

REVIEW OPEN ACCESS

Food Sovereignty and Agroecology in Conflict Zones: Building Resilience Amidst Crisis

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ABSTRACT

Armed conflict disrupts agricultural production, displaces farming communities, degrades natural resources, and weakens local institutions, thereby intensifying food insecurity and dependence on humanitarian assistance. This review examined how food sovereignty and agroecology can jointly strengthen food-system resilience, community self-reliance, and peacebuilding in conflict-affected settings. A qualitative narrative review was conducted using peer-reviewed articles, institutional reports, and case studies published between 2012 and 2025 and retrieved from PubMed, Scopus, and Web of Science. Evidence was synthesized thematically around conflict-related food-system disruption, local control of food resources, agroecological practices, implementation barriers, and recovery strategies. Findings from Colombia, Palestine, Syria, and Somalia indicate that community-led agroecology, including crop diversification, seed saving, agroforestry, water conservation, organic soil management, and local market development, can improve food availability, restore ecological functions, preserve traditional knowledge, strengthen livelihoods, and rebuild social cohesion. However, insecurity, displacement, contested land tenure, weak governance, inadequate financing, damaged infrastructure, and limited technical capacity constrain implementation and scale-up. The review concludes that integrating food sovereignty with agroecology offers a context-sensitive pathway for addressing immediate food needs while supporting long-term ecological recovery, economic autonomy, and conflict-sensitive development. Governments, humanitarian agencies, and development partners should embed agroecology in post-conflict recovery policies, secure equitable land and resource rights, strengthen farmer cooperatives and extension systems, finance locally led initiatives, rebuild markets and rural infrastructure, and establish participatory monitoring frameworks that prioritize women, displaced people, indigenous groups, and smallholder farmers across affected regions.

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1 | Introduction

In conflict zones, food insecurity is not merely a symptom of war but a complex and enduring crisis that undermines the foundations of human well-being (Mohamed and Homeida 2024). Armed conflicts disrupt agricultural production, displace communities, and decimate local economies, creating a vicious cycle of dependency on humanitarian aid and external food supplies. The result is not only a lack of access to nutritious food but also a loss of agricultural knowledge, biodiversity, and local resilience (Weldegiargis et al. 2023). These disruptions often exacerbate existing vulnerabilities, particularly in regions that rely heavily on subsistence farming for survival. In such environments, the promise of long-term stability hinges on transforming the food systems that underpin communities' survival and rebuilding local capacities to meet their nutritional needs sustainably (Dago, n.d.).

Food sovereignty, the right of people to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, offers a powerful antidote to this crisis. By restoring local control over food systems, food sovereignty aims to reduce dependence on external sources and empower communities to manage their own food security, even amidst the turmoil of conflict (Blue Bird Jernigan et al. 2021). Coupled with agroecology, an agricultural approach that emphasizes ecological sustainability, biodiversity, and community engagement, food sovereignty can transform conflict-ridden landscapes into resilient, self-sufficient food systems (Vikas and Ranjan 2024).

Despite growing scholarship on conflict-related food insecurity, food sovereignty and agroecology are often examined separately, while their combined relevance to conflict-affected and post-conflict settings remains insufficiently synthesized. Existing humanitarian responses commonly prioritize short-term food provision but may not adequately address disrupted local production, insecure land access, environmental degradation, loss of indigenous agricultural knowledge, and dependence on external assistance. A focused review is therefore needed to clarify how food sovereignty and agroecology can function together as complementary frameworks for restoring community control, ecological resilience, sustainable livelihoods, and social cohesion. By integrating conceptual evidence with lessons from conflict-affected regions, this review provides a timely basis for designing locally led, conflict-sensitive, and sustainable food-system recovery policies.

This review explores how food sovereignty and agroecology can serve as critical tools for building resilience in conflict zones. It examines their potential to not only address immediate food security concerns but also foster long-term peace and stability by empowering local communities, restoring agricultural knowledge, and enhancing ecological resilience. In the face of ongoing global challenges, the integration of these principles could offer a transformative approach to overcoming the food crises that persist in conflict-affected regions. Through this lens, food sovereignty and agroecology emerge not only as agricultural practices but as key components of peacebuilding and sustainable development. Food insecurity in conflict zones is a pervasive and multifaceted crisis, exacerbated by

disruptions to agriculture, displacement of communities, and environmental degradation. Conventional aid-based solutions often fail to address the root causes of food insecurity, fostering dependency rather than empowering communities to rebuild sustainable and resilient food systems. In this context, the principles of food sovereignty and agroecology offer transformative solutions that merit closer examination. This study combines food sovereignty and agroecology to address food insecurity in conflict zones. It emphasizes a holistic perspective, focusing on local control and equity, and ecological sustainability. The study specifically examines their applications in armed conflict regions. It also highlights the potential of agroecology and food sovereignty in fostering social cohesion and reducing resource-based conflicts. The study uses real-world case studies to provide practical insights and addresses intersectional challenges, highlighting the transformative potential of these frameworks for sustainable development and conflict resolution.

Conflict-driven food insecurity is widely documented, yet the literature often treats food sovereignty, agroecology, resilience, and conflict dynamics as separate fields. This fragmentation limits understanding of how local control over land, seeds, water, and markets can interact with ecological farming practices to strengthen adaptive capacity, restore livelihoods, and reduce resource-based tensions in conflict-affected settings. Existing studies also emphasize short-term humanitarian assistance more than community-led, ecologically grounded pathways for long-term recovery. Accordingly, a focused review is needed to synthesize evidence across these concepts, identify implementation barriers, and clarify their combined relevance to peacebuilding and sustainable food-system reconstruction. This review therefore examines how food sovereignty and agroecology can jointly enhance resilience, support social cohesion, and inform practice in conflict and post-conflict contexts.

To achieve this purpose, the study employed a qualitative narrative-review approach. Relevant peer-reviewed articles, institutional reports, and case studies published between 2012 and 2025 were identified through searches of PubMed, Scopus, and Web of Science. Studies were selected according to predefined inclusion and exclusion criteria and synthesized thematically to identify the impacts of conflict on food systems, applications of food sovereignty and agroecology, implementation barriers, successful interventions, and policy implications.

2 | Methodology

2.1 | Review Design

This study used a qualitative narrative-review design to perform a synthesis of the conceptual, empirical, and policy-oriented literature on how food sovereignty and agroecology can contribute to food-system resilience in conflict-affected and post-conflict contexts. Since the evidence at hand is variable in terms of methodological approaches, encompassing empirical research, conceptual papers, institutional reports, policy documents, program assessments, and geographically specific case studies, a

narrative approach was deemed suitable. This review, then, was designed as an interpretive and integrative synthesis and not as a statistical meta-analysis.

2.2 | Brief Geographical and Conflict Scope

The review was global in geographical scope and was not restricted to one country or continent. “Conflict-affected settings” included at the national or subnational level those areas where there was active armed conflict, prolonged political violence, military occupation, or forced displacement, or post-conflict recovery or persistent insecurity that severely affected agricultural production, access to land and water, rural livelihoods, food markets, or local governance.

Evidence was gathered from conflict and post conflict situations in Africa, the Middle East, Latin America, Europe, and other relevant areas. Colombia, Palestine, Syria, and Somalia were given greater analytical attention, as in these contexts there were more detailed examples of the application of the food-sovereignty and agroecological principles. Contextual evidence, similarly, was gathered from Sudan, the Democratic Republic of the Congo, Ukraine, Ethiopia, Burundi, Mali, Uganda, and other contexts in which a combination of factors such as conflict, displacement, resource insecurity, and/or institutional fragility impacted on food systems. The geographical cases were chosen to provide an illustration of varying conflict situations and not as a comprehensive country-by-country analysis.

2.3 | Thematic Scope

Literature providing reviews of the intersection of five main themes was evaluated:

- I. Armed conflict, displacement, occupation, and political instability and their impact on agricultural production and food systems.
- II. Control over productive factors like land, water, seeds, market, agricultural knowledge, etc. at local level.
- III. Agroecological practices, including water harvesting, organic soil management, local-market development, agroforestry and crop diversification, integrated crop-livestock systems, and seed conservation.
- IV. The role of food sovereignty and agroecology for livelihoods recovery, ecological resilience, social cohesion, community autonomy and peace-building; and. Barriers, enabling conditions, policy responses, financing mechanisms, institutional arrangements and future research needs.
- V. Literature focused solely on agricultural productivity, food aid, nutrition status, environmental aspects or climate change without a clear link to conflict-affected food systems, food sovereignty, agroecology, or resilience to build a community was beyond the scope of the themes.

2.4 | Information Sources and Search Strategy

Articles and literature of relevance were filtered between 2012 and 2025 focusing on publications in PubMed, Scopus and Web of Science. The databases were chosen because they have been found to cover a wide range of public health, agriculture, environmental science, development studies, food systems, and conflict-related research. Bonus institutional and policy documents from trusted international organizations, humanitarian agencies, development institutions and governmental and inter-governmental agencies were identified.

Search terms combined varied themes and actions to include food sovereignty, agroecology, conflict zone, armed conflict, occupation, food insecurity, forced displacement, community-based agriculture, land tenure, local food systems, post-conflict, and resilience. The main concepts were combined using boolean operators like AND, OR. A list of related publications was also reviewed to uncover more work and/or reports related to the objectives of the review.

2.5 | Eligibility Criteria

Sources were included when they:

- were published between 2012 and 2025;
- were written in English or had sufficient information in English to assess;
- analyzed food systems, agricultural livelihoods, food sovereignty, agroecology and/or sustainable agriculture in conflict-affected, fragile, occupied, displaced and/or post-conflict contexts
- gave empirical, conceptual, policy, program, or case-based evidence that was relevant to resilience, community autonomy, ecological restoration, social cohesion or peacebuilding; and
- appeared in peer-reviewed journal articles, peer-reviewed books or chapters, institutional reports, policy documents, humanitarian assessments and/or credible case-study materials.

Sources were excluded if they either did not speak to the topic of food systems and agricultural sustainability, did not have a significant connection to conflict/post-conflict situations, focused primarily on the topic of industrial agriculture, or lacked significant connections to food sovereignty or agroecology, duplicated information presented in a more comprehensive source, or lacked methodological or institutional credibility.

2.6 | Selection of Literature and Evidence Base

The titles and abstracts/executive summaries of potentially relevant records were first evaluated. Appropriate and relevant sources were then thoroughly examined with the geographical, topic, and eligibility criteria. The synthesis was limited to records that were not copies or obvious duplicates.

A total of 103 resources were cited in the final narrative synthesis comprising of peer reviewed journal articles, institutional and humanitarian reports, policy documents, conceptual publications and case-study materials. Since this was for an interpretive synthesis, this did not result in a meta-analysis of the sources. Rather, more weight was accorded to empirical, peer-reviewed studies and reports from respected organizations and institutions that were international, humanitarian, agricultural, and development in nature. The total number should be checked against the last reference list once all editorial additions and/or deletions have been made.

2.7 | Data Extraction and Thematic Synthesis

Each eligible source was narratively analyzed for geographical context, situation of conflict, food-systems disruption, affected population, food-sovereignty dimension, agroecological practice, reported results, problems of implementation, institutional situation, and policy implications. Data from the materials was compared and contrasted between them with patterns found and gaps noted to reveal areas of agreement and disagreement and areas of ongoing research.

The final synthesis was built around the issue of conflict-related disruption of food systems, the meaning and relevance of food sovereignty, agroecological strategies for resilience, synergies between food sovereignty and agroecology, experiences from Colombia, Palestine, Syria, and Somalia, barriers to implementation, enabling policies, and future research priorities.

3 | The Impact of Conflict on Food Systems

Conflicts and wars, whether localized or widespread, have profound and long-lasting impacts on food systems in affected regions (Table 1). These impacts go far beyond the immediate destruction of infrastructure; they reshape agricultural landscapes, erode food sovereignty, deepen socio-economic vulnerabilities, and diminish health infrastructures (Ongesa et al. 2025). The consequences are multi-faceted, and they often extend well beyond the end of active hostilities, perpetuating cycles of poverty, food insecurity, and environmental degradation. Recent empirical evidence and policy assessments demonstrate that conflict-related food insecurity is driven not only by reduced food availability but also by displacement, destruction of agricultural assets, restricted access to land and markets, environmental degradation, and weakened local institutions. In 2024, more than 295 million people across 53 countries and territories experienced acute food insecurity, with conflict remaining one of the principal drivers. These conditions reinforce the need to move beyond short-term food assistance toward approaches that protect agricultural livelihoods, restore community control over productive resources, and strengthen ecological resilience. Table 2 presents selected recent evidence from conflict-affected settings and illustrates the practical relevance of food sovereignty and agroecology to humanitarian response, recovery, and peacebuilding.

3.1 | Disruption of Agricultural Practices

In conflict zones, agricultural production is often among the first sectors to suffer. Fields are destroyed, crops are abandoned, and farming infrastructure—such as irrigation systems, storage facilities, and transport routes—are damaged or looted. These disruptions not only halt current agricultural activities but also lead to the loss of seasonal harvests, making it difficult to sustain local food supplies. Farmers are displaced or forced to abandon their land, and many are unable to return due to ongoing violence or landmines left behind in contested areas (Rohwerder, n.d.). The breakdown of rural economies exacerbates the situation, as many families rely on subsistence farming to meet their basic food needs. The displacement of farming populations to overcrowded urban centers or refugee camps further strains already fragile food systems, creating a dependency on external aid (Nisbet et al. 2022). This crisis of displacement often coincides with a lack of access to markets, which makes it nearly impossible to buy food, especially in areas that have lost infrastructure or where supply chains are cut off by conflict (De Matteis et al. 2021).

3.2 | Increased Vulnerability to Food Insecurity

The agricultural devastation wrought by conflict feeds directly into widespread food insecurity. The loss of food production leads to shortages, inflated food prices, and malnutrition, all of which disproportionately affect vulnerable groups, including women, children, and the elderly (Hassoun et al. 2024). International aid often steps in to alleviate short-term needs, but such aid can foster dependency on external food sources and undermine local food production. The distribution of food aid can also be politicized, further entrenching inequalities and leading to unequal access to necessary resources (Leach et al. 2020). Moreover, the long-term displacement of communities, particularly in refugee and internally displaced persons (IDP) camps, often means that agricultural skills and knowledge are lost (Osman and Abebe 2023). People who once relied on farming for their livelihoods are disconnected from the land and, over time, may become less equipped to return to agriculture once peace is restored. In this environment, communities become more vulnerable to hunger, as they lose the capacity to produce their own food and are dependent on inconsistent humanitarian assistance (Aniah et al. 2019).

3.3 | Loss of Agricultural Knowledge and Land

Beyond physical destruction, conflict also leads to the erosion of agricultural knowledge. Generations of local farmers possess a wealth of knowledge about their environment, crop cultivation, and sustainable land management practices (Alum 2024a). However, prolonged conflict often disrupts the transmission of this knowledge, as displacement and insecurity prevent farmers from passing down their expertise. This loss of traditional knowledge makes it even more challenging for communities to rebuild their food systems after conflict subsides (Muriuki et al. 2023). Land tenure issues

TABLE 1 | A comprehensive summary of the impact of conflict on food systems, including socio-economic and environmental aspects.

Impact area	Description	Consequences	Affected groups	Long-term effects	References
Disruption of agricultural practices	Destruction of fields, irrigation systems, and storage facilities	Loss of seasonal harvests, displacement of farmers	Farming communities, rural populations	Long-term decline in food production, reliance on aid	Rohwerder (n.d.); Nisbet et al. (2022); De Matteis et al. (2021)
Increased vulnerability to food insecurity	Food shortages due to loss of agricultural production	Rising food prices, malnutrition, dependence on food aid	Women, children, elderly, displaced persons	Prolonged food aid reliance, weakening of local food production	Hassoun et al. (2024); Leach et al. (2020); Osman and Abebe (2023); Aniah et al. (2019)
Loss of agricultural knowledge	Displacement disrupts knowledge transmission between generations	Decline in sustainable farming practices	Smallholder farmers, younger generations	Hinders post-conflict agricultural recovery	Muriuki et al. (2023); Alum (2024b)
Land tenure and access issues	Disputes over land rights and ownership after conflict	Conflicts over resources, delayed agricultural recovery	Returning refugees, rural landowners	Unresolved land disputes, lack of food sovereignty	Tchatchoua-Djomo and van Dijk (2022); Touch et al. (2024)
Market and supply chain disruptions	Destruction of infrastructure and restricted trade routes	Limited access to food and agricultural inputs	Urban populations, displaced individuals	Economic downturn, dependency on imports	Ongesa et al. (2025)
Health infrastructure strain	Weakened health systems due to war-related destruction	Poor nutrition, increased disease burden	Vulnerable populations, especially children and elderly	Worsened public health outcomes, higher mortality rates	
Political and economic instability	Conflict disrupts governance and economic structures	Devaluation of local currency, job losses, lack of investment	Entire population, especially low-income groups	Long-term poverty, slow economic recovery	Nisbet et al. (2022); De Matteis et al. (2021)
Environmental degradation	Land degradation due to abandoned farmlands, pollution, and deforestation	Reduced soil fertility, lower agricultural yields	Farming communities, future generations	Decline in arable land, loss of biodiversity	Rohwerder (n.d.); Muriuki et al. (2023)
Dependence on external aid	Reliance on food aid due to disrupted local food production	Undermines local agricultural markets, fosters dependency	Refugees, IDPs, low-income populations	Weakens self-sufficiency, delays economic stability	Hassoun et al. (2024); Osman and Abebe (2023)
Strategies for recovery	Approaches to rebuilding food systems	Agroecology, food sovereignty, sustainable agriculture	Entire communities, policymakers	Long-term resilience, self-sufficiency in food production	Ongesa et al. (2025), Touch et al. (2024)

TABLE 2 | Recent empirical and policy evidence supporting food sovereignty and agroecology in conflict-affected settings.

Conflict-affected setting	Recent contextual evidence	Main food-system disruption	Relevant food-sovereignty dimension	Relevant agroecological response	Practical and policy significance	Supporting source
Global food-crisis contexts	More than 295 million people in 53 countries and territories experienced acute food insecurity in 2024, an increase of 13.7 million from 2023	Conflict, displacement, climatic shocks, inflation and market disruption jointly weakened food access and production	Strengthening local control over land, seeds, water, food production and distribution reduces excessive dependence on unstable external supply systems	Diversified farming, soil restoration, water management and locally adapted production can improve resilience to overlapping shocks	Humanitarian programs should combine immediate food assistance with livelihood protection, local production and long-term food-system recovery	World Food Programme (2026)
Palestine	Conflict displaced approximately 1.9 million people during 2024, while markets, infrastructure and access to essential services were severely disrupted	Destruction of farms and markets, movement restrictions, reduced humanitarian access and loss of productive assets	Protection of farmers' access to land, water, local markets and culturally appropriate food systems is central to restoring autonomy	Rainwater harvesting, local seed conservation, home and community production, organic farming and soil conservation can support localized food access	Recovery policies should protect agricultural land, restore local markets and prioritize community-led livelihood assistance alongside emergency relief	World Food Programme, n.d.
Syrian Arab Republic	More than a decade of conflict, economic decline and climatic shocks has weakened agricultural production and pushed a substantial proportion of the population into acute food insecurity	Damaged irrigation systems, high input prices, disrupted markets, displacement and declining crop and livestock production	Restoring farmer control over productive resources and reducing aid dependence can strengthen rural self-reliance	Farmer field schools, climate-adapted crops, home gardens, water-efficient production, livestock protection and local food processing are appropriate interventions	Policies should combine emergency agricultural inputs with extension services, women-led enterprises, water rehabilitation and rural livelihood financing	FAO (2023)

(Continues)

TABLE 2 | (Continued)

Conflict-affected setting	Recent contextual evidence	Main food-system disruption	Relevant food-sovereignty dimension	Relevant agroecological response	Practical and policy significance	Supporting source
Somalia	Approximately 4.4 million people were projected to face acute hunger by April 2025 because of drought, conflict and high food prices. Flooding in late 2023 also affected 2.5 million people and submerged more than 1.5 million hectares of farmland	Recurrent drought and flooding, conflict, livestock losses, displacement and disruption of agricultural labour and cereal production	Community governance of grazing land, water, seeds and local markets can reduce vulnerability and resource-related tensions	Drought-tolerant crops, water harvesting, agroforestry, soil conservation and integrated crop–livestock systems can strengthen adaptive capacity	Investment should prioritize anticipatory action, pastoral and farming livelihoods, locally managed water systems and conflict-sensitive resource governance	Humanitarian Action, n.d.
Colombia	Conflict and rural displacement continue to disrupt agricultural activities and market access despite the 2016 peace agreement. Earlier assessments identified millions of people requiring food-security assistance in historically conflict-affected areas	Unequal land access, displacement, weak rural institutions and restricted access to markets and productive services	Land reform, collective territorial rights, farmer organizations and participatory food governance support rural autonomy and social justice	Agroforestry, diversified farming, community seed systems and farmer-to-farmer learning can support ecological and livelihood recovery	Colombia's emerging agroecology policy demonstrates how food sovereignty, rural development and peacebuilding can be integrated within national planning	Rooted in Agroecology and Food Sovereignty (n.d.)

(Continues)

TABLE 2 | (Continued)

Conflict-affected setting	Recent contextual evidence	Main food-system disruption	Relevant food-sovereignty dimension	Relevant agroecological response	Practical and policy significance	Supporting source
Sudan	Armed conflict has damaged agricultural infrastructure, disrupted markets and threatened the livelihoods sustained by major production systems such as the Gezira irrigation scheme. FAO planned to reach 14.2 million people with agricultural assistance in 2025	Looting and destruction of machinery, restricted farm access, rising input costs, displacement and weakened cereal production	Securing access to farmland, livestock, seeds and community-managed irrigation systems is necessary for restoring national and household food production	Rapid seed support, livestock protection, irrigation rehabilitation, soil management and locally adapted crop production can prevent further livelihood collapse	Agricultural assistance should be treated as life-saving intervention and implemented alongside food aid, market restoration and land-access protection	Food and Agriculture Organization, n.d.
Democratic Republic of the Congo	About one-quarter of the population was projected to experience Crisis-level food insecurity or worse by June 2025, and approximately 80% of affected people lived in rural areas	Armed conflict, mass displacement, market disruption, loss of agricultural inputs and restricted access to productive land	Community access to land, local markets and decision-making institutions is essential for protecting rural food systems	Community seed multiplication, diversified cropping, agroforestry, soil rehabilitation and smallholder livelihood support can rebuild production	Humanitarian funding should support local food production and rural livelihoods rather than relying exclusively on imported food assistance	DR Congo (n.d.)
Ukraine	FAO assessments show that small-scale and subsistence agriculture continues to buffer rural households against food insecurity, despite damaged assets, declining incomes and limited access to agricultural inputs	Hostilities, land contamination, damaged machinery, disrupted supply chains and reduced household purchasing power	Supporting household and smallholder production strengthens local control over food access during prolonged disruption	Locally adapted cropping, household gardens, input-efficient production, soil rehabilitation and restoration of small agricultural enterprises can sustain resilience	Recovery programs should protect small-scale producers, provide inputs and equipment, restore agricultural land and incorporate livelihood resilience into reconstruction planning	Nutrition Connect (n.d.)

further complicate recovery efforts. In post-conflict scenarios, land rights often become contentious, as people return to their homes or seek to reclaim their land. Disputes over ownership and access to resources can exacerbate tensions and slow the recovery of agricultural systems (Tchatchoua-Djomo and van Dijk 2022). In some cases, agricultural land is left abandoned or is repurposed for other uses, limiting the ability of communities to rebuild their food sovereignty. Without secure access to land, communities face significant barriers to re-establishing local food production and moving toward self-sufficiency (Touch et al. 2024). These challenges underline the need for a comprehensive and integrated approach to food security in conflict zones, one that not only addresses immediate food needs but also focuses on long-term strategies to restore agricultural productivity, reclaim lost knowledge, and rebuild local food systems. It is within this context that food sovereignty and agroecology present viable pathways forward—helping to transform vulnerable, post-conflict food systems into resilient, sustainable ones.

The findings listed in Table 2 all point to the need to continue considering agriculture as one of the areas most affected by conflict and as one of the areas most vital to recovery. In all the explored contexts, local food systems, access to productive assets, diversified agroecological farming and community engagement offer an opportunity to sustain livelihoods and decrease reliance on inefficient markets and market volatility, and on ongoing humanitarian support. However, strong enabling legislative conditions, including secure land tenure, ongoing investment, properly-functioning extension services, conflict-sensitive governance and women's inclusion in policy processes are needed.

3.4 | Cross-Contextual Patterns in Conflict-Affected Food Systems

The evidence across the settings reviewed shows that the impact of conflict on food systems is through intertwined pathways, and not the simple mechanism of decreased food production. The destruction of agricultural infrastructure, forced displacement, limited access to land and water, market segmentation, loss of productive capacities, and impaired institutions all contribute to a diminished capacity of households and communities to produce, exchange, and access food. The evidence we see from Palestine, Syria, Somalia, Sudan, the Democratic Republic of the Congo, Colombia and Ukraine tells us that supporting smallholder production, revitalizing local markets, facilitating access to productive resources and supporting locally governed food systems is critical. But the relative contribution of these mechanisms varies and is context dependent. Restrictions on movement, contaminated land and lost livelihoods are all paramount in Palestine and Ukraine; in Somalia and Sudan, there are multiple challenges from armed conflict, drought, flood, as well as from declining pastoralism and agriculture. Colombia also illustrates how effects of unequal distribution of land and fragility of rural institutions can still compromise food sovereignty, despite formal peace accords. The results show that a uniform package of practices cannot be used to implement agroecological recovery. Partly

because of its dependency on intensity of conflict, conditions of land tenure and ecological pressures, institutional capacity and community participation.

4 | Food Sovereignty as a Solution to Food Insecurity in Conflict Zones

Food sovereignty offers a transformative approach to addressing food insecurity in conflict zones. It is rooted in the belief that communities should have control over the production, distribution, and consumption of their food, without reliance on external actors or markets (Sampson et al. 2021). This approach goes beyond food security, which primarily focuses on ensuring sufficient food availability. Food sovereignty places a stronger emphasis on local control, equity, and sustainable food systems, making it particularly relevant in conflict-affected regions where traditional food systems have been disrupted (Cadavid et al. 2024).

4.1 | Overview of Food Sovereignty

Food sovereignty is a concept that emerged from the global peasant movement, particularly from La Via Campesina, and is based on the idea that the right to food should be tied to the ability of local communities to define their food systems (Byaruhanga 2024). Unlike traditional approaches that prioritize food security as a matter of food availability and access, food sovereignty emphasizes the rights of people to produce their own food and to decide how food should be produced, distributed, and consumed (Sampson et al. 2021). The principles of food sovereignty include:

- i. *Local Control over Food Systems*: Communities have the right to control the resources and processes involved in food production, including land, water, and seeds (Stella et al. 2019).
- ii. *Ecological Sustainability*: Food sovereignty promotes farming methods that respect the environment, protect biodiversity, and contribute to ecological resilience (Wittman 2023).
- iii. *Cultural Appropriateness*: Food sovereignty also respects local cultures and traditions, ensuring that food production aligns with the cultural values and preferences of the community (Weiler et al. 2015).
- iv. *Social Justice*: It calls for equity in food systems, addressing the needs and rights of marginalized groups such as women, indigenous peoples, and smallholder farmers (Blue Bird Jernigan et al. 2021).

In conflict zones, these principles of food sovereignty are especially relevant because they prioritize local autonomy and resilience, which are critical in environments where external aid is unreliable and often politicized. By focusing on local production and community control, food sovereignty offers a path to rebuilding food systems from the ground up, enabling communities to regain control over their food security and reduce dependency on volatile international aid.

4.2 | Empowerment of Local Communities

At the heart of food sovereignty is the empowerment of local communities. In conflict zones, where external humanitarian aid often dominates food systems, food sovereignty provides a means to restore agency to local populations. By re-establishing control over food production, communities can not only meet their immediate food needs but also begin to rebuild social and economic structures that have been weakened by conflict. Empowered communities are better positioned to design and implement their own solutions to food insecurity, incorporating local knowledge and cultural practices that are aligned with their needs (Dushkova and Ivlieva 2024). Food sovereignty can also strengthen community resilience by fostering collective action and cooperation. For example, farmer cooperatives or community-based food production networks can allow communities to share resources, skills, and knowledge, thus building solidarity and mutual support (Levkoe et al. 2019). In conflict-affected regions, where individual survival can often become the priority, such collective systems are invaluable in rebuilding social capital and reinforcing community ties. In this way, food sovereignty creates a foundation for peacebuilding, as it allows communities to take control of one of their most essential needs—food—and strengthens their capacity to face future crises. Moreover, by reducing reliance on external food aid, it can help mitigate the power imbalances that often arise from the distribution of aid, which can be politicized and disproportionately favor certain groups (Onyeaka et al. 2024).

4.3 | Relevance in Conflict Zones

In conflict zones, food sovereignty becomes even more critical due to the vulnerabilities created by instability. The disintegration of formal supply chains and the disruption of traditional agricultural practices often lead to dependency on international food aid. However, aid-based systems are temporary, unsustainable, and prone to inefficiencies and inequities. As aid systems often fail to address the root causes of food insecurity—such as land tenure insecurity, lack of local agricultural knowledge, and the erosion of social infrastructure—food sovereignty offers a sustainable alternative by enabling communities to restore and control their own food systems (Weiler et al. 2015). Furthermore, in conflict-prone areas where external assistance is often delayed or inadequate, food sovereignty can help communities build resilience and reduce their dependency on fragile international aid systems. By embracing food sovereignty, communities can develop their own methods of agricultural production that are not only sustainable but also better adapted to the specific challenges posed by their local environments, including disrupted ecosystems, scarce resources, and shifting climates (Rivera et al. 2024). In conflict zones, food sovereignty also aligns with broader goals of self-determination and peacebuilding. By asserting control over their food systems, communities can reclaim their dignity and independence, laying the groundwork for long-term social and political stability (Canfield et al. 2021). Rebuilding local food systems can help break the cycle of poverty and violence, creating an environment in which people can secure their livelihoods, rebuild social cohesion, and ultimately work

toward lasting peace. Ultimately, food sovereignty provides a framework through which conflict-affected communities can take charge of their food security, repair their agricultural systems, and strengthen their resilience to both current and future crises. As such, it is a powerful tool in the effort to rebuild post-conflict societies, providing not only food security but also the foundation for long-term social, political, and economic recovery.

5 | Agroecology: A Path to Resilience in Conflict Areas

Agroecology, as an agricultural approach, offers a transformative path to rebuilding food systems in conflict zones (Table 3). By focusing on ecological sustainability, community participation, and local knowledge, agroecology seeks to create resilient food systems that are capable of withstanding external shocks, including those caused by conflict, climate change, and economic instability (Kliem 2024). This approach integrates ecological principles with agricultural practices, using local resources and traditional farming knowledge to create more sustainable, self-sufficient, and adaptable food systems (Alum 2024b; Altieri et al. 2015).

5.1 | Principles of Agroecology

Agroecology is grounded in several key principles that make it particularly suitable for conflict-affected regions. These principles make agroecology particularly appropriate for rebuilding food systems in conflict zones, where ecological degradation, loss of biodiversity, and the depletion of resources are common. By applying agroecological practices, communities can restore their local ecosystems, enhance food security, and begin to rebuild their agricultural systems in ways that are both environmentally and economically sustainable. Principles of agroecology include:

- i. *Biodiversity and Ecosystem Health*: Agroecology promotes the use of diverse cropping systems that enhance biodiversity, improve soil health, and increase ecosystem resilience (Vikas and Ranjan 2024). Diverse ecosystems are better able to withstand disruptions, such as those caused by conflict, pests, or climate-related disasters. By encouraging crop rotation, polycultures, and the use of native plant species, agroecology helps maintain healthy ecosystems that can support food production over the long term (Bezner Kerr et al. 2023).
- ii. *Resilience and Adaptation*: Agroecology prioritizes practices that increase resilience to environmental stresses, such as droughts, floods, and soil erosion. In conflict zones, where access to external resources may be limited, agroecological methods like water conservation techniques, agroforestry, and integrated pest management can help communities adapt to rapidly changing conditions and ensure more stable food production (Akanmu et al. 2023).
- iii. *Local Knowledge and Participation*: Agroecology emphasizes the importance of integrating local knowledge and

TABLE 3 | Food sovereignty as a solution to food insecurity in conflict zones: challenges, strategies, and outcomes.

Aspect	Description	Benefits	Challenges	Examples	References
Local control over food systems	Communities manage their own food production, distribution, and consumption	Reduces reliance on external aid, increases food security	Limited resources, land access issues	Farmer cooperatives in Africa	Sampson et al. (2021); Stella et al. (2019)
Ecological sustainability	Encourages environmentally friendly farming practices such as agroecology	Protects biodiversity, enhances soil fertility	Initial transition challenges, requires knowledge transfer	Agroecological projects in Latin America	Wittman (2023); Bezner Kerr et al. (2023)
Cultural appropriateness	Food systems align with local dietary preferences and traditions	Supports cultural identity, improves nutrition	Threats from globalization, industrial agriculture	Indigenous food systems in Southeast Asia	Weiler et al. (2015)
Social justice	Prioritizes marginalized groups, ensuring equity in food access	Empowers women, indigenous communities, and small farmers	Policy barriers, social resistance	Community-led food projects in India	Blue Bird Jernigan et al. (2021)
Resilience in conflict zones	Strengthens local food production in unstable regions	Reduces dependency on international aid, increases self-sufficiency	Conflict-related disruptions, limited infrastructure	Small-scale farming initiatives in war-affected areas	Onyeaka et al. (2024); Rivera et al. (2024)
Peacebuilding and social cohesion	Strengthens community ties through collective farming initiatives	Reduces social tensions, fosters cooperation	Potential conflicts over land and resources	Post-conflict agricultural cooperatives	Canfield et al. (2021)
Economic self-sufficiency	Promotes local markets and reduced reliance on imports	Increases economic stability and employment	Market competition, pricing challenges	Local farmer markets in Sub-Saharan Africa	Le Goff et al. (2022)
Integration with agroecology	Utilizes agroecological principles to create sustainable food systems	Enhances adaptability to climate change and resource scarcity	Initial training and adaptation costs	Agroecology projects in Latin America and Africa	Kliem (2024); Altieri et al. (2015)

practices in farming systems. Farmers in conflict zones often have a deep understanding of their local environments and are best equipped to make decisions about how to adapt their agricultural practices to their unique circumstances. Agroecology encourages the participation of local communities in decision-making processes, fostering a sense of ownership and control over food systems (Ceddia et al. 2024).

- iv. *Sustainability*: At its core, agroecology seeks to reduce the environmental and social costs associated with conventional industrial agriculture. By focusing on sustainable farming practices, agroecology minimizes the need for external inputs such as chemical fertilizers and pesticides, making food systems more self-reliant and less vulnerable to external market fluctuations (Gamage et al. 2023).

5.2 | Agroecology's Role in Enhancing Food Security

Agroecology offers several tangible benefits for enhancing food security in conflict zones as outlined below:

- i. *Increased Productivity and Sustainability*: Agroecological methods are designed to increase food production without depleting natural resources. Practices like agroforestry, intercropping, and the use of organic fertilizers can improve soil fertility, increase water retention, and boost crop yields, making food systems more resilient to shocks and more productive in the long term (Octavia et al. 2023). These practices can be particularly important in conflict zones, where traditional agricultural systems may have been severely degraded by violence or neglect.
- ii. *Diverse and Nutritious Food Production*: Agroecology promotes the cultivation of a wide range of crops, which not only enhances food security but also improves nutrition. By growing diverse crops, communities can ensure that they have access to a variety of foods, reducing the risks associated with monocropping, such as crop failure due to pests or disease (Jaworski et al. 2023). Additionally, agroecology encourages the cultivation of traditional and indigenous crops that are well-suited to local climates and dietary needs, improving both food sovereignty and nutritional outcomes (Wittman 2023).
- iii. *Economic Self-Sufficiency*: Agroecological practices are cost-effective and rely less on external inputs such as synthetic fertilizers, pesticides, and imported seeds. This reduces the vulnerability of communities to external market fluctuations, such as rising food prices or disruptions in supply chains (Le Goff et al. 2022). By promoting local production and self-sufficiency, agroecology helps communities break free from the cycle of dependence on aid and external resources, fostering long-term economic stability (Le Goff et al. 2022).
- iv. *Restoration of Soil and Water Resources*: In conflict zones, soil erosion, land degradation, and water scarcity are common problems. Agroecological practices, such as

contour farming, water harvesting, and the use of green manure, help restore soil fertility and improve water retention, making land more productive and resilient to climate extremes (Wolf et al. 2023). These practices also help mitigate the environmental impacts of conflict, such as the destruction of ecosystems or the contamination of water sources.

5.3 | Agroecology as a Conflict-Resolution Tool

Beyond its role in food security, agroecology also has the potential to serve as a tool for conflict resolution and peacebuilding. The collaborative nature of agroecology encourages cooperation among farmers, communities, and local governments, fostering dialogue and building trust. In conflict zones, where social divisions are often deepened by violence and mistrust, agroecological initiatives can serve as platforms for reconciliation and collective action (McAllister and Wright 2019). Agroecology also promotes a more equitable distribution of resources, ensuring that marginalized groups, such as women, indigenous people, and smallholder farmers, have a voice in decision-making processes. In post-conflict situations, where rebuilding social structures is often as important as rebuilding infrastructure, agroecological practices can help restore social cohesion and reduce inequalities (Löhr et al. 2021). For example, community-based agroecological projects have been successful in bringing together diverse groups, facilitating communication, and promoting shared goals of food security and environmental stewardship (Isgren and Ness 2017). Moreover, agroecology's focus on environmental sustainability can help mitigate the environmental destruction caused by conflict. Rebuilding ecosystems through agroecological methods not only improves food security but also contributes to the restoration of landscapes that have been damaged by war (Edwards et al. 2021). This can create a sense of hope and purpose, as communities work together to repair the damage caused by conflict and move toward a more sustainable and peaceful future. Agroecology offers a powerful approach to rebuilding food systems in conflict zones. Its focus on sustainability, resilience, and local participation makes it particularly well-suited to addressing the challenges faced by conflict-affected communities. By integrating agroecology with food sovereignty, these communities can regain control over their food systems, enhance their food security, and begin to rebuild the foundations of social and economic stability.

6 | Synergies Between Food Sovereignty and Agroecology in Conflict Zones

The combination of food sovereignty and agroecology provides a holistic and integrated approach to building resilience in conflict-affected areas. While each framework offers distinct strengths, together they create a powerful synergy that can address the immediate needs for food security while simultaneously fostering long-term social, ecological, and economic stability. By empowering local communities, restoring sustainable agricultural practices, and fostering social cohesion, this combined approach can play a transformative role in rebuilding food systems in conflict zones (Gliessman et al. 2019).

6.1 | Complementary Strengths of Food Sovereignty and Agroecology

Food sovereignty and agroecology share common principles, which makes them natural allies in conflict zones. Both emphasize the importance of local control over food systems, ecological sustainability, and the value of indigenous knowledge. However, they address these principles from different angles, and their complementary strengths create a more robust and adaptive strategy for food security in crisis situations.

- i. *Local Control and Autonomy*: Food sovereignty emphasizes the need for communities to control their food production and distribution, reducing dependency on external aid and markets (Sampson et al. 2021). Agroecology, on the other hand, offers the tools and practices to restore and enhance local food production by promoting sustainable farming methods and biodiversity (Röös et al. 2022). Together, these frameworks enable communities to take charge of their food systems, strengthening their resilience to both conflict and external pressures. By combining the emphasis on self-determination with ecological practices, local food systems can become more independent, self-reliant, and adaptable.
- ii. *Ecological Sustainability*: Agroecology's focus on sustainable farming practices, such as crop diversification, soil conservation, and agroforestry, directly aligns with food sovereignty's goal of promoting ecological stewardship. In conflict zones, where environmental degradation is often exacerbated by war, these practices can restore and protect the natural resource base upon which local food systems depend (Vikas and Ranjan 2024). The combination of these approaches helps build food systems that are both resilient to environmental shocks and capable of producing nutritious, diverse, and culturally appropriate foods over the long term.
- iii. *Social Justice and Inclusion*: Both food sovereignty and agroecology prioritize social justice, equity, and the inclusion of marginalized groups in decision-making processes. Food sovereignty calls for empowering local communities, especially women, indigenous people, and small-scale farmers, to control their food systems (Blue Bird Jernigan et al. 2021). Agroecology fosters participation by integrating local knowledge and practices into farming systems. Together, these approaches ensure that the voices of marginalized groups are heard and that their needs are addressed in rebuilding food systems. In post-conflict zones, where inequalities and social divisions often deepen, this emphasis on inclusivity is essential for social cohesion and peacebuilding.

6.2 | Strengthening Community Resilience Through Combined Approaches

In conflict zones, resilience is key to surviving and recovering from the impacts of war. The integration of food sovereignty and agroecology strengthens community resilience by addressing both the immediate needs for food security and the long-term capacity of communities to recover and thrive.

6.2.1 | Building Adaptive Capacity

The combination of local control over food systems (food sovereignty) and sustainable farming practices (agroecology) enhances communities' ability to adapt to changing conditions. In conflict zones, where displacement, environmental destruction, and economic instability are common, this adaptive capacity is essential (Gliessman et al. 2019). Agroecology provides the tools for farmers to adapt their practices to different ecological conditions, while food sovereignty ensures that communities have the agency to make decisions based on their unique needs and circumstances. This holistic approach increases the likelihood that food systems will be resilient to future conflicts, climate impacts, or economic shocks.

6.2.2 | Restoring Agricultural Knowledge

One of the key challenges in conflict zones is the loss of agricultural knowledge due to displacement, trauma, and the breakdown of social networks. Food sovereignty and agroecology both emphasize the importance of reviving and preserving traditional farming knowledge (Anderson et al. 2019). While agroecology builds upon modern ecological principles, it also recognizes the value of indigenous knowledge systems and local agricultural practices. By reintroducing agroecological methods, communities can rebuild their knowledge base, empower local farmers, and restore the skills necessary for sustainable food production. This process not only ensures the viability of local food systems but also strengthens community ties, as the sharing of agricultural knowledge fosters cooperation and solidarity (Altieri et al. 2015).

6.2.3 | Creating Economic Opportunities

Agroecology and food sovereignty together can create economic opportunities in conflict zones by fostering local food production and promoting the development of sustainable livelihoods. By reducing dependency on external inputs and focusing on local resources, agroecology can help farmers increase productivity while maintaining ecological balance (Sinclair et al., n.d.). Food sovereignty ensures that the benefits of food production remain within the local community, contributing to the creation of a more equitable economy. Moreover, agroecology's emphasis on diverse farming systems, such as the integration of crops, livestock, and agroforestry, can open up new income-generating opportunities for communities, helping them recover economically after conflict (Johansson et al. 2023).

6.3 | Addressing Conflict Drivers Through Food Sovereignty and Agroecology

Beyond rebuilding food systems, the combined approach of food sovereignty and agroecology can also address some of the underlying drivers of conflict. Many conflicts are rooted in resource scarcity, inequality, and competition over land and water. By promoting equitable access to land, sustainable resource management, and community participation, food sovereignty and agroecology can reduce tensions over resources and promote more peaceful and stable societies (Onyeaka et al. 2024).

6.3.1 | Promoting Equity in Resource Distribution

Food sovereignty calls for equitable access to land and resources, ensuring that marginalized groups are not excluded from food production systems. In conflict zones, where land tenure issues and disputes over resources are common, food sovereignty can help restore land rights and promote fair distribution of resources. Agroecology supports this by encouraging practices that use resources efficiently and sustainably, reducing the pressure on land and water (Isgren and Ness 2017).

6.3.2 | Reducing Resource-Driven Conflicts

Resource scarcity, particularly access to water and arable land, is often a source of tension in conflict zones. The ecological practices promoted by agroecology, such as water conservation, soil restoration, and agroforestry, can help mitigate the impacts of resource depletion (Okello et al. 2024). By enhancing the sustainability of food production systems, agroecology reduces the competition for resources, fostering cooperation among communities and promoting long-term peacebuilding (Gamage et al. 2023).

6.4 | Rebuilding Social Cohesion

Food sovereignty and agroecology have the potential to foster social cohesion in post-conflict settings. The collective action required to implement agroecological practices encourages collaboration, while the focus on food sovereignty ensures that the benefits of these practices are shared equitably (Zeng et al. 2023). By bringing communities together to rebuild food systems, these approaches help heal the social divisions caused by conflict and contribute to the creation of more inclusive, stable societies. The synergy between food sovereignty and agroecology offers a comprehensive and sustainable solution to the food crises faced by communities in conflict zones. By restoring local control over food systems, promoting ecological sustainability, and fostering social inclusion, this integrated approach empowers communities to rebuild and thrive after conflict. Ultimately, the combination of food sovereignty and agroecology can lay the foundation for long-term peace, resilience, and food security in regions affected by war.

6.5 | Interpreting the Synergy Through Resilience and Peacebuilding Frameworks

There is a relationship between food sovereignty and agroecology that can be seen with the concept of social-ecological resilience. Resilience in food systems in conflict situations does not just mean the ability to keep food production going during crisis; it means the ability to absorb the shock or disturbance, adapt their livelihoods and institutions, and, most importantly, transform unequal or environmentally unsustainable food-system structures. Agroecological practices support absorptive capacity through increasing crop diversity, saving water, maintaining the fertility of the land, and decreasing reliance on outside and unavailable or costly inputs. By allowing farmers to adjust production systems to account for displacement, climatic variability, market disruption, and resource constraints, they help

build adaptive capacity. Thus, the principle of food sovereignty is one that allows us to shift towards transformative capacity by increasing the ability of communities to participate in food-system governance, organize themselves collectively, and have decision-making power and local control over their land and their seeds.

Resilience, however, should not be equated with communities' ability to withstand ongoing security crises. An overemphasis on the miniaturizing of self-reliance can push the burden of responsibility beyond governments, humanitarian actors, and armed actors and back on already challenged communities. However, agroecology can't enhance resilience without land protection, security, finance, working markets, and the participation of responsible institutions. It is, therefore, an if-and-then kind of peace-building contribution. While trust and collective action can be promoted via shared farming, sharing of water resources, seed networks, and cooperatives, poorly designed interventions can ripple existing inequalities or exacerbate land and resource conflicts. The linkage of the combined framework with rights-based governance, conflict sensitivity, and inclusive institutional reform is the most effective.

7 | Case Studies: Success Stories in Conflict Zones

The transformative potential of food sovereignty and agroecology in conflict zones is not merely theoretical; it has been realized in several regions where agroecological practices have played a key role in rebuilding food systems, restoring ecological balance, and promoting social cohesion. These success stories demonstrate the viability of agroecology as a pathway to sustainable recovery and resilience in areas affected by war, displacement, and environmental degradation. The following case studies highlight different conflict zones where agroecology has been successfully implemented and the key lessons learned.

7.1 | Post-Conflict Colombia: Rebuilding Agricultural Systems and Promoting Peace

Colombia has faced decades of armed conflict, resulting in significant loss of life, displacement, and environmental degradation. The country's agricultural systems were severely disrupted, with rural communities suffering from a lack of access to land, markets, and support systems (Triana Ángel et al. 2024). However, the Colombian peace process, initiated with the 2016 peace agreement between the government and the Revolutionary Armed Forces of Colombia (FARC), opened the door to agroecological interventions aimed at restoring sustainable farming practices in former conflict zones (Herbolzheimer, n.d.). A key initiative that emerged from this process was the "Agroecology and Peace" program, which brought together local farmers, former combatants, and rural communities to rebuild agroecological systems. The program focused on restoring soil health, increasing biodiversity, and promoting small-scale, diversified farming systems. Through participatory workshops and training, farmers learned about sustainable practices such as organic farming, agroforestry, and integrated pest management. These

practices not only improved food security but also helped to heal the social fabric, fostering trust and cooperation between former adversaries (Herbolzheimer, [n.d.](#)). The success of this program is evident in the re-establishment of thriving agricultural communities in rural Colombia. The project demonstrated that agroecology, when embedded within peacebuilding frameworks, can promote both environmental restoration and social healing. By addressing the root causes of conflict—such as land inequality and lack of access to resources—agroecology helped create a foundation for lasting peace.

Key Lessons

- i. The integration of agroecology into peacebuilding efforts can foster both ecological and social resilience.
- ii. Community-driven approaches that involve former combatants and displaced persons are crucial for rebuilding trust and social cohesion.
- iii. Agroecological practices can offer both short-term and long-term benefits in post-conflict settings, improving food security and promoting sustainable livelihoods.

7.2 | Rural Palestine: Agroecology as a Tool for Food Sovereignty Under Occupation

In Palestine, decades of conflict, military occupation, and political instability have severely disrupted agricultural systems. Restricted access to land, water, and markets has made it difficult for Palestinian farmers to sustain their livelihoods. Despite these challenges, the application of agroecological principles has allowed Palestinian communities to reclaim their food sovereignty and rebuild local food systems (Asi [2020](#)). One prominent example is the work of the Palestinian Agricultural Relief Committees (PARC), an NGO that has been promoting agroecology as a means of enhancing food security and resilience. PARC's initiatives focus on organic farming, water conservation, and agroforestry, aiming to reduce dependency on external food sources and international aid. PARC has worked with Palestinian farmers to restore traditional agricultural knowledge, incorporating techniques such as rainwater harvesting and soil conservation (Art-D  v and Markaz-Co, [n.d.](#)). In addition, PARC has facilitated the creation of local markets for agroecologically produced food, ensuring that farmers have access to fair prices and reducing reliance on imported goods. These efforts have been especially important in rural areas, where economic isolation and restricted access to external resources have intensified poverty. The success of agroecological initiatives in Palestine highlights the power of local knowledge and community-based solutions in overcoming external challenges. By focusing on sustainability and self-reliance, agroecology has enabled Palestinian farmers to resist the pressures of occupation and maintain their cultural and ecological heritage (Heinrich-B  ll-Stiftung, [n.d.](#)).

Key Lessons

- i. Agroecology can be a powerful tool for asserting food sovereignty in the face of external pressures, such as occupation and economic blockade.

- ii. Strengthening local food systems through community-based initiatives is essential for long-term resilience.
- iii. The integration of traditional knowledge with modern agroecological practices can enhance the sustainability and effectiveness of food systems in conflict-affected areas.

7.3 | Syria: Agroecological Resilience Amidst War and Displacement

The conflict in Syria has led to widespread destruction of infrastructure, displacement, and severe food insecurity. However, in the face of these challenges, many communities have turned to agroecology to rebuild their agricultural systems and regain control over their food sources. In the war-torn region of Aleppo, farmers have revived traditional agroecological practices such as crop diversification, organic farming, and local seed saving to adapt to the disrupted conditions. Despite the lack of resources, these communities have managed to maintain sustainable food production by focusing on local varieties of crops that are more resilient to climate change and war-related stresses. The use of organic fertilizers, composting, and integrated pest management has also helped reduce the reliance on chemical inputs, which are often unavailable due to the conflict (Dinc and Eklund [2024](#)). Furthermore, NGOs and community organizations in Syria have played a critical role in providing technical assistance and training to farmers. For example, the Syrian Rural Development Programme (SRDP) has supported the implementation of agroecological practices by offering workshops on organic farming, water management, and sustainable livestock husbandry. These efforts have contributed to the stabilization of local food systems, reducing the dependence on food aid and increasing food security for displaced families. The success of agroecological practices in Syria demonstrates the resilience of farming communities even in the direst circumstances. By adapting to the new reality of war and displacement, these communities have proven that agroecology can provide a foundation for recovery and food security even in the midst of ongoing conflict (Gorevan et al., [n.d.](#)).

Key Lessons

- i. Agroecology can offer practical solutions to food insecurity and environmental degradation in conflict zones.
- ii. The resilience of local communities and the ability to adapt traditional practices to contemporary challenges are crucial for maintaining food sovereignty.
- iii. Community-led training and technical support are essential for building the capacity of farmers to implement agroecological practices in conflict settings.

7.4 | Somalia: Agroecological Approaches to Drought and Conflict

Somalia has long been plagued by a combination of civil conflict, drought, and displacement, which has had devastating effects on food security. With a large proportion of the population dependent on agriculture and pastoralism, the country's food systems have been vulnerable to both conflict and

climate-related shocks. In response, agroecological practices have emerged as a means of restoring resilience to food systems and communities (Bedasa and Deksisia 2024). One notable initiative is the work of the Somali Agroecology Network (SAN), which focuses on promoting sustainable agricultural practices in the face of ongoing conflict and climate variability. SAN has introduced climate-smart agroecological techniques, such as drought-tolerant crops, water-efficient irrigation methods, and agroforestry, which help farmers cope with the effects of prolonged droughts and water scarcity. The organization also emphasizes the importance of indigenous knowledge in managing the land and water resources sustainably (Ahmed et al. 2004). In addition to addressing environmental challenges, SAN has facilitated dialogue between different ethnic and clan groups over shared natural resources, helping to reduce tensions and promote peacebuilding. By bringing together farmers, pastoralists, and local communities to discuss and implement agroecological practices, SAN has fostered cooperation and mutual understanding, which are critical to rebuilding social cohesion in conflict-affected areas (Warsame et al. 2023). The success of agroecology in Somalia demonstrates how ecological restoration and conflict resolution can go hand in hand. By focusing on both environmental sustainability and social cooperation, agroecology has contributed to the rebuilding of Somalia's food systems and has enhanced resilience against both conflict and climate change.

Key Lessons

- i. Agroecological practices can address the dual challenges of conflict and climate change, enhancing the resilience of food systems.
- ii. Dialogue and cooperation between different social and ethnic groups are essential for building long-term peace and food security in conflict zones.
- iii. The integration of indigenous knowledge and modern agroecological techniques can provide sustainable solutions to resource management and food production.

These case studies from Colombia, Palestine, Syria, and Somalia illustrate the transformative potential of agroecology in conflict zones. While each context is unique, the common thread is that agroecological practices provide a means of addressing food insecurity, rebuilding social cohesion, and restoring ecological health in areas ravaged by war and displacement. The success stories highlight the importance of community-driven, locally adapted solutions that prioritize food sovereignty, resilience, and sustainability. By learning from these experiences, other conflict-affected regions can explore the potential of agroecology as a tool for recovery and long-term peacebuilding.

7.5 | Cross-Case Synthesis: Consensus, Variation, and Emerging Insights

Comparison of the four principal cases reveals several areas of agreement. First, locally adapted agroecological practices were most effective when they relied on community knowledge, farmer participation, and resources already available within

affected areas. Crop diversification, local seed conservation, organic soil management, water harvesting, agroforestry, and local market development repeatedly emerged as mechanisms for reducing dependence on disrupted supply chains. Second, agroecological initiatives contributed to resilience through multiple pathways, including food availability, income generation, ecological restoration, knowledge preservation, and collective organization. Third, the evidence indicates that community institutions, cooperatives, farmer networks, and civil-society organizations often compensate for weak or absent formal agricultural services.

Important differences also emerge. In Colombia, agroecology is closely connected with land reform, rural reintegration, and post-agreement peacebuilding. In Palestine, food sovereignty is shaped by restricted access to land, water, markets, and mobility, making agroecology a strategy of localization and political-economic autonomy. In Syria, the evidence emphasizes adaptation under continuing war, damaged infrastructure, input scarcity, and displacement. Somalia illustrates the interaction between conflict, pastoral vulnerability, drought, flooding, and intergroup competition over natural resources. These differences show that agroecology is not a single intervention but a context-dependent collection of ecological, institutional, and political practices.

The literature also presents tensions. Although many sources associate agroecology with improved resilience, evidence of its long-term effects on yields, household income, nutrition, conflict reduction, and post-conflict reintegration remains uneven. Some studies emphasize ecological and social benefits, whereas others identify financing constraints, labor requirements, limited extension support, weak markets, and uncertain land rights as major barriers to adoption. Consequently, claims that agroecology directly produces peace should be treated cautiously. Available evidence more strongly supports the conclusion that agroecology can create enabling conditions for peacebuilding—such as cooperation, livelihood recovery, reduced input dependence, and shared resource management—when supported by inclusive governance and secure rights.

8 | Challenges and Barriers to Implementing Food Sovereignty and Agroecology in Conflict Zones

While the integration of food sovereignty and agroecology offers a promising approach to building resilience in conflict zones, several significant challenges and barriers can hinder their successful implementation. These challenges stem from both the nature of conflict itself and the broader socio-political and economic conditions in affected regions. Overcoming these obstacles requires targeted interventions, innovative solutions, and strong political will.

8.1 | Violence and Insecurity

Ongoing violence and insecurity remain the most significant barriers to the implementation of food sovereignty and agroecology in conflict zones. In many regions experiencing armed

conflict, access to land, resources, and markets is severely restricted, making it difficult for communities to practice agriculture, let alone adopt sustainable agroecological methods. Farmers may be forced to abandon their lands or flee to refugee camps, where access to land and resources is often limited (Lin et al. 2022). Even when displaced people return to their homes, the physical and psychological scars of conflict can impair their ability to engage in productive agricultural activities. The pervasive insecurity in conflict zones can prevent farmers from participating in agroecological initiatives, which often require stable conditions for knowledge exchange, resource management, and long-term planning. This insecurity also complicates the provision of necessary support services, such as extension services, financial assistance, and access to agricultural inputs, all of which are essential for implementing agroecological practices (Méndez et al. 2017). In some cases, agroecology may be perceived as a “high-risk” investment for farmers when the security situation is unstable, as it requires longer-term commitments to soil restoration and biodiversity-building efforts (Pretty and Bharucha 2014).

8.2 | Limited Access to Land and Resources

Access to land is a central issue in conflict zones, where land tenure systems may be disrupted or unclear. Displacement, land grabbing, and the destruction of infrastructure often leave communities without secure land rights, which is a major barrier to sustainable food production. Without clear land tenure, farmers may be unwilling to invest in long-term agricultural practices such as agroecology, which requires consistent access to land over time (Slotkin, n.d.). In some cases, land redistribution or restitution processes can be contentious, especially when disputes arise over the ownership or control of land (Joireman and Tchatchoua-Djomo 2023). Additionally, the destruction of critical agricultural infrastructure, including irrigation systems, storage facilities, and markets, can further hinder food sovereignty efforts (Bjornlund et al. 2022). Even when land is available, the lack of financial resources to purchase tools, seeds, and other inputs needed for agroecological farming can prevent communities from making the transition to more sustainable practices (Branca et al. 2022).

8.3 | Lack of Knowledge and Capacity

Agroecology requires significant knowledge and skills to implement effectively, particularly in conflict zones where traditional agricultural knowledge may have been lost or disrupted. In regions where farming systems have been severely impacted by conflict, farmers may lack the technical expertise needed to adopt agroecological practices, such as soil conservation, agroforestry, or crop diversification (Mekuria et al. 2022). In addition, many conflict zones lack the infrastructure for agricultural training and extension services, which are essential for building the capacity of farmers and communities to implement agroecology. The absence of trained professionals, such as agronomists or agroecologists, can make it difficult to transfer knowledge to local farmers and support them in the transition to more sustainable practices (Ayoub 2023). The need for capacity-building efforts that focus on both technical

skills and community organization is crucial in overcoming this challenge.

8.4 | Economic Constraints

Economic instability is another key challenge in conflict zones, where food insecurity, unemployment, and inflation are often widespread. In many conflict-affected areas, the economy is largely dependent on humanitarian aid and remittances, with limited opportunities for local economic development (Barkat et al. 2024). This economic context can make it difficult for agroecological initiatives to gain traction, as communities may prioritize short-term survival over long-term investments in sustainable agricultural practices. Agroecology requires access to both financial resources and markets for local products. However, conflict zones often lack functioning markets, and transportation infrastructure may be destroyed, making it difficult for farmers to sell their products or access the inputs needed for agroecological farming (Autio et al. 2021). Additionally, the transition from conventional agriculture, which often relies on external inputs such as fertilizers and pesticides, to agroecology can be financially challenging (Pépin et al. 2021). The initial investment in knowledge, labor, and materials can be a barrier for communities struggling with economic instability.

8.5 | Political and Institutional Challenges

The political environment in conflict zones can present significant barriers to the implementation of food sovereignty and agroecology. In many cases, governments may be focused on immediate security concerns rather than long-term agricultural development (Mercado and Nico Hjortsø 2023). The lack of political will to support sustainable agriculture, coupled with weak governance structures, can undermine efforts to promote food sovereignty and agroecology. In conflict zones, where governance is often fragmented or nonexistent, local communities may lack the institutional support they need to implement agroecological practices. Political instability, corruption, and competing interests can hinder the establishment of policies and regulations that support sustainable agriculture (Fiore et al. 2024). Additionally, in some areas, agroecology may face resistance from powerful stakeholders, such as multinational agribusinesses or government agencies that favor industrial agriculture over local, sustainable solutions (Zeng et al. 2023).

8.6 | Cultural and Social Resistance

In some cases, communities may resist adopting agroecological practices due to cultural beliefs or social norms that prioritize conventional farming methods. For example, in some regions, industrial agriculture may be seen as the only viable option for increasing productivity, and there may be skepticism about the effectiveness of agroecology (Mekuria et al. 2022). Additionally, traditional agricultural practices that align with agroecology may be viewed as outdated or less productive, especially in areas where conventional farming has been the dominant system for

decades (Sumberg and Giller 2022). Social divisions, often exacerbated by conflict, can also impede the implementation of agroecology. In areas where ethnic, religious, or political tensions are high, it may be difficult to bring together diverse communities to work toward a common goal of food sovereignty (Borra Jr. 2023). Agroecology's emphasis on collaboration and collective decision-making may face resistance in such contexts, particularly if communities are divided along lines of conflict or distrust.

8.7 | Environmental Degradation

Conflict can lead to significant environmental degradation, including deforestation, soil erosion, and contamination of water sources. These environmental challenges complicate the implementation of agroecology, which requires healthy ecosystems and natural resources to be effective (Chowdhury et al. 2022). Rebuilding ecosystems and restoring soil health in post-conflict zones may require substantial time and effort, and the process can be further delayed by ongoing violence or displacement. In many conflict zones, the damage to the environment is compounded by climate change, which is already exacerbating environmental stress in many regions. The combination of war-related environmental destruction and climate change makes it more difficult for communities to rebuild sustainable agricultural systems, as agroecology relies on a healthy environment to support food production (Feliciano 2022).

8.8 | Strengths and Limitations of the Existing Evidence

The evidence reviewed has a number of strengths. It highlights aspects of the food system which are largely excluded from traditional humanitarian assessments, such as community organization, women's participation, land rights, ecological restoration, and local knowledge and seed autonomy. The frequency with which a variety of those findings are reported in widely different locations gives greater confidence that a larger share of diversified production, local control of resources, farmer networks, and fewer reliance on external resources are all relevant to resilience. Peer-reviewed study evidence is complemented by humanitarian assessments, policy reports, and program experience which make it possible to link household-level outcomes with institutional and policy level outcomes.

However, there are some limitations in these evidence base studies. Many of the publications are case studies with description, conceptual analysis, program report or cross-sectional assessment. Few use longitudinal approaches or counterfactual analyses or harmonized indicators that can tell whether agroecological practices alone impact better food security, nutrition, income, ecological regeneration, or peacebuilding. Publication and selection biases may result in successful or well-documented interventions being more often the subject matter of publications, with unsuccessful programs being reported less often. Collecting primary data from areas where conflict is ongoing is specifically constraining due to insecurity, inefficient

data collection systems, limited access to sites and ethical issues. Furthermore, there are different interpretations of what food sovereignty is and what agroecology is across the studies, making a direct comparison difficult. Due to these constraints, the literature shows a significant level of plausibility and much contextual relevance but still lacks uniform causal evidence in all the conflict scenarios.

9 | Overcoming the Barriers to Implementing Food Sovereignty and Agroecology in Conflict Zones

By addressing these barriers, the potential of food sovereignty and agroecology to transform food systems in conflict zones can be fully realized, contributing to long-term peace, resilience, and sustainable development. To overcome these barriers, a multifaceted approach is necessary. Key strategies include:

9.1 | Building Peace and Security

Ensuring a peaceful and secure environment is fundamental for enabling communities to engage in agricultural activities and adopt agroecological practices. Efforts to end violence, establish rule of law, and support post-conflict peacebuilding can create the conditions for sustainable agriculture (Krampe et al. 2021).

9.2 | Strengthening Land Tenure Systems

Clear land rights and equitable access to land are essential for promoting food sovereignty and agroecology (Onyeaka et al. 2024). Land restitution and redistribution processes, combined with the protection of local land rights, can help restore confidence and security for farmers.

9.3 | Capacity-Building and Education

Investing in agricultural education and extension services can empower communities with the knowledge and skills needed to implement agroecology. Training programs, supported by local agricultural experts and international partners, can bridge knowledge gaps and build the necessary human capital.

9.4 | Access to Financing and Markets

Providing financial support, such as microloans or grants, can help communities overcome the economic barriers to adopting agroecology. Similarly, establishing local markets and improving infrastructure can enable farmers to sell their produce and access necessary inputs.

9.5 | Inclusive Governance

Ensuring that all stakeholders, including marginalized groups, have a voice in the planning and implementation of

agroecological initiatives can promote social cohesion and enhance the sustainability of food sovereignty efforts.

10 | Policy Recommendations and Strategies for Supporting Food Sovereignty and Agroecology in Conflict Zones

The evidence examined shows that there is a need to ensure that policy effectiveness is about the combination of the three levels of interventions. Seed access, water conservation, diversified production, soil restoration, livestock protection, and extension service enhance productive capacity at the household and farm levels. Social and institutional resilience is strengthened through cooperative, local market, farmer-to-farmer learning, collective resource management, and participatory decision making at the community level. Agricultural recovery activities at the national and humanitarian-policy level can nurture the conditions for local agricultural initiatives to continue: protection of land-tenure rights, rural infrastructure, funding, coordination between emergency assistance and agricultural recovery, and conflict-sensitive governance. Thus, across the settings studied, evidence points to the following: Ten approaches that separate the phases of food aid and agricultural recovery are in conflict with evidence. Immediate measures should be taken for saving lives and for conserving productive assets, local markets, agricultural knowledge, and community institutions. However, with the policy transfer process, it should be context-sensitive as interventions that have worked well in post-agreement Colombia might not be possible in the context of ongoing conflict, occupation, or displacement.

For food sovereignty and agroecology to be successfully implemented and sustained in conflict zones, targeted policies and strategies must be developed. Policies, financial support, governance structures, and community participation all play essential roles in ensuring that agroecological practices can thrive and that food sovereignty can be restored in post-conflict settings. These policies should address the specific needs and challenges of post-conflict communities while fostering a supportive environment for local food systems (Johansson et al. 2023). Given the complexity and scale of the challenges in implementing agroecology, as outlined earlier, a multi-level approach involving national governments, international organizations, local communities, and civil society actors is essential. With the right combination of local, national, and international efforts, the foundations for sustainable, resilient food systems can be established, contributing to peace, stability, and food security in conflict zones.

10.1 | Promoting Policy Frameworks That Support Food Sovereignty and Agroecology

Governments and international organizations must prioritize the integration of food sovereignty and agroecology into post-conflict recovery frameworks. This involves creating national and regional policies that explicitly recognize the importance of local control over food systems and sustainable agricultural practices, especially in the following areas:

10.1.1 | Land Reform and Tenure Security

One of the primary policy interventions should be the recognition and protection of land rights, especially for vulnerable groups such as women, indigenous peoples, and displaced persons. Land reforms that ensure secure tenure rights and equitable land access are vital for creating an environment conducive to agroecology. Strengthening land rights legislation and providing land restitution programs can help restore communities' confidence in agricultural investments (Lawry et al. 2014).

10.1.2 | Incorporating Agroecology into Agricultural Policy

National agricultural policies should promote agroecology as a key strategy for rebuilding food systems. Governments can incentivize agroecological practices through subsidies, training programs, and access to credit. Integrating agroecology into broader agricultural and rural development policies can help align food sovereignty with national development goals, particularly in conflict-affected regions where traditional agricultural practices have been disrupted (Dawson et al. 2019).

10.1.3 | Conflict-Sensitive Development Policies

Policies should be designed with a conflict-sensitive approach, recognizing the underlying causes of violence and incorporating mechanisms that prevent further escalation. This includes addressing resource-based conflicts, promoting social inclusion, and ensuring that agricultural policies do not exacerbate existing inequalities. Policies that foster dialogue and cooperation between different social and ethnic groups can promote peace and stability, contributing to a stronger foundation for food sovereignty initiatives (Onyeaka et al. 2024).

10.2 | Strengthening Local Institutions and Governance Structures

Local governance and institutions play a central role in implementing and sustaining food sovereignty and agroecology in conflict zones. Strengthening these institutions is crucial to ensuring that communities are empowered to take ownership of their food systems and effectively manage their resources. This can be achieved by the following.

10.2.1 | Decentralization of Power

Decentralizing agricultural governance to local levels can increase responsiveness to community needs, foster greater participation in decision-making, and promote more context-specific solutions (Bashaasha et al., n.d.). Local governments should be supported in developing capacities for managing agricultural recovery programs and coordinating community-based agroecological initiatives.

10.2.2 | Capacity-Building for Local Leadership

Leadership at the local level is key to successfully implementing agroecology and food sovereignty. Training and supporting local leaders, community-based organizations, and farmer cooperatives can build the human capital needed to guide sustainable agricultural practices (Kalogiannidis et al. 2024). These institutions can act as bridges between communities and national governments, ensuring that local priorities are addressed and fostering community ownership of food systems.

10.2.3 | Strengthening Farmer Networks and Cooperatives

Building strong networks of farmers and cooperatives can help amplify the voices of small-scale producers, enabling them to advocate for policies and resources that support food sovereignty and agroecology (López-García and Carrascosa-García 2023). These networks can also provide a platform for knowledge exchange, resource sharing, and mutual support, helping farmers to overcome collective challenges, such as accessing markets or securing seeds (Dower and Gaddis 2021).

10.3 | Increasing Financial Support for Agroecological Initiatives

Financial resources are crucial to the successful implementation of agroecology and food sovereignty in conflict zones. Both local and international actors must increase investments in agricultural recovery and sustainable development initiatives.

10.3.1 | Microfinance and Credit Programs

Access to credit is essential for farmers in conflict zones to rebuild their agricultural operations. Microfinance programs and low-interest loans can provide the initial capital required for adopting agroecological practices, such as purchasing organic inputs, building infrastructure, or investing in agroforestry systems (Stringer et al. 2020). International financial institutions and non-governmental organizations can support these programs to ensure that farmers have the financial support they need during recovery periods.

10.3.2 | International Aid for Agroecology

International aid organizations should direct funding toward agroecological projects that integrate food sovereignty principles. Aid should prioritize local ownership and long-term sustainability, rather than short-term relief, ensuring that support leads to the transformation of agricultural systems (Bisht et al. 2021). Humanitarian assistance should incorporate agroecological principles in food distribution and recovery programs, which can help restore agricultural livelihoods and increase resilience to future crises (Mumararungu et al. 2024).

10.3.3 | Public-Private Partnerships

Encouraging public-private partnerships (PPPs) can mobilize additional resources and expertise for agroecological initiatives. PPPs can help build the necessary infrastructure for sustainable agriculture, including transportation, storage facilities, and access to local markets (Turley and Uzsoki 2014). They can also support capacity-building programs and the development of sustainable value chains for agroecological products.

10.4 | Fostering International Cooperation and Knowledge Exchange

International cooperation and knowledge exchange are vital to advancing food sovereignty and agroecology in conflict zones. While local context must always be considered, there is much to learn from other regions where agroecological practices have been successfully implemented.

10.4.1 | South-South Cooperation

Countries and regions with experience in agroecology, particularly those that have faced conflict or environmental degradation, can share their knowledge and expertise with communities in conflict zones. South-South cooperation initiatives can facilitate the transfer of knowledge, technologies, and best practices for sustainable agriculture, empowering local farmers to adopt effective agroecological methods (Kampini and Kalepa 2024).

10.4.2 | Global Networks and Alliances

Creating or strengthening global networks of agroecology practitioners, civil society organizations, and international agencies can help promote the adoption of food sovereignty and agroecology. These networks can advocate for policy changes, facilitate the exchange of knowledge, and offer technical assistance to conflict-affected regions (Rivera-Ferre et al. 2021).

10.4.3 | Leveraging International Legal Frameworks

International frameworks, such as the UN's Food Systems Summit or the UN Decade on Ecosystem Restoration, can help create a global commitment to sustainable agricultural practices. These frameworks can encourage countries to adopt agroecological principles in their agricultural policies and strategies, creating a global movement that reinforces the work happening on the ground in conflict zones (von Braun et al. 2021).

10.5 | Building Community-Based, Resilient Food Systems

The success of food sovereignty and agroecology in conflict zones depends on the active involvement of local communities in shaping their own food systems. Efforts to rebuild food

sovereignty must be grounded in community-based approaches that prioritize local needs, knowledge, and capacities. This can be achieved through:

10.5.1 | Community-Led Recovery

Efforts to restore food systems in conflict zones should be led by communities themselves. Community-led recovery programs ensure that interventions are culturally appropriate and relevant to local needs. These programs also promote social cohesion, as they encourage collaboration across different groups and foster a sense of ownership over the recovery process (Carrasco et al. 2023).

10.5.2 | Participatory Planning and Decision-Making

Inclusive, participatory processes that involve all community members in planning and decision-making can lead to more equitable and sustainable outcomes. In conflict zones, where social divisions may have been exacerbated, participatory planning fosters social cohesion and ensures that the voices of marginalized groups are heard (Brady et al. 2020). It also helps build trust in the process, increasing the likelihood of successful implementation.

10.5.3 | Promoting Local Food Systems and Resilient Livelihoods

Rebuilding local food systems that are both diverse and resilient to external shocks is central to achieving long-term food sovereignty (Chavez-Miguel et al. 2024). Community-level initiatives should focus on supporting diverse farming systems, strengthening local food markets, and rebuilding food distribution networks that prioritize local products. These efforts can help reduce dependence on external aid and promote food security that is independent of volatile global markets.

11 | Future Directions and Research Gaps

As the global community continues to explore the potential of food sovereignty and agroecology in conflict zones, several key areas of research and development warrant further attention. Addressing these gaps will be essential to refining strategies, improving outcomes, and ensuring that agroecology remains a viable approach for rebuilding food systems and promoting resilience in post-conflict settings.

11.1 | Research on the Socio-Political Dimensions of Agroecology in Conflict Zones

While agroecology is often viewed as an agricultural practice, its full potential in conflict zones can only be realized if the socio-political dimensions are thoroughly understood and addressed. Research that explores the complex relationships between agroecology, governance, and peacebuilding is essential. This includes:

- i. *Examining the role of land tenure systems:* Research into how land rights and tenure systems can be restructured in post-conflict societies is crucial for fostering food sovereignty. Land conflicts are often at the heart of many post-conflict situations, and ensuring equitable access to land for all community members, particularly marginalized groups, is essential to long-term peace and food security.
- ii. *Investigating power dynamics and local governance:* Understanding the role of local governance structures and the power dynamics within communities is crucial for the success of agroecological initiatives. Research should examine how agroecology can help build social capital, reduce social tensions, and strengthen democratic governance processes in post-conflict regions.
- iii. *Exploring the intersection of agroecology and gender equality:* Gender dynamics play a crucial role in the adoption and success of agroecology in conflict zones. Research that explores how agroecological practices can empower women, address gender-based inequalities, and foster greater gender equity in agricultural systems will be critical to ensuring inclusive recovery processes.

11.2 | Evaluating the Ecological and Agricultural Impact of Agroecology in Post-Conflict Areas

Agroecology offers significant potential for restoring ecological balance and promoting sustainable agricultural practices, yet further research is needed to fully understand its effectiveness in post-conflict contexts. Key areas for investigation include:

- i. *Soil restoration and biodiversity enhancement:* Conflict often leads to soil degradation and loss of biodiversity. Research into the specific agroecological practices that can restore soil health and enhance biodiversity in post-conflict regions is essential. Understanding how agroecology can rehabilitate degraded lands and promote long-term environmental sustainability will be crucial for rebuilding food systems that are both resilient and ecologically viable.
- ii. *Agroecological adaptations to climate change:* Climate change poses an additional threat to food security in conflict zones. Research on how agroecological practices can be adapted to mitigate the impacts of climate change in these regions is needed. This includes exploring how agroecological systems can increase climate resilience, improve water management, and reduce the vulnerability of food systems to extreme weather events.
- iii. *Assessing the productivity and efficiency of agroecological systems:* While agroecology is lauded for its ecological benefits, there is still a need for comprehensive research on its productivity, efficiency, and scalability in post-conflict settings. Understanding how agroecological systems can meet the food security needs of communities while maintaining environmental sustainability will be essential for promoting its widespread adoption.

11.3 | Integrating Agroecology With Broader Conflict Resolution and Development Frameworks

Agroecology should not be viewed in isolation but as part of a broader framework for post-conflict recovery and peacebuilding. Future research should explore how agroecology can be integrated with conflict resolution and development initiatives to achieve sustainable peace and resilience. This could include:

- i. *Exploring agroecology as a tool for conflict resolution:* Research into the potential of agroecology as a peace-building tool is an emerging area. Agroecological practices that promote cooperation, community cohesion, and shared resource management can be critical in conflict resolution processes. Studies that investigate the role of agroecology in fostering dialogue and collaboration between different groups in post-conflict societies will contribute to the development of integrated peace-building strategies.
- ii. *Linking agroecology with economic recovery:* Research is needed to explore how agroecological practices can be linked to broader economic recovery efforts in post-conflict zones. This includes investigating how agroecology can create employment opportunities, foster entrepreneurship, and generate sustainable income sources for communities, particularly in rural areas.
- iii. *Policy integration and multi-sectoral approaches:* Further research is required to identify best practices for integrating agroecology into post-conflict recovery policies. Understanding how agroecology can align with national development goals, humanitarian aid strategies, and peacebuilding initiatives will enhance the effectiveness of interventions and ensure that agroecology contributes to broader socio-economic recovery.

11.4 | Innovative Financing Models for Agroecology in Conflict Zones

Financial constraints are one of the most significant challenges facing agroecological initiatives in conflict zones. Innovative financing models are needed to sustain agroecology projects and ensure that they are scalable and adaptable to diverse post-conflict settings. Research in this area could focus on:

- i. *Examining new funding mechanisms:* Investigating alternative financing mechanisms, such as social impact bonds, community-driven funds, and blended finance models, could provide the necessary resources for agroecology projects in conflict zones. Understanding how to mobilize resources from both the public and private sectors will be key to scaling agroecological practices.
- ii. *Assessing the economic viability of agroecological systems:* Research should focus on evaluating the economic viability of agroecological practices in conflict zones, considering factors such as cost-effectiveness, profitability, and the potential for long-term sustainability. This will help

identify financial strategies and models that can make agroecology a sustainable and attractive option for farmers in post-conflict regions.

- iii. *Engaging with international financial institutions:* Exploring how international financial institutions, such as the World Bank or regional development banks, can support agroecology in conflict zones through grants, loans, and capacity-building programs is another critical area of research

11.5 | Building Knowledge Networks and Regional Cooperation

The success of agroecology in conflict zones can be significantly enhanced through collaboration and knowledge sharing between regions with similar challenges. Future research should explore the development of regional knowledge networks that connect practitioners, policymakers, and communities involved in agroecological projects. These networks could focus on:

- i. *South–South knowledge exchange:* Strengthening South–South cooperation in agroecology can provide valuable lessons and insights for conflict-affected regions. Research into successful agroecological models in regions that have experienced conflict—such as parts of Latin America, Sub-Saharan Africa, and the Middle East—can inform strategies for similar contexts.
- ii. *Cross-border collaboration in agroecology:* Many conflict zones span national borders, and agroecological solutions often require cross-border cooperation. Research into how agroecology can be promoted in transboundary regions, where shared resources and challenges exist, will help create cooperative frameworks that foster resilience and reduce conflict over natural resources.

11.6 | Improving Monitoring and Impact Assessment Tools

Finally, the development of robust monitoring and impact assessment tools is essential for measuring the effectiveness of agroecology in conflict zones. Research should focus on:

- i. *Creating indicators for agroecological resilience:* Developing clear, context-specific indicators to assess the resilience of agroecological systems in conflict zones will help track progress and identify areas for improvement. These indicators should include both environmental and socio-economic factors, ensuring a holistic approach to measuring impact.
- ii. *Long-term monitoring:* Conflict zones often experience fluctuations in security, political stability, and environmental conditions. Long-term monitoring and assessment frameworks are needed to track the evolving impacts of agroecological interventions and ensure that they continue to meet the needs of local communities.

11.7 | Priority Research Agenda

Future research should move beyond descriptive accounts toward comparative and longitudinal evaluation. First, studies should develop standardized indicators covering food availability, dietary diversity, household income, soil health, biodiversity, local autonomy, social cohesion, and conflict sensitivity. Second, longitudinal and quasi-experimental designs are required to determine whether observed improvements can be attributed to agroecological interventions rather than to improved security, humanitarian assistance, market recovery, or other concurrent changes. Third, research should compare active-conflict, protracted-crisis, transitional, and post-conflict settings because the feasibility and effects of agroecology are likely to differ across conflict phases.

Further investigation is needed into how gender, displacement status, ethnicity, age, disability, and land ownership influence participation and benefit distribution. Greater attention should also be given to failed, interrupted, or contested agroecological programs to reduce positive-outcome bias. Economic studies should assess implementation costs, labour requirements, market access, scalability, and cost-effectiveness relative to conventional agricultural assistance. Finally, research should examine whether collective agroecological initiatives measurably reduce resource-related tensions, strengthen trust, or support reintegration, rather than assuming that livelihood cooperation automatically produces peace.

12 | Conclusion

This review shows that food sovereignty and agroecology offer intervening solutions and complementary routes to reconstruct food systems in conflict and post conflict contexts. Their worth goes beyond feeding the population; it is about reinvigorating community farming power over land, seeds, water, markets, farming know-how, and local choices. Crop diversification, agroforestry, seed conservation, soil restoration, water harvesting, integrated crop–livestock systems, and local market development were common to all the reviewed literature and found to be practices that were able to offer support for livelihood recovery and decreasing reliance on disrupted external supply chains.

The evidence also indicates that agroecology helps develop stages of resistance via three interconnected routes. It supports a range of adaptive, absorptive, and transformative capacities including human capacity to continue producing food during food-system crises; flexibility of food-system actors to cope with scarcity, displacement, market disruption, and climatic stress; and community organization, autonomy, and control over governance of the food system.

But agroecology is not a “one size fits all” technical fix and does not deliver peace to everyone. This effectiveness relies on the reasons of secure land rights, inclusive institutions, functioning markets, extension services, long-term financing, conflict-sensitive programming and meaningful community participation. Best results are seen when agroecological practices are tailored to local ecology, culture, livelihoods

and conflicts. The evidence available demonstrates the relevance of food sovereignty and agroecology, but most of this evidence is descriptive. Additional longitudinal, comparative, and impact evaluation (post-crisis) studies should be conducted to assess their impact on food security and nutrition, income, ecological recovery, social cohesion, and peace. These strategies can be the foundation for a localized approach to food-system recovery with the right policy, institutional and persistent investment.

13 | Policy Implications

The findings suggest planning for emergency relief, agricultural recovery, rural development, peacebuilding should be carried out as interlinked processes. Humanitarian operations should include immediate response to food insecurity, and also efforts to safeguard seeds and livestock, access to land and local markets as well as productive assets and facilities, and local knowledge and expertise.

The policies should shift beyond promoting individual farm practices to broader institutional mechanisms needed for agroecology. These range from access to security of tenure, through access to finance, extension support, water governance, transport, storage facilities, processing, and local market development. Agroecology must be included in national recovery plans as part of the agriculture, climate adaptation, social protection, and land reform and peacebuilding agendas.

In designing programs, conflict sensitivity needs to be taken into consideration. The potential of decisions on land allocation, water access, and beneficiary selection, financing mechanisms, and market support to exacerbate inequality and/or create resource-related tension should be evaluated. There must therefore be clear selection procedures, co-development, and an easy complaints process. The effective supporting role of the local institutions should be drawn up instead of passively accepting the local institutions as beneficiaries. The design, implementation, monitoring, and evaluation of programs should involve farmer cooperatives, women groups, pastoral associations, indigenous institutions, community seed networks, and local authorities.

14 | Recommendations

14.1 | Governments and Local Authorities

1. Ensure food sovereignty and agroecology are mainstreamed into post-conflict recovery, agricultural, climate and food-security policies, prioritizing and budgeting, establishing timeline and decision-making bodies.
2. Protect land and resource rights by engaging in community mapping of land, recognizing tenure and providing legal support, restitution, and readily available dispute resolution.
3. Reconstruct extension services and educate local extension personnel on seed conservation and agroforestry practices, soil restoration, water harvesting, diversified cropping, and livestock integration.

4. Revival of the irrigation system, the road network, storage, processing facilities and local markets, and public procurement for local producers.

14.2 | Humanitarian Agencies

5. Link food assistance to seed, tools, animal rescue, water, and animal asset protection when appropriate to security situation.
6. Take into account land, water, seed, livestock, market, and labour in the course of food-security assessments.
7. Broaden the use of transparent beneficiary selection processes, community consultation, conflict analysis, and grievance procedures to prevent that people are being excluded and that resources are the subject of disputes.
8. Do not opt out of multi-year recovery programs in protracted crises but ensure tools such as immediate emergency responses are also deployed.
9. Organizations in the Development non-profit and Donor sectors are exempt.
10. Offer flexibility in terms of finance and loan processing—long term, grants, revolving funds, and for women, youth, cooperatives, and local processors.
11. Improved storage, transport, market information, processing, cooperative marketing, and procurement linkages to enhance local value chains.
12. Ensure significant community engagement and assess for community ownership, inclusion, environmental sustainability, and conflict sensitivity.

14.3 | Research Institutions

13. Conduct longitudinal, comparative, and mixed method studies on food security, nutrition, income, soil health, biodiversity, gender equity, and social cohesion and conflict outcomes.
14. Give standard indicators, context-specific, investigate unsuccessful programs or programs that were interrupted in order to combat positive-outcome bias.

14.4 | Local Communities

15. Make decisions on land, water, seed, markets and distribution of benefits—including representation of women, youth, displaced persons, pastoralists and smallholders.
16. Poverty reduction and strengthening of seed banks, farmer-to-farmer learning, collective storage, collective purchase, collective processing, and collective marketing.
17. Develop clear rules for community water/grazing/land work/settle, monitored inclusively at a local level.

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