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Efficiency in transdisciplinary cooperation

The example of the Jigjiga One Health Initiative

Abstract

Communication in transdisciplinary research projects takes place in a very heterogenous setting from the outset. These projects consist mainly of international consortia of project partners and collaborate with several local partners. Due to the intense interaction of project partners from inside and outside academia on various levels and in different languages (for specific purposes), efficient communication faces challenges that need to be dealt with. In the present article, some of these challenges are outlined referring to a project between Ethiopia and Switzerland as a concrete case study. The authors point out the importance of multilingualism for efficient communication in international transdisciplinary research, as it is an important factor for efficiency in terms of co-production of transformational knowledge. With the aim of finding a consensus together with as little financial and time effort as possible, this project will present an example of co-production that could not have been achieved without a transdisciplinary process.

1 Introduction

Digitization, climate change, the United Nations Sustainable Development Goals – these topics are on everyone's lips right now.[1] However, these are not just buzzwords, but concrete tasks for science, politics and society. The need for transdisciplinary cooperation, the interaction between science and practical domains, is increasing in order to achieve these societal goals. Research fields that have dealt with transdisciplinary cooperation at an early stage are therefore becoming increasingly important (Bührmann/ Franke 2018). For example, in the field of sustainability research, transdisciplinary work has already been increasing for several years – with a triad of research, teaching and

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societal engagement. This means an intensive interaction of different disciplines, cultures and languages. In transdisciplinary cooperation, especially in its intercultural form, the existence of a common language is questionable; rather, different forms of multilingualism are assumed.

This article is intended to illustrate different multilingual communication situations on the basis of a research project with partners in Switzerland and Ethiopia and thus to demonstrate the need for efficient multilingual communication.

2 Transdisciplinarity

Transdisciplinarity stands for the joint acquisition of knowledge and the joint solving of real-life problems through the cooperation of academic scientists and representatives of practical domains within joint projects (Pohl 2011). This form of collaboration has been researched for years (Hirsch Hadorn et al. 2008; Darbelley 2015) and applied in various contexts – mostly by medical, natural and social scientists in international and multicultural projects (Pohl/Krütli/Stauffacher 2017; Obrist/Zinsstag 2017; Zinsstag et al. 2022). Transdisciplinarity can be defined in different ways. The definitions vary depending on the focus (Pelikan/Zinsstag 2021). In this contribution, we understand transdisciplinarity as cooperation between science and practice domains: Knowledge is acquired and transferred jointly, for which specific methods exist and continue to be developed (Pohl 2018: 282). The jointly acquired knowledge, and the benefit of transdisciplinary cooperation, is also referred to as added value (Berger-González et al. 2020: 59). This added value consists of jointly acquired knowledge that could not have been acquired in intra-, inter- or multidisciplinary collaboration. All participants learn from and with each other (mutual learning); they thus also learn a new way of learning (Tobias/Ströbele/Buser 2019: 412). For this, transdisciplinarity requires a form of self-reflected cooperation, which not all researchers are willing and able to do. Transdisciplinary action can only be taken by those who have understood and can reflect on the intradisciplinary content of their subject (Weinhardt 2017) – and who can (and want to) transfer this content. Experience from more than 20 years of research in international health projects has shown the relevance of inter- and transdisciplinary cooperation and also the demands on all participants (Montavon et al. 2013). Guimaràes et al. (2019: 5) very impressively presented various characteristics of so-called “transdisciplinarians”, without which transdisciplinary collaboration is hardly possible.

Transdisciplinary research projects consist of different phases in which intradisciplinary (arrangement of the knowledge and skills within one subject area), interdisciplinary (link between disciplines into a coordinated and coherent whole), multidisciplinary (a team from different specialties who work together but each one remain within his/her discipline) or transdisciplinary (engaging stakeholders throughout the research process) work is carried out (Hurni/Wiesmann 2004: 59). The goals and the methodology of the project are worked out together before the project leaders work on them in different compositions. In various phases of the project, interim results, difficulties and recommended

solutions are discussed in subsequent transdisciplinary workshops. The project partners involved interact with each other, but – depending on the phase of the project – also withdraw into their own scientific discipline or practice domain. A transdisciplinary project does not consist exclusively of transdisciplinary cooperation: phases of transdisciplinary cooperation alternate with disciplinary and interdisciplinary phases, and they are iteratively reflected upon again in a transdisciplinary way. Figure 1 below presents this based on a transdisciplinary project in the area of One Health, the Jigjiga One Health Initiative (JOHI), described in detail below. One Health is defined as the added value of closer cooperation between human and veterinary medicine (Zinsstag et al. 2011).

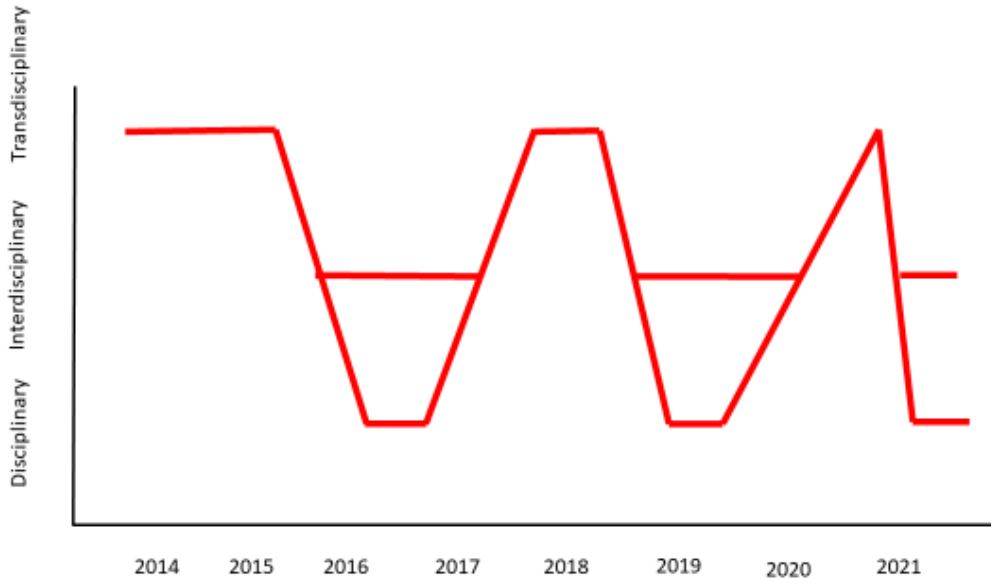

Figure 1: Iterative trajectory of the research process (red lines) of JOHI between transdisciplinary, interdisciplinary and disciplinary research – referring to the process of transdisciplinary research (Herweg/Schäfer/Zimmermann 2012: 15)

First, the research questions and hypotheses were discussed and defined together in transdisciplinary exchange, then all participants worked in their inter- and disciplinary teams but they meet regularly in trans-, inter- and disciplinary meetings to exchange knowledge and to agree on the common approach. Additional opportunities for exchange arise during the field research. The interdisciplinary level serves the continuous adaptation of the methodology, the joint field research facilitates the subsequent synthesis of the results. Both in the field research and in the synthesis of the results, added value is generated through the joint acquisition of knowledge during the interaction. At the disciplinary level, researchers conduct research relevant to their discipline (Herweg/Schäfer/Zimmermann 2012: 15).

In a successful transdisciplinary project, the goals of both areas involved are thus achieved: solutions for problems in the community's everyday life together with answers

to scientific questions (and corresponding publications). In the following, the JOHI project will be described in more detail.

3 The Jigjiga One Health Initiative (JOHI)

The Jigjiga One Health Initiative (JOHI) is a 12-year (2015–2026) research and development project aiming at improving operational health research and development capacity at Jigjiga University. It was designed to improve the health and well-being of pastoral and agro-pastoral communities in the Somali region of Ethiopia through innovative and integrated health systems. This project is funded by the Swiss Agency for Development and Cooperation (SDC), with a main partnership between Jigjiga University (JJU), the Armauer Hansen Research Institute (AHRI) in Ethiopia and the Swiss Tropical and Public Health Institute (Swiss TPH) in Switzerland. A bottom-up participatory approach was used to bring together pastoralist communities, district, regional and federal state representatives, scientists and non-governmental organizations (NGOs) in iterative workshops in different locations (Table 1). Plenary sessions alternated with focus group discussions (FGDs) to give a voice to all stakeholders, especially women.

As part of the transdisciplinary research process, all the social difficulties that require a solution were collected from the pastoralist communities and prioritized by the project staff in terms of urgency in March 2015 (Table 1).

Although focusing on a bottom-up approach, the project management team also aligns the priorities with government priorities (trying to find a common ground). If the project management would only listen to the community, the project may fail at having the proposed science results taken up and accepted by the government. So it is always about finding the balance between community needs/priorities, the priorities of the government and our resources/expertise.

Based on these findings the full proposal of the project was written and the first batch of students was recruited. After training in Switzerland the students engaged in interdisciplinary research as a “One Health” team and some disciplinary work.

In March 2018, the students presented their research results in the field study site in Gode (Adadle woreda) and discussed interventions with participants. In this workshop, focus group discussions (FGDs) were also conducted. Men and women were separated during the FGDs. Women and men describe certain aspects of their life differently – even if using their own native language. This highlights the paramount importance of these GFDs.

The findings and discussion points of the FGDs were presented by each group leader. The project team discussed with the local communities and other non-scientific stakeholders about the livelihood difficulties that could be addressed during the project period. A second workshop in June 2018 in Jigjiga reviewed the approach of the proposed field intervention studies.

Month / Year	Content and topics of participatory workshops	Location	External events
Sep / 2014	Preparatory workshop between the project partners and the donor	Jigjiga	
Jan / 2015	Inception phase of the project		
Mar / 2015	Inception phase consultation of communities, authorities and scientists on local priorities for research and development	Jigjiga	
Preparation of full proposal by the partners			
Nov / 2015	Begin of JOHI phase 1		
Mar / 2018	Presentation of research results and identification of field interventions with communities, authorities and scientists	Gode	
May / 2018	Validation of field intervention studies with communities, authorities, NGOs and scientists	Jigjiga	
Oct / 2019	Science day at Jigjiga University	Jigjiga	
Nov / 2019	Planning of phase 2 between partners and donor	Addis Ababa	
Jan / 2020	Validation of JOHI phase 2 plan with communities, authorities and scientists	Gode	Covid-19 pandemic onset
Jan / 2021	Inception planning of phase 2 with JJU leadership, communities and local authorities	Gode	
Apr / 2021	Start of JOHI phase 2		
Nov /2021	Operational planning of food security and food transformation with communities, authorities and scientists	Jigjiga with virtual participation from Swiss TPH	

Table 1: Sequence, thematic and location of participatory stakeholder workshops in JOHI

The project team encouraged NGOs and other interested parties to contribute their intervention proposals – even after the core components of the project had been developed and shared with all stakeholders. This approach ensures that subsequent project outcomes are of direct or indirect benefit to all stakeholders.

Among the project collaborators are PhD and Master's students from Swiss TPH. With their different national and disciplinary backgrounds (veterinarians, medical doctors, nutritionists, sociologists, anthropologists, ecologists, public health experts etc.), they conducted the field research in the Somali region of Ethiopia with an integrated One Health approach. This collaboration creates an added-value for people and animals – in terms of health and also through financial savings in terms of funding and environmental services. The JOHI scientists involved in the field research work closely with the project partners from local practice domains – for example with joint logistics. This kind of scientific work in such a project process, whose composition changes depending on the project's phase and which is shaped by the project partners who are involved, cannot be realized without multilingualism. Hence, there is a strong need for communicative efficiency to avoid a waste of working time and budget.

4 Multilingualism in project communication

Communication can be seen as the backbone of project cooperation and it is only successful if all participants agree on commonly used values and concepts. Such a consensus should first be acquired for internal and then for external project communication (cf. Pelikan 2019: 234; Pelikan et al. 2019: 83). Since values and concepts manifest themselves in language, the desire for a common language arises quickly in transdisciplinary projects: English is often used as the lingua franca (LF) (shared language for communication in multi-linguistic settings). However, the use of an LF excludes many actors and can lead to unsuccessful communication.

4.1 Lingua franca (shared language for communication)

It is obvious that not all projects can use a single language as a lingua franca because not all project participants speak a common language. In some projects, several individual languages have to be used as linguae francae (Pelikan et al. 2019: 83), making translations into different languages necessary. Using an individual language as lingua franca is not unproblematic for ethical and epistemic reasons as "science is language-bound" (Thielmann 2012: 53). "Finding new knowledge, fixing new knowledge and communicating and enforcing innovation in the community" (Thielmann 2012: 53) – these are language-dependent processes that are based on the respective individual language and cannot be carried out in the same way in a foreign language (Pelikan 2019). For example, epistemic writing, acquiring knowledge through writing, is extremely rarely achieved in a foreign language. For example, English as lingua franca (ELF) used for all phases of a research project with native speakers of various individual languages likely prevents optimal language transfer. Project members with native languages other than

English are systematically disadvantaged (Pelikan et al. 2019). Here, therefore, the greatest possible acquisition of knowledge is deliberately foregone (Pelikan et al. 2019) – project members neglected for their languages may thus acquire less knowledge.

4.2 Technical languages and their varieties

Each individual language (for example, English) entails varieties. These varieties include the technical languages of all the disciplines involved and also of the practical domains. The transition between technical and general language is fluid. Within the individual varieties (professional terminology, dialect etc.), linguistically manifested degrees of expertise in in the academic and non-academic sector can be identified, which do not have to be based on scientific disciplines (Pelikan 2019: 182). Also, professional terms from outside of academia can prove the existence of expertise in a certain field. If a lingua franca is used, the terms from the corresponding specialist fields are usually retained from the speaker's native language, so that these may cause difficulties in understanding. Thus, a project-specific technical vocabulary can improve comprehensibility here (Pelikan 2019: 98). In addition, there are gender-specific topics and corresponding terms. For example, women can describe specific topics that men do not know – and vice versa. Gender-specific terms occur in the mother tongue and also in foreign languages, so the use of a lingua franca does not automatically ensure comprehensibility here.

4.3 Translations

It is not individual terms that are translated, but concepts that are embedded in different communicative practices and strategies (cf. Pelikan et al. 2019). Therefore, for correct translations within individual areas of communication, all concepts, communicative practices and strategies within this area must be known, which is often difficult to achieve. Translations are often carried out by project staff themselves or by translators who are financially as cheap as possible and who are not familiar with all the concepts in the project. It often happens that translators basically answer for the participants (e. g., in workshops) because they think they know more about the topic. It is important to highlight here that translations cause difficulties in both areas: local communities lose content and knowledge through translations (where e. g. important concepts are missing so that they cannot understand all the content and therefore lack important knowledge for the project) but scientists feel the same way. Also, translations of local content for scientists are often just summaries and simplifications – again, missing essential concepts.

4.4 Research ethics

Knowledge is not only transferred through communication, it can also be acquired in the writing process – in epistemic writing (cf. Bereiter 1980). This happens in different phases of a project (cf. Pelikan/Jeffery/Roelcke 2020), for example during data analysis and interpretations. In epistemic writing in a foreign language, the highest level of epistemic writing is not reached as the knowledge acquisition while writing in a foreign language is

limited. As less knowledge is thus acquired, all non-native speakers are disadvantaged in their knowledge acquisition, which can lead to "epistemicide" (Bennett 2015): Reduction of acquisition and production of new knowledge thus reduces the opportunities of transferred knowledge within the project. Is it ethically acceptable to deny some of the project participants the possibility of acquiring optimal knowledge by using a lingua franca? The question of who is allowed to decide on the language(s) to be used in a project is thus of a great relevance to research ethics (Pelikan/Jeffery/Roelcke 2020). In addition to the obvious disadvantages for the research process and the scientific community, the use of a lingua franca in research projects also exerts a significant influence on the power imbalance between the participants and the fairness of the collaboration. Therefore, the question of who gets to decide on the language(s) to be used in a project is of utmost research ethical relevance (Pelikan/Jeffery/Roelcke 2020).

5 Multilingualism within JOHI

In JOHI, the following three forms of multilingualism can be identified.

5.1 Territorial multilingualism

Ethiopia's administrative situation has changed several times, even though Ethiopia was colonized only briefly. Currently, over 109 million people speak about 80 regional languages of equal status, but the national working language is Amharic and the second lingua franca is English (cf. Auswärtiges Amt Deutschland 2019). Ethiopia's different administrative regions are based on ethnic groups with territorial multilingualism; different regional languages are spoken (Eno/Eno/Dammak 2016: 28). In the Somali region, Somali language has been the official working language in the region since 1991. However, other local individual languages are spoken, for example Amharic and Oromiffa. Since 1991, it has been officially permitted for all ethnic groups there to use their own language (Eno/Eno/Dammak 2016: 28).

5.2 Individual multilingualism

The project team members, consisting of Ethiopian and Swiss scientists, all speak at least two languages (between which they can switch spontaneously) and can thus be considered multilingual: Somali and Amharic, English and Somali, (Swiss) German and English, Somali and Oromiffa. English is the most spoken language by the members of the project team. In discussions with population representatives or authorities who only speak Somali and Amharic, interpretation is provided to the Swiss staff and vice versa.

5.3 Inter- and intra-lingual multilingualism

Within JOHI's multilingual project communication, it can be further divided into inter-lingual and intra-lingual multilingualism: Inter-lingual multilingualism stands for multilingualism between individual languages (for example, English and Somali), while

intralingual multilingualism stands for multilingualism within individual languages (for example, technical languages). Inter- and intra-lingual multilingualism play an essential role in the communication of transdisciplinary projects, as it can be seen in the example of JOHI.

The scientific project team communicates internally with the Swiss project management in English, but during the field research in Somali and Amharic: research data is collected in Somali, translated to English and then analyzed in English before being submitted to a journal for publication in English. One Master's student had difficulties with Somali and conducted the data collection in English translated back and forth to Amharic; an interpreter was temporarily hired for him during his data collection. Even in Somali language, the names of livestock diseases vary in different territories within the region. For example, the disease helminthiasis is called “caal/gooryaan/dhuuqe” in Somali depending on the location of pastoralist communities.

The annual transdisciplinary workshops take place regularly in different places with corresponding multilingualism:

(i) Workshop with local population:

In workshops with the local population, the scientific content is presented bilingually: the language of the speakers is generally Somali; however, the power point slides are written in scientific English. Swiss scientists are also present during these presentations where they receive both the slides and an oral summary of the presentations, including the following discussion, in scientific English. Some technical terms can be translated from English to Somali, some terms need to be explained (and future usage discussed accordingly).

(ii) Workshop with stakeholders, including NGOs:

In these workshops, the slides are prepared in scientific English and presented in English. In addition, there will be translations and interpretations into Somali. In contrast to the workshops described above, technical terminology is also used here in Somali, so that it is no longer just general language. General Amharic is also used for metacommunication, exchange about the ongoing communication, during the workshops. The following inter- and intra-lingual translation processes can be identified in JOHI.

Figure 2 (next page) gives an overview of the different translation processes within the project. All the lines of this figure are translation processes taking place between project members – or even within project members, as they could receive information in one language and share it with other project members in a different language afterwards. In English, German and Somali as well as in Amharic, a distinction can be made between technical language and general language, whereby only the lexis was considered here. There is professional terminology (of scientific and non-scientific topics) in these languages, which allows this differentiation. For example, a project member receives information in general English during a coffee break from a colleague. As it is scientific

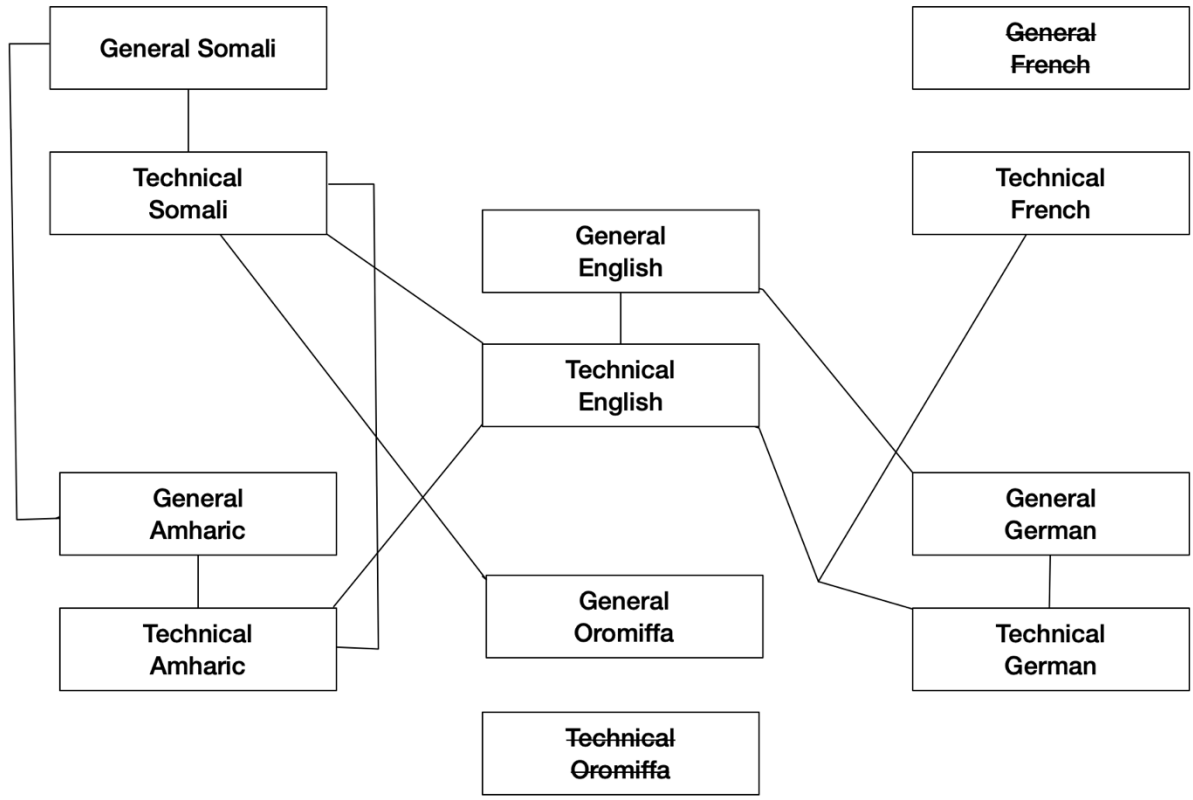

Figure 2: Translation processes (translated from Pelikan et al. 2022)

information, he translates the information to scientific language (by adding appropriate terminology) and transfers it in scientific (technical) English to a project partner, who translates it to technical Somali for exchanging this information with a research partner in the Somali region. In Basel, project participants talk about the project in German; the project manager talks about details of the project in French with the project accountant involved.

Both in the technical language domains of the scientific disciplines involved (in interdisciplinary and multidisciplinary interaction, depending on the project phase) and in the practice domains, technical communication takes place on various vertical levels. By means of a vertical technical language structuring, various levels could be shown (Pelikan 2019: 183), which indicate linguistically manifested degrees of expertise. Experts from the scientific and non-scientific fields are essential for transdisciplinary cooperation: Here, degrees of expertise cannot be identified on the basis of educational background: Expert knowledge is based, for example, on experience and action knowledge of the local population. This can be manifested linguistically with non-scientific technical terms.

All translations are done directly by the project team, by staff who speak the relevant individual and technical languages and have the ethnic and technical backgrounds.

Transferring concepts into different languages and cultures is often difficult, as the example of zoonoses (diseases that are transmissible between animals and humans) shows: one of the research areas of the project is zoonoses. However, at the beginning of the project, only 27% of the project participants were familiar with the concept that can be designated by this term. After days of intense discussion, agreement was finally reached on a common statement in Somali language: “cudurada dadka iyo duunyadaba wadaagaan” – which literally means diseases shared by humans and animals. A concept of diseases transmitted directly from animals to humans would have caused fear of their own animals among the population and was therefore out of the question. On the one hand, this example shows the need for negotiation processes to determine terms and concepts to be used. On the other hand, it also shows the enormous effort required by those involved in the project to do this, which cannot be avoided by using a lingua franca. The example of zoonoses can be seen as a so-called boundary object in this project: a concept for which concepts were jointly found and verbalized, on which the following work can build.

Based on JOHI as well as on other research projects (cf. Pelikan/Jeffery/Roelcke 2020), it can be said that intra-lingual multilingualism is more challenging than inter-lingual multilingualism. Hardly any translator knows all the concepts that can be verbalized in the languages (and their varieties), disciplines and cultures involved, so that they can be translated directly. Not all concepts can be transferred into all individual languages. Moreover, translation would not only have to take place between the individual languages, but increasingly also within the individual languages, which is hardly possible.

6 Efficiency

There are various definitions of efficiency circulating; Burches and Burches (2020) differentiate between effectiveness (doing the right things), efficacy (getting things done) and efficiency (doing things in the most economical way). Efficiency can therewith be seen as the ratio of the output to the inputs of any system (good input to output ratio). In the case of JOHI, this means that the communication effort must be set in relation to the result – based on ethically acceptable communication. The outcome here also includes the epistemic outcome, which requires maximum knowledge transfer and knowledge acquisition. “Indigenous communication systems are a vital aspect of culture and should be respected by outsiders” (Ali et al. 2016: 614). “Communication is vital for the economic development of pastoral communities” (Ali et al. 2016: 614).

Successful communication is characterized by how good information is circulated among project managers, between the coordinator and stakeholders as well as the project team (Diallo/Denis 2005). Poor quality of information flows usually leads to misunderstanding about the project management and subsequently causes the project participants to show dissatisfaction (Shen/Tam 2002). Various studies showed that project communication efficiency is affected by multiple factors including the project structure, communication media (the way the message is transferred from the project

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manager to sponsor, for example), and the relationship between project stakeholders (Lievens/Moenaert/Jegers 1997). For improving the efficiency of project communication, one needs to bear in mind for the flexibility in adapting to changing circumstances in the project (Cooke 2002). Efficient project communication is important to raise awareness and understanding the project throughout its different phases; development, implementation and project updates to key stakeholders (Cooke 2002). It also provides opportunities for stakeholders to share information and raise their concerns toward the project (Turner 2006).

7 The writing process

Adequate ethical cooperation is essential (not only) for scientific development. In accordance with the procedure of transdisciplinary projects described above, the authors of the present article were selected on the basis of their expertise – regardless of their mother tongue and culture. In this way, both their internal (emic) and their external (etic) perspective (Pike 1982) could flow into the article. Kristina Pelikan wrote on this contribution as a (technical language) linguist in the foreign language English and in the corresponding technical language – her focus is on the etic view. Jakob Zinsstag contributed his experience as a principal investigator of JOHI and other transdisciplinary projects. He also contributed to this article in the foreign language English, with a background in veterinary medicine and the relevant technical language. He speaks English with the project team members, German with the Swiss project staff and French with the French project accountant. Mohammed Ibrahim Abdikadir is Dhakhtarka Xanaanada Xoolaha, a veterinary epidemiologist whose mother tongue is Somali and who finished his PhD in the project described here. He uses the appropriate technical language and has contributed to this paper in English. Seid Mohammed Ali who is a range ecologist and speaks Somali is doing his PhD in the JOHI project and as he is deeply involved in the ongoing activities. Rea Tschopp as project manager and coordinator contributed with her background in veterinary medicine and knowledge of the Ethiopian culture. She communicates with the donors, project members and Ethiopian authorities in English, with the project accountant in French, with some of the Swiss-based team members in German. All actors in the project have an internal (emic) and external (etic) perspective.

All participating authors contributed substantially to this paper, which implies an intensive engagement with the topic by all participants – from their own etic and emic views. They are familiar with and agree with the content of this contribution; they can communicate about it in their own languages – and in English as their lingua franca.

8 Conclusion

Efficient transdisciplinary collaboration is not feasible without multilingualism. Even in projects carried out exclusively by speakers of a single language, intra-lingual multilingualism occurs through interaction with domains of practice. Multilingualism is there-

fore an essential component of transdisciplinary and fair (Saric et al. 2019) cooperation and must be addressed as such and clarified at the beginning of the project.

At JOHI, a leadership committee for successful project management was set up which had responsibility for strategic management and all project processes. A technical committee was responsible for all technical areas of the project. Despite this promising set-up, considerable difficulties arose. Staff changes at the participating institutes, drought in the Somali region, civil unrest and bureaucratic problems can be mentioned as examples. With regard to communication, difficulties occurred in the communication structure. There are some difficulties in understanding, followed by negotiation processes on the relevant terms and concepts. The strategy of dealing with multilingualism and using it in a targeted way is thus showing success and can be considered a good example for other transdisciplinary projects. As scientists face up to their responsibilities and science communication has to take on different forms, transdisciplinary cooperation will no longer be a topic of individual disciplines alone in the future. The benefits of transdisciplinary cooperation have also already been recognized in linguistics (cf. Perrin/Kramsch 2018), but implementation still needs to be developed. The multilingual subject communication of transdisciplinary collaboration is interesting for linguistics for several reasons. Transdisciplinary collaboration can be explored from a meta-level (Zinsstag/Pelikan 2019; Pelikan et al. 2022), including directly in inter- and transdisciplinary collaboration and its reflection. Transdisciplinary cooperation can improve the acceptance of the subject in practice and thus the interaction with politics and society. If this were transferred into teaching (cf. Pelikan 2021), the opportunities for students on the labor market could be significantly improved. For sustainable success, however, more “transdisciplinarians” (Guimaràes et al. 2019) are needed – in every discipline.

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