Agriculture and Human Values
https://doi.org/10.1007/s10460-025-10730-3

SYMPOSIUM/SPECIAL ISSUE

# Relocalising agriculture and renewing agrobiodiversity in the Western Italian Alps through co-creation of agroecological knowledge and practices

Chiara Flora Bassignana[1] · Gabriele Volpato[1] · Paola Migliorini[1]

Accepted: 4 March 2025



## Abstract

After almost a century of abandonment, in the last three decades the Western Italian Alps are witnessing a process of repopulation, urban-rural migration, and reactivation of agriculture and food production. However, 'new highlanders' moving to these Alpine valleys with the willingness to start farming find that fields and meadows have been claimed by shrubs, brambles, and trees, that locally adapted seeds and varieties have been largely lost, and that the transmission of the knowledge on how to farm these lands has been discontinued. This knowledge is even more important in such inner areas, where geographical and environmental conditions don't allow conventional agriculture to be applied as such, and where the relationship with the surrounding ecosystems calls for knowledge intensive approaches to agriculture. Based on fieldwork in six valleys of the Western Italian Alps, in this study we focus on the dynamics surrounding agroecological knowledge, investigate the processes of its co-creation and sharing among new highlanders, and discuss the role of social collectives in this renewed knowledge transmission. We argue that, to inform their agricultural path, new highlanders rely on a plethora of sources of knowledge, which are local and global, in person and virtual. We also posit that the diverse social collectives linking locals with new and returning highlanders act as platforms for knowledge co-creation and sharing and for community building, where renewed agroecological knowledge and agrobiodiversity are mobilized. These platforms also support the revitalization of agrobiodiversity, the further adoption and adaptation of contextualized agroecological practices, acting as niches of innovation and fueling agroecological transitions and the back-to-the-land movement itself.


**Keywords** Social collectives · Knowledge exchange · Niches of innovations · Agroecological transitions · New highlanders · Local varieties · Inner valleys

## Introduction

After almost a century of depopulation, during the last three decades the valleys of the Western Italian Alps are witnessing a back-to-the-land migration whereby individuals and families abandon their urban, globalized lifestyle and move to inner rural areas seeking self-sufficiency, a sense of community, and a reconnection with nature (Bender and Kanitscheider 2012; Loffler et al. 2016; Perlik and Membretti 2018; Bassignana and Volpato 2024). While this trend is in contrast with global processes of urbanization, it is also characterizing several post-industrial regions and countries, and it has been the focus of a flourishing academic interest across disciplines (Steinicke et al. 2012; Gretter et al. 2017; Molden et al. 2017). These repopulation trends encompass a return to farming in several Alpine areas, involving a plethora of local, new, and returning farmers and a variety of associations and collectives supporting the endeavor (Loffler et al. 2016; Molden et al. 2017; Gretter et al. 2019). After decades of abandonment of fields, hamlets, crops, and associated knowledge and practices, there are people who envision a relocalization of food production and forms of community-building in these alpine valleys and embark in

✉ Chiara Flora Bassignana
c.bassignana@unisg.it

[1] University of Gastronomic Sciences, Pollenzo/Bra, Cuneo, Italy

Published online: 08 April 2025

such projects (De Matteis 2011; Gretter et al. 2019; Zola 2024).

This back-to-the-land migration is, at some degree, reconstituting the complex and millennia-long webs of relations between human communities and the Alpine biomes, a web that has historically led to biocultural systems in which humans play a fundamental role in maintaining biodiverse semi-natural habitats (von Glasenapp and Thornton 2011; Barthel et al. 2013). Especially in mountainous areas, the peculiar soil, environmental, and climatic conditions call for an attentive and iterative repatterning of human knowledge and practices to be able to continue producing food while regenerating the wider social-ecological system (von Glasenapp and Thornton 2011). The abandonment of hamlets and fields erodes the pool of knowledge and practices and the intangible heritage that has historically guided local communities in the stewarding of species, habitats, and (agro) ecosystems (Barthel et al. 2013; Marini et al. 2011). The loss of knowledge and practices associated with food production in these mountain areas has disrupted the co-production processes between people and surrounding ecosystems, particularly in agriculture, leading to ecological and landscape-level changes (Barthel et al. 2013; van der Ploeg 2018). Nowadays, those who move to these Alpine valleys with the intention of farming often find fields overrun by shrubs, brambles, and trees, with adapted seeds and varieties lost, and the associated knowledge only partially and fragmentarily passed down (Zola 2024; Tasser et al. 2017; Viazzo and Zanini 2014; Marini et al. 2011). Knowledge in these inner areas is dynamic, shaped by collective understandings that have historically evolved through continuous adaptation and hybridization. Over the last century, however, knowledge transmission has been disrupted by depopulation and abandonment (MacDonald et al. 2000; Mauerhofer et al. 2018). This knowledge is even more important in such inner areas, where geographical, soil, and climatic conditions do not permit conventional, mechanized agriculture, and where the relationships with the surrounding ecosystems call for knowledge intensive approaches to agriculture (Mann 2013). It is therefore of particular interest to investigate in these contexts how people acquire knowledge to farm, and how the co-creation and sharing of this knowledge is functional to the renewal of locally-adapted agrobiodiversity and to the relocalization of food production.

The re-localization of agriculture, revival of agrobiodiversity, and co-creation of knowledge are central to agroecology (HLPE 2019), which combines food security, healthy diets, and ecosystem preservation as a scientific discipline, practice, and movement (Migliorini et al. 2018; Fernandez Gonzales et al. 2021). At the agroecosystem level, agroecology emphasizes nutrient recycling, reducing external inputs, and valuing agrobiodiversity, while at the food system level, it focuses on diversifying products, shortening supply chains, and supporting fair livelihoods (Rosset and Altieri 2017). Through agroecological transitions agricultural systems shift from conventional, industrialized practices to more sustainable, ecologically sound methods that are based on the principles of agroecology. This transition involves integrating ecological, social, and economic dimensions to create farming systems that are not only productive but also resilient, environmentally friendly, and socially just. (Oteros-Rozas et al. 2019; Pimbert 2018; Tittonel 2020). Scholars have identified co-creation and sharing of knowledge and practices as a core element of agroecological transitions and as a foundational agroecological principle (Hlpe 2019; Gliessman 2020). Within the body of agroecological literature, this refers both to the interaction between knowledge epistemologies, i.e., between scholars, political institutions, and farmers (Frank et al. 2022; Bello Cartagena 2019; Roux et al. 2006), and to the processes of knowledge sharing and production between farmers (Wilbur 2014; Norström et al. 2020; Seiferth et al. 2024). Studying the co-creation, sharing, and transmission of this latter knowledge contributes to the understanding of processes of relocalization of food production as well as to the exploration of knowledge processes taking place outside the hegemonic knowledge spheres of mainstream academia, policy think tanks, and research institutes (Pimbert 2018; Peña-Torres and Reina-Rozo 2022).

Given this premise, the aims of this study are: (1) to investigate how agrobiodiversity and related agroecological knowledge and practices are sourced, renewed, and shared among back-to-the-landers[1] (i.e., locals, new, or returning highlanders) in selected areas of the western Italian Alps; and (2) to shed light on the role of the social collectives that the back-to-the-land movement is engendering as platforms of agroecological knowledge co-creation and exchange. We thus reckon about those knowledge processes and social dynamics that are triggering and supporting the relocalization of food systems according to agroecological principles in these inner mountainous areas. To do this, we first explicit the theoretical framework and the concepts used, followed by an explanation of the fieldwork and analytical methods employed. In the results and discussion, we first present the interviewees and their activities and agroecological practices, and then we analyze the social ties that attracted the interviewees and facilitated their settling in these inner areas in the first place. We then discuss how new and returning highlanders acquired, developed, and shared agroecological

[1] This study focuses mainly on vegetables and crop farming, while livestock farming or husbandry in Alpine valleys has been impacted differently by abandonment and it has been addressed by a consistent body of literature across disciplines (Mazzocchi and Sali 2019; Fassio et al. 2014; Battaglini et al. 2014; Marini et al. 2011).

knowledge and practices, with particular emphasis on the role of social collectives in these knowledge dynamics.

## Theoretical framework

This paper discusses the co-creation and exchange of agroecological knowledge and practices in the context of a back-to-the-land movement in the western Italian Alps. It focuses on how agroecological practices are innovated and shared and on the role of social collectives in these processes. We understand agrobiodiversity and associated knowledge as key for back-to-the-landers to achieve an agroecological relocalization of the food system.

Back-to-the-land movement or migration refers, following Wilbur (2013, 149), to 'the intended adoption of a primarily agrarian lifestyle by individuals from non-agrarian backgrounds.' Those involved are known as back-to-the-landers – also called neo-peasants, neo-rurals, or neo-farmers (Mailfert 2007; Brunori et al. 2011) – and are commonly driven by the desire to pursue sustainable food production and self-sufficiency and to reconnect with nature, by the longing for meaningful and dignified lives, or by political activism and the wish to build grassroot alternatives. Back-to-the-landers often have food production and alternative food economies at the forefront of their wishes (Halfacree and Rivera 2012), and as such intersect with forms of food systems' relocalization in contexts of unbearable urban lifestyles and economic crisis (Benessaiah and Eakin 2021). Across the Alps, back-to-the-landers are often called 'new highlanders', a category that encompasses individuals and groups who migrate or back-migrate to inner mountainous areas affected by heavy depopulation during the last century, and reactivate food production and community building there (Löffler et al. 2014; Viazzo and Zanini 2014; Bassignana and Volpato 2024).

Although back-to-the-landers often have high motivations, the repopulation of inner, mountainous areas is a difficult endeavor, fraught with uncertainties, and its outcomes depend on other variables besides these people's motivations. Outcomes are particularly dependent on the capacity of highlanders for community-building, that is to network and cooperate with each other, and to acquire the knowledge and skills needed to dwell the mountain. Indeed, a whole array of knowledge (e.g., about farming, processing, relating with wildlife, interpreting the weather and the landscape, foraging) is sourced by new highlanders from a variety of sources, including online manuals and local elders (Viazzo and Zanini 2022). Amid this knowledge, we focus on that realm concerning farming, and specifically 'sustainable agriculture', which we understand as concerning contextually-adapted agroecological practices and a relational, ecologically-embedded mode of dwelling the mountains. The study of knowledge and its dynamics has characterized academic writings across disciplines (Wilbur 2014; Ingold 2000). A vast terminology has been used to describe knowledge in its multiplicity of forms and from different disciplinary perspectives, i.e., local knowledge (Kloppenburg 1991), local and traditional ecological knowledge (Berkes et al. 1999; von Glasenapp and Thornton 2011), grounded knowledge and situated knowledge (Ashwood et al. 2014) as well as traditional and indigenous knowledge (Folke 2004; Kimmerer 2013). In this work, we refrain from readily categorizing this knowledge based on its origin or history because of the fluidity and multiplicity of sources, processes, and outcomes characterizing it. We instead focus on the processes of knowledge co-production (or co-creation) and exchange (or sharing), which are increasingly recognized as critical tools in sustainability science and for the complex challenge of building sustainable futures (Harvey et al. 2019; Wyborn et al. 2019; Seiferth et al. 2024; Arredondo Reivera 2021). Following Norström et al. (2020: 183), we understand knowledge co-production as encompassing collaborative processes involving diverse types of expertise, knowledge and actors to produce context-specific knowledge and pathways towards a sustainable future.' As noted by Seiferth et al. (2024), 'processes of co-production enable moving from individually held perceptions of problems and solutions to shared and collective understandings.' We analyze these processes by focusing on a specific subset of the whole knowledge needed to dwell the mountains, and that is *agroecological knowledge*. This knowledge is particularly relevant in back-to-the-land processes because it allows, once adapted to specific local conditions, to farm these inner areas, and to do so in ways that regenerate those same conditions. Agroecological knowledge is critical in re-establishing productive links between mountaineers and the mountain, the more so in light of the disruptions in its transmission that took place with the Alps' depopulation during the last century.

In their exploratory nature, these attempts at productive repopulation of the inner Alps need the support provided by forms of social aggregation for community building that we understand as *social collectives*. We argue that these collectives function as platforms of agroecological knowledge co-creation and exchange among highlanders of the Western Italian Alps. Social collectives are 'assemblages of actors [who] mutually affect one another and conceive of themselves as parts of a collective' (von Scheve 2019, p. 268). Social collectives encompass a diverse array of social formations and are fluid and constantly evolving, though characterized by a certain degree of shared beliefs, values, and goals (Dilger et al. 2018). As such, they have the potential to promote collective action, mutual support, and social cohesion, and to be places of co-creation and sharing of knowledge and understandings underpinning that action. They are arguably also key for back-to-the-land movements and in all those situations in which knowledge-intensive practices are recovered, created, and adapted. Some authors have discussed the role of social collectives in alternative food systems (Pascucci et al. 2021) and sustainable agriculture (Slimi et al. 2021). Slimi et al. (2021) have reviewed the role of farmers' collectives in contexts of transition toward sustainable agriculture, finding that these collectives have critical importance during the transition process, being loci for knowing and learning. Social collectives of different kinds are also important in all those contexts where farmers and peasants need to mobilize against the incursions of private investment, the state, and policies of economic liberalization and land grabbing (Harvey 2018).

## Materials and methods

The study area encompasses the Western Italian Alps, specifically six valleys located in the Region of Piedmont, Italy. Five of these valleys, from Susa valley to the Stura valley, are part of the Cottian Alps, a section of the Southwestern Alps that spans between Italy and France, while Chiusella valley is the only exception located in the Graian Alps, belonging to the larger sector of the Northwestern Alps. The Susa Valley, the largest and most populated valley in Piedmont, stretches approximately 80 km and is home to over 90,000 residents. The Chisone Valley covers 380 square kilometers and encompasses 12 municipalities. It borders the Susa Valley to the west and north, the Sangone Valley to the north, the Pellice Valley to the south, and opens onto the Po Valley to the east. The Pellice Valley, located south of Chisone, spans 292 square kilometers and has a population of 22,880. The Varaita Valley is situated in the Western Alps in Cuneo Province, Northwestern Italy. The valley is traversed by an alpine stream of the same name, which stretches 75 km. This stream originates on the slopes of Monviso in the Cottian Alps, near the French border, and flows into the Po River near Casalgrasso. Lastly, the Stura di Demonte Valley runs along the Stura di Demonte River and spans for 601 square kilometers and it is 50 km long, it is entirely located within the Province of Cuneo.

Since the early 19th century, the Western Alps have experienced an unprecedented demographic transformation. For centuries, these valleys have been defined by pastoral activities, transhumance, local agriculture, and commonly managed resources such as forests and water sources (Mazzocchi and Sali 2019). In recent decades, many mountain municipalities in Italy and France have experienced notable population declines. However, since the mid-1980s, the Western Italian Alps have shown initial signs of repopulation, a trend particularly evident in the Cuneo Valleys, including Maira Valley, Varaita Valley, and Po Valley—regions that were previously among the most affected by emigration (Pettenati 2013). The valleys under study today vary in length, size, and population, yet share a broadly similar organization of economic activities. At the entrance to the valleys, in the so-called bassa valle or "low valley," agricultural activities are more prevalent, and some fields are still managed conventionally at an industrial scale, with occasional industrial facilities also present. In the upper valleys, primary activities are oriented toward hospitality, mountain sports, and livestock farming, including high pastures and transhumance. In the mid-valley regions, both tourism and agriculture coexist; agricultural activities here are typically organized in smaller plots on slopes and tend to employ more sustainable practices, as geographical constraints limit the viability of industrial-scale agriculture (Mann 2013).

The fieldwork for this study was carried out between May 2020 and June 2022 in the aforementioned six valleys of the Western Italian Alps (Fig. 1).

An exploratory fieldwork was conducted in summer 2019 to identify the valleys and case studies to include in the research. Anthropological fieldwork methods such as semi-structured interviews and participant observation were used (Bernard 2017). Fifty interviews were conducted with the valleys' inhabitants and farmers (most in Chiusella and Varaita valleys), and participant observation was used in the fields and in collective gatherings with locals and new highlanders (Table 1). Thirty-one interviewees identified themselves as males and nineteen as females. The interviewees included mainly farmers as well as other key actors in the local food systems who could have provided insights on farming practices in the valleys. Although our study included interviewees from six different valleys, the distribution was uneven, with Chiusella and Varaita valleys being more represented in our sample. This difference in number of Interviewees per valley arose from the methodological approach: we started fieldwork in the six valleys and used snowball sampling, which naturally directed more attention to areas where the back-to-the-land movement is more established. This led to a focus on certain valleys over others, particularly those with a predominance of crop farmers as opposed to livestock farmers.

The interviews included a first part inquiring about the interviewees' life history, their motivations to moving to or staying in the valleys and to farm, and their relationships with the land and with other actors. We focused our attention on those initiatives, associations, collective of peers, and other groups mentioned by the interviewees as a source of inspiration to move to the valley and/or start farming. The second part dealt with the dynamics of knowledge and

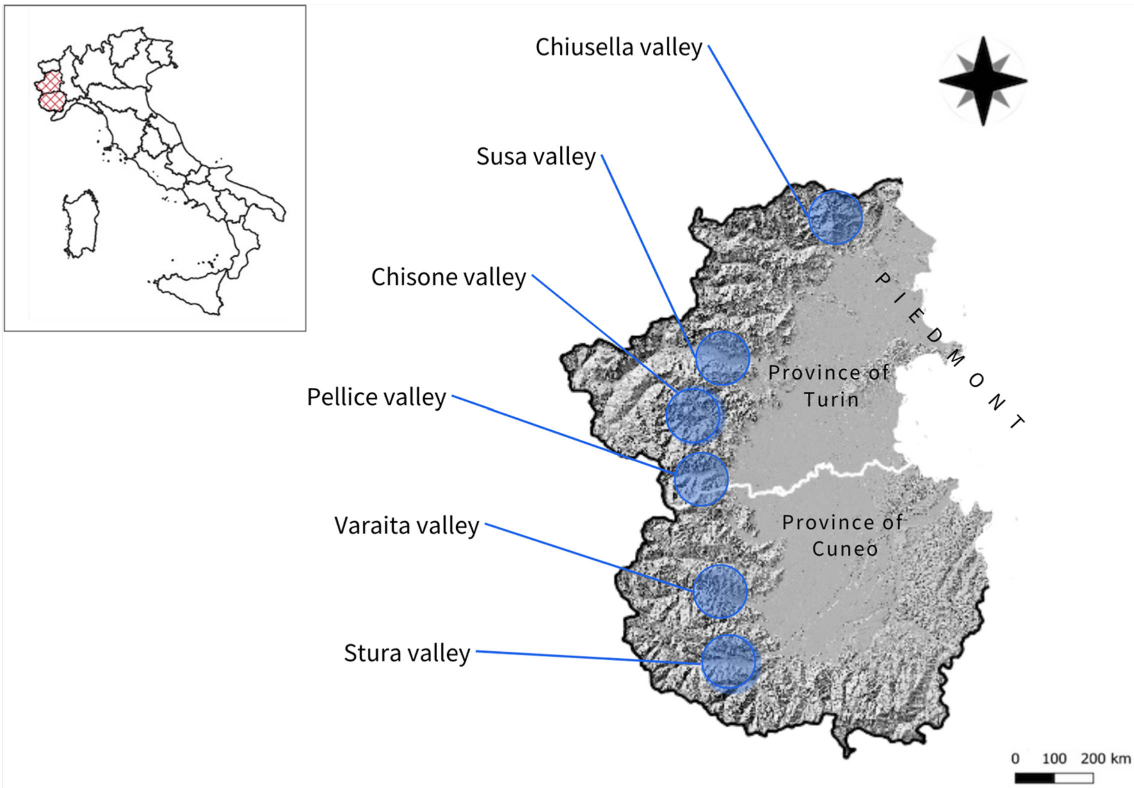


**Fig. 1** Map of the valleys under study in the provinces of Turin and Cuneo in Piedmont region, in the Western Italian Alps

**Table 1** Interviewees by valley, profiled according to gender, origin, and role in these valleys' food systems

| Valleys | *N* of Interviewees | Gender the interviewees identify with | | | Role within the food system | |
|---|---|---|---|---|---|---|
| | | Female | Male | Other | Farmer | Other stakeholders |
| Chiusella | 14 | 5 | 9 | 0 | 13 | 1 |
| Varaita | 19 | 6 | 13 | 0 | 17 | 2 |
| Stura | 5 | 3 | 2 | 0 | 5 | 0 |
| Pellice | 4 | 1 | 3 | 0 | 4 | 0 |
| Chisone | 4 | 2 | 2 | 0 | 3 | 1 |
| Susa | 4 | 2 | 2 | 0 | 4 | 0 |
| N of interviewees | 50 | 19 | 31 | 0 | 46 | 4 |
| % of Interviewees | 100% | 38% | 62% | 0 | 92% | 8% |

adoption of ways of farming around a set of agroecological practices in accordance with the established agroecological principles (from the choice of seeds and varieties to food networks for sales; HLPE 2019) (Table 2). For each practice, the interviewees were asked about its origin and the source of associated knowledge, and about the role played by different kinds of social collectives (e.g., associations, local businesses, community-supported agriculture) in its adoption and in terms of mutual help for farming tasks, exchange of knowledge, and sharing of tools, machines, or land. Throughout the field study, the ethical guidelines adopted by the American Anthropological Association (2012) were followed. Interviews were recorded and transcribed, transcripts were qualitatively analyzed through thematic content analysis, and codes, concepts, and categories were generated (Guest et al. 2011). We derived descriptive statistics from the interviewees' replies to specific questions of the semi-structured interviews. Four social collectives active in one or more valleys emerged from the interviews as crucial spaces and opportunities of sharing and co-creating agroecological knowledge and practices, and were thus investigated in depth through participant observation and semi-structured interviews between June 2020 and June 2022 (Table 3): *Cresco*, a Community Supported Agriculture working across the Varaita valley[2]; *Antagonisti*[3], a company made up of a brewery, a hostel, a restaurant and a café in the village of Melle; *La Milpa*, a collective garden

[2] https://noisiamocresco.it/.

[3] https://antagonistimelle.com/.

**Table 2** Agroecological practices about which the interviewees were interrogated

| Ecological dimension at farm level | | Economic and social dimension at food system level | |
|---|---|---|---|
| Domains | Specific practices | Domains | Specific practices |
| 1. Soil till | Minimum till | 11. Knowledge and practices exchange | Seed exchange |
| 2. Soil fertility | Use of Manure | | Collaboration with other local farmers |
| | Use of Compost | | Intergenerational learning |
| 3. Crop & Variety diversification | Large number of Crop species | 12. Economy and food chain | Short food chain |
| | Use of local varieties | | Local food chain |
| | Adoption of resilient varieties and/or underutilised crops | | Multifunctionality |
| | Self-production of seeds | | Diversification of products |
| 4. Crop rotation | Practicing crop rotation on different time and space scales | | Diversification of supply chain |
| | Presence of Cover crops | | Social and solidarity economy |
| 5. Intercropping | Strip intercropping, row intercropping, relay intercropping | 13. Participation and advocacy | Participation in networks, collectives, organizations |
| 6. Management of landscape | Ecological infrastructure | | Advocacy and education on agroecology |
| 7. Crop pest, disease and weed management | Prevention, indirect and direct agroecological methods | | |
| | Mulching | | |
| 8. Water management | Rainwater collection | | |
| | Drip irrigation | | |
| 9. Agroforestry | Agroforestry systems | | |
| | Silvopastoral systems | | |
| | Agrosilvopastoral systems | | |
| 10. Livestock | Free range | | |
| | Local breeds | | |
| | Self-production of feed | | |

**Table 3** Social collectives selected for in-depth analysis

| Valley | Case studies | Type | Activity | Actors involved | Fields of activity | Since |
|---|---|---|---|---|---|---|
| Varaita | Cresco | Economic activity | Community Supported Agriculture | Citizens, volunteers, farmers | Gardening, educational and cultural activities. | 2019 |
| Varaita | Antagonisti | Business | Business - Brewery, restaurant, hostel and bar | Employees, Founders, Consumers, neighboring businesses | | 2012 |
| Varaita | La milpa | Volunteering/Self-sufficiency | Collective garden | Citizens, volunteers, farmers, researchers | Gardening, Education about agroecology and sustainable agriculture, spiritual ceremonies and cultural activities | 2014 |
| Pellice | Chiavula | Volunteering/Self-sufficiency | Community - living and working the land together | Inhabitants and their friends and families | | 2010 |

in Piasco, just at the entrance of the Varaita valley; and the hamlet of *Chiavula* in Pellice valley, which consists of individuals and families living together and sharing some fields and assets (e.g., ovens and community buildings).

## Results and discussion

To illustrate and discuss the sourcing of agroecological knowledge and the role of social collectives as platforms for the co-creation and sharing of this knowledge among highlanders of the Western Italian Alps, we organized this section as follows. We first briefly present the interviewees and provide an overview of the agroecological practices they adopted, and then we focus on the social connections and supporting groups that facilitated their settling in the mountains and attempts at food production. We then analyze the means and sources through which the interviewees acquired, built, and shared knowledge and practices. Finally, we discuss the role of specific social collectives as platforms catalyzing relationships, renewing agrobiodiversity and shaping contextually-adapted agroecological knowledge.

## The interviewees and their agroecological practices

We begin with a description of the interviewees, their motivations, means, and connections that drove their back-to-the-land migration, and of the agroecological practices they adopted in their farming activities. More than half of the interviewees (52%) are new highlanders, some 38% are locals, and the remaining 8% are returning highlanders back-migrating to the mountains after time living away. Some 10% of the interviewees are foreigners – non-Italians – and they are part of the pool of new highlanders moving to these valleys. The interviewees have a relatively young average age (39 years), with some 72% having started their farming activities in the last decade. They mainly farm vegetables, but also cereals, berries and small fruits, and aromatic plants. Some 25% also raise livestock, mainly chickens and cows. All of them are engaged in agroecological practices in the management of their activities.

The link between back-to-the-land movements and the pursuit of sustainable agriculture and alternative food networks is well established in the literature (Wilbur 2013; Benessaiah and Eakin 2021) and evident in the words and actions of the highlanders we interviewed. In their discourses, they highlight this link, referring to farming in the valley as philosophically and empirically distant and radically different from the monocultures of the flatlands: none of the interviewees grows only one crop; rather, the number ranges between six and fifty, while *Cresco*, a Community Supported Agriculture in Val Varaita, grows more than 120 vegetables and their varieties. These crops include local varieties (e.g., of potatoes, beans), part of the valleys' gastronomic heritage, as well as new, imported varieties and underutilised crops (e.g., of eggplants from mountainous areas of Asia, of corn from indigenous communities in Mexico) with potentially-useful traits (e.g., in coping with climate change, in adapting to soil conditions). Crops and farming practices are chosen based on factors like soil conditions, climate, seasonality, and interactions with wildlife and forests, and are further based on knowledge that is accumulated across the years of engagement with the local environment, and which is shared and further adapted across social collectives forming in the repopulating mountains. As such, knowledge and practices are not a re-proposal of past peasant practices, but rather many interviewees take an experimental approach, testing the boundaries of what can be grown and how, at times challenging locally-established understandings. Nonetheless, the valorization of local varieties was underlined by several interviewees as a fundamental aspect of their farming approach. New highlanders have reintroduced certain underutilised crops whose cultivation had been abandoned or greatly reduced, and have revitalized the use of certain tools and practices. Crops and varieties are put back into dialogue with the local Alpine environment, as illustrated by the fact that a majority of the interviewees produce the seeds or other reproductive materials of at least one crop, e.g., potatoes, zucchini, pumpkins. The interviewees take such a retro-innovative approach also concerning soil practices – spanning from those historically established like the use of local manure and rotation schemes, to innovations like no dig agriculture and new composting techniques. Although just 8% of the farmers interviewed were certified organic, some 70% defined their activities as "more than organic" and widely employed agroecological methods of pest and weed control such as mulching, intercropping with beneficial plants, home-made macerates, and organic treatments. These activities can also be ascribed to a philosophical approach of system thinking in structuring the farm to be productive, highly diversified, resilient, and agroecological, as reported by several interviewees. These farms are managed using multifunctionality as a prevalent approach characterized by the diversification of activities—ranging from agriculture to cultural initiatives and hospitality services—and the diversification of products to prevent surplus waste and secure subsistence and income, even if part of the production falters in a given year. Common features observed across different valleys include efforts to shorten value chains by developing alternative food networks, which also support crop and product diversity. Additionally, various collaborative networks have formed among actors, involving the sharing of physical labor, machines, and tools, as well as participation in political and advocacy efforts, such as lobbying for regulations related to farming in marginal mountainous areas.

We also enquired about the interviewees' motivations and links to move to these Alpine areas. A large majority concurred that previous connections with other actors and groups in different ways involved in the back-to-the-land movement have been critical for the establishment of their new dwelling. Provided that all the interviewees reported more than one link, and multiple forces concurred in creating the favorable conditions and the necessary support to help the interviewees to settle and start their activity, *family* (relatives can be local or returning highlanders, or could own land in the valley and be able to support financially and emotionally, 50%) and *friends* (individuals not organized in groups, 36%) were the most frequent replies. The other replies included different kinds of social collectives, from informal groups jointly carrying out activities regularly, to formal associations formed or joined by new highlanders, and whole communities (e.g., inhabiting a hamlet). One example ascribable to this latter category is the community of Chiavula, an abandoned hamlet that was repopulated following the renovating activities of two new highlanders, and which drew other people over the years. Established businesses in the valleys have been reported by ten interviewees as facilitating their moving and settling there. Filippo from Varaita valley, for instance, returned there after working for long abroad, and did so thanks to his family connections and relations with a local business owner, which permitted him to start his own agricultural project. Three interviewees mentioned WOOFing[4] as the experience and opportunity that brought them to farming in these Alpine valleys. Sometimes, random encounters in one's life path lead to the mountains. Pino from Varaita valley, for example, recalled: *"I came to the valley to write my thesis. I rented a small studio and spent my days writing. I started frequenting the pub where I met a guy who just started growing vegetables for local restaurants. I was inspired by his job and I asked if I could help him every now and then. After a while*, *I finished my thesis and I moved permanently to the valley*, *where now I grow vegetables in partnership with that guy."*

## Sources of knowledge guiding agricultural practices

Driven by personal, relational, and political motivations, our interviewees have moved to inner mountainous areas with the support of relatives, friends, and different social collectives to farm the land through specific and contextualized agroecological practices. At the core of this process, there is knowledge. Dwelling the mountains, producing and gathering food, firewood, and other necessities, and doing so in sustainable ways through agroecological practices, all this demands a lot of knowledge to apply to these mending human-mountain relationships. For these reasons, following other scholars who have remarked on the knowledge intensive nature of back-to-the-land movements (Wilbur 2014; Mauerhofer et al. 2018), we have focused on how the interviewees acquired, adapted, and shared agroecological knowledge and on its sources. Wilbur (2014), for example, argues that *"The diversity in sources of agricultural knowledge gives considerable insight into the methods by which back-to-the-landers learn to become self-sustaining farmers*.*"*

Analyzing the interviewees' replies to our enquiries on the sources of their agroecological knowledge, we grouped them in ten categories. In Fig. 2, we illustrate these sources from the most to the least mentioned. The most cited were blogs, websites, and digital audio-visual materials on the

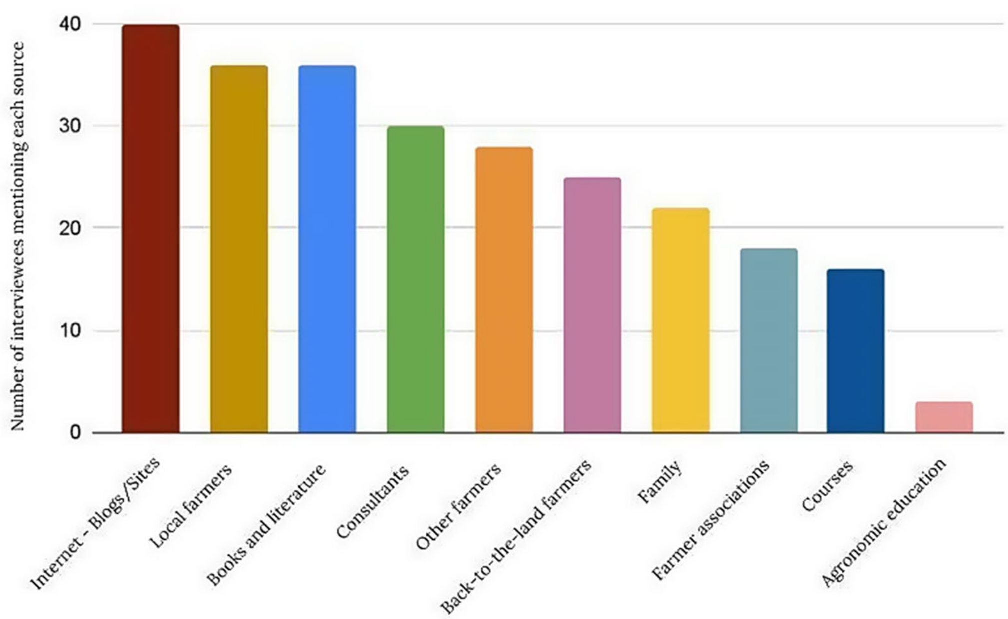


**Fig. 2** Sources of agroecological knowledge and practices mentioned by the interviewees

[4] WOOF (https://wwoof.net/) is an acronym for Worldwide Opportunities on Organic Farms (WWOOF) and it is a worldwide movement that links visitors (WWOOFers) with organic farmers in order to promote cultural and educational exchange about ecological farming and sustainability practices (Wilbur 2014).

internet. For example, Alice, a vegetable farmer connected to a home-restaurant in Chiusella valley, was inspired by a youtuber educating about no-dig agriculture. Alice displays pride in showing *"cucumber, eggplants, and all kinds of vegetables in a field that local elders considered good just for pastures and maybe potatoes."* Her results inspired other local farmers to try no-dig farming on their land.

Especially those interviewees who moved to valleys without previous acquaintances there, sought connections with virtual communities to be able to support their choices both technically and emotionally. This is confirmed by the work of other scholars who have studied the process through which new farmers settle in the inner Alpine areas of Northern Italy. According to Wilbur (2014), for example, "*digital communication* […] *enables the spread of commercial and technical knowledge in the sphere of alternative agriculture, but that knowledge is likely to be filtered and redistributed within the limits of its applicability to local circumstances, through 'neighborly networks' of interpersonal exchange."* Among our interviewees, these neighborly networks encompass local farmers – either established in the valleys for generations or recent arrivals – as well as farmers and other acquaintances from other areas known personally or virtually. Local farmers were indeed the second source of knowledge mentioned by 72% of the interviewees. The specific topics reported as discussed with local farmers include the choice and characteristics of local varieties, the relationship with wildlife, the management of woodlands and soils, the use and management of water resources, and seasonality, among others. Relations between new highlanders and local farmers emerge from our interviews as reciprocal, in that locals are sometimes the first to reach out to the new arrivals out of curiosity or suspicion, and provide – sometimes unsolicited – advice. Concurrent to reaching out to other farmers and locals as sources of contextualized knowledge, our interviewees also rely heavily on existing literature and books, particularly when experimenting with farming practices new to the area (e.g., permaculture, biodynamic agriculture). Luca, a new highlander in Chiusella valley, welcomes visitors to his farm with a big table in the middle of the garden under a pergola, covered with books that inspired, guided, and instructed him in the development of his farm (Fig. 3).

Both academic and practical experts in agriculture and agroecology were cited by thirty interviewees as key sources of information, whether through personal consultations or during structured courses. Group initiatives often involve experts and consultants, both academic and


**Fig. 3** The table of Luca, a new highlander in Chiusella valley, with books displayed for the visitors to his farm

practitioners. These are opportunities for highlanders to expand their knowledge as well as to share perspectives, challenges, and solutions. Some 22 interviewees mentioned a relative among their sources of agroecological knowledge. This is a lower figure in comparison with the replies about the connections that brought these new highlanders to the Alps in the first place, and could hint at a lower relevance of one's family in acquiring agroecological knowledge, which is mainly outsourced to non-kin individuals and collectives.

In any case, most interviewees mentioned more than one source of knowledge and this is fundamental in unveiling how the approaches to agriculture in these inner areas are the result of processes of hybridization of local and historically-rooted knowledge with exogenous knowledge, practices, and whole farming paradigms. For instance, Carlo settled in Varaita valley following his wife, a local, and started farming and livestock husbandry there. Without prior knowledge, Carlo was supported by other farmers and by his wife's family in setting up his activity. Once settled, he started connecting with other new and returning highlanders who carried out innovative farming methods and food distribution approaches like Community Supported Agriculture, agroecological farming, and veggie box schemes. These encounters drove Carlo's activities toward multifunctionality including vegetable production sold through a veggie box system, semi-wild livestock farming for meat production for local restaurants, and courses and educational activities. These and other courses have been mentioned by some 15 interviewees as sources of agroecological knowledge, whereas only three interviewees had a formal education in the agricultural sector before starting farming in the mountains.

All this shows that the interviewees rely on a plethora of sources of knowledge, spanning from local to global, and that these sources are embedded into physical and digital communities that empower and inform these highlanders' agricultural paths. These sources' three-dimensionality allows the interviewees to build a body of place-based agroecological knowledge that enables them to co-produce food in these complex social-ecological systems. In these systems, both farming and economic practices can be reinvented while being adapted to local conditions. Abandonment creates gaps to be filled with imagination and creativity, fueled also by global sources of innovative practices. At the same time, it is crucial to be able to navigate and recognize the constraints to the applicability of different practices, and often local sources of support can lessen this difficulty and shorten the time of the experimenting-observing-responding cycles. Nevertheless, locals' advice and stances may sometimes be conservative and driven by rooted beliefs, and may thus constrain or delay the application of innovative approaches in these territories. Lorenzo, a new highlander in Chiusella valley, for example, remarked that if he would have relied solely on the advice of local elders and farmers, he would have never successfully grown dozens of varieties of vegetables other than potatoes in his field.

## Social collectives as platforms of agroecological knowledge co-creation and exchange

From what presented above, the role of different kinds of social collectives in the process of repopulation and dwelling of these inner areas stands out. These collectives vary in kind (e.g., informal communities, cooperatives, businesses; physical, virtual), size (e.g., from a dozen to hundreds of individuals), scale (e.g., local, regional, national, international), and main social purpose (e.g., conviviality, educational, work-related). Amid their diversity, transiency, and fluidity, these collectives act as platforms that ease and stimulate the exchange and co-creation of agroecological knowledge among highlanders.

Four collectives have been selected as case studies based on their relevance as emerged during the interviews. They include: a local business including a brewery, a pub/restaurant, a hostel, and a shop, *Antagonisti*; the formerly abandoned hamlet of *Chiavula* in Pellice valley, whose renovation has been triggered by two returning highlanders and is now hosting some fifteen families sharing buildings like community ovens and fields where they grow cereals, potatoes, and vegetables; the collective garden *La Milpa*, which is volunteering-based and involves more than forty families growing more than a hundred varieties of vegetables; and the Community Supported Agriculture[5] *Cresco*, encompassing more than 70 families and shareholders and organizing also educational activities for local schools, trainings about agroecology for farmers, cultural activities such as concerts, open air cinema, and theater plays, as well as yoga and meditation gatherings. More informal social collectives like those forming around relighted community ovens are also considered in the analysis (Bassignana and Volpato 2024).

We regard these social collectives as platforms of knowledge co-creation and exchange, spaces where new and renewed visions of farming and living are shaped, and consider them as entailing three (overlapping) domains that drive their creation and participation: productive, relational, and political (Fig. 4).

[5] A Community Supported Agriculture (CSAs) is an alternative form of agricultural economic entity, different from traditional companies. The most characteristic feature is the mutual commitment between producers and consumers. A group of consumers unites and pays for the entire costs of a farm for the coming year. In return, the farm commits to providing the consumer community with healthy food to the best of their ability (Landwehr et al. 2021). The farm is thus secured and the community are the harvest shareholders.

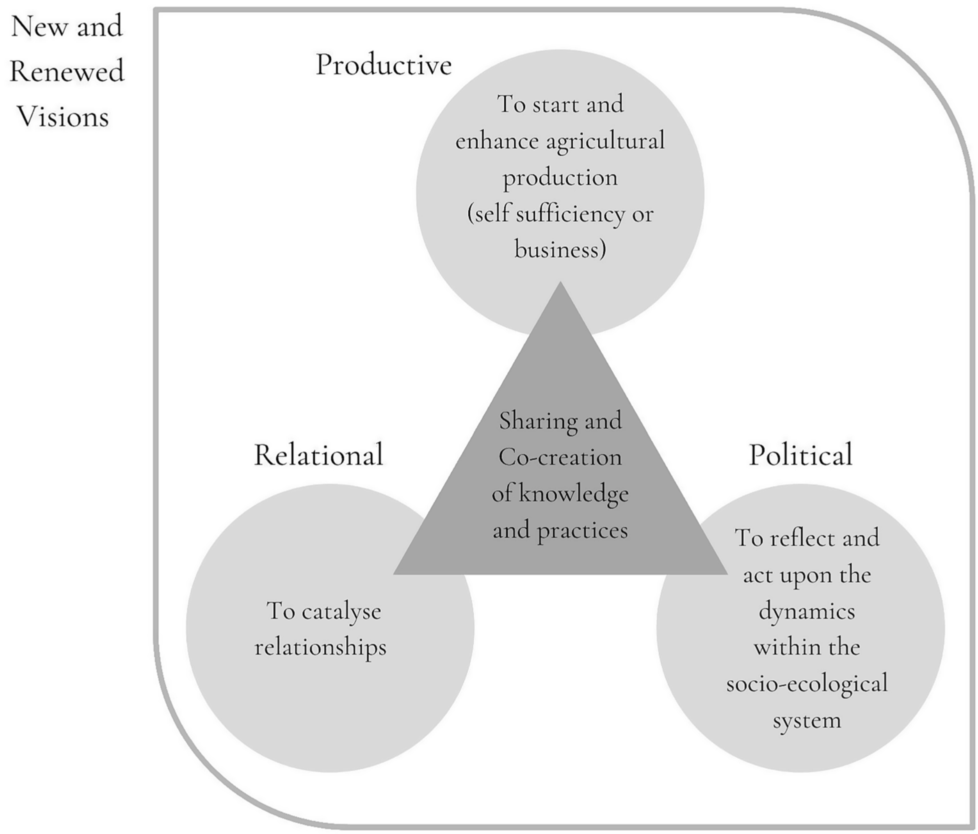


**Fig. 4** The three spheres that represent both drivers for joining or creating social collectives, and domains of possible outcomes and contributions that the interviewees reported finding/receiving/working on once they joined these platforms (authors' original work)

We identify the productive drivers behind the creation of or involvement in social collectives as the motivations, desires, and needs related to seeking support for agricultural ventures or other food-producing activities, whether for subsistence or commercial purposes. These collectives are also relational endeavors almost by definition, as they catalyze relationships and promote a sense of belonging; through social collectives, isolated efforts transform into a networked agency. Whenever people relate and produce, they also act politically: they reflect and act upon local social-ecological dynamics (e.g., upon relationships with local wildlife like wolves, boars, and deer) and how to govern them, as well as upon regulations and institutions at multiple levels. Political drivers in these social collectives also include the willingness to advocate for agroecology, farmers' rights, and sustainability from the vantage perspective of the Alpine valleys. At the intersection of these three domains shaping and influencing social collectives, back-to-the-landers are creating, building upon, and sharing knowledge on how to dwell and steward these valleys. Productive, relational, and political motives drive the highlanders' involvement in these social collectives and also represent three key areas of outcomes reported by interviewees after joining, often beyond their initial expectations. One interviewee might have joined a group or an association primarily to cope with loneliness or learn about farming but ends up also engaging with broader political implications related to food production. For instance, many interviewees reported joining the social collective *La Milpa*, initially aiming to grow vegetables for self-consumption but eventually becoming part of a supportive community, deeply involved in political reflections on the social and environmental sustainability of food systems.

Local agrobiodiversity and the recovery and creation of agroecological knowledge are thus embedded into social dynamics while playing a crucial role in mending human-nature relationships in the inner Western Italian Alps. This reconnection is essential for fostering collective ties to the land and its fruits, underlining that the conservation of agrobiodiversity is not a static endeavor but a dynamic and co-creative process. In these Alpine valleys, farming has historically been based on a shared stewardship memory tying locals to food production and to the wider environment (von Glasenapp and Thornton 2011). Despite depopulation and abandonment during the last century, some knowledge and practices are still rooted in certain contexts or there are written or oral sources about them (Tattoni et al. 2017; Pieroni and Giusti 2009). The possibility and willingness of accessing these pools of knowledge impact the degree of possible retro innovation as well as of revival of local crops and farming practices. In this context, collectives function as platforms of knowledge exchange and concur to the degree of hybridization between local and innovative approaches, in the possibility of imagining alternative ways of living, non-exploitative food networks, and different forms of relationship with the local biocultural diversity. The collective garden *La Milpa*, for instance, is a unique setting where local crop varieties – and practices to maintain and regenerate them – merge with new varieties of tomatoes, beans, and maize from Mexico, and with innovative approaches such as advanced composting techniques. Similarly, *Cresco* fosters and facilitates occasions of co-creation and sharing of knowledge about agrobiodiversity, involving a wide array of actors, from local farmers to members of the general public. Cresco's co-creative dimension emerges from the tight collaboration with other farmers and it is the result of a process of continuous hybridization of local and new knowledge, varieties, and practices. *Antagonisti*, in collaboration with Cresco and other partners, are also leading experimental projects such as trial rye fields to relocalize the production of rye, once the staple of the valley.

The productive dimension of social collectives encompasses also their capacity to act as community markets for the produce of the valley. *Antagonisti* collaborates with several local producers, making ice cream from local milk and hay, blackberries, or elderberries, preparing hamburgers sourced from a local semi-wild pig livestock farm, and packing Christmas boxes with their beers and other products from local producers. Similarly, *Cresco* founded a collaborative brand of processed foods such as jams and preserves made with the produce of so-called *Brigate Contadine*, including two more local farmers and a chef who owns the processing facility. The relationship between social initiatives, knowledge and crop diversity is in constant evolution, and the emergence of alternative food networks provides innovative platforms to support this biodiversity, offering new ways to sustain and enhance the link between agricultural practices and ecological diversity. These platforms serve as vital conduits for sharing resources, knowledge, and support, thereby bolstering the foundations for a more sustainable and interconnected food system that values and preserves agrobiodiversity.

Social collectives can be understood as spaces where relations are catalyzed and a renewed local knowledge is mobilized and reassembled. They play a crucial role in engaging people, citizens as well as farmers, in a dimension that is convivial and yet dense of debates, knowledge sharing, and advocacy claims. As posited by Brunori et al. (2011), this can become virtuous feedback: *"The more farmers are connected to other actors, the more learning becomes 'social learning', improved ways of knowing or doing that are common goods within the network."* La Milpa is a strong example of an inclusive platform of socialization and knowledge sharing, since it was founded by Luce, a woman native from a Maya indigenous community in Mexico, and Sandro, her partner from Piasco, at the entrance of Varaita valley. The project is based on volunteering and as Luce explains: *"Everyone contributes as much as they can. Sometimes someone tells me that they don't feel comfortable taking vegetables because they haven't worked in the garden enough that month, and I get angry at them. And I tell them that without their small contribution we wouldn't be where we are now, so please take as much as your family needs."* This approach based on mutual support and cooperation stems also from the background of Luce and Sandro who frequented the *Escuelita Zapatista*[6] in Mexico right before launching La Milpa at Piasco. La Milpa also organizes cultural and convivial events, such as concerts, parties, harvest celebrations as well as courses on agroecology and other farming approaches, and workshops on soil health. Platforms such as La Milpa offer a place to cultivate not only vegetables, but friendships, communities, reciprocal support, motherhood care, spirituality, political awareness, innovative practices and more. Amid the recontextualization of her Maya culture in the alpine environment of the Varaita valley, Luce also reactivated the 'Fiesta del Maís' every September during the corn harvesting time. During the celebratory gatherings, the whole community stands in a circle surrounding artistic composition of colorful varieties of maize and other vegetables grown in the gardens. The return to the inner Alps gets so infused on Maya spirituality.

Social collectives, as they emerge from this study, offer spaces to explore and experiment new forms of collective action and to engage with farming and agrobiodiversity, but they are not devoid of tensions, disputes, and separations. During the fieldwork, we could witness instances in which these frictions emerged, primarily in relation to divergences in approaches and priorities regarding the relational, productive and political aspects of the collective. For instance, frictions arose between groups of participants that valued more the political feature versus the relation and convivial one of the collective. Other times conflicts emerged regarding the management of the hamlet, the fields, or social life, and their underlying ideologies. Although not the focus of this study, tensions sometimes arise also between new settlers and locals, for example in relation to the conservative views of some locals about how the land ought to be managed, what crop should be grown, or what kinds of relations

[6] In the summer of 2013, thousands of autonomous Zapatista communities throughout the five zones of the state of Chiapas opened their communities and homes to 2,000 people from all over the world to learn first-hand about the Zapatistas' lives and their ongoing struggles. *La Escuelita* or Little School offered a course entitled Freedom According to the Zapatistas, including also agricultural and food-related practices. This first edition of *La Escuelita* was so popular that two more sessions of the school were organized at the end of 2013 and beginning of 2014. (https://schoolsforchiapas.org/advances/schools/la-escuelita/)

ought to be established and promoted with the world beyond the valley (e.g., in relation to tourism). Divergences may arise also in relation to the farming approach and systems of knowledge and practices adopted, especially when productive priorities come in contrast with ecological or political ones (Cortes-Vazquez 2014).

The interviewees for this study are walking the arduous path to community building, with its successes and setbacks. Most actors engaging in social initiatives of one or another kind highlighted how participation has been fundamental to the development of their activities or simply to the unfolding of their life in the valley. Luce used these words speaking about community building through food production: "*Since I moved to Italy*, *I missed the relationship with the land*, *with farming. I come from a family of indigenous farmers. So I started growing tomatoes on my balcony. And after a while we spoke with some friends and decided we could come together to produce vegetables for our families. So we rented a piece of land and we started this project.*" Community building has been mentioned as crucial especially because of the uniqueness of social gatherings in a general context still characterized by depopulation and abandonment. *"Everybody goes away"* is still a phrase dropped by some elders as well as young people, even in those villages or valleys where the continuous urbanization is also accompanied by a phenomenon of repopulation. Dwelling the mountains, in the words and actions of many interviewees, is also a political act, e.g., against industrialized food production, exploitative food systems, to recover direct relationships with food and nature, or even as a form of 'desertion' from lives embedded and maneuvered by capital, one with post-capitalistic yearnings (Staid 2022). As such, the back-to-the-land movement to the inner Alps and the adoption of agroecological practices and alternatives to or post capitalistic ideologies ought to be understood also in its counter-hegemonic dimensions, which are also fueled by social collectives.

What stands evident is that processes of relocalization in inner areas like the Western Italian Alps require time, communication, and imagination. Time to tune in with the local soil, ecological, and cultural conditions; communication, to have support and advice and share efforts and dilemmas; and imagination, to envision how to steward the land and build viable livelihoods. These collectives offer time in proximity, often through conviviality, and therefore spaces in which imagination can unfold through conversations and encounters. In these contexts, de-contextualized knowledge and practices can be transformed into re-localized ones within the limits of the applicability in the socio-ecological and environmental conditions (Wilbur 2012).

## Collectives as niches of innovation for sustainable food systems

Social collectives, in their productive, relational, and political dimensions and in their role as platforms for knowledge co-creation and sharing, are embedded into higher-order dynamics of change. As such, knowledge co-production and exchange are central iterative processes for the emergence of innovations (Popadiuk and Choo 2006; Wilke and Pyka 2024). Tittonell (2020), after Gliessman (2020), have discussed the variables influencing transitions towards agroecology and sustainable food systems, and among the proposed indicators they highlighted the key components of connectivity, participation, and co-creation of knowledge. Platforms where people can gather together in physical proximity, being exposed to or involved in systems of food production that are experimental and inclusive, are quite extraordinary in conventional food systems. The marginality of Alpine valleys presents gaps of communities and knowledge that impact on local inhabitants and food actors. These gaps need to be addressed and filled somehow to be able to restore local food chains and pursue sustainability in food production. Put more simply, the emptiness of these gaps reverberates more deeply in the individuals that decide to invest in these territories. At the same time, the absence and difficult applicability of conventional and industrial agriculture leaves space and opportunity for sustainable and agroecological approaches to thrive. As these approaches are knowledge intensive, they need to be supported by widespread knowledge transmission.

As Pimbert (2018) points out, networks for co-creation of knowledge and practices play a crucial role in reframing food, agriculture, and landscapes through radical pluralism, conviviality, autonomy, and reciprocity. Acting as platforms of knowledge co-creation and exchange, the social collectives discussed here can be understood as niches of innovations according to the multi-level perspective adopted by scholars to discuss transitions toward sustainable food systems and agroecology (Isgren and Ness 2017; El Bilali 2019; Geels 2002; 2018). The multi-level perspective asserts that transitions occur through interactions within and between three analytical levels (Geels 2002; Schot and Geels 2008): (1) niches, situated at the micro level and serving as the breeding ground for radical innovations; (2) socio-technical regimes, positioned at the meso level and representing established practices along with associated formal, normative, and cognitive rules; and (3) an external socio-technical landscape at the macro level. The social collectives discussed above can be regarded as niches of innovation at the micro level in the process of dwelling these inner valleys, and to be able to generate internal momentum in the food transition process. Changes at the agroecosystem and

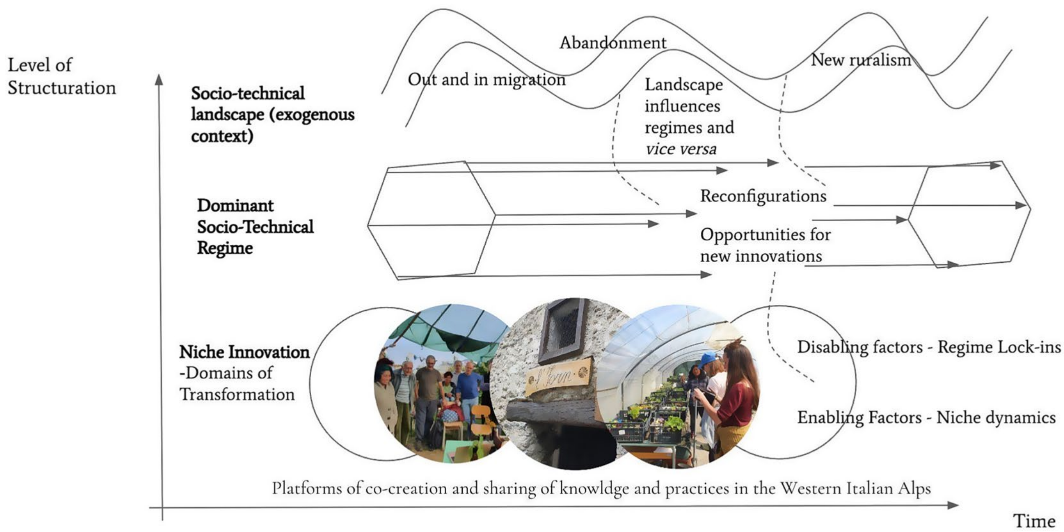


**Fig. 5** Within the multi-level perspective, the platforms analyzed can be described as niches of innovations

landscape level beget destabilizing pressures on the existing regime, creating windows of opportunity for innovations and reconfigurations (Fig. 5).

Within a socio-technical landscape like the one of the Western Italian Alps, characterized by out-migration first, and by a back-to-the-land movement and new farming trajectories recently, social collectives represent niches to explore innovations from agroecological practices to alternative food networks. The arising of these niches of innovation could be hypothesized (and this hypothesis tested by future research) to feed reciprocating cycles, where the more people get involved, the more agroecological knowledge is shared, experimented upon, and co-created, and the more agroecological the system will evolve. The existence and thriving of such collectives simultaneously promote co-creation and sharing of agroecological knowledge and practices as well as the permanence/arrival of new highlanders in these inner areas (Rahman et al. 2021). Also in light of ongoing changes to climatic and environmental conditions (Gobiet et al. 2014), platforms for highlanders to collectively discuss and address these changes provide avenues to renew and adapt the local pool of agroecological knowledge and thus adapt to changes in the wider socio-technical landscape.

## Conclusions

In this study, we have explored the relationships that exist between agrobiodiversity, agroecological knowledge co-creation and exchange, and social collectives in the context of a back-to-the-land movement and relocalization process in the Western Italian Alps. We have highlighted the complexity and diversity of motivations, connections, and sources of knowledge that shape the back-to-the-land movement in these inner Alpine areas. The role of personal connections, including family, friends, and broader social groups, has been pivotal in these highlanders' decision to settle and start farming. Agroecological knowledge acquisition among these highlanders is characterized by a blend of local and global sources, ranging from digital platforms and literature to direct interactions with local farmers and participation in formal and informal educational initiatives. This multiplicity of knowledge sources highlights the ongoing dynamic process of hybridization, where traditional and innovative practices are combined and adapted to the unique environmental and socio-cultural contexts of the Alpine valleys.

Repopulating and dwelling these valleys, however, is hardly an individual endeavor; rather, it is a process imbued with relationality, aiming at community-building, and supported by a variety of social collectives. These collectives, varying in form, scale, and purpose, serve as productive, relational, and political spaces where highlanders can collaborate, share resources, and engage in communitarian initiatives towards sustainable food systems. We have further reckoned on the role of social collectives to catalyze relations, in imagining and enacting shared understandings of human-nature relationships, and in building and sharing agroecological knowledge and agrobiodiversity. We have argued that, amid their diversity, fluidity, and transiency, these collectives function as social platforms for sharing, adapting, hybridizing, and contextualizing knowledge stemming from a plethora of sources – from locals to online guides, from elders to virtual workshops. A main contribution of this study to the body of literature addressing knowledge innovation and sharing among back-to-the-landers rests indeed on arguing for the key role of social collectives as platforms for knowledge transmission among new highlanders and other neo-rurals.

These platforms can be further conceived as niches of innovation, where bodies of knowledge are mobilized and reassembled around agrobiodiversity, alternative food networks and local biocultural diversity. The existence and thriving of such platforms of co-creation and sharing of knowledge and practices simultaneously feeds renewed agrobiodiverse agroecosystems, agroecological trajectories, and the permanence and arrival of new highlander farmers in these inner areas previously characterized by abandonment and depopulation. This is particularly important given the knowledge-intensive character of living, producing, and reproducing in the inner Alpine valleys selected in this study. By exploring processes of knowledge co-creation and sharing concerning agroecological farming practices, the study thus contributes to the literature on agroecological transitions and relocalization of food systems. Further studies among other back-to-the-landers, both in the Alps and elsewhere, could shed further light on the role of social collectives in facilitating knowledge exchange and dwelling in rural inner areas, on food relocalization processes, and within empirical and conceptual explorations of alternative food networks and sustainable food systems.

**Funding** This article has been funded by the Project Realising Dynamic Value Chains for Underutilised Crops (RADIANT), a Research & Innovation Action supported by European Commission's Horizon 2020 programme under Grant Agreement number 101000622.



## References

American Anthropological Association. 2012. AAA Statement on Ethics. Retrieved 12 December, 2022, from https://americananthro.org/about/policies/statement-on-ethics/

Arredondo Reivera, M. 2021. Advancing agroecology through knowledge co-creation: Exploring success conditions to enhance the adoption of agroecological farming practices, illustrated by the case of Chilean wineries. [Master Thesis, Utrecht University] https://studenttheses.uu.nl/bitstream/handle/20.500.12932/39927/Marcia%20Arredondo%20Rivera-MSc%20Thesis%20SD.pdf?sequence=1&isAllowed=y

Ashwood, L., N. Harden, M. M. Bell, and W. Bland. 2014. Linked and situated: Grounded knowledge. *Rural Sociology* 79(4):427–452. https://doi.org/10.1111/ruso.12042

Barthel, S., C. L. Crumley, and U. Svedin. 2013. Biocultural refugia: Combating the erosion of diversity in landscapes of food production. *Ecology and Society* 18(4). https://doi.org/10.5751/ES-06207-180471

Bassignana, C. F., and G. Volpato. 2024. The relighting of community ovens in the Western Italian alps as a process of commoning the relighting of community ovens in the Western Italian alps. *Food Culture & Society* 27(1):242–265. https://doi.org/10.1080/15528014.2022.2100082

Battaglini, L., S. Bovolenta, F. Gusmeroli, S. Salvador, and E. Sturaro. 2014. Environmental sustainability of alpine livestock farms. *Italian Journal of Animal Science* 13(2):431–443. https://doi.org/10.4081/ijas.2014.3155

Bello Cartagena, L. 2019. Bridging the gap between theory and practice in agro-ecological farming farmers and scientific researchers in Southern Spain. [Master Thesis, Regeneration Academy] https://studenttheses.uu.nl/bitstream/handle/20.500.12932/33619/THESIS_BELLOCARTAGENA_3976157.pdf?sequence=2&isAllowed=y

Bender, O., and S. Kanitscheider. 2012. New immigration into the European Alps: Emerging research issues. *Mountain Research and Development* 32(2):235–241. https://doi.org/10.1659/mrd-journal-d-12-00030.1

Benessaiah, K., and H. Eakin. 2021. Crisis, transformation, and agency: Why are people going back-to-the-land in Greece? *Sustainability Science* 16(6):1841–1858. https://doi.org/10.1007/s11625-021-01043-5

Berkes, F. 1999. *Sacred ecology: Traditional ecological knowledge and resource management*. Philadelphia, PA: Taylor & Francis, ©1999.

Bernard, H. R. 2017. *Research methods in anthropology: Qualitative and quantitative approaches*. Rowman \& Littlefield. https://books.google.it/books?id=2Fk7DwAAQBAJ

Brunori, G., A. Rossi, and V. Malandrin. 2011. Co-producing transition: Innovation processes in farms adhering to solidarity-based purchase groups (GAS) in Tuscany, Italy. (Special issue: Collective farmers' marketing initiatives). *International Journal of Sociology of Agriculture and Food* 18(1):28–53. http://ijsaf.org/index.php/ijsaf/article/view/257

Cortes-Vazquez, J. A. 2014. A natural life: neo-rurals and the power of everyday practices in protected areas. *Journal of Political Ecology* 21(1):493–515. https://doi.org/10.2458/v21i1.21148

De Matteis, G. ed. 2011. Montanari per scelta. Milan: FrancoAngeli. https://www.francoangeli.it/libro/?Id=19536

Dilger, H., O. Kasmani, and D. Mattes. 2018. Spatialities of belonging: Affective place- making among diasporic neo- pentecostal and Sufi groups in Berlin's City scape. In *Affect in relation: Families, places, technologies*, ed. B. Röttger-Rössler, and J. Slaby. 93–114. New York: Routledge. https://doi.org/10.4324/9781315163864

El Bilali, H. 2019. The multi-level perspective in research on sustainability transitions in agriculture and food systems: A systematic review. *Agriculture (Switzerland)* 9(4). https://doi.org/10.3390/agriculture9040074

Fassio, G., L. M. Battaglini, V. Porcellana, and P. P. Viazzo. 2014. The role of the family in mountain Pastoralism—Change and continuity. *Mountain Research and Development* 34(4):336–343. https://doi.org/10.1659/mrd-journal-d-14-00019.1

Fernández González, C., G. Ollivier, and S. Bellon. 2021. Transdisciplinarity in agroecology: Practices and perspectives in Europe.

*Agroecology and Sustainable Food Systems* 45(4):523–550. https://doi.org/10.1080/21683565.2020.1842285
Folke, C. 2004. Traditional knowledge in Social–Ecological systems. *Ecology and Society* 9(3). http://www.jstor.org/stable/26267675
Frank, M., M. M. Amoroso, M. Propedo, and B. Kaufmann. 2022. Co-inquiry in agroecology research with farmers: Transdisciplinary co-creation of contextualized and actionable knowledge. *Agroecology and Sustainable Food Systems* 46(4):510–539. https://doi.org/10.1080/21683565.2021.2020948
Geels, F. W. 2002. Technological transitions as evolutionary reconfiguration processes: A multi-level perspective and a case-study. *Research Policy* 31(8–9):1257–1274. https://doi.org/10.1016/s0048. -7333(02)00062– 8.
Geels, F. W. 2018. *Socio-technical transitions to sustainability*. Oxford: Oxford University Press. https://doi.org/10.1093/acrefore/9780199389414.013.587
Gliessman, S. 2018. The co-creation of agroecological knowledge. *Agroecology and Sustainable Food Systems* 42(1):1. https://doi.org/10.1080/21683565.2017.1289727
Gliessman, S. R. 2020. Transforming food and agriculture systems with agroecology. *Agriculture and Human Values* 37(3):547–548. https://doi.org/10.1007/s10460-020-10058-0
Gobiet, A., S. Kotlarski, M. Beniston, G. Heinrich, J. Rajczak, and M. Stoffel. 2014. 21st century climate change in the European Alps-A review. *Science of the Total Environment* 493:1138–1151. https://doi.org/10.1016/j.scitotenv.2013.07.050
Gretter, A., I. Machold, A. Membretti, and T. Dax. 2017. Pathways of immigration in the alps and Carpathians: Social innovation and the creation of a welcoming culture. *Mountain Research and Development* 37(4):396. https://doi.org/10.1659/mrd-journal-d-17-00031.1
Gretter, A., C. D. Torre, F. Maino, and A. Omizzolo. 2019. New farming as an example of social innovation responding to challenges of inner mountain areas of Italian alps. *Revue De Géographie Alpine* 107–102. https://doi.org/10.4000/rga.6106
Guest, G., K. M. MacQueen, and E. E. Namey. 2011. *Applied thematic analysis*. Thousand Oaks: Sage.
Halfacree, K., and Rivera, M. 2012. Moving to the countryside … and staying: lives beyond representations. *Sociologia Ruralis* 52(1):92–114. Doi: https://doi.org/10.1111/j.1467-9523.2011.00556.x.
Harvey, Penny. 2018. Interrupted futures: co-operative labor and the changing forms of collective precarity in rural Andean Peru. *Journal of the Royal Anthropological Institute* 24(S1):120–133. https://doi.org/10.1111/1467-9655.12803
Harvey, B., L. Cochrane, and M. Van Epp. 2019. Charting knowledge coproduction pathways in climate and development. *Environ Policy Gov* 29(2):107–117. https://doi.org/10.1002/eet.1834
HLPE. 2019. Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition. A report by the high level panel of experts on food security and nutrition of the committee on world food security, Rome. https://openknowledge.fao.org/server/api/core/bitstreams/ff385e60-0693-40fe-9a6b-79bbef05202c/content
Ingold, T. 2000. The perception of the environment: essays in livelihood, dwelling and skill. London: Routledge. https://www.routledge.com/The-Perception-of-the-Environment-Essays-on-Livelihood-Dwelling-and-Skill/Ingold/p/book/9781032052274?srsltid=AfmBOorSq7hvElWX2MAGAPlSIseDB_su9R3KXvyeffxnC_hIreluWVOi
Isgren, Ellinor, and Barry Ness. 2017. Agroecology to promote just sustainability transitions: Analysis of a civil society network in the Rwenzori region, Western Uganda. *Sustainability* 9(8):1357. https://doi.org/10.3390/su9081357
Kimmerer, Robin Wall. 2013. *Braiding Sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants*. Milkweed Editions.
Kloppenburg, J. 1991. Social theory and the de/reconstruction of agricultural science: Local knowledge for an alternative agriculture. *Rural Sociology* 56(4):519–548.
Landwehr, M., P. Engelbutzeder, and V. Wulf. 2021. Community supported agriculture: The concept of solidarity in mitigating between harvests and needs. Conference on Human Factors in Computing Systems - Proceedings. https://doi.org/10.1145/3411764.3445268
Löffler, R., M. Beismann, J. Walder, and E. Steinicke. 2014. New Highlanders in traditional out-migration areas in the alps. The example of the Friulian alps. *Journal of Alpine Research| Revue De Géographie Alpine* (102–103).
Löffler, R., P. Čede, M. Beismann, J. Waldher, and E. Steinicke. 2016. Current demographic trends in the alps nothing quiet on the Western Front – quiet in the East. *The Alps in Movement: People Nature Ideas*, 134–169.
MacDonald, D., J. R. Crabtree, G. Wiesinger, T. Dax, N. Stamou, P. Fleury, J. Gutierrez Lazpita, and A. Gibon. 2000. Agricultural abandonment in mountain areas of Europe: Environmental consequences and policy response. *Journal of Environmental Management* 59(1):47–69. https://doi.org/10.1006/jema.1999.0335
Mailfert, K. 2007. New farmers and networks: How beginning farmers build social connections in France. *Tijdschrift Voor Economische En Sociale Geografie* 98(1):21–31. https://doi.org/10.1111/j.1467-9663.2007.00373
Mann, S. 2013. The future of mountain agriculture. The future of mountain agriculture, May, 1–176. https://doi.org/10.1007/978-3-642-33584-6
Marini, L., S. Klimek, and A. Battisti. 2011. Mitigating the impacts of the decline of traditional farming on mountain landscapes and biodiversity: A case study in the European alps. *Environmental Science and Policy* 14(3):258–267. https://doi.org/10.1016/j.envsci.2010.12.003
Mauerhofer, V., T. Ichinose, B. D. Blackwell, M. R. Willig, C. G. Flint, M. S. Krause, and M. Penker. 2018. Underuse of social-ecological systems: A research agenda for addressing challenges to biocultural diversity. Land Use Policy, 72(October 2017), 57–64. https://doi.org/10.1016/j.landusepol.2017.12.003
Mazzocchi, C., and G. Sali. 2019. Assessing the value of pastoral farming in the alps using choice experiments: Evidence for public policies and management. *Journal of Environmental Planning and Management* 62(4):552–567. https://doi.org/10.1080/09640568.2018.1430557
Migliorini, P., V. Gkisakis, V. Gonzalvez, M. D. Raigón, and P. Bàrberi. 2018. Agroecology in mediterranean Europe: Genesis, state and perspectives. *Sustainability (Switzerland)* 10(8):1–23. https://doi.org/10.3390/su10082724
Molden, D., T. Breu, S. W. Von Dach, A. B. Zimmermann, and S. L. Mathez-Stiefel. 2017. Focus issue: Implications of Out- and In-Migration for sustainable development in mountains. *Mountain Research and Development* 37(4):387. https://doi.org/10.1659/mrd.3704
Norström, A. V. et al. 2020. Principles for knowledge co-production in sustainability research. *Nat Sustain* 3(3):182–190. https://doi.org/10.1038/s41893-019-0448-2
Oteros-Rozas, E., F. Ravera, and M. García-Llorente. 2019. How does agroecology contribute to the transitions towards social-ecological sustainability? *Sustainability (Switzerland)* 11(16):1–13. https://doi.org/10.3390/su11164372
Pascucci, S., D. Dentoni, J. Clements, K. Poldner, and W. B. Gartner. 2021. Forging forms of authority through the sociomateriality of food in partial organizations. *Organization Studies* 42(2):301–326. https://doi.org/10.1177/0170840620980232

Peña-Torres, J. A., and J. D. Reina-Rozo. 2022. Agroecology and communal innovation: LabCampesino, a pedagogical experience from the rural youth in Sumapaz Colombia. Current Research in Environmental Sustainability, 4(August 2021), 100162. https://doi.org/10.1016/j.crsust.2022.100162

Perlik, M., and A. Membretti. 2018. Migration by necessity and by force to mountain areas: An opportunity for social innovation. *Mountain Research and Development* 38(3):250. https://doi.org/10.1659/mrd-journal-d-17-00070.1

Pettenati, G. 2013. Maira Valley (Piedmont): A territorial laboratory of a new mountain population. *Revue De Géographie Alpine* 101–103. https://doi.org/10.4000/rga.2208

Pier Paolo Viazzo et Roberta Clara Zanini. Taking advantage of emptiness? », *Journal of Alpine Research| Revue de géographie alpine* [En ligne], 102-3| 2014, mis en ligne le 01 février 2015, consulté le 08 septembre 2024. URL: http://journals.openedition.org/rga/2478; https://doi.org/10.4000/rga.2478

Pieroni, A., and M. E. Giusti. 2009. Alpine ethnobotany in Italy: Traditional knowledge of gastronomic and medicinal plants among the Occitans of the upper varaita Valley, Piedmont. *Journal of Ethnobiology and Ethnomedicine* 5:1–13. https://doi.org/10.1186/1746-4269-5-32

Pimbert, M. P. 2018. *Food sovereignty, agroecology and biocultural diversity - constructing and contesting knowledge*. Routledge.

Popadiuk, S., and C. W. Choo. 2006. Innovation and knowledge creation: How are these concepts related? *International Journal of Information Management* 26(4):302–312. https://doi.org/10.1016/j.ijinfomgt.2006.03.011

Rahman, D., T. Moussouri, and G. Alexopoulos. 2021. The social ecology of food: Where agroecology and heritage meet. *Sustainability (Switzerland)* 13(24). https://doi.org/10.3390/su132413981

Rosset Peter, M., A. Miguel, and Altieri. 2017. *Agroecology: Science and politics*. Rugby, UK: Practical Action Publishing.

Roux, D. J., K. H. Rogers, H. C. Biggs, P. J. Ashton, and A. Sergeant. 2006. Bridging the science-management divide: Moving from unidirectional knowledge transfer to knowledge interfacing and sharing. *Ecology and Society* 11(1). https://doi.org/10.5751/es-01643-110104

Runhaar, H. 2021. Four critical conditions for agroecological transitions in Europe. *International Journal of Agricultural Sustainability* 19(3–4):227–233. https://doi.org/10.1080/14735903.2021.1906055

Schot, J., and F. W. Geels. 2008. Strategic niche management and sustainable innovation journeys: Theory, findings, research agenda, and policy. *Technology Analysis & Strategic Management* 20(5):537–554. https://doi.org/10.1080/09537320802292651

Seiferth, C., M. Tengö, and E. Andersson. 2024. Designing for collective action: A knowledge co-production process to address water governance challenges on the Island of Öland, Sweden. *Sustainability Science* 19:1623–1640. https://doi.org/10.1007/s11625-024-01531-4

Slimi, C., M. Prost, M. Cerf, and L. Prost. 2021. Exchanges among farmers' collectives in support of sustainable agriculture: From review to reconceptualization. *Journal of Rural Studies* 83:268–278. https://doi.org/10.1016/j.jrurstud.2021.01.019

Staid, Andrea. 2022. *Essere natura. Uno Sguardo antropologico per Cambiare Il nostro Rapporto Con L'ambiente*. Torino: UTET.

Steinicke, E., P. Čede, and R. Löffler. 2012. In-migration as a new process in demographic problem areas of the alps. Ghost towns vs. *Amenity Settlements in the Alpine Border Area between Italy and Slovenia Erdkunde* 66(4):329–344. https://doi.org/10.3112/erdkunde.2012.04.04

Tasser, E., G. Leitinger, and U. Tappeiner. 2017. Climate change versus land-use change—What affects the mountain landscapes more? *Land Use Policy* 60:60–72. https://doi.org/10.1016/j.landusepol.2016.10.019

Tattoni, C., E. Ianni, D. Geneletti, P. Zatelli, and M. Ciolli. 2017. Landscape changes, traditional ecological knowledge and future scenarios in the Alps: A holistic ecological approach. *Science of the Total Environment* 579:27–36. https://doi.org/10.1016/j.scitotenv.2016.11.075

Tittonell, P. 2020. Assessing resilience and adaptability in agroecological transitions. *Agricultural Systems* 184 (August 2019), 102862. https://doi.org/10.1016/j.agsy.2020.102862

van der Ploeg, J. D. 2018. *The new Peasantries - Rural development in times of globalization*. Routledge.

Viazzo, P., and R. C. Zanini. 2022. Taking stock of two decades of change: The Alps and alpine anthropology in the early twenty-first century. In cultures in mountain areas: Comparative perspectives/culture in aree di montagna: Prospettive comparative/Kulturen in Gebirgsregionen: Vergleichende Perspektiven (pp. 123–150). Bozen/Bolzano University Press. https://doi.org/10.13124/9788860461902

von Glasenapp, M., and T. F. Thornton. 2011. Traditional ecological knowledge of Swiss alpine farmers and their resilience to socio-ecological change. *Human Ecology* 39(6):769–781. https://doi.org/10.1007/s10745-011-9427-6

Von Scheve, Christian. 2019. Social collectives. In *Affective societies*, 267–278. Doi: Routledge. https://doi.org/10.4324/9781351039260

Wilbur, A. M. 2012. Seeding alternatives: Back-to-the-land migration and alternative agro- food networks in Northern Italy. 316. https://theses.gla.ac.uk/id/eprint/3440

Wilbur, A. 2013. Growing a radical ruralism: Back-to-the-land as practice and ideal. *Geography Compass* 7(2):149–160. https://doi.org/10.1111/gec3.12023

Wilbur, A. 2014. Cultivating back-to-the-landers: Networks of knowledge in rural Northern Italy. *Sociologia Ruralis* 54(2):167–185. https://doi.org/10.1111/soru.12024

Wilke, U., and A. Pyka. 2024. Assessing the relevance of different proximity dimensions for knowledge exchange and (co-)creation in sustainability-oriented innovation networks. *Sustainability Science* 19:1427–1443. https://doi.org/10.1007/s11625-024-01463-z

Wyborn, Carina, Amber Datta, Jasper Montana, Melanie Ryan, and Peat Leith. 2019. Brian Chaffin, Clark Miller, and Lorrae Van Kerkhoff. Co-producing sustainability: reordering the governance of science, policy, and practice. Annual Review of Environment and Resources 44(1):319–346. https://doi.org/10.1146/annurev-environ-101718-033103

Zola, L. 2024. More than human altitudes: Exploring assemblages of bees, flowers, and people in the Italian alps. *The Oriental Anthropologist* 24(1):166–178. https://doi.org/10.1177/0972558X241230656

**Publisher's note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

**Chiara Flora Bassignana** is a research fellow at the University of Gastronomic Sciences of Pollenzo, working in the field of agroecology and biocultural diversity. Her interdisciplinary interests also encompass new ruralisms, gender, intersectionality, and commons. She holds a PhD in Ecogastronomy, Education, and Society, with research focused on emerging agricultural trajectories and food practices in the Western Italian Alps.

**Gabriele Volpato** is an anthropologist, lecturer, and research fellow at the University of Gastronomic Sciences in Pollenzo (Italy). His interests are interdisciplinary and include biocultural diversity studies, ethnobiology, pastoralism and human-animal relationships, as well as food systems and peasants' livelihood strategies.

**Paola Migliorini** is associate Professor in Agronomy and Crop Production at University of Gastronomic Sciences, Pollenzo Italy. Agroecologist expert and activist. Coordinator of the Master in Agroecology and Food Sovereignty; Course Leader in Agroecology, Sustainable and Organic Agriculture; Coordinator of Agroecology research group with several projects: 1 Agroecology Partnership (ALL-Facts), 3 H2020 (AE4EU; RADIANT; HUMUS), 7 regionals (4 Piedmont and 3 Liguria), Educational Garden supervisor. Founder and former President of Agroecology Europe (2018–2022) and board member of IFOAM AgriBioMediterraneo (2005–2015). Scientific referent for AEEU of H2020 AGROMIX project. Author of 100 technical and scientific publications.