Supplementary Material Note 4:
Qualitative analysis of Knowledge Communities

Understanding emergence of the Sustainable Development Goals Research.

This section presents the analysis of the exploratory interviews undertaken in this study. The results are organised according to the interview guide shown in table S2. Each category is subdivided into opportunities, barriers and funding dynamics.

4.1 Relation to SDG agenda

Opportunities

Even though most of the interviewees indicated that they do not consider the SDGs when formulating a new research question, two interviewees said that they actively think about the SDGs when formulating a research question. One uses the SDGs to motivate their work, because of a close collaboration with a large supra-national institution where the SDGs are a central part of the work motivating action plans (interview C1). Another interviewee indicated that the SDGs are important for their research and are also considered when thinking about future research (interview C2). These two researchers are both in community 71, and they both mention that their work is contributing to strategies to reach the SDGs and that their work is mission driven. A possible explanation could be that research topics in this community are more mission oriented and follow an agenda with a stronger fit to the SDGs, whereas other research might be more related to agendas that have a fuzzy link with the SDGs and are more concerned with fundamental research and less related to the applied nature of the SDGs.

From the interviewees who do not actively consider the SDGs in their research, some of the interviewed researchers answered that even though they do not consider the SDGs, they do know their research is related to them. One of the interviewees explained that he has been doing his research for many years, and that his research is completely related to SDG 7, but that that happened 'accidental'. His research has always been on these topics, but this topic happens to be closely related to SDG 7 and he is aware of this. Another interviewee explained that he knows his research has societal relevance and is concerned with global problems, so therefore he 'expected' it to be related to the SDGs, but he did not know to which SDGs precisely. Additionally, one interviewee said that with working on these topics the relation with the SDGs kind of *'comes natural'* (interview A3) and another interviewee argued that it depends on the definition of the SDGs whether his research relates to it. Another researcher said that:

> *'a lot of what I'm doing, indirectly, bears on them. (…) But I also do think, for example, human rights are important. And then very often, of course, you can put things in the same sort of terminology of SDGs or in terminology of human rights or development'* (interview D1).

In the workshop the participants were asked whether it is important to be aware of how research is related to the SDG targets, and why. Most participants answered 'yes', mostly with the argument that the SDGs provide a framework to build communities, connect and discuss research in the global community. Other arguments are more related to the aim of the SDGs, for example so that no one is left behind or that it is good to see how we contribute to a certain set of goals. These answers show that most of the workshop participants think it would be positive to relate research to the SDGs and create more awareness. Additionally, we asked the

participants how Utrecht University can make researchers more aware of their contribution to the SDGs. Most of the participants answered in the line of educating and disseminating knowledge about the SDGs and underlining the benefits of linking research to the SDGs. For example, one participant answered: *'create incentives (and not requirements) for researchers to make a direct link between their research and a given SDG'* (workshop participant).

Barriers

As mentioned previously, eleven of the interviewees indicated that they do not think about the SDGs when formulating new research questions. The reasons are diverse, but among others the reasons for not linking research to the SDGs are because *'not informed well enough what the benefits of the SDGs would be for me'* (interview D3) or not 'suddenly' changing research because of some new framework, such as the SDGs (interview A2). Another interviewee argued that *'to the extent that it becomes the dominant language, then it will be something to which I need to adapt my research'*, but until then *'what gets most traction internationally where my governance questions then go'* (interview D1). Some researchers argued that the SDGs should not play a role in (all) research. One researcher said that *'these SDGs were designed a while ago, while 10-20 years ago I already was working on solar energy anyway'*. Also, this interviewee argues that as a university *'we are focusing on that research groups are doing'*, and there are links with the SDGs, but they don't guide (interview B3).

In the workshop, to the question whether it is important to be aware of how research is related to the SDG targets, a couple of participants answered 'no' or 'depends'. Their arguments are that the SDGs are rather new whereas most researchers started their research already before, and that the SDGs might be useful to embed research, but not for research itself. Other arguments are that the definition of the SDGs is not clear or that it depends on the field of research. The participants were also asked why researchers do not find a strong fit between SDG topics and their research. Some participants argued in the line of not enough knowledge about the SDGs or a to narrow definition of the targets. One argument was that there is a difference between more fundamental research and more applied SDG goals, and that direct impact and contribution to achieving the SDGs is limited. One participant answered that some researchers might have a longer standing agenda with which they align their research.

Funding

From the interviews followed that different types of grants offer different opportunities, whereas small grants are useful for experimenting with new ideas, methodologies, etc., for example:

> *'both the larger and the smaller types of funds are important, where the smaller are more important to look at some more innovative approaches'* (interview A3), or: *'It's usually the larger grants that we attract and that allows us to really make big steps. But you can also imagine that sometimes you want to work on this very specific component of that research that can be done with a smaller grant'* (interview C3).

Or they are useful for more practice-based experiments: *'Smaller grants usually, in my domain, are more about small skill, practical projects'* (interview D3) and: *'So the smaller grants are more like kind of..., yeah that's why they call them seed money, right, so like it's a seed that you plant somewhere with the hope that it will grow into a bigger idea'* (interview A3). Here we see that both small and large grants are important, where the small grants allow for more

experimental research to come to a research proposal for a large grant, and the large grant allows for extensive research.

One of the interviewees indicated that:

> *'So given that there's a certain popularity in thinking about corporate social responsibility in terms of SDG goals, maybe in a couple of years from now, when I search for funding opportunities, I will look at grant schemes which use that framework to go for a next grant, but no actual plans at the moment'* (interview D1).

This was mentioned by more interviewees and implies that if funding agencies use the SDGs as a framework and require researchers to formulate their research according to the framework of the SDGs, researchers would have to think more actively about how their research is related to the SDGs.

Additionally, in the workshop, we asked what the role of small grants is in research topics related to the SDGs or in combining the SDGs. Some participants answered that it might work if this is the purpose of the call, others answered that this can be used as seed money to take a first dive into the research, by explicitly seeding the development of SDG related project proposals. Some participants answered that difficulties may arise when the SDG goals insufficiently match other research interest, or that they should not play an extra role, that if research is in SDGs it is great, but if it's not, it is also great.

4.2. Research motivation

Opportunities

Some of the interviewed researchers indicate that they or their respective research communities have been doing research on particular topics for a long time, however, they acknowledge that they are aware of changes in their context (for example scientific, political, etc.) which can influence their research:

It's, of course, related to what we've been doing in the past, our key expertise, but also current developments in the field, which come together with an interest of the European Union, the green deal, that also very much aligns with the things that we are researching' (interview C3).

This means that even though the knowledge trajectories on these topics are long-standing, researchers do see new possibilities and changes in their own and other fields. Two interviewees mentioned that they consider the strategic plan of Utrecht University when developing new research questions and starting a new research project (interview D3 and D4), in the sense that they align their research with the strategic plan of Utrecht University. These are both in community 197, which is concerned with educational research. Other interviewees did not mention the strategic plan.

Barriers

As previously mentioned, some of the interviewed researchers indicated that they have been undertaking research on these topics for a long time themselves, but also that their respective networks or communities have been doing research on these topics for a significant period of time. As described by one of the interviewees: *'So a research career is like a sort of path with*

stepping stones, in which you are going from stone to stone' (interview D1). This relates to personal interests and the intrinsic motivation of researchers to do research on these topics. As described by one interviewee *'(...) while still having a large motivation to work on, to continue working on alternative energy sources. That's why I said I don't need the SDGs for myself, I already was motivated to work on them'* (interview B3). Because they have been working on these topics for a long-time and are motivated for other reasons, they do not feel the need to link their research to the SDGs.

Funding

Funding plays an important role in the research motivation, whereas interviewees indicate that *'most of what we actually do is answering calls'* (interview C1) and *'there is a call and then we try to fit'* (interview B2). But even though funding has an influence, interviewees also indicate that *'we would never do research just because of the fact that there is funding, and so there are types of research that we don't engage in because we're simply not interested in it'* (interview C1). All interviewees noted that they have never nor would ever change a research idea if the requirements of a grant or funding organization asks for it, after having received the grant.

The interviewed researchers indicated that having received a grant, there is no influence of the funding organization on how the research is performed. Also, as interviewees explained, if a call does not fit the research ideas or interests of the researchers, the call is not considered:

> *'If there's a project, a call, where we think what we want to do does not fit in, we don't consider it from the beginning. (...), it's not that we would tweak our idea, so that they fit the call, but we check if the call, if we can make that fit to develop our ideas and really get our goals implemented.'* (interview B2)

This shows the integrity of the researchers is more important than receiving a grant.

On the other hand, most interviewees do acknowledge that funding has a large influence on research in more general terms, in the sense that *'the research goes where the money goes'* (interview D4). This means that funding opportunities largely determine which research ideas are feasible and can be implemented and which ones cannot. One of the interviewees said:

> *'I don't think I could say that there is no influence of the funding organization at all. And they have strict, I mean, a call itself, of course, limits what you can propose. If they specifically write that they are interested in certain health outcomes or they are interested in children's health or adult health or elderly health.* (interview C1).

This shows that calls limit research in the sense that you can only apply if you are willing to conform to the outcomes they are looking for in the call. Another interviewee said:

> *'So the first part of that the research goes where the money goes, or where there's money, for instance in industrial partners, yeah that has a huge influence of the research that we are actually doing. So, the people who provide funding have a lot of power'* (interview D4).

This is more related to industry, whereby the interests of the industry also exert influence on research. One of the interviewed researchers pointed out that there is a difference between

research that is more restrictive, that aims to answer certain questions or problems, compared to fundamental research which is more open:

> *'Of course, I mean calls are restrictive sometimes and there is a tension between curiosity driven research, basically completely blue sky, versus basically addressing societal questions or specific goals. And that of course puts things into a more restrictive framework'* (interview C2).

Another important influence of funding mentioned by interviewees is that sometimes there is no focus within a certain area or topic, which also means that there is not yet funding for it. This relates back to the fact that research goes where the money goes, and vice versa, that research will not be carried out in areas for which there is no money. On the other hand, there are some interviewees who are more optimistic. For example:

> *'And if you don't get it, yeah, then you have to reschedule and rethink at some of the research is not possible then, simply because there are no funds for that. So then you have to reduce it to what your original plans were and see what is possible within the budgets that you have or move it to some other kind of topic that you think perhaps better'* (interview A2), and: *'Yeah sure it plays a role, because if there's no funding, then I cannot do all the things that I want to do. But there is always some funding available to at least do smaller parts of it'* (interview A3).

There were also interviewees whom mentioned that if they cannot obtain funding for their research ideas at a particular point, the ideas will remain in mind and for which they will try to obtain funding at a later date implying that researchers also have influence on how funding is distributed

> *'Researchers play a role in what a call actually is as well, especially in the European Union. There is a lot of input from researchers in what a call, a text will be, so partly it's a matter of responding to it, but it's partly also shaping or at least trying to shape what the call text will be about'* (interview C1),

4.3 Collaboration

Opportunities

The most common reason given by interviewees for interdisciplinary collaboration with researchers from other fields is to complement one other and to add expertise which would otherwise be lacking. This can for example be in an interdisciplinary research question which should be researched from different angles and perspectives: *'(...) the social geography has expertise on all kinds of social processes, choices by people, on which we simply don't have expertise'* (interview C1). Several interviewees also indicated that new possibilities offer new opportunities for their research, where *'this new area of research requires new skills'* (interview A1).

 These new methods require different skills that these researchers often do possess. Another reason is to learn more from one other and other disciplines:

'I learn the most from people that are not in my field and less from the people that are in my field' (interview C2) and: *'we also need people from the outside, to keep us awake, to see the different cultures, different backgrounds, different trainings. It has proven in the past that we benefit from that a lot, as a group'* (interview B3).

As explained by another interviewee: *'There's a lot of knowledge related to a certain discipline which could add value to what we are doing in other disciplines'* (interview D3). More specifically, reasons for international collaboration are often the context it offers in specific country. Especially when doing research on multiple countries or societies, researchers from these countries can offer more context about a country and its practices.

Different factors help in facilitating collaboration such as funding, (detailed later), but also networks and networking events. Most interviewees acknowledged that they do not actively think about how they choose partners for collaboration as this is mostly through their own – existing – network. If researchers want to connect to someone outside of their network (mostly because the expertise they need cannot be accessed within it) they simply e-mail of call these researchers. In these cases these researchers are mostly found through their publications.

Networking events are important to facilitate becoming acquainted with people from different disciplines, for example conferences, which enable exposure to the areas of other researchers and collaboration possibilities. A number of interviewees mentioned the networking events and interfaculty meetings organized by Utrecht University which stimulate interdisciplinary collaboration:

'Within Utrecht university, for me, the most important platform there is institutions for open societies. (...) And within that area I went to a lot of meetings over the last five years, met a lot of colleagues, some of them became co-authors. So that was ultimately a stimulus for me to try to write things, for example, on the interface of law and philosophy or economics and philosophy or politics and philosophy. So part of my output and is also sort of more interdisciplinary that would otherwise have been without these kinds of contacts' (interview D1).

Barriers

The majority of the researchers interviewed identified epistemological barriers that occur in the language or jargon employed in different disciplines and different interpretations following from this. For example:

'Language is also a problem, sometimes, it can be very subtle. You think you understand each other, but then people are talking really about something else' (interview A1) and *'So people have different habits, have different vocabularies, et cetera. So one of the challenges that we ran into is that we have different interpretations of how you look at the environment and how you link that to health. So that has been, let's say, a learning curve to understand each other's vocabulary and interpretation'* (interview C1).

Methods to overcome this barrier include establishing a common language at the outset of the project and ensuring that all involved are talking about the same things and that words have the same meaning for everyone. Another barrier is the difference in methodological approach used in disciplines,

> *'So we had this really methodological but also some epistemological problem that we as social psychologists tried to generalize across contexts and look for mechanisms that apply everywhere, equally, and historians really are interested in case studies and every case study is different'* (interview A3),

but also differences in philosophy or perspective between disciplines were reference, for example:

> *'And then after several months of work, working together on this proposal, they said, well, yeah, we don't have the same philosophy as sociology, and we think - we don't believe you can study this in a scientific way. So there were all kinds of unexpected, difficult, more philosophical issues that that I hadn't foreseen'* (interview A1).

In this example the collaboration ended because of the differences, but despite this, the researcher involved remains positive about interdisciplinary collaboration.

With specific reference to international collaboration, some interviewees mentioned additional barriers such as the privacy laws in other countries, time zones that make communication challenging and the cultural differences. The differences between intellectual cultures was mentioned and conceptual and contextual differences:

> *'some of these questions and some of the developments are in other countries quite different. And this is sometimes difficult to get on the same page if you have questions like ethnicity, racism, discrimination and different historical and cultural context, because they can play out very, very differently'* (interview A2).

All these barriers can be overcome and do not mean that the researcher does not collaborate interdisciplinary or internationally anymore. Researchers learned from the past and found ways to overcome these challenges.

> *Funding*

Funding is an important driver for inter-university and international collaboration, whereby collaborating is often a requirement of the grant. For example:

> '*So if you're applying for a large consortium, and you have to have collaborators from abroad, then that's basically what you do'* (interview A3) and *'(…) often, this is also prescribed by the call requirements. You see a call that might be for a socio-technical challenge, so you need both the technical people and the scientists from social science'* (interview B2).

This does stimulate collaboration between countries and universities, but there are also drawbacks. Some of the interviewees are critical about this kind of stimulant for collaboration through funding:

> *'So, I guess this kind of funding can also become a bit trivial, in the sense that you might reach out to more partners, who won't invite you, because you come from the Netherlands. That's the main criteria, which is a bit strange, right'* (interview B2) and *'But nowadays, one of the requirements is to look for another university, while it may*

be more logical even to find colleagues within our own university to do that, but that's not fulfilling the requirement by NWO then' (interview B3).

Within Utrecht University funding enables interfaculty collaboration The interviewees indicated that smaller grants available within Utrecht University, from the strategic themes for example, stimulate collaboration across faculties. For example:

> *'But the collaboration with the geography department that really has been prompted by the availability of research funds within the university'* (interview C1), and: *'For these smaller grants, particularly if it's within UU, I really like them, because they enable collaboration across faculties'* (interview A3).

These grants require collaboration within Utrecht University and therefore not only stimulate interfaculty collaboration but also make researchers aware that other disciplines could be a useful addition to their own research, as described by one interviewee:

> *'Now I am also more and more aware that the method and statistics department is also available for people like me to, you know, to work together on research projects'* (interview A1).

In the workshop we gave two statements related to this to participants. The first statement was: 'the Utrecht University Strategic Research Themes, Hubs and Focus Areas enable interactions across faculties and disciplines. These platforms are therefore well placed for addressing SDG research that implies the combination of diverse concepts and methods'. All of the participants agreed with this statement. Secondly, we stated that the Utrecht University Strategic Themes should also help researchers to collaborate with researchers outside Utrecht University, with which all participants also agreed.

In contrast, interviewed researchers indicated that funding can be a significant barrier for collaboration. For example:

> *'So when we started there were strong ambitions to do joint projects (...). But that actually, because of funding, has been very difficult to work in practice. There are very few organizations that fund combined projects, and that's probably because many of these funding organisations are more disciplinary oriented'* (interview C1).

This shows that even though researchers wanted to collaborate across disciplines, there were no funding opportunities to do so, meaning that such joint projects cannot be realised. Other interviewees mentioned that there are projects which are not interdisciplinary, for example:

> *'But I also think that our research should be guided by the questions that we have, so if a question does not lend itself for interdisciplinary research, so if I have a simple question that is only sociological, then I should be able to also answer that question in that way and not always think okay, I have to do something interdisciplinary so I have to change my question so that I could engage someone from humanities, because that's what now the university wants, because I think that then kind of goes against the research idea itself'* (interview A3).

These two are important issues, because whereas funding can obstruct collaboration across disciplines, it is also possible that an increasing amount of funding schemes call for collaboration across disciplines, this is not necessary or desirable for all research topics.

Specifically for international collaboration, two interviewees mentioned that one of the serious problems they face is the lack of funding to address real global challenges:

> *'I think, where we do have large problems is actually addressing real global challenges, so the funding scheme basically for us is very clear if we stay within European boundaries. But to cross European boundaries becomes very difficult, so we do also a lot of research on indoor air pollution in China, Africa, Latin America, but it's almost impossible to find funding for this kind because the European Union will not pay, the Dutch government well not really pay for this kind of research, because it's not a problem that we have within our boundaries, European or nationally'* (interview C2).

This is problematic as it prevents collaboration between countries worldwide to research worldwide topics referred to by the SDGs. Additionally, workshop participants were asked what they thought the biggest barrier to working on SDG related global challenges in collaboration with researchers located outside Europe was to which most responded was funding, in the sense that there are few funding opportunities for truly global projects and that EU projects are restrictive in the countries that can be involved. We posed the follow up question 'In what ways can Utrecht University help researchers to overcome such barriers?', to which a couple of participants responded was to build alliances with universities abroad. Others said by listening to researchers and by acknowledging the issues and barriers they experience. The University providing funding for such research was also suggested.