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Article

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We Need Transdisciplinary Research on Sustainable Business Models

Claudia Alba¹ and Nikolay A. Dentchev²

Abstract

Purpose: This paper explores the challenges sustainable business model (SBM) studies may face related to the information gathered during the data collection process, and elaborates on how transdisciplinary research can help to overcome these challenges. Our contribution is based on the theoretical lens of information asymmetry.

Design/Methodology/Approach: This paper uses a qualitative methodology based on a transdisciplinary program that aims to support disadvantaged communities in Bolivia. The program started 3 years ago, with as objective to help vulnerable communities through transdisciplinary intervention in 6 projects, viz. 1. Social vulnerability, 2. Integrated water management, 3. Food security, 4. Indigenous rights, 5. Productive development and 6. Transversal. In addition to our experience in the program, we have conducted 57 interviews and 10 focus group discussions with vulnerable entrepreneurs and relevant stakeholders, alongside numerous on-site observations.

Findings: The findings of our study illustrate that SBM research can face information asymmetry issues such as lack of access to, lack of understanding of and lack of trust in the information provided. We also show how transdisciplinary research helps to bridge such issues of trust, understanding and information availability. Based on our research, we propose 5 suggestions to scholars who wish to adopt transdisciplinary research in their study of SBMs: (i) understand the context, (ii) adapt to the context, (iii) develop relationships of trust, (iv) be flexible with your research focus and (v) systematically present to other disciplines and non-academic actors.

Originality/Value: Our contribution is based on the theoretical lens of information asymmetry and argues that a transdisciplinary approach is necessary to accumulate fundamental knowledge on SBMs. Such an approach constitutes a rather sophisticated research methodology that can help us embrace the complexity of sustainable business models and find practical solutions for their scalability.

Keywords: Transdisciplinary research, vulnerable entrepreneurs, sustainable business models, methodology

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Introduction

Scholars in the field of sustainable business models (SBMs) have generated a solid body of knowledge during the past years, as demonstrated by numerous special issues, academic conferences as well as the vast interest shown by business and policymakers (Lüdeke-Freund and Dembek, 2017). Such a broad interest in SBM scholarship is a logical consequence of the serious social and environmental challenges that our planet faces (Brundtland *et al.*, 1987), and of the expectation that managers can find solutions to them (Bansal, 2003). Lüdeke-Freund (2010) argues that SBMs create competitive advantage while contributing to the sustainable development of our planet. In fact, SBM scholars are often preoccupied with the practical side of sustainable business models, studying how organizations can improve their positive impact. The attention to practical relevance in this field is indicated by the various SBM ontologies (Breuer, 2013; Joyce and Paquin, 2016; Upward and Jones, 2016) and archetypes developed (Stubbs and Cocklin, 2008; Bocken *et al.*, 2014; Yip and Bocken, 2018). Despite the growing body of research with a practical orientation in SBMs, much work still needs to be done to develop stronger and cumulative theoretical knowledge in this scholarly field (Dentchev *et al.*, 2018).

This need for cumulative development of theoretical knowledge is a result of the complexity of SBMs (Høgevoid *et al.*, 2014), which is associated with the overall activity and strategic management of organizations (Kolk and Mauser, 2002). Integrating sustainability in the business models arguably requires specific knowledge of social and environmental issues, additional processes and procedures, and an ambition to realize continuous improvement. The complexity of SBMs themselves is based on their triple bottom line approach, embracing economic, environmental and social dimensions (Bocken *et al.*, 2014). The economic dimension refers to value generation from a profit perspective (Osterwalder and Pigneur, 2011), the environmental one to the preservation of environmental resources, while the social dimension appertains to the consideration of various stakeholders in business activities (Joyce and Paquin, 2016). These three dimensions need alignment (Bocken *et al.*, 2014) and should result in tangible outcomes of sustainable development (Stubbs and Cocklin, 2008). To understand this

complexity of SBMs, scholars need to be familiar with the practice of SBMs, studying their slightest details and their context. In this line of reasoning, we follow the assertion of Lüdeke-Freund & Dembek (2017, p. 1677) that our field “requires multi-, inter- and transdisciplinary efforts [... with the] importance to establish and maintain a strong link and communication not only within but also between academia, industry, and government.”

Transdisciplinary research involves academics from different disciplines studying a specific phenomenon in collaboration with non-academic participants (Stock and Burton, 2011). Non-academic participation provides information about the real-world dynamics that complement academic knowledge and improves the understanding of a specific phenomenon (Horlick-Jones and Sime, 2004). Such transdisciplinary research is adequate to study complex phenomena (Wickson, Carew and Russell, 2006; Pohl and Hadorn, 2008; Stock and Burton, 2011), such as SBMs and is considered a valuable research strategy to increase academic rigor in the SBM field (Lang *et al.*, 2012). Hence, our paper will elaborate on transdisciplinary research as a means to resolve challenges related to data collection and interpretation in SBM studies, our paper’s purpose.

We use information asymmetry as a theoretical lens to focus on the challenges of data collection and interpretation (Akerlof, 1970; Malkiel and Fama, 1970; Stiglitz, 2000). This theoretical viewpoint is useful to help us understand the challenges of studying complex phenomena, such as SBMs since it points out issues such as information availability, understanding and trust (cf. *infra*) that appear in the process of studying complex phenomena.

This paper offers insights gathered in a transdisciplinary research program in support of disadvantaged communities from the Universidad Catolica Boliviana (UCB) in Bolivia. This program is funded by VLIR, the Flemish Interuniversity Council in Belgium. Drawing on the author’s experience in the program, we have further developed our methodological recommendations based on 57 interviews and 10 focus group discussions with vulnerable entrepreneurs and relevant stakeholders. Here vulnerability refers to an inability to earn sufficient income to live a decent life, with exposure to a variety

of social and environmental disadvantages such as malnutrition, insufficient health-care, lack of education, pollution and violence (Pearlman, 2012). The business models of vulnerable entrepreneurs can resolve a variety of social issues, and in this sense, they can be seen as a subtype of SBMs (Dembek, York, & Singh, 2018).

The remainder of the paper is organized in five sections. First, we explain the importance of transdisciplinary research for the field of sustainable business models. Secondly, we propose the use of the theoretical lens of information asymmetry in transdisciplinary research. Thirdly, we clarify the methodological considerations used in this paper. Fourthly, we present the findings of this paper. The fifth and final section summarizes our concluding remarks and recommendations.

TRANSDISCIPLINARITY IN SBMs

Transdisciplinary research is recommended for the study of life-world problems (Pohl & Hadorn, 2008) with a complex nature (Stock & Burton, 2011). Transdisciplinary research approaches complex problems (e.g. poverty) through the insights of various scientific disciplines and through the involvement of any relevant group of actors in a study (Bracken, Bulkeley and Whitman, 2015). Sustainability problems are not limited to the boundaries of a single discipline, therefore it is useful to approach them from multiple scientific angles, as transdisciplinary research prescribes (Wickson, Carew and Russell, 2006). Such an approach is also effective in creating linkages between theory and practice, yet above all it is a very useful tool in solving societal problems (Horlick-Jones and Sime, 2004).

The strength of transdisciplinary research is related to its ability to understand (1) the complexity of the phenomena studied, (2) the possible logical explanations and predictions, and (3) the different interpretations of reality (Max-Neef, 2005). This is achieved in the first place by the interactions of disparate disciplines, which provide distinct lenses through which to study complex problems. Moreover, the involvement of stakeholders affected by the problem (e.g. poverty) provides an additional perspective on the phenomenon. Poor people, for example, are then no longer the object of study, but have become part of the transdisciplinary research team. These non-academic participants are useful for researchers to

make sense of the complex phenomena (Horlick-Jones and Sime, 2004). As such, the research team receives a more solid understanding about the context of the phenomenon studied, based on knowledge exchange with non-academic participants. As a result, the theoretical knowledge is more accurate, and its implications are more useful for the solution of complex societal problems. Additionally, the mix of scientific and non-scientific perceptions of problems offers opportunities for practical solutions (Wickson, Carew and Russell, 2006; Pohl and Hadorn, 2008; Stock and Burton, 2011). Transdisciplinary research emphasizes three interrelated components, i.e. the context of the problem, the knowledge necessary for its solution and the learning about possible solutions (Mitchell, Cordell and Fam, 2015). It thus provides a comprehensive approach to complex problems and enables the co-creation of solutions by the various members of the transdisciplinary team (Polk, 2015).

It therefore should not come as a surprise that transdisciplinary research is recommended for studying sustainability (cf. Brandt et al., 2013). Resolving the sustainability challenges of our planet requires coordinated research across multiple disciplines, and input by practitioners, policy makers, and civic organizations involved in a specific challenge needs to be taken into account (Hadorn *et al.*, 2006). Actors outside academia provide knowledge and expertise that are indispensable to solving sustainability problems (Polk, 2015). Such a transdisciplinary research team is expected to result in collaborative problem solving of sustainability challenges (Gibbons and Nowotny, 2001; Cundill, Roux and Parker, 2015; Mitchell, Cordell and Fam, 2015). In this context, SBMs being rather complex and involving a wide range of stakeholders (Bocken *et al.*, 2014; Schaltegger, Hansen and Lüdeke-freund, 2016) seem prime candidates for such collaborative problem solving, i.e. the reduction of harm to society and the natural environment, and the increase of social and environmental benefits (Dembek, York and Singh, 2018).

In other words, the engagement of actors with various backgrounds is deemed necessary to develop successful SBMs. We follow the assertion of Max-Neef (2005, p. 15) that “the epistemology of transdisciplinarity may be relatively clear, its applicability as a methodology in the social sciences still suffers from deficiencies” Yet, we will argue that transdisciplinary research

is essential to bridge the various information problems related to SBMs, and we base our arguments on the theory of information asymmetry.

INFORMATION ASYMMETRY

The theory of information refers to the various problems related to information imperfections (Schwartz and Wilde, 1978). Stiglitz (2000) identifies three major problems of information, i.e. incentives, scarcity, and selection. The *problem of incentives* is better known in literature as a moral hazard (Holmstrom, 1979). Mirrlees (1997) draws our attention to the problem of trust as a consequence of moral hazard, i.e. the question whether the information collected in SBM studies is always trustworthy.

Scarcity of information is related to its availability: do we have sufficient information? Fama (1970) argues that markets work more efficiently when more information is available. He points at various types of information that could be available, such as secondary information, publicly available and insider information. The availability of information (Sandmo, 1999) refers to our access to information in the data collection process of sustainable business models studies.

The *problem of information selection* is related to the complexity of information (Akerlof, 1970), which goes beyond the access to information and focuses on its being understood and interpreted. Based on our background knowledge and interests, as Simon (1991) would argue, scholars select and interpret information differently. Without prior knowledge of relevant aspects of sustainable business models, it would be difficult to find a meaningful solution for improving their efficiency and effectiveness in doing this.

Successful SBM solutions can be developed with access to information, the comprehension of it, and the trust in the honest motives of all actors involved. Information problems generate market imperfections (Schwartz and Wilde, 1978), and thus suboptimal solutions to the sustainability challenges of our planet, as it reduces the ability of practitioners and academics to develop new knowledge (Bergh, Ketchen, Orlandi, & Heugens, Boyd, 2019). We will use the three dimensions of information asymmetry – incentives, scarcity,

and selection – to discuss the challenges and potential solutions in adopting transdisciplinary research methods on SBMs, based on the insights from a transdisciplinary research program in Bolivia.

RESEARCH CONTEXT AND METHODS

The goal of this paper is to argue why and how transdisciplinary research should be adopted in SBM scholarship. The insights presented in this paper are based on a transdisciplinary research program with UCB Bolivia, aimed at “contribut[ing] to the development of the Bolivian society by enhancing institutional capacity building” (VLIRUOS, 2019). Bolivia is one of the poorest countries in South America (World Bank Group, 2019b), which is among the least industrialized regions (Nyssens, Wanderley and Gaiger, 2019). According to the Inter-American Development Bank, 41% of the total Bolivian population can be considered vulnerable, with a low level of education, limited access to healthcare, minimal social protection and inferior quality of jobs (Beverinotti, 2018; Castellani & Zenteno, 2015).

The transdisciplinary research program with UCB started in January 2017, with the objective to help disadvantaged communities in a transdisciplinary intervention in 6 projects: 1. Social vulnerability, 2. Integrated water management, 3. Food security, 4. Indigenous rights, 5. Productive development and 6. Transversal. Each of these projects contributes to the program from a specific scientific discipline, viz. psychology, water engineering, agriculture, law, entrepreneurship, and research methods respectively. The involvement of four different vulnerable communities in Bolivia is deemed crucial. The focal points of this program are the so-called transdisciplinary learning communities (TLCs), composed of team members of each of the 6 projects mentioned above and stakeholders from the selected communities (such as local NGOs, political organizations, and the local population) as well as the involvement of scholars from different disciplines.

As a team of authors, we are involved in project 5, Productive development, with as main objective to build supportive ecosystems that can help vulnerable entrepreneurs to improve their business models. Vulnerable

entrepreneurs are defined as poor individuals who are self-employed by necessity and unable to earn sufficient income to ensure minimal life standards (Yurdakul, Arik, & Dholakia, 2017). Disadvantaged communities suffer typically from extreme poverty, and as a consequence are exposed to a variety of social and environmental problems. According to Dembek, York, & Singh (2018), the business models of vulnerable entrepreneurs can be seen as a subtype of SBMs. Casado-Caneque & Hart (2015) further explain that vulnerable entrepreneurs develop activities that are in harmony with the social community and the natural environment, while generating sufficient income to survive. Therefore, we recognize the business models of vulnerable entrepreneurs in Bolivia as a good proxy of SBMs. Despite the high percentage of self-employed, many entrepreneurs operate in informality (Beverinotti, 2018). Although Bolivia has the seventh-highest rating of "Total entrepreneurial activity" (Querejazu, Zavaleta and Mendizabal, 2014), more than 60% of the enterprises in this country are motivated by pure necessity and not because they have identified a business opportunity (Fernandez *et al.*, 2010). The legal process to start a company in Bolivia is quite demanding (Pardo Rada, 2019), ranking the country at one of the bottom places (175 out of 190) in the world (World Bank Group, 2019a). Regarding the financial system, access to loans is limited and expensive, since business angel investors and venture capitalists are not legally approved (Pardo Rada, 2019).

The transdisciplinary research program has been developed across the four campuses of UCB, viz. in Cochabamba, La Paz, Santa Cruz, and Tarija. Data collection for this study is based on the triangulation of (i) participatory techniques and observations, (ii) secondary information, and (iii) primary information based on interviews and focus group discussions in the period between December 2017 and April 2019. Triangulation comes naturally in transdisciplinary research as it contributes to the internal validity by providing stronger justifications of constructs (Eisenhardt, 1989). As to the external validity, it is typically considered rather limited in qualitative research (Sharir and Lerner, 2006), as generalization would only be relevant in contexts with similar characteristics (Creswell, 2014). It is important to mention, however, that the overall research process – study design, data collection, data analysis, and research conclusions – has coincided with continuous

discussions with actors from the vulnerable communities and with researchers from other disciplines. In this sense we can speak of a co-creation of research.

As members of the transdisciplinary program, we have participated in 3 steering committees per year. Each UCB campus has selected a specific disadvantaged community, viz. UCB La Paz chose Batallas, UCB Cochabamba picked Tiraque, UCB Santa Cruz preferred San Jose de Chiquitos, and UCB Tarija selected Subcentral de Cirminuelas. In each of these communities, there is constant interaction between the different scientific disciplines and the different stakeholders from the local population in order to guarantee mutual learning, which is essential for the transdisciplinarity of the program (Lang *et al.*, 2012). We have received minutes and briefings of the TLC discussions (659 pages). We have personally visited each community at least twice and have organized events in three communities to observe the needs related to the business models of vulnerable entrepreneurs. In addition, we have studied secondary data from governmental plans, the publicly available data of the National Institute of Statistics of Bolivia, publicity material by the different supporting organizations, marketing material of the ventures including their webpages and social media communications, newspaper articles, and books regarding the researched communities.

Our primary data collection is based on 57 interviews and 10 focus group discussions. Interviewees were chosen following discussions with local researchers and community members, and we followed a combination of purposeful and snow-ball sampling. The interview protocols guided a discussion with the participants towards the challenges and opportunities related to the business models of vulnerable entrepreneurs and to the exploration of their supportive ecosystems. Two interview protocols were used (cf. Appendix 1), one for entrepreneurs and one for supportive organizations such as NGOs, financial institutions, government or others (e.g. Church institutions that support entrepreneurship). Interviews lasted on average of 51 minutes, ranging between 19 and 156 minutes. The 10 focus group discussions included between 4 and 18 participants and took on average of 106 minutes, with a range between 60 and 240 minutes. Interviews and focus group discussions were recorded and transcribed

to heighten reliability. Please note that one interviewee refused to be recorded and during one focus group we had technical problems with the recording. On these two occasions, only notes were taken. The interviews were conducted in Spanish, which is the mother tongue of the first author and the language of preference of the interviewees. All quotes from respondents are a translation into English. We have adopted a thematic analysis (Clarke, Braun and Hayfield, 2015) using the three problems of information asymmetry, i.e. incentives, scarcity and selection, while the analysis was conducted in NVivo 12. After interviews and focus groups, there have been follow-up discussions with the communities and also with colleagues from other disciplines. For an overview of the participants in the interviews and focus group discussions, cf. Table 1.

Sector	No. of Interviews	No. of Focus Groups	TOTAL
Entrepreneurs	36	4	40
NGO	7	2	9
Financial Institution	4	0	4
Government	6	2	8
Other	4	2	6
TOTAL	57	10	67

Table 1: Interviews and focus groups

Out of 36 interviews with entrepreneurs, 14 involved vulnerable ones, while they made up all of the 4 focus group discussions. We have deliberately approached both vulnerable and conventional entrepreneurs to be able to determine what are the general and what are the specific challenges of their business models. The data provided by conventional entrepreneurs allowed us to better understand the distinctive challenges related to the business models of vulnerable entrepreneurs.

RESULTS

Based on this research in Bolivia, we will now present the results predicated on the three dimensions identified in information asymmetry. We discuss first how the transdisciplinary research method can help to resolve

the information problem of incentives. Only then do we examine the information problems of scarcity and selection. This order in our discussion is guided by the insights gained from our study.

The information problem of incentives

The problem of incentives refers to the trustworthiness of information. In this context, one needs to build a solid relationship with the respondents, which is a basic principle in transdisciplinary research (Polk, 2015). This is expressed clearly by one of the researchers who is part of the VLIR Project in Cochabamba. He visited Tiraque at least two times per week in the last year.

I55: “We need to build good relationships, which basically means that we come here to become friends of the people. You do not come to interview, because you are going to hear what you want to hear or because they will not tell you anything. (...) Entrepreneurs think that we are coming to get information and return nothing. Not even the results of the research. We are trying to change things by also giving back something valuable for them. Hence, we do workshops on topics that they are interested in.”

This quote indicates that one needs to create a dynamic around the research that peaks the interest of people in the communities and stimulates them to join based on the added value to themselves. It is not about going and getting the information that the researcher needs, but about creating value for all the participants. This is essential to generate trust, which is the most important element to avoid problems related to information asymmetry. As Mitchell, Cordell and Fam (2015) explain, all the aspects of the research need to be shared with the participants and be as transparent as possible to maintain trust. However, respondents will question the researchers' motives, as they occasionally suspect opportunistic behavior. This was mentioned by a vulnerable entrepreneur who is producing leggings:

I41: “Researchers come regularly to us, but we do not think they are here to really help us. We attend their theoretical courses, but when we ask their support in practice, their support remains absent. Their behavior is selfish. If we have taken their training, why can they not support us?”

In transdisciplinary research, engaging with respondents is specifically helpful to overcome selfish and short-sighted research behavior. A good tactic to overcome the perception of opportunism is to work through intermediaries that are closer to the entrepreneurs and already have their trust. Nevertheless, and even with the intermediaries helping in the process, researchers doing transdisciplinary research need to be ready to devote substantial amounts of time to overcome this suspicion of self-centered intentions (Stokols, 2006). This method allowed the VLIR researcher I54 to approach the people in Tiraque faster.

I54: "There is a lot of mistrust (in the entrepreneurs). Also, they are very reluctant to receive and even more, to give information. That is why I go often with the NGO, so they can start trusting me (...) but takes time."

It is therefore important to select carefully the intermediaries through whom a researcher can approach vulnerable entrepreneurs, keeping in mind the goal of the transdisciplinary research and the profile of the entrepreneurs. With or without intermediaries, good transdisciplinary practice presupposes that the collaboration between researcher and entrepreneurs becomes obvious (Wickson, Carew and Russell, 2006) due to mutual trust.

The scarcity of information

Once entrepreneurs and researchers trust each other, access to information becomes fairly easy. Throughout the activities of the project, we have noted that vulnerable entrepreneurs are then eager to share information about their business models. This mainly entailed a detailed explanation of the business, an invitation to visit their premises and homes, and in only a few cases a business plan (prepared thanks to supportive organizations). It is essential to have access to this detailed information about the business models and the context in which vulnerable entrepreneurs are working. Without it is impossible to understand their business ideas, opportunities, and challenges, nor their needs and requirements. In other words, detailed information is a precondition to help vulnerable entrepreneurs improve their business model.

Moreover, a transdisciplinary approach improves not only access to information for the researcher but also for the

vulnerable entrepreneurs (Bracken, Bulkeley and Whitman, 2015). It is important to realize that a transdisciplinary intervention involves various stakeholders with different backgrounds and potentially useful networks to help vulnerable entrepreneurs to improve their business models. These stakeholders can thus provide access to valuable information for the entrepreneurs. This point is well illustrated by interviewee 39 from Tarija, a vulnerable entrepreneur producing llama sausages:

I39: "This business plan was developed by me, but it was impossible to have all the details and ideas without the information and feedback provided by the people of the municipality, the business incubator, and the university."

In addition, transdisciplinary interventions can provide access to more specific and technical information for vulnerable entrepreneurs. In the words of interviewee 4, a member of a handcraft association from San Jose de Chiquitos:

I4: "Recently we had a training by UCB regarding the development of a strong brand. One week before we had a training by an NGO about clothing and traditional painting. Until now we have received a lot of trainings that are useful to further develop and improve our business."

There is no doubt that the business models of vulnerable entrepreneurs are strengthened by additional information, training, and feedback. Nevertheless, transdisciplinary interventions should keep flexibility in their priorities and timing (Lang *et al.*, 2012). Without such flexibility, the value of the intervention risks becoming suboptimal. This argument is made clear by an NGO member that works with the VLIR project in Tiraque (I56) and a researcher of the VLIR project (I54):

I56: "Even if they are interested in the training that you are offering to them, be careful with the timing. If you plan activities in the period of planting or harvesting, they will not participate."

I54: "There was a meeting during which the entrepreneurs were talking about politics. At that meeting, the researcher was giving a training on marketing strategies, willing to help them to improve their sales. The entrepreneurs did not say anything to the researcher, but just wanted the

researcher to be out of the room, so they could continue with their discussion about politics.”

Referring to this last quote, making time to discuss overarching issues contributes to further the dynamic of the transdisciplinary research. It might feel like time wasted for the researcher, but in fact, such a discussion could be helpful to better understand the context, the needs, and the thinking of the vulnerable entrepreneurs. After all, transdisciplinary research is meant to help vulnerable entrepreneurs, and the flexibility of the researcher can contribute to realize this objective.

The problem of information selection

The problem of information selection is related to our understanding of the information available. At the beginning of project 5, we were thinking that our intervention is simply related to scaling up the business models of vulnerable entrepreneurs. However, the transdisciplinary methodology proved in various ways beneficial to understanding the context and the needs of vulnerable entrepreneurs. During one project meeting, for example, we were talking about the scaling of business models with the project leader of P1 (social vulnerability). On that occasion, our colleague explained that growing the business might increase domestic violence, especially in cases of female entrepreneurship. In paternalist communities, she explained, the husband feels humiliated when his wife earns more money and this carries the risk of an increase of violence as well as the husband wasting the financial resources of the enterprise. After this discussion, we understood that our task is not only simply focusing on the business model, but we should take into account the overall social context of the entrepreneur. Understanding the context of vulnerable entrepreneurs constitutes a long process of constant interaction, in which the researcher needs to understand the available information, and interpret it correctly (Hadorn *et al.*, 2006). Jumping quickly to conclusions based on early-stage preconceptions should therefore be avoided. In this sense, according to VLIR researcher in Tiraque, a transdisciplinary approach needs to adopt a careful and open attitude:

I55: “The context of vulnerable communities contains a completely different life philosophy and different logic regarding the role of woman and man

in the family. It is not a good idea to go in those communities only with your own perspective, without a willingness to understand their reality.”

The above quote was confirmed in a discussion with a vulnerable entrepreneur. During our visit to his textile production activity, we asked what he would wish for in case his business became successful. The answer “I just wish to have a peaceful life” was rather surprising to us. No reference to an ambition of owning a business empire, becoming rich, living in a better house or having a new car. For vulnerable entrepreneurs, wealth is apparently not about having money but about satisfying their daily needs while acting responsibly toward nature (Casado-Caneque & Hart, 2015). Our Western view on life and business might hence diverge from the philosophy of vulnerable communities (Chmielewski, Dembek and Beckett, 2020). Therefore, an open mindset is required, in which it is important to reflect on the views of the vulnerable entrepreneurs and of all other stakeholders and scientists from various disciplines (Wickson, Carew and Russell, 2006). The case of an entrepreneur from Tarija who makes leggings makes it very clear how contextual factors may impact the business model of precarious ventures.

I41: “I am a single mother and I reached a point in which I wanted to quit my venture. But due to the support of my daughter and my desire to help other women in need through employment made me continue with the business. (...) Why did I want to quit? At a certain moment, I needed a credit to finance the growth of my business. But I am separated from my husband without a divorce. Since my ex has a credit, and we are not separated, I have no access to funding.”

The above quote illustrates the differences in the financial and legal system of a country, and hence the importance to keep an open mind and understand the local context. The necessity for such an open attitude is further asserted in the 2017 Annual Report of the project: to integrate the different researchers and work together, for example by jointly designing surveys. This is in line with conventional views on transdisciplinary research, stressing the importance of dissolving disciplinary boundaries (Wickson, Carew and Russell, 2006; Bracken, Bulkeley and Whitman,

2015). However, such discipline transgressing is easier said than done, even in a program with transdisciplinarity at its core. Three years into the program, engaging colleagues from other projects and disciplines remains a continuous concern and needs constant attention, due to the differences in their research routines and the divergence in their respective theoretical approaches. Therefore, we have decided at program level to organize regular presentations between projects. This methodological tactic ensures the possibility of feedback from different disciplines. Moreover, through this dynamic, colleagues find opportunities for joint research initiatives. It is important to stress that transdisciplinary research is a learning process that requires regular adaptation (Lang *et al.*, 2012; Mitchell, Cordell and Fam, 2015).

The problem of understanding the information available is also relevant to vulnerable entrepreneurs. Please note that those vulnerable entrepreneurs are not educated, let alone familiar with theories on entrepreneurship, marketing, management, accounting, or finance, to mention only a few of the most relevant disciplines to develop a solid business. When supporting entrepreneurs, therefore, some colleagues adopted game-based methodologies, where the learning experience takes place during the play of the game. On other occasions, we organized fairs, where vulnerable entrepreneurs had the opportunity to sell their products, and the coaching took place in a real-life environment. Moreover, an NGO which had been working with vulnerable communities for 34 years explains the need to use examples from the entrepreneur's reality, to improve their understanding of the information provided:

I56: "Simply explaining a certain topic is not sufficient. With the years, I start explaining by using the examples of a community, where to context is very close to theirs (...) In this way, vulnerable entrepreneurs see themselves in similar situations and understand our advice."

The overall goal of our research is to improve the business models of vulnerable entrepreneurs, which requires a thorough understanding of their context and background, and a transdisciplinary intervention is thereby an indispensable approach.

DISCUSSION AND CONCLUDING REMARKS

In this paper, we explain that SBM studies face challenges related to the information gathered during the data collection process and argue that transdisciplinary research can help us overcome these challenges. We view our arguments through the theoretical lens of information asymmetry. Such a lens helps us to see the contribution of transdisciplinary research to the trustworthiness of information, the availability of information, and the access to information. Based on our research and on insights from various disciplines (international management, BoP, and transdisciplinary research methods), we would like to advance 5 suggestions for adopting transdisciplinary research methods in SBM studies:

1. Understand the context.

This is in line with insights from international business research (Verbeke, 2013) warning that copy-pasting strategies from other contexts may prove futile.

2. Adapt to the context.

The timing and content of transdisciplinary research should be adapted towards the needs of the relevant actors (Casado-Caneque & Hart, 2015). Understanding their living conditions, their background, and their time availability will help you make more accurate suggestions on how to improve SBMs.

3. Develop relationships of trust.

Improving trust (Rivera-Santos and Rufin, 2010) can be done by: (a) creating trustful relationships, (b) working together with all kind of intermediaries, – or – by (c) simply being transparent about what your needs are and what you can contribute to the community.

4. Be flexible.

Researchers may want to be flexible in adapting their research focus to what the field finds relevant. SBM quarrels may change substantially over time (Chmielewski, Dembek and Beckett, 2020), so relevant transdisciplinary research should take such changes into account.

5. Present your ideas to stakeholders.

Researchers typically work in a monodisciplinary fashion. However, they should adopt an open attitude towards other disciplines (Bracken et al., 2015). We simply recommend systematically presenting individual research ideas at different stages of the process to scholars from other disciplines and to non-academic actors. This methodological tactic not only provides continuous feedback but also gives researchers from various disciplines the opportunity to throw light from different angles on your ideas and ensures that the solutions become co-created by all stakeholders.

While the 5 above-mentioned suggestions of transdisciplinary research in SBMs are advocated, it is important to note the limitations of our study. In the first place, our study is restricted by the exclusive focus on vulnerable entrepreneurs. Although we openly admit that vulnerable entrepreneurs are a very specific context of SBMs, we are convinced that the challenges of information asymmetry apply to a broad variety of sustainable business models. Therefore, a future avenue for transdisciplinary research could be to extend it to a variety of SBM contexts, apart from the context of vulnerable entrepreneurs. Secondly, our study is constrained by its geographical context, i.e. 4 cities in Bolivia. Future transdisciplinary research should take place in other geographical contexts as well (Lang *et al.*, 2012). A third limitation of our study is our use of qualitative research. Please note that transdisciplinary research may be perfectly well conducted in the form of surveys, experiments and any other forms of quantitative research. A fourth and a final limitation of our study is the focus only on the theoretical lens of information asymmetry, whereas a variety of theoretical lenses may further enhance the argumentation for transdisciplinary research of SBMs.

The creation of cumulative knowledge in SBMs based on transdisciplinary research implies a serious reflection on the above-mentioned limitations and opportunities for future research. In addition, we note that it is not self-evident to conduct transdisciplinary research as it presumes intense contact within academic and nonacademic fields. Yet, the development of tools and the gathering of resources that can help social entrepreneurs constitute powerful avenues for future research. Despite all challenges of information asymmetry in SBM research, this field of research remains an important contributor to sustainable development. Overall, we may conclude that transdisciplinary research can help us embrace the complexity of sustainable business models, find practical solutions for their scalability and as such is a much-needed additional methodological tool in the field.

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Appendix 1: Interview protocols

Questionnaire for Entrepreneurs

1. Tell me about yourself (studies, family situation (kids, married, brothers, profession...))
2. Can you describe your day-to-day routine?
3. What product/service is being provided?
4. To whom?
5. How many customers have been served?
6. Where are you providing your products/services?
7. What are the major costs of your activity (materials, labor,...)?
8. How is your activity funded?
9. Do you consider yourself as an entrepreneur?
10. Is there an entrepreneurial culture in San Jose?
11. What are the main problems of your business activity?
12. What type of support do you need as an entrepreneur (financials, networking, legal, coaching,...)?
13. What are the organizations or people in Bolivia (San Jose, Santa Cruz, etc.) who can support of entrepreneurs like yourself?
14. Are you part of a network or a group? Can you describe how's that working?
3. Is there a culture for Entrepreneurship in San Jose de Chiquitos? What is the most relevant activity for entrepreneurs in San Jose de Chiquitos?
4. What is your relationship with Entrepreneurship/ Entrepreneurs in the city of San Jose de Chiquitos?
5. Policy environment for Social (vulnerable) entrepreneurs: a. What is the role of the government in supporting entrepreneurship: programs, needs or constraints? b. What is your perception of the policy environment: ease to create new businesses, taxes, incentives, regulations, grants, other programs) c. Are there any other institutions or organizations having an influence in the organization's environment?
6. What are the principal obstacles in the local market for your organization?
7. Do you consider there is sufficient and qualified human capital to stimulate entrepreneurship/support entrepreneurs? If not, what types of profiles are missing.
8. Infrastructure: what is your perception (Electricity, Telecommunications – internet, water, gas and transport)
9. Can you please describe the Business Environment for your organization? Competitors, supply chain, informal competition, and other relevant aspects.)
10. Support: a. What type of support is available to Entrepreneurs in the city: (networking, training, mentorship, coaching, legal, funding) b. Who provides this support?
11. What do you consider is further needed to stimulate entrepreneurship in the city of San Jose de Chiquitos?
12. What are the relevant entrepreneurs/entrepreneurial organisations in San Jose de Chiquitos?

Questionnaire for organizations

1. Can you describe the mission of your organization? (Association, NGO, Government, Training, Financing, Education, Other)?
2. Describe your organization: legal status, years of operation, founders, capital, top management, board of directors (if applicable) and other relevant information about the management of the organization.
3. Is there a culture for Entrepreneurship in San Jose de Chiquitos? What is the most relevant activity for entrepreneurs in San Jose de Chiquitos?
4. What is your relationship with Entrepreneurship/ Entrepreneurs in the city of San Jose de Chiquitos?
5. Policy environment for Social (vulnerable) entrepreneurs: a. What is the role of the government in supporting entrepreneurship: programs, needs or constraints? b. What is your perception of the policy environment: ease to create new businesses, taxes, incentives, regulations, grants, other programs) c. Are there any other institutions or organizations having an influence in the organization's environment?
6. What are the principal obstacles in the local market for your organization?
7. Do you consider there is sufficient and qualified human capital to stimulate entrepreneurship/support entrepreneurs? If not, what types of profiles are missing.
8. Infrastructure: what is your perception (Electricity, Telecommunications – internet, water, gas and transport)
9. Can you please describe the Business Environment for your organization? Competitors, supply chain, informal competition, and other relevant aspects.)
10. Support: a. What type of support is available to Entrepreneurs in the city: (networking, training, mentorship, coaching, legal, funding) b. Who provides this support?
11. What do you consider is further needed to stimulate entrepreneurship in the city of San Jose de Chiquitos?
12. What are the relevant entrepreneurs/entrepreneurial organisations in San Jose de Chiquitos?

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