

Key lessons on the change processes that drive agroecological transitions in Zimbabwe.

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To inform the setup and operationalization of Agroecological Living Landscapes (ALLs), the CGIAR Agroecology Initiative's (AE-I) Work Package 5 (WP5) assessed actor agency as well as drivers and barriers to behavior change among farmers and non-farmer actors in target regions. Activity 5.1 reviews an inventory of agroecological science, practice, and social movement successes and failures that engender agency and behavior change toward agroecological transitions. This brief presents our findings and reports key lessons on the change process that drives agroecological transformation in Mbire and Murehwa districts.

The CGIAR initiative Transformational Agroecology across Food, Land, and Water Systems develops and scales agroecological innovations with small-scale farmers and other food system actors in seven low- and middle-income countries. It is one of 32 initiatives of CGIAR, a global research partnership for a food-secure future, dedicated to transforming food, land, and water systems in a climate crisis.

<https://www.cgiar.org/initiative/31-transformational-agroecology-across-food-land-and-water-systems>

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Introduction

Zimbabwe's agri-food systems face a range of challenges. While upwards of 70% of Zimbabwe's population works in agriculture, the sector generates only 17% of GDP (FAO, 2023). Livestock production contributes an additional 35% of GDP and is equally common, with 60% of the population owning cattle and 70-90% owning goats. Zimbabwe experiences a single rainy season that historically runs from November to March. Rainfall is limited and erratic, and peasant farmers have access to under 5% of national irrigation facilities (FAO, 2023). Soils in Zimbabwe are highly sandy and low-fertility granitic soils, contributing to water management challenges under changing climatic conditions. Many smallholder farmers use inorganic fertilizers, but at rates lower than typically recommended, and manure is widely used among livestock owners (Zingore et al., 2011).

Zimbabwe has a burgeoning youth population, with 42% of its 12 million inhabitants under 15 (FAO, 2023). These conditions, combined with political uncertainty and currency instability, contribute to widespread food insecurity and malnutrition; 38% of the population suffered undernourishment between 2020-2022, and 29% was severely food insecure (FAOSTAT, 2023). Over 90% of children aged 6-24 months do not consume the minimum acceptable diet (FAO, 2023), and 22% of children under 5 are stunted (FAOSTAT, 2023).

Although Zimbabwe is reasonably well forested (40% of land area), it has Africa's third-highest rate of deforestation and has lost an estimated 6 million ha of forests in the last twenty years (FAO, 2023). Many regions boast high levels of biodiversity and an abundance of wildlife, including tourist-attracting megafauna that, while revenue-generating, often contribute to human-wildlife conflict and heightened tensions between agro-pastoralists and conservation efforts (Baudron et al., 2022).

These conditions underscore the potential of agroecological transformation to improve livelihoods, boost economic productivity, conserve natural resources, and support food security and nutrition. In Zimbabwe, the CGIAR Agroecology Initiative (AE-I) supports the transition to more environmentally sustainable, productive, and socially just agri-food systems. AE-I activities in Zimbabwe are based around multi-stakeholder Agroecological Living Landscapes (ALLs) aimed at knowledge co-production and co-design of agroecological innovations. To support ALL activities, AE-I Work Package 5 (WP5) works to identify the factors contributing to and/or constraining agri-food system actors' agency and behavior change in the context of agroecological transformation. The objective of this Zimbabwe WP5 country brief is to identify trends in the country's agroecological transition process by examining past initiatives' approaches, successes, and failures. Through this process, we identified key lessons to help guide AE-I's implementation in Zimbabwe.

Agroecological Living Landscape (ALL) context.

The ALLs in Zimbabwe are organized in two wards (4 and 27) in Murehwa District of Mashonaland East Province and two wards (2 and 3) in Mbire District, Mashonaland Central Province. Cropping systems in these regions are largely centered around maize, the primary staple crop. In the two targeted districts, diverse crops are produced alongside maize, including groundnut, cowpea, sweet potato, sunflower, sorghum, millet, tobacco, cotton, and various vegetables (FAO, 2006). Mixed crop-livestock production are very common in both regions, with cattle and small ruminants typically penned overnight and during the rainy season, allowing for manure collection (FAO, 2006). Most livestock graze on communal grazing lands and consume crop residues left on fields, contributing to a flow of nutrients to wealthier, livestock-owning farmers' land, on which they are tethered overnight (Zingore et al., 2011). In Mbire, as the profitability of cotton has decreased, households have become more focused on livestock production and are cultivating less land relative to fifteen years earlier (Baudron et al., 2022).

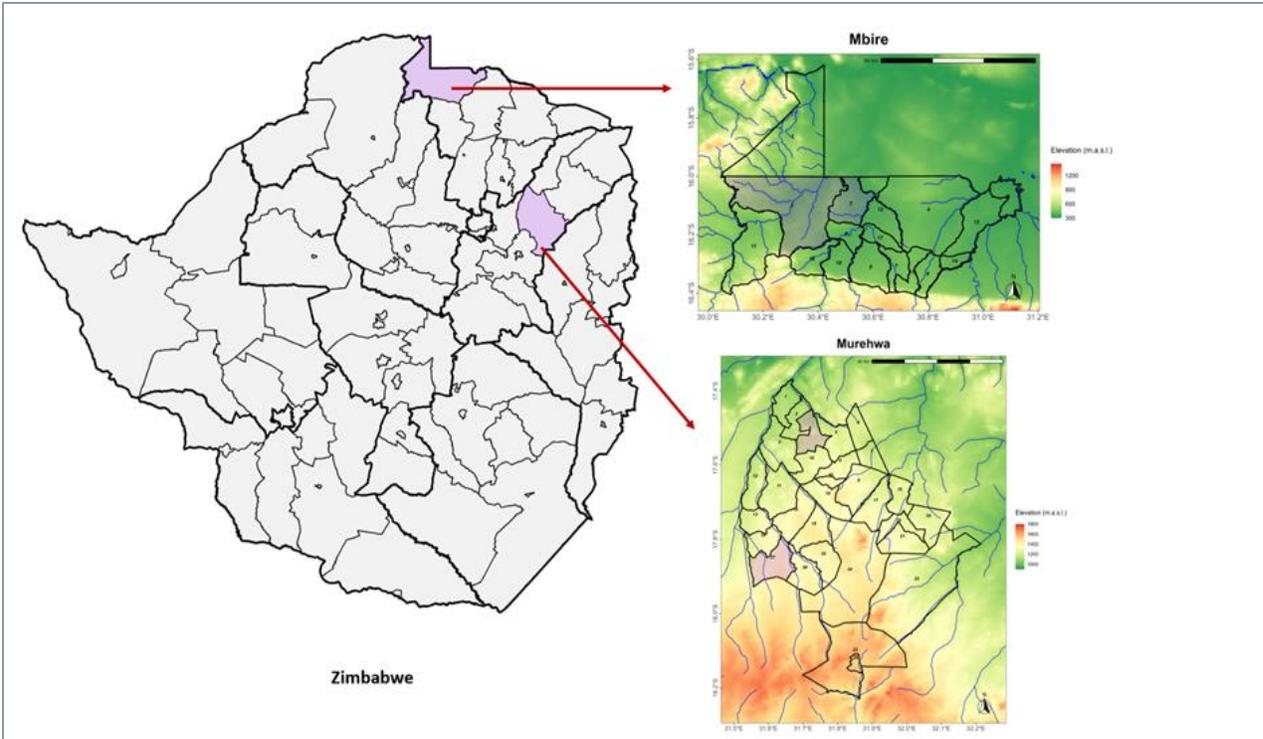


Figure 1. Map indicating the location of Mbire and Murehwa districts in Zimbabwe (Source CIMMYT).

Murehwa District, in Mashonaland East Province, is a relatively densely populated region that receives, on average, 750 to 1000mm annually. Mbire District, in the low-lying Mid Zambezi Valley in Mashonaland Central Province, receives only 450 to 650 mm annually on average, and is prone to hotter temperatures and dry spells (FAO, 2006). Human-wildlife pressures are especially acute in Mbire District (Baudron et al., 2022), which neighbors several protected areas. Climate change presents a clear threat to smallholder farmers in both regions, who are actively adapting both on- and off-farm (Asare-Nuamah et al., 2022). In Mbire, climate change and shifting market prices have contributed to a shift away from maize and cotton towards hardier small grains (Baudron et al., 2022).

Methodology

To identify the factors contributing to and constraining agri-food system actors’ agency and behavior change in Zimbabwe, we compiled and analyzed an inventory of past initiatives related to agroecology, then conducted an in-depth review of six of these. The inventory process began with a desk review using search terms “Zimbabwe” paired with “agroecology”, “agroforestry”, “conservation agriculture”, “sustainable agriculture”, “regenerative agriculture”, “organic agriculture”, “integrated farming systems”, “diversified farming systems”, “livestock integration”, and “agrobiodiversity” on Google and Google Scholar. Relevant results pertaining to initiatives, projects, or social movements over the last twenty years (2002-2022) were reviewed, along with some relevant scholarly research. Focus group discussions with farmers and other stakeholders at AE-I launch events in Murehwa and Mbire Districts, as well as during WP1 stakeholder mapping exercises, yielded additional initiatives implemented in ALL target regions. These were added to the inventory and, if possible, links to relevant documents were located online and reviewed. Information collected included dates of operation, funding and implementing agencies, type of initiative (program/project, community initiative, social movement), and core focus and activities. From this data, we assessed which agroecological principles had been addressed, using the HLPE principle definitions and framework (HLPE, 2019). Review of initiatives in the inventory often relied on limited information

(e.g., blogs or briefs), so while the most prominent agroecological principles were easy to identify, more minor principles may not have been consistently captured in this process.

Initial review of past initiatives enabled purposive selection of six interventions deemed most relevant for in-depth review. Final selection was made in partnership with WP1 Zimbabwe staff most familiar with ALL stakeholders' experiences with past projects. Selection criteria included:

- engagement with diverse agroecological principles (i.e., focusing not only resource-conserving agronomic practices but also social and economic outcomes)
- scale of reach (i.e., regional, or landscape-scale initiatives, especially in ALL target regions, were prioritized over household or village-level activities and initiatives outside target ALL regions)
- diversity and inclusivity (in terms of agroecological practices, principles, and farming systems targeted)
- relevance/impact as reported by ALL stakeholders.

Key informant interviews were conducted with representatives and affiliates of selected initiatives in Murehwa District from 18-21 October 2022, and between 1-4 November 2022, in Mbire District. Key informants were identified using snowball sampling prioritizing members of initiative design and/or implementation teams, generally from local government offices and implementing partner organizations. The interviews included district heads from the departments of Agricultural Technical and Extension Services (AGRITEX), the Environmental Management Agency (EMA), Rural District Council (RDC), District Administrators (DA), implementing partners/NGOs representatives, community organizations/groups/CBOs within the targeted districts and other key personnel in the district. For each project, a small number of farmers were identified as active participants/beneficiaries and were consulted about their experiences. Many projects were also discussed in the context of local agroecological transition timelines, which were developed in focus group discussions of 5-15 individuals (disaggregated by gender, age, and split between farmers and other stakeholders). These discussions served as additional information sources. Interview data were then paired with secondary document review, where project documents were available.

Results

Trends in agroecology-related initiatives

Searches for agroecology-related terms in association with Zimbabwe yielded a relatively limited number of results, suggesting these types of initiatives may have perhaps played a smaller role in Zimbabwe than elsewhere, and/or that online documentation of these initiatives is limited. Very few of the reviewed initiatives were explicitly termed "agroecological." Instead, most initiatives reviewed focused on a "set of practices" linked to agroecology as means toward improved resource efficiency and resilience. Those initiatives that focused specifically on agroecology had been implemented in recent years. Few community-based initiatives (3) and no social movements or collective actions were identified, although these efforts are likely not to have as visible an online presence as projects and programs funding by the government or development partners.

Table 1. Overview of AE initiatives in Zimbabwe, 2002-present

	Frequency
Initiative type	
Project/Program	23
Community based/grassroots initiatives	3
Collective action	0
Social movement	0
Target locations	
Initiatives targeting ALL areas	16
Countrywide initiatives	10
Implemented in an ALLs target site(s)	
Murehwa District, Ward 4	7
Murehwa District, Ward 27	6
Mbire District, Ward 2	5
Mbire District, Ward 3	5
Years of implementation	
2018 - 2022	15
2012 - 2017	5
2011 and earlier (11 years)	1
AE principle addressed	
Improved resource efficiency	20
Strengthen resilience	25
Secure social equity/responsibility	21
Number of AE principles addressed	
1-2	2
3-5	5
More than 5	19

Relatively few past initiatives encompassed the full range of agroecological principles. On average, past initiatives addressed just over six principles. Most addressed were soil health (81%), economic diversification (76%), recycling (73%), input reduction (69%), biodiversity (69%), and participation (58%). The least commonly addressed were land and natural resource governance (8%), connectivity (12%), synergy (19%), and animal health (19%). These patterns in principles are reflective of overarching trends in agricultural development projects over this period. For instance, many projects (at least nine) focused on elements of conservation agriculture (CA), which has been widely embraced by international and faith-based NGOs, CGIAR research centers, and governments in Southern Africa (Baudron et al., 2012). The literature review suggested that many more CA initiatives have been implemented that

are not well documented. However, two in-depth case studies (Pfumvudza and ZimCLIFS) drew heavily on CA principles.

These projects contributed to an overall trend toward improving crop-livestock synergies, soil health, recycling, co-creation of knowledge, and input reduction principles. For many CA projects, a primary motivation in promoting these practices has also related to improved water management in semi-arid zones.

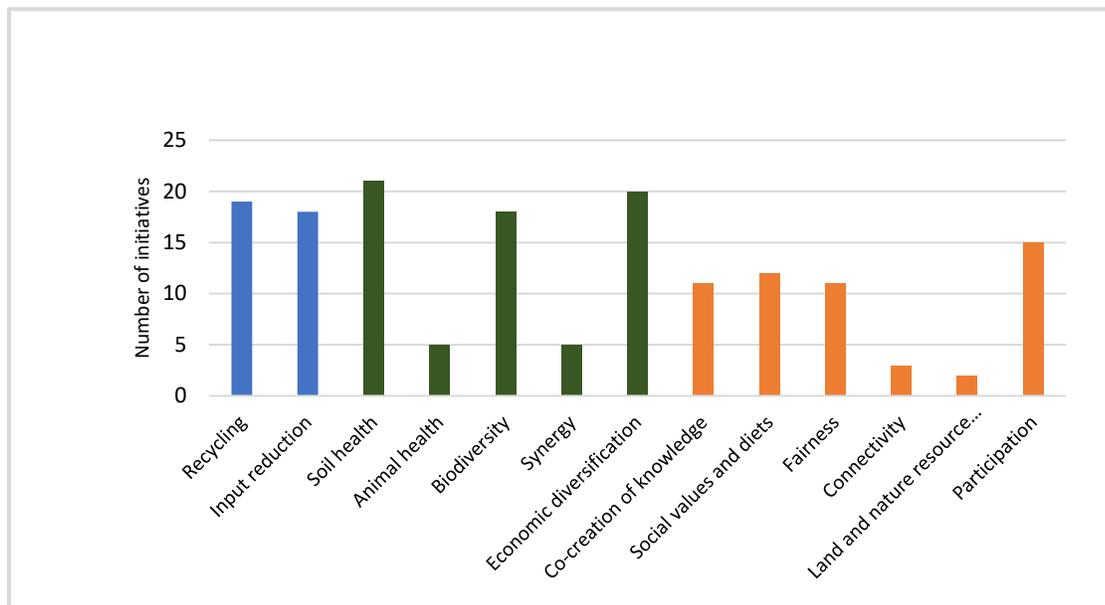


Figure 2. Number of initiatives addressing each agroecological principle (resource efficiency-related principles indicated in blue, resilience-focused principles in green, and social equity principles in orange).

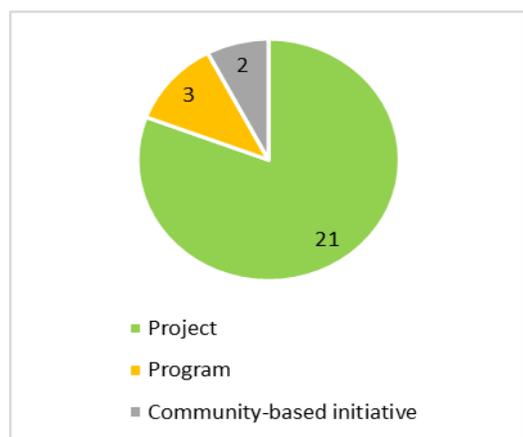


Figure 3. Number of initiatives that were projects, programs, and community-based initiatives.

Six initiatives focused on livestock systems or integrated crop-livestock systems, likely due to the importance of livestock systems to livelihoods in Zimbabwe, and all but one of these addressed animal health in some capacity. In recent years, CA projects have been integrated into livestock systems by, for example, introducing fodder crops in rotation or intercropping systems. Many of the livestock-focused projects were implemented in Mbire, generally with a focus on livelihoods support rather than explicit crop-livestock integration. Two projects on crop livestock integration in Mbire district, ZRBF VALUE Project and the GOFAR 2 ERIC Project were unique in that they included more than 50% of the 13 principles into their project. Key to their approach was establishment of feed/fodder gardens to provide seed banks to farmers and goat feeding centers and running breed improvement programs through crop-livestock innovation centers.

The other noticeable trend concerned biodiversity conservation, including (agro)forestry. In these projects, beekeeping (apiculture) and fish farming (aquaculture) featured as a means toward economic diversification. In addition, three projects touched specifically on agro-biodiversity through seed saving and multiplication. A small number of projects identified in the search (namely the Zambezi Valley Biodiversity Project and AWF’s Transboundary Conservation Program) sought to pair wildlife (megafauna) conservation, reduced human-wildlife conflict, and sustainable livelihood development in buffer zones of Mbire District.

Theories of change

Past initiatives in the target locations can be interpreted according to their engagement with three aspects of agroecology: (i) improving resource efficiency; (ii) strengthening resilience; and (iii) securing social equity/responsibility. Although nearly all projects in the inventory (25/26) engaged with resilience-related principles, slightly fewer touched on social equity (21/26) and resource efficiency (20/26). The five most popular principles were related to resilience and resource efficiency, while the two least popular principles related to social equity.

The case studies examined in detail (Table 2) suggest these patterns are reflective of past initiatives' focus on achieving behavior change through promotion of improved farming and natural resource management practices (touching on soil health, biodiversity conservation, input reduction, and recycling) rather than more holistic agri-food system reform (that might involve land and natural resource governance and producer-consumer connectivity, for instance). Market and value chain development was often a component of theories of change that aimed to foster sustainable behavior change through alignment between community livelihood needs and resource conservation goals, for instance, in the ZimCLIFS, ENGAGE, and Small Grains projects.

In terms of approach, most initiatives combined training programs (typically training-of-trainers to achieve wider reach) with outreach and education efforts, either top-down (most common among projects) or farmer-to-farmer (common among grassroots initiatives). The in-depth case studies illustrate that assumptions among these projects varied, although there was clear emphasis on the assumption that knowledge and information were the key behavior change driver/constraint. Several initiatives (including ENGAGE, the Small Grains Project, ZVA, and ZimCLIFS) leveraged Innovation Platforms, capacity building of producer groups, and farmer-to-farmer exchanges, with the assumption that more participatory mechanisms and social learning could contribute to sustainable behavior change. These activities reflect an assumption in these four initiatives that building social capital and linkages within communities speed up economic development. Few projects grappled with policy in any substantial ways. The Zambezi Valley Biodiversity Project was one notable exception, in its acknowledgement that regulatory reforms and enforcement capabilities were critical to supporting local conservation efforts.

Marginalized groups

Few initiatives engaged meaningfully with marginalized groups, although "counting" women, youth, and other marginalized groups as beneficiaries was common. Initiatives that did focus on social inclusion reported significant challenges related to gender norms, labor burdens, and stigma around disabilities (ENGAGE, Small Grains Project). One case study (ZVA) in Mbire district noted inadequate needs assessment for marginalized groups had undermined benefits to them. Labor-intensive practices presented a particular challenge that one project (ENGAGE) worked to overcome by adapting practices. A small number of initiatives in the inventory specifically focused on women's empowerment through development of agricultural, livestock (ZVA) and non-timber forest product value chains, and others (including ZimCLIFS) put some (but seemingly minimal) effort into targeting practices and existing value chains most relevant to women. One initiative (Pfumvudza) put no evident focus on reaching women or marginalized groups.

Table 2. Summary of in-depth case study initiatives in Zimbabwe

Name of initiative	Pfumvudza / Climate-Proofed Presidential Input Support Scheme	Zambezi Valley Biodiversity Project	ENGAGE	Integrating crops & livestock for improved food security & livelihoods in rural Zimbabwe (ZimCLIFS)	Zambezi Valley Alliance (ZVA)	Small Grains Project
Type of initiative	Project/program	Project	Project	Project	Project	Project
Goal and objectives	Pfumvudza is a large-scale government initiative that promotes select conservation agriculture practices as a means to support household food self-sufficiency and climate resilience. It aims to train (via training of trainers) smallholder farmers countrywide to plant basins, minimize soil disturbance, use mulch, and practice precision farming, thereby increasing household food security and reducing malnutrition. Seed and fertilizer inputs (for precision application in the basins) are provided for free to farmers who set up plots as prescribed.	ZVBP promotes an integrated landscape approach to managing wildlife resources, climate change threats, and ecosystem services in forests, protected areas, and surrounding community lands. It aims to reduce poaching and other wildlife crimes and promote sustainable forest management through community wildlife conservancies and integrated landscape management plans that support sustainable resource management and livelihoods.	ENGAGE focuses on increasing horticultural production and product quality, promoting judicious and safe chemical use, and training smallholders in marketing skills. Promoted practices include conservation agriculture practices related to trench digging and use of organic inputs.	ZimCLIFS focused on the integration and intensification of smallholder crop-livestock systems, and helped smallholder enterprises participate in markets by improving links between value chain actors. ZimCLIFS promoted conservation agriculture practices, including reduced tillage, rotation, mulching, legume integration and embraced an innovation platforms approach.	ZVA focused on resilience building and disaster risk management. It worked to increase the capacities of communities to protect development gains and achieve improved well-being outcomes in the face of shocks and stresses through improved agricultural practices, livelihoods diversification, policy dialogues, information exchange, ICT services WASH clubs, market linkages, and VSLAs.	The project promotes conservation agriculture with specific focus on small grains and legumes for soil conservation and food nutrition including linking farmers with markets to sell produce. The project also supports horticultural gardens through small scale mechanisation (pumps) for drawing water into gardens.
Location	Country-wide Caritas activities in Murehwa Wards 4, 9, 10, 11, 27	Lower and Mid Zambezi Valley, including Mbire Wards 2; 3; 4 & 12	Murehwa Wards 1; 2; 3; 4; 7; 8; 11; 14; 17; 20 & 23	Murehwa District	Mbire District	Mbire Wards 3; 6; 9; 14; 15 & 17
Years of implementation	2019-present	2018-2024	2021-2024	2010-2019	2016-2022	2020-2023
Ag system(s) targeted	Maize + sorghum, millet, sunflower, beans	Agroforestry, climate smart agriculture	Horticulture	Integrated cereals-livestock systems	Cropping & livestock systems, NTFP, apiculture, agroforestry	Small grains systems in particular

AE principles supported	Soil health Biodiversity Animal health Economic diversification Input reduction Recycling	Economic diversification Animal health Synergy Social values & diets Biodiversity Participation Fairness	Soil health Social values & diets Input reduction Economic diversification Recycling	Input reduction Soil health Animal health Economic diversification Synergy Participation Biodiversity	Recycling Soil health Animal health Biodiversity Synergy Participation	Economic diversification Biodiversity Synergy Soil health Input reduction
Most important innovation(s)	Tying input provision to conservation agriculture practices	Community-based wildlife and forest management using landscape-level frameworks.	Pairing sustainable production practices with market skills development	Developing smallholders' market linkages while promoting crop-livestock management practices with	Specific technologies targeted, ICT elements, financial inclusion models	Conservation agriculture practices
Target beneficiaries	Smallholder households	Communities living in proximity to forests, conservation areas	Smallholder horticulturalists	Smallholder households with livestock	Smallholder households (cropping and livestock), natural resource managers	Smallholders in rainfed zones
Number of target beneficiaries	1.8 million households	14,000 individuals		480 'core' farmers 5,000 potential adoptees 20,000 households exposed	16,714 households	3,402 farmers
Marginalized groups targeted	None	Women	Women, youth, people with disabilities	None (women's inclusion)	Native communities, women, youth, and people with disabilities	Women, youth, and people with disabilities

Actor motives

Actors' motives and interests varied somewhat across projects, although generally appear aligned within projects. Development actors (donors, development agencies, development NGOs, and local CBOs) were the largest group of players involved in designing and implementing these projects and appeared fairly aligned in support of development and livelihood growth. Conservation groups and environment-focused NGOs made up a much smaller proportion of involved actors. Government agencies (agriculture, environment, and social welfare-related) were regularly involved, which brought political interests into initiative design and implementation. A few private sector groups interested in market opportunities also appeared as collaborators, although they were not generally involved in theory of change development. In several cases, particularly those in which a wider range of behaviors are targeted (e.g., increased market engagement, changes in policy and landscape management practices), more diverse interests are evident in the design and implementation team—for instance, the Zambezi Valley Biodiversity Project's involvement of GEF teams focused on wildlife conservation, UNDP, and local CBOs.

Factors contributing to success.

- (i) Addressing production constraints.** Provision of inputs was noted as a factor contributing to success creating behavior change in two case studies (Pfumvudza and the Small Grains Project), while a lack of free inputs was noted as a challenge in generating goodwill among participants in three other case study initiatives. Timeline activities and KIIs indicated that farmers had a clear (and concerning) preference for initiatives that give tangible benefits. One of the agroecology-related initiatives most successful in changing behaviors, at least in the short term, has been the government's Pfumvudza project focused on basin planting and conservation agriculture. Pfumvudza was reported to have greatly influenced behaviors; adoption of the promoted practices has been high across the farmer population and is said to have added benefits for marginalized populations that lack access to tractors or animal traction. However, there are several clear concerns around the behavior change mechanisms in the project. Pfumvudza distributes inputs (improved seed and fertilizer) to farmers who implement the promoted practices on 1/16 ha of their land. Stakeholders readily admit that most farmers place only the minimum amount of land under Pfumvudza practices to qualify for the associated free inputs. Basin digging is very labor intensive and not taken up widely beyond the mandated plot size – the project has attracted the nickname “dig or die” due to the mandate required to get inputs. Some farmers indeed pointed to the idea of maximizing benefits without having to purchase inputs themselves as they reason they participate. Provision of inputs was also cited as a factor contributing to success in the Small Grains Project. However, three other case studies (ZimCLIFS, ZVA, and ENGAGE) identified farmer expectations of and reliance on free inputs or money as a challenge in promoting new practices; in ZimCLIFS, any farmers not receiving inputs (as lead farmers) were not actually perceived to be project beneficiaries. Thus, although input provision may generate goodwill and help address immediate production constraints and change behavior in the short term, more sustainable means to address production constraints, for instance through value chain development, are likely needed.
- (ii) Market opportunities.** Many of the agroecological innovations that persisted were aligned with market opportunities and market training for farmers or had market opportunities deliberately created around them. The ZimCLIFS project, for instance, brought together stakeholders to assess and strengthen value chains around nitrogen-fixing forage crops. The project generated a great deal of enthusiasm among farmers because a market developed for velvet bean and mucuna seed. A key implementing partner (CIMMYT) facilitated market linkages by connecting the project beneficiaries to buyers. Other projects, including ENGAGE and the Small Grains Project, also focused on value chain development and farmers' marketing skills, and several past initiatives in the inventory explored organic certification and marketing. Unfortunately, the ZimCLIFS case also provides a cautionary tale concerning the sustainability of market linkages. The project contributed to a spike in interest in production of velvet bean, but the market ultimately became over-saturated, and prices dropped. Additionally, the end of the project saw the loss of connections between communities and the seed buyer and the dissolution of the farmer coalition capable of selling/buying in aggregate. Farmers resumed selling independently to middlemen who did not offer prices as high as the other buyers.
- (iii) Engaging with communities the 'right' way.** Impact appears to be strengthened when working with locally known and respected individuals and groups, including farmer leaders, respected extension agents and NGOs, and traditional community leaders. While key informants indicated that there has been an erosion of hard power among traditional leaders, their soft power remains – their endorsement and collaboration may be an important way to generate community buy-in. Long-term engagements between implementing partners and communities were clearly also valued by initiative participants. In many cases, the least successful initiatives in the eyes of farmers were those that came into the community, offered training, and left. Initiatives that had a steady presence in the communities, with regular visits by implementing partners, efforts to share knowledge and findings and build capacity within communities, and tangible benefits accruing to farmers, were those viewed as most successful.

Factors contributing to failure.

- (i) Misalignment with farmer and stakeholder needs constraints.** A key marker of failure to achieve intended behavior changes in several projects was disadoption of promoted practices. This likely occurs for several reasons but aligning promoted practices with the needs and constraints of producers and other stakeholders emerged as a critical factor in multiple cases. In the case of ZVA, inadequate needs assessment with marginalized groups, and particularly their unique financial inclusion constraints, was blamed for limited impacts. Energy-intensive treadle pumps were cited as a failure factor in the Small Grains Project, as this technology was not well suited to the context. In contrast, Pfumvudza conservation agriculture practices were perceived as being well aligned with the constraints of some resource-poor farmers who lack animal traction. However, labor-intensive conservation agriculture practices had negative impacts on labor-constrained women farmers and proved less accessible for people with disabilities in the case of ENGAGE and Pfumvudza. In timeline activities, farmers reported taking up Pfumvudza practices because they do not have other options, and several said that if they get cattle, they will likely go back to plowing. This may indicate that training on these practices was not adequate to convey knowledge about the more holistic benefits of conservation agriculture.
- (ii) Assumptions about farmer knowledge as the only gap.** The most prominent activity used to promote behavior change among smallholder farmers was training, typically through a training-of-trainers approach with demonstrations (top-down or farmer-to-farmer), under the assumption that training would be adequate incentive for farmers to shift their practices. In several of the past initiatives identified as most effective, training was paired with facilitation of market linkages. Otherwise, training-of-trainers approaches may lead to some information loss, where the focus is mostly on shifting practices and less on economic or holistic agroecological benefits. Labor constraints clearly pose a barrier to uptake of labor-intensive practices in many projects, even where training is adequate. This is especially acute in relation to farmer livelihood priorities and aspirations; high labor investments will only be considered justified if the activity aligns with the farmers'/family's priority livelihood area(s). As such, more comprehensive behavior change mechanisms are needed that build compound benefits to farmers, alongside training.
- (iii) External pressures.** Focus group participants reported numerous external pressures that acted as barriers to agroecological transition in the ALLs target regions. For example, changes in broader market conditions were cited as a reason for disadoption of promoted agroecological practices. Production of nitrogen-fixing fodder crops promoted by ZimCLIFS became less profitable as the market became saturated, leading many farmers to abandon the practices. In the Small Grains Project, the Grain Marketing Board's monopoly on sorghum purchasing undermined the profitability of this crop. Pressures related to population growth and land reform also emerged. Both have increased pressure on available farmland and led to intrusion into forests, riverbanks, and protected areas. While there are few immediate ways to mitigate external pressures through the AE-I, anticipating how these pressures would impact uptake and retention of agroecological practices and taking steps to collectively prevent or mitigate negative outcomes might be possible. For instance, anticipating that deforestation or riverbank cultivation could accelerate as profitability of promoted practices increases, there may be a need to establish community commitments to prevent expansion into conservation areas. Diversifying market entry points for farmers may also be critical to ensure diverse channels for generating economic returns on agroecological practices.

Conclusions and Recommendations

Several recommendations can be drawn from this study of past initiatives.

- 1. Look beyond agronomic practices to appropriate social equity goals.** The focus of past agroecology-related initiatives has been primarily on on-farm practices, leading initiative success and failure to be measured primarily through technology adoption rather than impacts on livelihoods and wellbeing. Wider food system reforms, such as those that shift resource management and governance into communities' hands or better connect producers and consumers, are an important component of agroecological transition. These efforts may require higher-level engagement with policymakers and government agencies, and increased research on and attention to consumer dynamics, than the initiatives documented here reported.
- 2. Consider the behaviors and needs of non-farmer actors.** It is evident that most of the initiatives focused on addressing farmer needs and excluded the non-farmer actors who are critical in influencing behavior change. Without adequate buy-in of, for instance, value chain actors who purchase producers' goods, behavior changes may not be sustained beyond the life of an initiative.

3. **Act beyond farmer knowledge for sustaining behavior change.** Assumptions that farmer knowledge is the only gap that must be filled to achieve behavior change have proved problematic in past initiatives. While training is often necessary to introduce and disseminate practices, it is not always adequate to support sustainable behavior change among producers and should be paired with other incentives and opportunities.
4. **Provide market opportunities and strengthen farmers' marketing skills.** Economic incentives through market opportunities appear most powerful in extending the impacts of training efforts but must be organized with attention to long-term sustainability. Market linkages need to be designed to outlast initiatives—ideally, ownership should be passed to a community well before the conclusion of partner organizations' engagement. Several past initiatives emphasized market skills development for smallholders and smallholder aggregation as priority areas, alongside promotion of agronomic practices.
5. **Co-design technologies and practices to align with farmer needs and constraints.** Actively co-designing innovations with target beneficiaries is the best approach to avoiding misalignment of goals. There is risk of falling into a well-worn path of introducing labor-intensive practices, especially around conservation agriculture. If such practices are further promoted, they should be integrated with livestock production or mechanization (to reduce labor requirements), or market opportunities that generate complementary benefits. Buy-in from respective government stakeholders and local leadership has additional value in promoting these practices.
6. **Conduct deliberate needs assessment with marginalized groups.** New practices may require tailoring to the requirements of labor-constrained groups and people with disabilities. Complementary interventions such as innovative financial inclusion models may also be necessary to ensure marginalized populations' ability to access benefits.
7. **Incorporate gender transformative approaches.** Deep-rooted social norms have presented barriers to equitable initiative impacts, even when marginalized groups are actively targeted. Priority must be given to intervention approaches that seek to shift these norms and create more opportunities for marginalized groups.
8. **Design meaningful engagements with communities that build capacity for behavior change in the long term.** Worryingly, farmers appear to expect provision of inputs and may be disappointed in initiatives that do not supply them. However, they also express some of the greatest appreciation for initiatives that engage communities as long-term partners, share findings regularly, and build local capacity. Even if initiatives do not offer tangible benefits to producers, deep and sustained engagement by initiative partners is crucial.

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