

A photograph of a rural landscape under a blue sky with scattered clouds. In the foreground, a man and a woman are walking towards the camera. The woman is wearing a colorful striped skirt. In the background, there is a traditional round hut with a thatched roof, a wooden frame structure, and a wheelbarrow. The ground is dry and dusty.

ONE HEALTH CASES

December 2022

Social-ecological System Health in Transfrontier Conservation Areas to Promote the Coexistence Between People and Nature

The ProSuLi in Transfrontier Conservation Areas in southern Africa project engaged with four communities living in two TFCAs in three countries (Botswana, Mozambique and Zimbabwe) to identify, co-design, implement and monitor livelihoods interventions that could improve well-being in TFCAs. Through a participatory approach, and with the help of postgraduate students and senior researchers, each community decided to design and implement demand-driven activities that could engage them on more sustainable pathways for them and their landscape.

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Summary

Africa has managed to conserve an exceptional mammal diversity but is also facing an increasing demand for agricultural land to address a booming human population. Conserving natural resources while producing food in natural landscapes is a challenge that requires ecosystem health and social-ecological systems thinking.

Transfrontier Conservation Areas (TFCAs) were created to achieve the promotion of biodiversity conservation while at the same time offering better living conditions for local residents, most of them struggling to live from subsistence agriculture in semi-arid savannas. In addition, local communities bear most of the costs of conservation while getting few of the benefits. While substantial means are invested into biodiversity conservation in TFCAs, too little is invested in the development and well-being of local communities, compromising the health of both social and ecological systems in the long term.

The ProSuLi project engaged with four communities living in two TFCAs in three countries (Botswana, Mozambique and Zimbabwe) to identify, co-design, implement and monitor interventions that could improve and diversify livelihoods and, at the same time, manage natural resources. The approach was transdisciplinary, demand-driven and fully participatory, as the project activities were designed by TFCA residents, the final beneficiaries, promoting more environmental justice. Technical support was provided by postgraduate students, senior researchers and other private, governmental and non-governmental institutions. The project's hypothesis was that collective action supported by targeted capacity building and co-designed governance systems could result in a better appropriation of one's livelihood and more sustainable use of natural resources for the benefit of the whole social-ecological system.

What Is the Incremental Value that Makes This a One Health Case?

This One Health case draws its theoretical basis from the ecosystem approach to health and the six principles presented by Charron (2012) in the first chapter of her book. It is also embedded in the social-ecological system health (SESH) approach as defined in de Garine-Wichatitsky *et al.* (2021) in which an operational framework explicitly links health and ecosystem management with the resilience of social-ecological systems (SES) and the adaptive capacity of the actors. This SESH approach not only takes into consideration the concept of health *in* social-ecological systems (as defined in Zinsstag *et al.*, 2011) but also links the functionality and sustainability or resilience of SES. The latter has become more prominent in the last decade, especially in the context of global changes such as the climate, biodiversity and natural resource crises. It not only links the health of humans and animals to the social-ecological system in which they live but it also highlights the dependencies and feedback loops between the health of SES and the health of people and animals (and plants). More explicitly, one cannot promote the health of humans or (e.g. domestic) animals at the expense of the health of SES, as feedback loops will ultimately impact negatively on the health of both.

Promoting Sustainable Livelihoods in Transfrontier Conservation Areas (ProSuLi in TFCAs) is a project funded by the European Union to support TFCAs in southern Africa. The overall project structure was designed by a multidisciplinary group of researchers from southern Africa (Zimbabwe, Mozambique and Botswana) and France with long experience (since 2007) of collaboration on the topic in the region through their involvement in a long-term research platform entitled Production and Conservation in Partnership (www.rp-pcp.org). The initial group was composed of animal production specialists, wildlife ecologists, veterinarians, social scientists, agronomists, sustainability and foresight experts, and rural development specialists, including water scientists.

The topic of the project lies at the nexus of biodiversity, agriculture and health, seeking a balance between the objectives of biodiversity conservation and local livelihoods in complex landscape encompassing protected areas and communal lands. Systems thinking was therefore adopted during the design of the project.

The project proposal simply sketched the overall participatory approach needed without defining the activities of the project, assuming that final beneficiaries, i.e. the residents of TFCAs, would be in the best position to decide what kind of interventions/actions could improve their livelihoods and well-being. This challenged the classical development project's design process in which a donor funds external experts for pre-designed activities on which final beneficiaries have little say. The approach was therefore extensively *transdisciplinary* as the project involved beneficiaries interacting with experts from different disciplines from the design process to the implementation and monitoring.

In each site, the participatory approach involved a local and a dynamic multi-stakeholder network, *inter-sectorial* by definition, composed of participants from rural development (e.g. animal health and production, agricultural production, water access and use), conservation (e.g. protected areas managers, international NGOs), civil society (e.g. local residents, associations, local NGOs, private sector) and research (mainly senior and junior African researchers).

From the inception of the project, the sustainability of the action beyond the lifetime of the project itself was the first stated preoccupation shared by all stakeholders. During the project, this aspect has always been internalized in the governance processes at stake and the exit strategy always kept in mind. This is not enough to ensure sustainability, but one of its conditions. The second objective was to reach within each community (e.g. understood as heterogeneous groups of people living in a defined space) the highest possible level of *inclusivity* and *social equity*. The *gender* aspect was not prevalent at the beginning of the project but became prevalent in most sites given the activities selected and implemented by local stakeholders.

The project set-up defined an applied research framework, demand-driven by local stakeholders producing knowledge for direct action. Hence, the objective of the research was not to produce knowledge for academic circles but to respond to local identified needs through a process of collaboration between academic and non-academic actors, co-designing the research, learning by doing and engaging in adaptive management iterations through monitoring and evaluation processes.

The health of ecosystems in TFCAs depends on interacting social and ecological processes. In southern Africa, still rich in biodiversity, especially mammalian wildlife, opportunities to create sustainable social-ecological systems could be grasped. However, to put TFCAs on sustainable or 'healthy' trajectories, TFCA residents should play their role as principal custodians of the natural resources that they depend on and natural habitats that produce those resources. This means that to achieve more environmental justice in

TFCAs, local stakeholders must not only have better access to the sustainable use of natural resources (i.e. distribution component) but they also need to be better included in governance and decision-making processes (i.e. procedure component) which take into account local cultures and knowledge (i.e. recognition component) (Martin *et al.*, 2016). Also, the project attempted to design tools to monitor both the social and ecological components, and their interactions (e.g. human–wildlife conflicts and illegal natural resource harvesting) at the SES level.

Learning Outcomes

- Experience from a fully transdisciplinary project in which the final beneficiaries co-design, implement and monitor the project's outputs: it challenges all stakeholders, including academics' principles and dogma, because it demands embracing more complexity and accepting complex courses of action that are not 'simple solutions'. The project team needs to be willing to learn with transparency any existing lessons from previous and ongoing development interventions and to source additional expertise along the way.
- Understanding the difference between 'technical innovation' and 'process innovation' and why the former needs the latter to succeed, especially for the sustainable use of natural resources. The project team needs to acknowledge that they may not necessarily be introducing novel technology, but just a different way of implementing existing technology involving inclusive governance systems.
- Time, specific skills and well sequenced application of mixed methodologies and dedicated means are necessary to build trust and mutual respect with local stakeholders before any concrete intervention can take place, but should not take too long to compromise stakeholders' expectations. Skipping the first steps, usually to respect a project timeline, is counterproductive and compromises outcomes (i.e. positive results beyond the lifetime of the project). This 'inception phase' is therefore necessary and needs to be negotiated with the donor, the consortium members and the final beneficiaries.
- A 'local community' represents a heterogeneous group of people, characterized by their ethnic origin, political orientation and shared history, defining (dynamic) power relationships between its members. Each community possesses, therefore, a 'social capital' that can be described as its capacity to respond to an external intervention (e.g. a project). From the project team's perspective, it means that the same approach used to engage and work with different communities will not produce the same results and that a good understanding of the local power relationships and governance systems can help in adapting the approach to the local context. This is linked with the previous point.
- External innovations are always perceived as a threat to local practices and culture and are met with scepticism by local stakeholders, *a priori*. Interventions should favour local knowledge and practices and/or promote the emergence of innovation by the local stakeholders themselves, instead of them being imposed.
- Community processes can only emerge from individual commitment to shared interests. An individual will only invest the required knowledge, time and energy if they perceive the process as resonating with their inner self. The most difficult part is to provide room for this inner self to express itself in a meaningful way to build trust and agency in the transformation process and contribute to the collective objective. Pathways to sustainable and healthy systems probably depend more on the respect of that inner self than on the level of information and capacity production.

Background and Context

Rationale of the intervention

Conserving biodiversity while feeding a growing human population is one of the greatest challenges in sub-Saharan Africa. According to goals set by international organizations, 2030 should be the advent of zero-hunger and the achievement of protection of 30% of terrestrial and marine areas, globally (United Nations 2022; IUCN 2022). For sub-Saharan Africa, this would mean healthy people (absence of diseases and well-being), healthy ecosystems (resilient and functional) and healthy agriculture (food security and sustainability). Understanding how to manage ecosystems for both conservation and people's livelihoods

requires an understanding of both the social and ecological drivers and their interactions in the ecosystem (Folke *et al.*, 2010; Shrivastava *et al.*, 2020). Under which type of landscape (i.e. a set of actors who interact to achieve different objectives in a functional space) (Kremen and Merenlender, 2018) can conservation and production objectives be delivered simultaneously?

In southern Africa, TFCAs were created with the dual purpose of protecting biodiversity and promoting local development and well-being for the inhabitants in transboundary areas of southern Africa (SADC, 2020). Started 20 years ago, TFCAs are sets of complex socio-ecological systems that combine protected areas and communal lands. TFCAs represent a formidable opportunity to achieve conservation and production goals in remote and semi-arid transboundary landscapes characterized by good quality and relatively abundant wildlife and with subsistence agriculture societies barely reaching food security (Fig. 1). In TFCAs, a range of local actors (local residents, NGOs, government departments, private sector, researchers) have unequal access to natural resources (e.g. water, grazing, wildlife, timber) in governance systems regulated by customary, statutory, informal rules at local and international levels.

However, to date, there is, globally, a clear imbalance in motivation and means invested towards conservation versus local well-being. TFCA residents barely participate in the planning and designing of the TFCAs in which they live, giving opportunity for hegemonic practices, exclusion, manipulation and limited benefits to local residents (Lunstrum, 2016; Bruna, 2019; DeMotts and Hoon, 2012). The assumption that a wildlife economy will develop and its benefits will trickle down to local residents prevails, while most local economies are based on subsistence agriculture and their indigenous knowledge systems. If opportunities exist in the region to develop successful wildlife-based enterprises (e.g. safari, trophy hunting), these activities cannot entirely replace current livelihood activities. At best, they participate in the diversification of these livelihoods in the few places where it is economically sustainable. Despite this reality, TFCA governance has been dominated by powerful stakeholders such as states, international conservation NGOs and the wildlife private sector, defending the wildlife economy as the 'golden bullet' for the sustainability of TFCAs. As a result, most of the wealth creation in TFCAs is captured by the private sectors and by states, and rarely do benefits trickle down to local residents who have to bear most of the conservation costs (Mbaiwa, 2005; Norton-Griffiths and Said, 2010). The negative impact of the COVID-19 crisis on international wildlife tourism lifted the veil on the weakness of linking in excess local livelihoods to nature-based economies

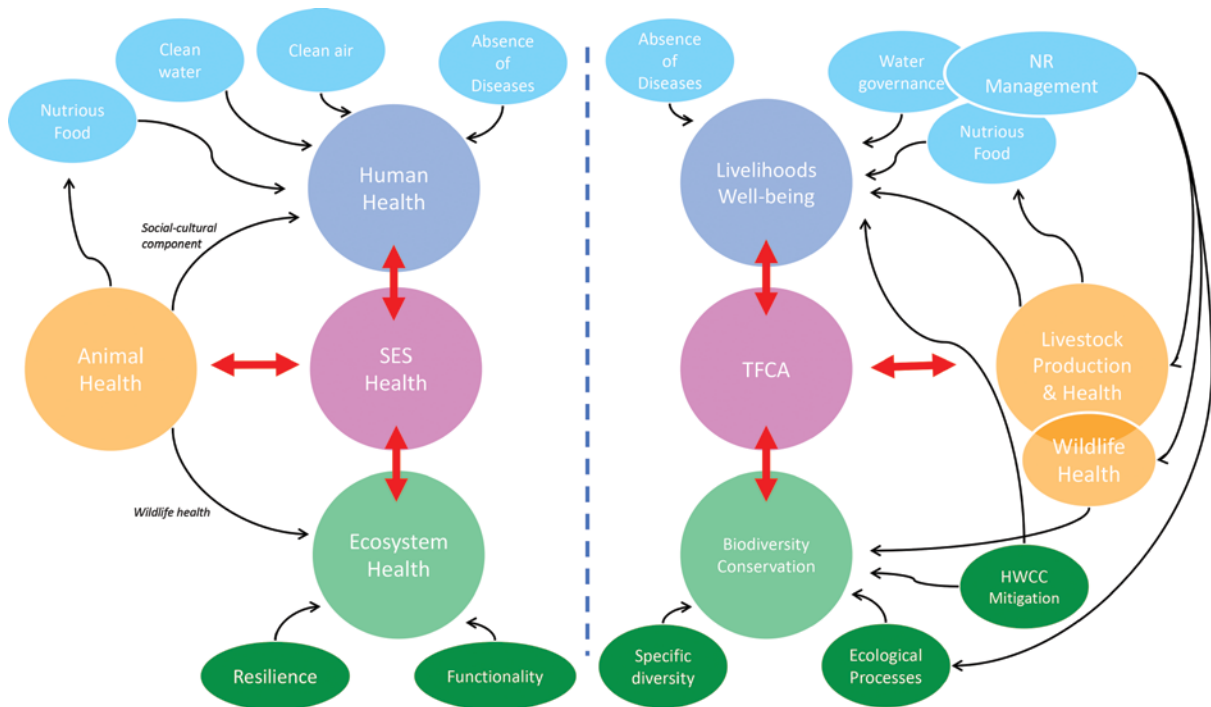


Fig. 1. The social-ecological system health (SESH) concept on the left-hand side translated into the context of Transfrontier Conservation Areas (TFCAs) in southern Africa on the right. Given the complexity of this context and interacting components, only the most salient components and interconnections relevant for the ProSuLi project are provided on the left-hand side and the example should be taken as one simplified representation of issues at stake and their relationships. Human health encompasses the absence of disease and mental health and well-being. (NR = natural resources; HWCC = human-wildlife conflicts and crimes)

(a weakness identified before the crisis by many) (Lindsey *et al.*, 2020). In addition, as local livelihoods are only projected through the prism of conservation, programmes only focus on problems encountered by local residents (e.g. human–wildlife conflicts) as the result of a lack of systemic approach at the landscape level and improper initial consultations, reinforcing gaps and mismatches (Dressler *et al.*, 2010; Büscher and Dressler, 2012). For TFCAs to achieve their objectives, there is an urgent need to repair and improve social and environmental justice (Chan *et al.*, 2020; Martin *et al.*, 2016). Currently, the coexistence of successful conservation areas valorizing the wildlife resource and poverty-ridden communal lands impacted by wildlife management without enough substantial benefits to compensate the loss of livelihood opportunities is bound to fail in the long term, setting SES in TFCAs on unsustainable and unhealthy trajectories.

Methodology of the intervention

The ProSuLi project was designed to address the mismatch between biodiversity conservation, local livelihoods and well-being in TFCAs and to promote a change in attitude of all stakeholders towards TFCAs and a paradigm shift on their role in the co-management of the same. This can be achieved by supporting TFCA residents to: (i) stop being passive actors of top-down external projects, an attitude that prevents them from engaging proactively in present actions and future livelihood options; (ii) develop the capabilities and agency to efficiently claim their rights and role in the management of TFCAs; and (iii) improve their livelihoods and well-being in TFCAs based on the sound management of natural and social assets (resources, e.g. water, rangeland, cattle, culture). Without systematically referring to conservation objectives or agenda, ProSuLi is still promoting healthy TFCAs by reinforcing the weak pillar of TFCAs, namely local livelihoods and well-being.

The project was implemented in four sites in three countries (Botswana, Mozambique, Zimbabwe) in two TFCAs (the Great Limpopo and the Kavambo-Zambezi TFCAs) (Fig. 2). In each site, a co-ordination team led by national researchers and supported by Master's students, local focal points (i.e. local individuals, locally based student or NGO staff) and the rest of the international co-ordination team interacted with local stakeholders over four-plus years. The project duration was initially three years but the COVID-19 crisis allowed two no-cost extensions, a necessity that was already highlighted in the project proposal submitted in 2018 given the type of research-action methodology. Inter-site collaboration was promoted by annual meetings (prior to the COVID-19 crisis) and completed by more regular virtual meetings involving the project team. Due to the COVID-19 crisis, exchanges of stakeholders between sites to share experiences, innovations and skills were postponed to 2022.

In each site, the project team explored alternative futures by adapting a co-elaborative scenario-building approach built around the Participatory Prospective Analysis (PPA) (Bourgeois *et al.*, 2017; Bourgeois *et al.*, forthcoming) to explore alternative futures for local livelihoods and associated issues at stake. Knowledge brokers and local residents of each site gathered during three days to attend this futures workshop. This methodology is particularly appropriate for stimulating future-oriented thinking (20–30 years ahead) and creating alternative futures in complex multistakeholder environments. In brief, participants identify the factors of change of their local livelihoods, their interconnexions, and select together the five most impacting factors. The potential future states of these main factors are then used to elaborate synopses and scenarios. A back-casting process invites people to create narratives that lead to the different scenarios. These narratives are then used to identify which activities/actions in the present could promote the desired, and avoid the undesired, futures. This participatory approach requires weeks of preparation and the involvement of experts of the local context and its power dynamics, who have the capacity to identify and gather key knowledge brokers and role-players as the level of appropriation by local stakeholders, is key for the subsequent steps of the process.

A substantial consistency and similarity in the main drivers of change and their different states across the four study sites were observed (Bourgeois *et al.*, forthcoming). TFCA residents in the four sites have livelihoods that are heavily dependent on the state of natural resources (water, soil, energy-wood, forage/grazing and non-timber products). Living in semi-arid climates, the sustainable management of these natural resources is critical for farming systems including both crops and livestock, which are livelihood pillars supported by indigenous knowledge systems rooted in culture and traditions. The local cultures are often overpowered by other belief systems and external interventions, including innovations, preventing the efficiency of externally imposed projects. In addition, governance structures and processes, both within the local communities and between the community and local government and other stakeholders, particularly those linked to resources and land-use allocation and regulations, also call for improvement. Finally, the absence of explicit linkages between the drivers of these livelihoods and the wildlife economy underlines our initial assumption about the lack of involvement of local stakeholders and their appropriation of the concept of TFCAs.

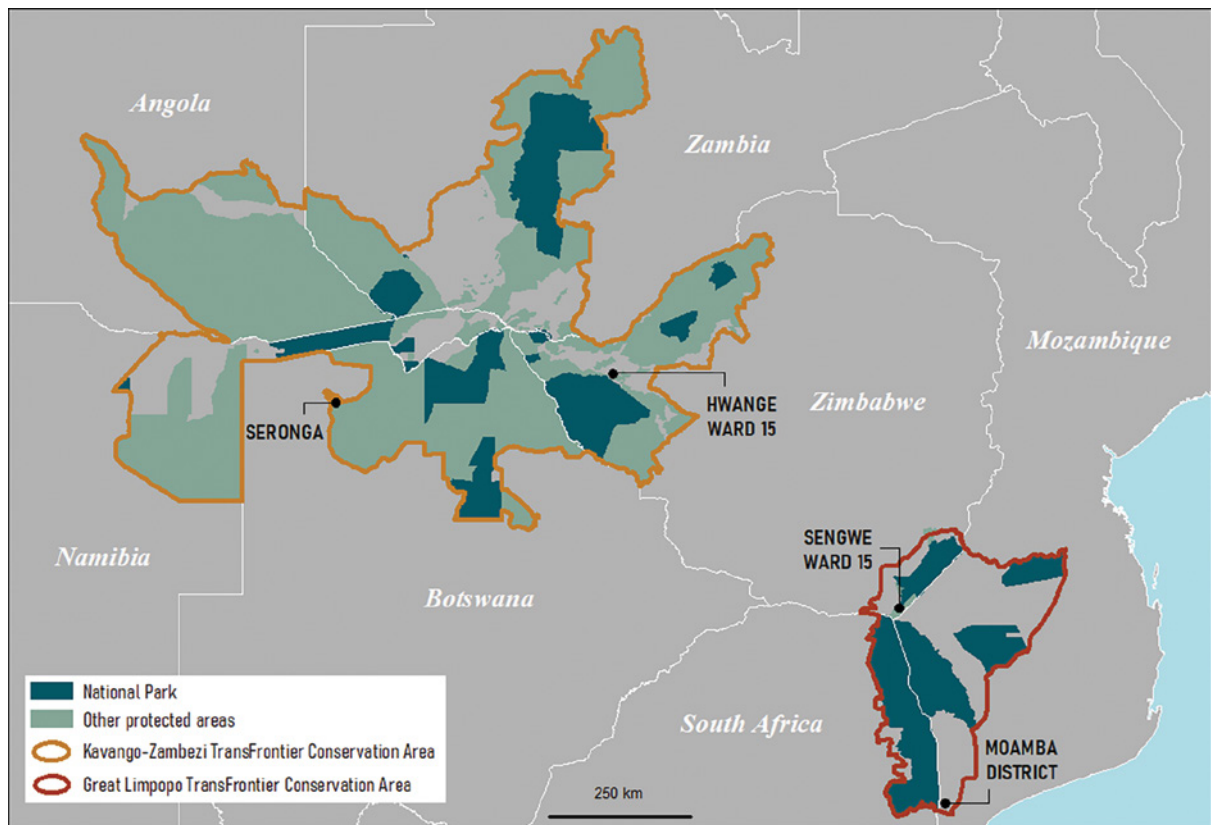


Fig. 2. Localization of the four sites of the ProSuLi project in the Great Limpopo (GLTFCA) and the Kavango-Zambezi (KAZATFCA). (Map: Laure Guerrini)

Based on the outputs of this initial step, in each site, further participatory engagement with local stakeholders was supported by the project team in order to identify and select 'management options' that could be co-designed during the lifetime of the project, implemented, monitored by local stakeholders using indicators defined collectively, and adjusted if necessary. Local and international experts were involved to provide technical expertise and/or to support the governance processes accompanying the management options. Master's students were recruited *ad hoc* to specifically work with local stakeholders to design monitoring and evaluation systems for management options (e.g. Gobvu *et al.*, 2021). Capacitating local stakeholders for change was one of the main requested supports from the project and was achieved through trainings by government services, academics or local NGOs.

In order to provide TFCA practitioners with a tool to monitor and evaluate TFCAs' SES, the project team contributed with CARMa-Africa (Capacity for African Resource Management) to the elaboration of a participatory community-based socioeconomic livelihood toolkit in Zimbabwe (involving individual and focus group discussions and surveys) that is currently being tested in all the project sites. This toolkit can complement the already available indicators of biodiversity and ecological functions as well as human-wildlife conflicts and crimes indicators (e.g. conflict monitoring, anti-poaching data). The objective of these monitoring and evaluation tools is to monitor, every five years or so, the state of an SES to assess its 'healthiness'.

The project philosophy and approach were presented in regional and international academic and non-academic fora, such as within the TFCA SADC network through interventions and article writing, in order to contribute to discussions about the necessary paradigm shift of each and every stakeholder in TFCAs.

Transdisciplinary Process

This section provides more detailed information about the management options selected and implemented by local stakeholders in each site. The whole life cycle of these activities, from identification to monitoring and adjustment, followed an adaptative management loop through a transdisciplinary and participatory approach.

Ward 15, Sengwe communal land, Chiredzi district, Zimbabwe

ProSuLi Sengwe intervention site is located in Ward 15 in the south-east lowveld in Chiredzi district of Zimbabwe, at the southern edge of Gonarezhou National Park. Average annual rainfall is below 450 mm and very unpredictable. Inhabitants of Ward 15 are largely of the Shangaan tribe, present also in South Africa and Mozambique. Livelihoods include crop (mainly maize and sorghum) and livestock (mainly goat and poultry, with cattle for the 44% of wealthier families) production.

Based on the future workshops, four thematic committees were created: livestock production, irrigated agriculture, governance, and tourism. Based on a list of potential activities, it was collectively decided that the main intervention would be a couple of solar-powered boreholes to which irrigated gardens would be coupled. These boreholes would be built close to the dip-tank (for regular tick removal on livestock) in order to ease the tiresome collection of water in these infrastructures. The CAMPFIRE (a community-based natural resource management programme in Zimbabwe) committee organized the funding for the linking of the borehole to the school. Support by the project was given for the management of the water resource (governance, rules of access, maintenance capacity), for the setting-up, technical support and governance of irrigated gardens and additional training on soft skills by government or NGOs. Lastly, a community centre is currently being built (workforce provided by the community) in order to provide a place for culture and traditions in one of the villages. Master's students developed projects, on request, on crop cycles in the irrigated gardens, performance indicators for livestock production, and risk management related to the interventions.

Emergence of collective action was observed in this site (e.g. creation of garden lines for village elders and clinics). The sustainability of the interventions is expected given the local dynamism and appropriation of activities. (a video on this site is available at: https://youtu.be/B_ho0zXPBv4)

Seronga area, Eastern Panhandle, Botswana

The Maese site is located in the Eastern Panhandle region of the Okavango Delta and is focused on five villages, which are located along the start of the alluvial fan. The people are dominantly agropastoralists and from a variety of ethnic groups. The region is characterized by severe human-wildlife conflict (HWC). A large elephant population results in frequent killing of people and damage to crops, with people's movements for livelihood activities being restricted by the fear of being attacked. A significant lion population results in many cattle being killed and associated retaliatory killings.

After the futures and additional community workshop, the local ProSuLi team worked in close collaboration with a local conservation NGO, CLAWs, already established in the area to work on strategies to reduce conflict with lions through cattle herding and rangeland management. The intervention focused on accompanying local stakeholders, including the wildlife private sector operating in the delta, through, for example, role-playing games, in exploring pathways for sustainable coexistence. Firstly, two Master's studies were identified to support cattle and natural resource management: one examined how forage quality and quantity vary seasonally on a moisture gradient from the woodlands to the wetlands, the findings of which will help guide decisions on cattle management and policy that determines people's access to key seasonal grazing areas. The other study used mixed-method surveys to examine local community participation in and costs associated with conservation to highlight the need for the setting up of community-based organizations with strong community empowerment, capacity building and distribution of benefits. Secondly, ProSuLi supported the development (management, governance and first steps of building) of a local abattoir that will greatly improve slaughter processes and beef markets (including for the local wildlife private sector), hence improving income for local communities while providing incentives to manage cattle better.

The fact that ProSuLi associated with an already operating NGO that had its own approach to stakeholder engagement did not facilitate the full implementation of the project's own approach but provided an interesting experience on how the approach could insert itself in a pre-existing process.

Ward 15, Hwange district, Zimbabwe

The Ward 15 of Hwange district is bordered by Sikumi Forest (Forestry Commission) and Hwange National Park (Zimbabwe Parks and Wildlife Management Authority). This communal area falls under the CAMPFIRE

programme co-ordinated by the Hwange Rural District Council. The six villages constituting Ward 15 are home to more than 7500 people resettled from the park in the area in the late 1950s and 1960s. Subsistence crop and stock farming and natural resources harvesting are the support elements of local livelihoods at the vicinity of the PAs.

After 30 engagements involving a total of over 300 people, the management interventions identified by the local communities included: rehabilitation and solarization of boreholes associated with irrigated gardens; building of dams; training and capacity building in leadership; landscape management and farming systems (especially for small stock); the development of community market; and community-based tourism. The local leaders outlined the crucial need to nurture a culture of respect for soil, plants and people, to warrant the success of these interventions. Exemplary leadership, inter-generational and inter-institutional conflict resolution, the revival of local cultures and strengthened collaborations around resource management were pointed to as the main levers for achieving this goal. Monitoring, evaluation and co-learning systems were developed at specific project scales by emerging committees with the help of local leadership, especially around water access, landscape management and farming practices. In total, 60 engagements took place in the form of focus group discussions and training workshops (by government or NGOs), reaching out to some 500 community members. From the beginning of the process, interventions were implemented within the existing government policy and legal framework and the project became a local government (Rural District Council) project to ensure sustainability when the project ends.

In Hwange, ProSuLi provided the foundations for a community-led landscape regeneration initiative in communal lands, the Dirimu Dream, a paradigm shift aiming at reviving the social-ecological processes allowing life to flow again, through the power of Ubuntu.

Mangalane area, Moamba district, Mozambique

Mangalane is a remote and neglected semi-arid area located about 40 km from the administrative post of Sábie, in Moamba district, close to Sabie Game Park, a private conservancy, bordering the Kruger National Park in South Africa. The five communities, together, cover approximately 50,000 ha, with about 290 households. The project intervention started with an anticipation exercise facilitated by the project researcher, engaging the community members and leadership.

Based on the futures workshop, ProSuLi project has been working with the community on two projects: the first to establish a water system that satisfies the expressed needs of the community; and the second to deal with a disease causing heavy cattle mortality, later identified as theileriosis, a tick-borne disease. By using the water intervention as the central intervention, the local community leadership, community members and district government representatives were engaged in a process to collectively establish a local governance system to ensure the sustainability of the water system as well as equitable access for all users. Community participation in the construction process and the roles and responsibilities of the actors during and after the construction process were also negotiated. A solar-powered water storage and distribution system was built including two fountains with four pumps, two drinking points for cattle and one washing stand with two washing points. To control tick-borne diseases, awareness training and capacity building were provided to let farmers design their own tick-control interventions using selected community members to develop profit activities around these interventions.

Today, both interventions continue but have been delayed by issues related to leadership and power relationships within the community. It took an MSc student project to understand the issues at stake in the leadership related to family histories, and competing claims on leadership leading to constraints on the interventions that were invisible for the project team before this study. Currently, the process continues to monitor and facilitate the adaptation of the governance structure and process as needed, based on the continuous understanding of the local dynamics.

Project Impact

Because the project's starting point was the observation of an imbalance between conservation and local development initiatives, and the need to change how wicked problems in TFCA were tackled, an objective of the project was to contribute to an impact on all TFCA stakeholders. Of course, as we are talking about impact, and the project has not yet ended, this impact cannot yet be assessed as the most important impact would be the sustainability of the activities beyond the project's lifetime.

The main objective of ProSuLi was to empower and capacitate TFCA residents to become more proactive in the decisions relating to their livelihoods and in the management of natural resources on which they depend. To achieve this, we hypothesized the need for a full participatory approach supported by transdisciplinarity involving demand-driven research that could be institutionalized in the local development involving government and other civil society organizations; accompanied by capacity building through technical training and support to collective action and good governance of natural resources. Interestingly, the COVID-19 pandemic provided an opportunity to test the approach mid-way through the project, because for more than a year the success of on-the-ground activities relied mostly on community cohesion and collective action rather than the driving hand of researchers.

The ProSuLi multistakeholder approach attempted to involve all willing local stakeholders, including governmental services, local NGOs and private actors (i.e. local TFCA practitioners) in order to create a space for communication and negotiation of shared concerns.

National postgraduate students (n = 13 in 3 countries) were sensitized to the approach and involved and capacitated in research-action methodology in order to become future TFCA practitioners or decision makers. Senior researchers were also impacted by being initiated into a demand-driven, research-for-development approach, requiring more interdisciplinarity and transdisciplinarity than that which had been directed by their formal training.

By communicating honestly about the project approach, lesson learned, outputs and expected outcomes (as we do here), we hope to sensitize also decision makers and donors to the paradigm shift necessary to promote healthy landscapes at the nexus between conservation and local development and the conditions necessary to do so – e.g. project lifetime; inception phase duration; and investment in social, participatory and sustainability sciences – to better understand the local stakeholder context.

Despite our objective to change the rules of project implementation by co-designing the activities with local stakeholders instead of consulting them only when activities have been validated by external experts and the donor, the process cannot totally prevent an imposition of worldviews (e.g. conservation models), methodologies (e.g. anticipatory action research) and values (e.g. relationship between people and nature) onto local stakeholders' own worldviews, knowledge systems and values. The few international and many national researchers who implemented the project are themselves external stakeholders relative to the SES in which the project was implemented. However, the use of anticipatory participatory action research at the beginning of the project aimed to promote a decolonial practice connected to justice for the exploration of alternative futures as a citizen-centred approach that acknowledges the relevance of a plurality of perspectives (Bourgeois *et al.*, 2022). Therefore, acknowledging the bias linked to our intervention as external stakeholders, we tried to minimize them using participatory approaches (Bourgeois *et al.*, forthcoming).

Project Outlook

The outlook of ProSuLi will depend on its impact. As indicated in the initial logical framework of the project, the success of the approach and methodology will only be known once the project has ended and the governance processes are still functional, sustainable and evolving by themselves. This is uncomfortable for donors, practitioners and academics and calls for longer-term investment in 'observatories' in which the impact can be measured.

In addition, it would be pretentious to state that this single project has changed the rules of the game. It is located within a series of projects implemented by similar or different stakeholders in each site. A realistic outlook would be that the project has modestly contributed, amongst other initiatives sharing its objectives, to a paradigm shift that, hopefully, will be observed in the future.

The project proposal conceptually placed the management of natural resources by local and other (e.g. state, conservation NGO) stakeholders within the framework of the common-pool resource-management framework of Ostrom and colleagues (McGinnis and Ostrom, 2014; Ostrom, 2007). The framework was practically used in the co-design and implementation of management options by stakeholders associated with a monitoring and evaluation system to feed an adaptive management cycle. As mentioned in the previous point, the success of this approach by local stakeholders can only be measured once the project resources have been removed and the activities are sustaining themselves. From an academic perspective, we failed to properly monitor the use of the SES framework in the four sites (we are investigating if we can in some of the sites). This failure is probably due to the greater attention

allocated to support and facilitate the design, implementation and monitoring of management options by local stakeholders that were identified as the project unfolded and required a lot of adaptability by the project team. Future projects should try to capture these processes and data to be able to report these experiences academically.

An important outlook is also to question the scalability of the approach. Changing scale (e.g. from individual sites to TFCA-wide) is a challenge that can be met by transferring the experience and skills of the project to civil society bodies and/or governmental services that have the social and economic capital to do so. There is a possibility that the quantity of resources invested in a few sites during a project such as ProSuLi is unscalable.

Of course, a logical outlook is that the ProSuLi approach is replicable and contributes to new management forms in TFCAs, in which environmental justice is not sacrificed for biodiversity conservation and *vice versa*.

Conclusions

The ProSuLi project tested the SES health framework in the context of TFCAs. Its experience shows how human and animal health are pillars of SES, through the production of healthy food for healthy people and how the health of SES can be operationalized to navigate wicked problems at the interface between biodiversity conservation and local development. We hope ProSuLi will provide a relevant case study to inform future interventions in TFCAs.

Group Discussion Questions

1. How do we better define and integrate Ecosystem Health in the One Health concept? More specifically, how do we advocate for more Social-Ecological System (SES) Health in the One Health concept, both conceptually and functionally?
2. If the ProSuLi project is considered successful, how do we up-scale the approach at district, provincial level? How do we institutionalise the process within government, local NGOs and academia?
3. How can we convince funding institutions that they need to change the length and scope of projects dealing with SES Health? In addition, how do we advocate for a change in the way the monitoring and evaluation processes assess the impact of the project? These processes should better measure the sustainability of projects after their implementation.

Further Reading

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