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MINODU

FOSTERING LOCAL SUSTAINABLE DEVELOPMENT THROUGH TECHNOLOGY AND RESEARCH

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ABSTRACT

Rapid climate change is exposing subsistence farmers to enormous challenges, especially in Sub-Saharan Africa. Several foreign aid programs have been set up to cope with these issues, many of which have focused on technical solutions. However, there seems to be a large gap between scientific research and the needs of local communities. Besides focusing on new ways to improve the resilience of local food production, there is also an urgent need to adapt available knowledge to the local context. Based on experiences from a project to co-create community networks in Togo in 2020, we aim to empower local stakeholders, including farmers and scientists, to adapt existing knowledge of sustainable crop farming to current practices. New modes of knowledge exchange can be established with the help of participatory design. These methods may help to foster a collective approach to learning that enables people to cope with global challenges on a local level, all while valuing the traditional practices of local farmers and enriching them with scientific knowledge.

1 INTRODUCTION

Climate change and the steady increase of the world's population already pose great challenges to sustainable land management and the conservation of natural resources and will certainly do so in the years to come. This particularly applies to the African continent, where the population is predicted to double in the next 30 years.

Farmers in Sub-Saharan Africa are facing enormous challenges when it comes to the staple crop farming that is needed to feed local populations. Several foreign aid programs have been set up to cope with this challenge. Many of them have a focus on technical solutions and look at issues like at irrigation methods and technologies. However, networking and knowledge exchange between sectors is barely encouraged, even though the adaptation of knowledge to the local context and the networking of actors along the value chain are key factors. They enable actors to anchor the needed knowledge on climate change and to foster durable behavioral change, eventually leading to agricultural practices that are able to cope with the challenges and feed populations.

While it is important to further boost research that helps to increase the resilience of local food production, there seems to be an urgent need to translate already available knowledge so that local communities can understand and use it. Social and technical measures that could be helpful for subsistence farmers in reducing their exposure to climate change already exist, but local communities are unable to access them. Our presumption is that these communities could be a decisive player in climate change adaptation if they are enabled to take an active role in resource conservation, sustainable land management, and change management.

Research on sustainable land management in sub-Saharan Africa, for example by the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL), provides both raw and processed empirical data. However, they often do not consider the exchange of this knowledge between actors, the distribution of data, or the transfer and adaptation of new technologies, and practices to local groups with limited access to information and digital technologies. In addition, a multitude of languages, illiteracy, and a focus on oral transmission make it difficult for farming communities to gain access to the needed scientific knowledge. Often there is no awareness of the existence of this knowledge, and hence, it is not looked for.

With our approach, we aim to address the sustainable development goals (SDGs)[100] set out by the UN. We are particularly targeting SDG 2, "Zero Hunger," and SDG 11, "Sustainable Cities and Communities". Our aim is to empower local communities to co-create more sustainable and resilient farming methods through participatory methods of knowledge exchange. We will focus on the

[100] Sustainable Development, Department of Economic and Social Affairs of the United Nations. URL: sdgs.un.org

resources and needs of local farmers and explore how these can be addressed in participatory design sessions by using suitable digital and analogue approaches. By using co-creation and involving local experts, students, and community members, we aim to bridge the gaps between different languages, cultures, and skills.

In this project, our co-creators are subsistence farmers in the rural areas of northern Togo and students who grew up in those communities. Our intent is to encourage local stakeholders, including farmers, local decision makers, or scientific researchers, to engage in a knowledge exchange. Ultimately, we hope that agricultural practices that combine the best of both worlds—the latest scientific results as well as proven traditional practice developed. We are drawing on experiences from our prior project *Miadé* (2020), where we co-created community networks in Togo.

Figure 4. Graphical representation of the project's approach (Illustration by Mia Grote). (Figure 1. Project illustration.)

The aim of this project, called *Minodu*, is to close the implementation gap between scientific concepts and concrete, local challenges in land management (see Figure 1). At the same time, the intercultural project team from Germany and Togo intends to collectively design a space for knowledge exchange that allows actors to address global challenges on a local level and value the traditional practices of local farmers.

2 Background and Related Works

With our pilot project, Miadé (duration: April–December 2020)[101], funded by the Federal Ministry for Economic Cooperation and Development (BMZ) and co-facilitated by the Gesellschaft für Internationale Zusammenarbeit (GIZ), Germany, we developed an approach for co-designing

[101] Miadé – Local Community Networks in Togo. URL: togo.drlab.org

participation formats in Lomé, Togo. The project involved co-creating digital community networks using small and cheap single-board computers, with the aim to build self-contained local WiFi networks that enable knowledge creation and transfer, for example for educational contents, entrepreneurs, or an artist collective (see Fröbel and Lange et al., 2022). We learned that local stakeholders who are able to facilitate these community exchanges are an indispensable part of the project consortium. Thus, we established the role of "local leads," who were able to build bridges between researchers and the communities. Equipping them with design and moderation methodologies and co-designing methodologies that are adapted to the local context was a huge part of our project work.

We concluded that building trust and respect is a necessary precondition for establishing an intercultural dialogue and mutual learning circles. It takes a lot of time but is worth the effort. We see empathy for local needs and the cultural setting as a starting point for every collaborative practice. We aim to give as much space as possible to the Togolese members of our team, being conscious of the imbalance regarding both information and finances, as our project was framed and funded by a German public actor. We see ourselves as facilitators and are aware that our local partners possess the important knowledge and are key to achieving our objectives. Nonetheless, it is important to consider our past and coming projects in the context of post-colonialism and "white saviourism." Those are complex and important discussions and invitations to self-reflection that need to be continued at every stage of our project. Building on the knowledge and methodologies developed in the Miadé project, in the Minodu project, we will further elaborate on and carry forward our approach in more depth.

3 PROJECT SCOPE

The project name Minodu means "let's be together, let's work together" in Mina. Named after the town Elmina in Ghana, this dialect of Ewe is spoken in the south of Ghana, Benin, and Togo. French is the official language in Togo, as the country is a former French colony. However, the most common languages for everyday communication are Ewe and Kabye, as well as the various dialects of these languages. The diversity of languages presents, inter alia, the entry points for the Minodu project. How can the knowledge of a certain topic be captured, conditioned, leveraged, exchanged, and made available between different stakeholders, despite these linguistic challenges? How can people from small language communities in turn contribute to scientific research, for example in sharing their needs or good practices when it comes to crop resilience?

The focus of the four-year project is to create local and scalable participation formats for communities in vulnerable rural areas. The project will consist of three iterative workshop phases and

a concluding pilot phase. Each stage will last about a year and conclude with evaluations and deduced concepts for the following stage. We will collaborate with six communities of subsistence farmers in the rural area of Kara in the north of Togo. The core work will center on their specific needs, which will be collected and assessed in detail as a first step. The focus on their needs will increase motivation to be part of our project, as we are creating solutions of immediate interest to them.

Each community will collaborate with students and doctoral candidates from the Institute of Agricultural Professions (ISMA) of the University of Kara. The institute has experience in using a community outreach approach and is familiar with the surrounding communities and their needs. This provides a basis of trust. Local leads are a further part of the consortium, —they are experts, we have already worked with at the Miadé project (Fröbel & Lange et al., 2022). These local leads help to anchor the project implementation, contribute with their expertise, and guide the moderation of the workshops through their various stages according to different design methodologies.

Our task as researchers also consists in co-developing moderation guidelines with the local leads. This helps the respective facilitators to lead through the co-creation modules and to prioritize participant's input. We will create a "collective learning space" during our project. This includes the design, development, and implementation of a participatory tool consisting of low-cost hardware and free/libre/open-source software (FLOSS) for the creation and exchange of knowledge modules. Topics will include the adaptation of farming practices, the choice of local staple crops, or measures for disaster prevention in the light of climate change.

By "translating" existing studies into formats that can be applied directly in rural communities in the north of Togo, we will establish a mutual exchange of knowledge between the team of researchers and local stakeholders. We will combine analogue and digital technologies to create participation formats such as co-design sessions. Social media platforms, video tutorials, or podcasts will be potential levers of our communication strategy. The aim is to allow for exchange and participation in a customized manner that includes the use of different languages, video formats for illiterate people, and hands-on sessions for the application of knowledge. Content will be "translated" into these formats and ultimately be certified using Creative Commons in order to increase accessibility.

The results will then be evaluated, presented, and discussed in a concluding symposium involving all partners and stakeholders to enable scaling, independently of the project team.
Summing up, the three project goals are to:

- Co-design a participation format for knowledge exchange on regional land management with a focus on staple crop farming and with regards to climate change and climate adaptation.

- Encourage networking of different actors to bundle competencies, improve the use of resources, and anchor good practices.
- Co-design, provide, and further develop knowledge modules on topics such as climate change, sustainability, and land use with respect to issues such as water management and desertification, as well as associated technologies in relevant languages and for different levels of expertise.

3.1 METHODOLOGICAL APPROACH

The Minodu project thrives on participation and co-creation. It is based on and builds on our experiences with the Miadé project. This implies that the users, stakeholders, and different interest groups—the "communities" —are actively involved in the development process of the project and its objectives from the very beginning (Saad-Sulonen, 2018).

Furthermore, we draw on the concept of social learning spaces (SLSs). These thrive thanks to the engagement of participants who intend to share experiences and create change together (Wenger-Trayner & Wenger-Trayner, 2020, p. 19). In the process, learners develop agency, which Wenger-Trayner & Wenger-Trayner define as "the power to make a difference". SLSs thus go beyond the simple acquisition of knowledge; learners become directly involved in application and reflection, leading to a deeper and more sustainable learning experience. This in turn activates sustainable behavior change.

The aspect of community learning continues to be neglected in classical learning theories and in most (adult) education approaches. Learning has become more and more individualized in recent years (Azalde et al., 2019; Baker et al., 2019), which makes it even more difficult for learners in collectivist societies, such as those in Togo, to keep up. By collectivist societies, we mean less self-centered groups which emphasize common values above the needs of the individual. One example are e-learning courses, which are typically addressed to an individual learner. A farmer from the north of Togo, who may have difficulties in speaking French or might be illiterate, will struggle when attending such an online course. SLS allows us to investigate alternative scenarios: How can learners with different skillsets support each other in their learning journey and together pass certain milestones? Are there ways to intuitively link learners who are left behind to knowledge? "Social learning spaces are rarely designed directly because it is by definition something participants create together. Still, with the proper mindset, there is much you can do to help bring one into being," according to Wenger-Trayner & Wenger-Trayner (2020, p. 39). Our ambition is to create the space for such an SLS to emerge.

We follow the “design justice movement”, which considers the role of the designer as a facilitator rather than an expert in the design process (Costanza-Chock, 2020). We do not intend to impose a solution or apply a specific technology to the communities we are working with. Our aim is to co-design a format that allows the knowledge within the community to grow, using technology as a lever. Technology—in this case digital media formats and potentially digital community networks (see Miadé) —is only a means to enhance processes within the project; it is not an end in itself.

We thus aim to challenge the “traditional” approach of development work, which often exports knowledge or technology from the Global North to the South. In our design, we aim to lift our end-users—farmers who are marginalized in many aspects—up to a position as experts on their own experience and grant them an active part in the design process (Sanders and Stappers, 2008). Consequently, we do not see ourselves as “experts” but as designers who hold the space for members of the communities that are directly affected and are thus at the front and center of our design endeavor.

Togo was chosen as the locality of this project because our research team has been deeply linked with it for more than five years. Close connections to local NGOs and communities have been established, allowing collaboration on an equal basis and reducing power imbalances between North and South.

The farmers in the region of Kara are often disconnected from expert knowledge and digital information exchange: they are isolated in many senses and are facing disproportionate challenges linked to climate change at the same time. Following the “leave no one behind” (LNOB) principle of the United Nations (UN), their integration is key to achieving the United Nation’s Sustainable Development Goals (SDGs). As a project team, our ambition is to design SLSs by using our local network and contributing our design experiences.

Ideally, both the knowledge generated and the SLSs that are designed should further be applied in other communities who are marginalized and/or affected by climate change—both methodologically and in terms of their content. Through bringing this knowledge from South to North, we aim to question entrenched systems of power and dominance and twist the traditional North/South dynamic. We also intend to reflect the worldwide impact of climate change, the possibilities of local adaptions of expert knowledge, and the role of intercultural competences in development cooperation and research.

3.2 TECHNOLOGICAL APPROACH

We will work with "do-it-yourself" (DIY) participation approaches. These include, for example, local community networks (LCNs) that are independent of the internet and based on microservers. Those networks provide access to digital infrastructure, participation, and knowledge sharing in a dedicated local setting. FLOSS technology is used to strengthen, enhance, and expand already existing social connections. As LCNs are independent of the internet, they can also be used in the event of connection failures or natural disasters and independently of the radio cells provided by telecommunications service providers. We have proven the value of these LCNs in the Miadé field study and observed their value for local content production and exchange (Fröbel and Lange et al., 2022).

Arguments in favor of those networks include their capacity to stimulate communication within local communities and enable self-owned digital infrastructures. Installing LCNs offers communities the opportunity to open up to digital participation in general (Smyth & Helgason, 2019). However, accessibility is not only a question of the availability of technology but also depends on education, physical access, awareness, social structures, access to electricity, and technical know-how (Antoniadis, 2016, Unteidig et al., 2016). LCNs are only one possible approach to knowledge exchange in the project. We aim to develop other formats, considering intercultural aspects such as different languages, (digital) literacy, and social aspects. Therefore, we will facilitate co-creation workshops with local stakeholders as well as with researchers from the University of Kara to design appropriate media formats and evaluate their efficiency in an iterative process.

4 CONCLUSION AND OUTLOOK

The overall aim of the Minodu project is to bridge the gap between scientific research and local communities and provide analogue and digital participation formats to adapt available knowledge to the local context and open up access. Minodu encourages a networking of different actors to merge competencies, improve the use of resources, and reduce expenditures.

Our thematic focus lies on sustainable land use. We aim to strengthen capacities for sustainable local farming in times of climate change and develop a toolbox of methodologies and formats that can be transferred to other local contexts as well as to other topics.

We aim to encourage interdisciplinary knowledge exchange and raise awareness regarding intercultural competencies and the value of diverse research teams. A collaborative approach and a critical reflection on power structures within research teams is key to producing knowledge that is relevant locally and helps address the SDGs collaboratively. Spaces where local knowledge can be

expressed in the realm of scientific research are rare but can be designed. Here lies an underestimated lever to reaching the SDGs.

We are using the findings of our prior projects on community networks and adapting this knowledge to the specific context and topic. Our project team from Germany and Togo aims to collectively learn and design in a participatory manner, showing how to cope with global challenges on a local level, enhancing our intercultural competencies, and valuing the traditional practices of local farmers. We are therefore eagerly looking forward to the beginning of the Minodu project as a potential contribution to opening up new ways of participation and knowledge exchange.

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