planning and prioritisation of outdoor recreation areas (Porębska et al., 2021)." (Figari et al. 2023, p.23).*

Geraldine Brown, Alex Franklin and Geeta Ludhra (2023) proclaimed to diversifying access to the outdoors through bringing people from diverse backgrounds together and exchanging their biodiversity stories and knowledge in the Chilterns Area of Natural Beauty, a White rural area outside of Oxford in the UK. The case study centres around the shared experiences of people from ethnic minority communities serving as a vehicle to connect to stakeholders from the environmental sector as a starting point for change. The case study team states:

> *"An intersectional approach will enable us to capture similarities and differences within and between participants and capture a nuanced understanding of how racialised communities' experience nature and the outdoors." (Brown et al. 2023, p.26).*

The UK case study will co-produce knowledge about the relationship of ethnic minority communities to biodiversity and will foster a dialogue with decision makers to engage with people from diverse backgrounds in addressing biodiversity loss (ibid.).

Ilkhom Soliev, Ammalia Podlaszewska, Zafar Saydaliev and Torsten Wähler (2023) planned on researching how experiential learning, behavioural games, and creative interventions can enable nature prioritisation in decision-making of young people, including youth with less privilege in their case study in Germany.

The main assumption is that feeling powerless is a relevant barrier in prioritising biodiversity in young people's everyday lives. The German case study team states:

> *"The anxiety and the feeling of powerlessness might be stronger in young people with less privileged intersectionality backgrounds (e.g. migration) (e.g. Borho et al., 2022), who might have less access to various political systems (e.g. elections) and might face additional challenges of social acceptance/inclusion/integration, all potentially explaining the level of nature and biodiversity prioritisation." (Soliev et al. 2023, p. 32).*

Sandra Karner, David Steinwender and Anita Thaler (2023) planned initiating an edible city initiative, which connects biodiversity, sustainable food and social justice issues in Graz, Austria.

The starting point of including intersectionality in this urban gardening related case study is the assumption that in Austria inequality is the main driver of food insecurity, not the unavailability of 'good food' per se. These mentioned inequalities are mostly area-based in cities, leading to poorer access to healthy food for residents of low-income and ethnic minority neighbourhoods.

Alternative food and gardening initiatives aiming at overcoming prevailing problems of the corporate food regime advocate more food justice. However, in practice, it turns out that these alternatives tend to be lacking social diversity, and reproducing inequality and hegemonic domination. This is the communicated motivation for setting up a "diverse foodscape" in Austria:

> *"The Bio-Diverse Edible City Graz will aim at establishing a diverse foodscape, which will not only cover the food system in its narrow sense (food production and supply perspective), but also green spaces as edible landscapes and areas for learning, recreation and social interaction (societal perspective) as well. … to get in touch with different user groups to identify their needs and to make green spaces more attractive for under-represented groups, especially women at the intersection of gender, age and migrant background." (Karner et al. 2023, p. 40)*

Robert Home and Ghezal Sabir (2023) described their case study as biodiversity-promoting farming practices in Switzerland with a focus on the role of spirituality and religious beliefs. It is to be seen, whether certain spiritual beliefs and practices in the context of farming are positively influencing behaviour change towards biodiversity decisions like it could be shown for health. Discussing their starting point to include intersectionality in the biodiversity case study in Switzerland, the team was advised to take a closer look at gender inequities in Swiss

farming and move along from there. As religion was an already set variable, the team concluded with their concept:

> *"Religion and gender are the two axes along which intersectionalities will be included in this study. … The majority of Swiss farmers being male is largely due to the social structures that favour sons over daughters in questions of farm inheritance. Hence, males are more likely to gain education in agriculture, which indirectly means that women have fewer knowledge resources to participate in strategic discussions. Less is known about the relationship between religion and biodiversity decisions." (Home & Sabir, 2023, p. 44).*

3.3 Impact Level: Analysing Final Concepts Using Intersectionality in Biodiversity Case Studies

To assess the impact of the knowledge co-creation process, the content of the report on "Learning Communities and sectoral Advisory Boards established for 5 intensive place-based and 6 extensive sector-based case studies" (Mendes et al. 2023), published in November 2023, was analysed. The leading research question of the content analysis (Mayring 2014) was how the discourse on intersectionality in the 72 pages long report of Mendes and colleagues (2023) refers to the co-created gender knowledge of the participatory action research (the methodological framework on intersectionality described in Thaler & Karner 2023).

At first a quantitative content analysis could show that the concept of intersectionality was used 51 times in the text, followed by 38 mentions of a related concept, "diversity". It is important to state that not all references of "diversity" or "diverse" were counted as related concept of intersectionality, as the term is also part of epistemologically different concepts like "biodiversity" or "agrobiodiversity" etc. Likewise, all mentioned terms, which were analysed and their frequency noted in table 1, are only those epistemologically connected to intersectionality. To further contextualise the term "diversity" within this specific project, it is also important to note that the semantically close term "biodiversity" – which is the core topic of PLANET4B – was used 171 times.

Table 1 shows that besides intersectionality and diversity also terms like "vulnerabilities", "privileges", "ecofeminism" and "postcolonialism" were analysed as relevant concepts related to intersectionality, but they were referred to only at six to eight instances, "feminism" and "postcolonialism" were never mentioned at all.

The lower part of table 1 comprises categories related to the concept of intersectionality, and here terms around "age" were used predominantly, which can be explained as this is a category used in several case studies.

This most used term was followed by "disability", "women"/"men", "migration"/"immigration"/"emigration", "Black"/"White"/"Asian", "gender", "ethnicity" and "religion". "Class" and "race" were only used two times and once, "sexuality" and "LGBTQ" were never mentioned in the analysed report (Mendes et al. 2023).

Table 1. Frequency of the term „intersectionality" and connected relevant concepts as well as frequencies of categories of intersectionality in the analysed document of Mendes et al. 2023

	Analysed terms	Frequency	Ranking
Concepts related to inter-sectionality	„intersectionality", „intersectional"	51	1
	„diversity", „diverse"	38	2
	„vulnerable"	7	3
	„privilege", „privileges", „privileged"	6	4
	„ecofeminism", „ecofeminist"	3	5
	„feminism", „feminist"	0	6
	„Postcolonialism", „postcolonial"	0	6
Social, political and identity categories related to intersectionality	„age", „elderly", „youth", „young"	76	1
	„disability", „disabilities", „disabled"	32	2
	„women", „men"	30	3
	"migration", "immigration", "emigration"	26	4
	„Black", „non-white", „White", „Asian"	25	5
	„gender", „genders", „gendered"	24	6
	„ethnicity", „ethnic"	24	6
	„religion", „religions"	21	8
	„class"	2	9
	„race"	1	10
	„sexuality", „sexualities"	0	11
	„LGBTQ", „queer"	0	11

While a quantitative analysis gives an overview of used terms, and their frequency, only a qualitative analysis can bring a deeper understanding of how concepts and social or political categories are used epistemologically (Mayring 2014).

In the project report of Mendes and colleagues (2023), the phrasing around intersectionality shows that the concept is often not connected to its theoretical roots highlighting – intersecting – discriminations based on social and political categories or identity markers (Crenshaw 1989). It is rather used as a term in the general meaning of 'social categories' or 'sociodemographic variables' like these quotes suggests:

"In addition, other intersectionality dimensions were addressed, in particular, age, ablism & disabilities, and varied ethnicities and geographies within and beyond Europe."
(Mendes 2023, p. 2)

"Participants were selected based on the five-helix framework... We also followed the intersectionality criteria." (ibid., p. 26)

"How to work with the dimension of intersectionality in this case study?" (ibid., p. 27)

"The age of the participants falls between approximately 30 and 55 years. and the SB [Stakeholder Board] consider gender parity (4 females and 4 males). Different experiences, skills, roles, and types and levels (local, national, and international) of action and activation implemented are represented. Other criteria of intersectionality will be considered in the next phase." (ibid., p. 40).

"This system characteristic (as well as scientific literature pointing to differences in the environmental attitudes of girls and boys) led us to consider gender as one of our most important intersectionality dimensions to be included in our study." (ibid., p. 43)

"Nonetheless, in the next steps of the research, we are trying to include more women, and other colleagues with varied intersectionality backgrounds (Indigenous peoples, black or quilombolas communities in Brazil; farmers in the Netherlands, and others)." (ibid., p. 46)

"We do not address intersectionality with the SB. We do not have the freedom to choose the intersectionality characteristics of our SB [Stakehoder Board]." (ibid., p.56)

In comparison, the definition of intersectionality discussed in the knowledge co-creation process and the published methodological framework of PLANET4B emphasises the intersection of categories as well as the issues of power and oppression:

> *"Intersectionality highlights that race, gender, disability, sexuality, class, age, and other social categories are interrelated and lead to different levels of power and oppression influenced by forces like colonialism and neoliberalism." (Thaler & Karner 2023, p. 5).*

In other parts of the analysed report from Mendes and colleagues (2023), intersectionality was used as a synonym or closely related to diversity. This quote represents an example, where fostering diversity is discussed as a value, which drives the inclusion of a broad variety of actors, along "a wide range of intersectionality dimensions":

> *"In line with our commitment to fostering diversity and inclusion, our LC [Learning Community] embraces a wide range of intersectionality dimensions. Participants hail from various corners of the world, including India, Central Russia, and West Asia, offering a multicontinental perspective. We represent different ethnicities, religions, and genders, with a balanced ratio of three females and six males." (Mendes et al. 2023, p. 30).*

4. Discussion and Conclusions

This paper explores how the discourse on intersectionality in an ongoing EU project refers to the co-created methodological framework on intersectionality from this very project (described in Thaler & Karner 2023).

We present the participatory action research of the project's knowledge co-creation process, and the content analysis of the discourse – the use of the intersectionality concept in planning the PLANET4B biodiversity case studies case studies, which was synthesised in a project report (Mendes et al., 2023).

The content analysis of this report, published in November 2023, showed that the definition of intersectionality was not in line with the definition, which was co-created earlier in the project (Thaler & Karner 2023): "intersectionalities", "intersectionality dimensions", "intersectionality backgrounds", this wording represents a use of the concept as a placeholder for 'social variables' or 'socio-demographics', and does not acknowledge the interlinkage of social or political categories, leading to different levels of power and discrimination. According to the European Commission, it is the consideration of "… interlocking systems of power between gender and other

social categories and identities", which should enable biodiversity research "to better address access to and ownership of nature-based solutions."

(https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl6-2022-biodiv-01-09?tenders=false&callIdentifier=HORIZON-CL6-2022-BIODIV-01)

The qualitative content analysis of the project report showed that intersectionality was used as a synonym or as closely related to diversity, which can be defined as:

> *„Some alternative definitions of diversity extend beyond race and gender to include all types of individual differences, such as ethnicity, age, religion, disability status, geographic location, personality, sexual preferences, and a myriad of other personal, demographic, and organizational characteristics. Diversity can thus be an all-inclusive term that incorporates people from many different classifications. Generally, "diversity" refers to policies and practices that seek to include people who are considered, in some way, different from traditional members. More centrally, diversity aims to create an inclusive culture that values and uses the talents of all would-be members." (Herring, 2009, p. 209).*

This motivation to include various actors from different backgrounds was found in many case study descriptions, but does it follow the same aim as the intersectionality approach? There are scholars who refer to both concepts, like Mangelsdorf et al. (2016):

> *"Environmental justice and the biodiversity crisis must include an intersectional lens, because '… looking at biodiversity is inseparable from looking at the diversity of human communities …'" (ibid., p. 7)*

Is the direction of diversity – inclusion of all potential persons – different to the focus of intersectionality pointing towards discriminations at the crossroads of social or political categories – addressing specifically neglected, excluded, or oppressed persons?

The following definition distinguishes "critical diversity" from "colourblind diversity", and this could settle the debate, because while the first has undoubtedly an overlapping with intersectionality, the latter has not:

> *„… critical diversity is about more than embracing cultural differences that exist between groups and appreciating those differences. It also includes examining issues of parity, equity, and inequality in all forms. It confronts issues of oppression and stratification that revolve around issues of diversity. A theory of critical diversity includes an analysis of exclusion, discrimination, and it challenges hegemonic notions of colorblindness and meritocracy.*
> *Critical diversity is in stark contrast to other notions of diversity such as 'colorblind diversity'. A colorblind diversity understanding of the social world is based on the premise that it is sufficient to embrace cultural differences among various racial and ethnic groups without acknowledging disparities among these groups in power, status, wealth, and access." (Herring and Henderson 2011, p. 632).*

Thus, using diversity could also be a valuable and useful path for biodiversity research. Yet this requires that the concept is defined and understood by all involved researchers as critical diversity. Similar to intersectionality, critical diversity highlights discriminations and power imbalances to address excluded or oppressed persons. Environmental justice and biodiversity loss deal with structural barriers in participation and systematic discrimination of specific persons, therefore policies calling for an intersectional or critical diversity approach seem both to address the same important issue.

This paper could not only provide insights into a knowledge co-creation process and the difficulties in communicating the concept of intersectionality and implementing it in biodiversity research, moreover, the paper serves the participatory action research itself. The presented data and arguments were and will be used for deeper debates around intersectionality within the PLANET4B team itself. The feedback from project colleagues not only helped to improve this paper but also triggered further discussions and reflections on taking an intersectional approach in our case study work. The PLANET4B team might have *"overlooked the deeper political and social meanings of intersectionality"* as our colleagues, who had compiled the report, which was analysed for this paper, concluded. The PLANET4B team is still in a learning phase, and colleagues emphasise our intention to apply intersectionality *"to strengthen the critical edge of the analysis within case studies"* as well as the final goal to *"explore intersectionality's full potential to trigger transformations towards socio-environmental justice"*. However, to achieve this, further steps in translating intersectionality as a critical social theory to our specific case study contexts will be necessary.

It must be stated that the presented challenges to integrate intersectionality in empirical research and case studies are not limited to the project at hand, it can be assumed that the core ideas and methodological consequences of using intersectionality have generally not been made fully accessible outside gender studies. The authors – and their colleagues of PLANET4B – will go on to work towards their aim, to provide knowledge on using intersectionality as a practical concept, which helps to understand interlinked complexities of systems of oppression such as patriarchy, ableism, racism, ageism, colonialism, which marginalise people and their knowledges, also in the discourses and decision-making processes in biodiversity research and policy making.

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