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Safeguarding the land to secure food in the highlands of Peru: The case of Andean peasant producers

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Local or traditional agri-food systems in the Andes depend on community land use planning to maintain the genetic pool of crops and landraces in the face of disease, disasters, and climate change. These systems are managed integrally and on the basis of traditional knowledge around soil conservation, water management and maintaining biodiversity. At the same time, agri-food system research, policy and programming exhibit a limited understanding of local or traditional systems planning and community and cultural contexts. In policy and programming, the treatment of communities as homogenous groups overlooks heterogeneity in local identities, which is reflected for example in different access and use of traditional knowledge among men and women and forms of community organization and customs. The purpose of this article is to respond to this gap by shedding light on the intersecting identities of Andean farmers-peasant women and men—that contribute to the sustainability and resilience of local agri-food systems. Our focus is on intersecting identities and planning processes in particular. We detail the nature and cultural components that make up local agri-food systems in the Andean region and identify policy gaps around identities. To do this, we draw on intersectional feminist thinking, socio-ecological systems and resilience thinking to apply an intersectional lens to the study of planning processes in several Andean communities. Findings identify contributions around soil conservation, biodiversity upkeep, water management, and communal or cultural practices that are shaped by peasant's intersecting identities and their interactions within social-ecological systems. Findings illustrate the importance of multiple social locations, relations, and structures of power, including but not limited to gender, but other categories such as age and ethnicity for the delivery of equitable resilience. We formulate some initial recommendations so that national approaches and interventions better reflect the diversity of Andean people's identities and the way these affect relationships with socio-ecological systems in national and public planning. In particular, we suggest there may be value in exploring further the potential of rights-based approaches for enhancing equitable resilience in Andean agri-food systems. This article should be of interest to academics and practitioners in planning working around local or traditional food systems.

KEYWORDS

resilient agri-food systems, social ecological resilience, intersectional analysis, discourse analysis, situated knowledge, land use planning

Introduction

The focus of agri-food system research for the most part has been on non-local and non-indigenous systems that are attuned to large scale cultivation and which support national development imperatives. Left out of the picture have been local, traditional and indigenous systems, such as found in the Andean highlands where communities have preserved and managed a vast diversity of crops and species and maintained sustainable and resilient agri-food systems over many millennia (Brush, 2004). In this setting, local practices are set apart from rational, technocratic perspectives on planning that undergird research, policy and practice. Rather, local planning practices are culturally-informed, set within wider Andean worldviews, or “cosmovisions”, about nature, values and livelihoods, and rest on the principle that these resources should be maintained, preserved, and improved for securing food for present and future generations. They emphasize the interfacing of humans and nature and the importance of maintaining and valuing ecological systems as guiding principles for harmonizing these relationships and guiding social organization of communities (Helles, 1995; Zimmerer, 1996).

Lack of treatment of these systems in the planning literature reflects a dominant strand of thinking in the field that prioritizes intensification of the use of land, extensive use of external inputs and reliance on the technocentric paradigm of agricultural industrialization (Núñez Ramírez, 2005). Though there is a focus on climate and environmental change, analysis and planning for resilience and adaptation to diverse social and biophysical changes is lacking (Bennett et al., 2016). The influence of this on policy and programming in the Andean region is that these remain insensitive to local systems and practices. Top-down systems of control persist which are inefficient and take responsibility away from peasant people in the Andean region, who routinely find themselves excluded from decision-making processes (Grillo, 1998). Plans are drawn up by small groups of “experts” or by outsiders with little or no reference to community priorities or realities.¹ One particularly significant implication is that the role of community

1 In Peru, the National Strategic Planning System (SINAPLAN) and its governing body, the National Center for Strategic Planning (CEPLAN) were created to articulate and integrate set of bodies, subsystems and functional relationships to coordinate and make viable the national strategic planning process for national development. The SIPLAN granted responsibility and function of provincial municipalities to comprehensively plan local development and land use planning at the provincial level. The provincial municipalities are responsible for the planning process for integral development in the scope of their province, gathering the priorities proposed in the local development planning processes of a district, where peasant communities are found. However, these gaps still exist and have become wider and more severe due to confrontation among peasant communities (Central Andes) and Amazon

heterogeneity in planning is overlooked. Peasant farmers are treated as a homogenous group, as “campesinos”, “comuneros”, or as “beneficiaries”, where local identities and their roles in local planning processes are overlooked. Peasant men and women’s concerns and experiences, contributions, and opportunities are ignored. This is strongly evident at the macro level, as reflected in national policies and legal frameworks, while heterogeneity, expressed for example through social diversity and the intersection of socially and culturally defined identities such as gender, age and marital status, is ignored. When projects have included Andean communities, these are sector-oriented and overlook the importance of identities shaping who benefits and who is excluded from policies and resource allocation.

The aim of this article is to respond to these gaps. It does this seeking to shed light on the complex identities of Andean farmers–peasant women and men–that contribute to sustainability and resilience in local agri-food systems through traditional or local planning. We situate the article as a contribution to the indigenous planning literature, which treats planning in alternative agri-food systems such as indigenous, local, family and smallholding systems (Altieri and Nicholls, 2012; Pereira et al., 2018; Tiftonell et al., 2021). The article responds to these gaps by (1) documenting local processes of land use planning for agri-food production; (2) identifying the contributions and positions of peasant people in the agri-food systems; and (3) identifying the impact of social identities on peasant people’s relationships or interactions within social-ecological systems. By focusing on five Andean communities, our analytic treatment of intersectionality is on the meso- and micro levels where we are concerned to understand identities and social practices in terms of community institutions and processes of identity construction (McCall, 2005; Grünenfelder and Schurr, 2015). We treat the macro-level in terms of the discordance of policy and programming with the complex identities of Andean farmers. Further, the article draws on rights-based thinking to consider implications for policy and practice as a further set of contributions. We identify policy gaps and formulate some initial policy and practice recommendations so that national approaches and interventions might better reflect the diversity of Andean people’s identities and the way these affect relationships with socio-ecological systems in national and public planning. In doing this, we lay out in some detail the nature, social and cultural components making up the local agri-food system. We note here that we use the term “Andean peasant producers” to differentiate this group from other Andean groups and communities, yet recognize that communities are heterogeneous, as reflected in our study approach.²

Indigenous groups (Amazons) with the different levels of government that is due to the misuse of natural resources and environmental problems.

2 “Andean Peasant Producers” are a distinct and heterogenous socio-cultural and economic group established in a specific geographic

Overall, we position the article within a wider literature that responds to the inattention to local or traditional systems and planning, and as a response to a gap in understanding how indigenous planning and its outcomes for resilience are shaped by local identities. Our choice of focus on Andean peasant producers highlights how impacts related to agriculture are integrated and addressed in local and traditional land use planning and how land use planning and planning for agriculture relate to local food security. We also suggest ways for connecting local and in particular indigenous planning with state policies and legal frameworks.

The paper is structured as follows. First, we introduce the context of the study before moving on to present the theoretical bodies of the literature on local resilient agri-food systems, social-ecological resilience, and feminist intersectional critical analysis. We then introduce the context, the Central Andes of Peru and the peasant communities. The research design section sets out the methodological approach and is followed by a presentation and discussion of results. The study is presented in two phases. The first concerns the first research objective and is a thematic and descriptive account of women's and men's contributions to planning for local agri-food systems sustainability and resilience. We have opted for a descriptive approach that outlines in some detail Andean specific processes of land use planning and planning for agriculture on the grounds that these processes are not well understood in the literature. The second, focused on remaining objectives, critically analyzes the discourses on the impacts of women's and men's identities in their relations within social-ecological systems.

Andean agri-food system context and its novelty

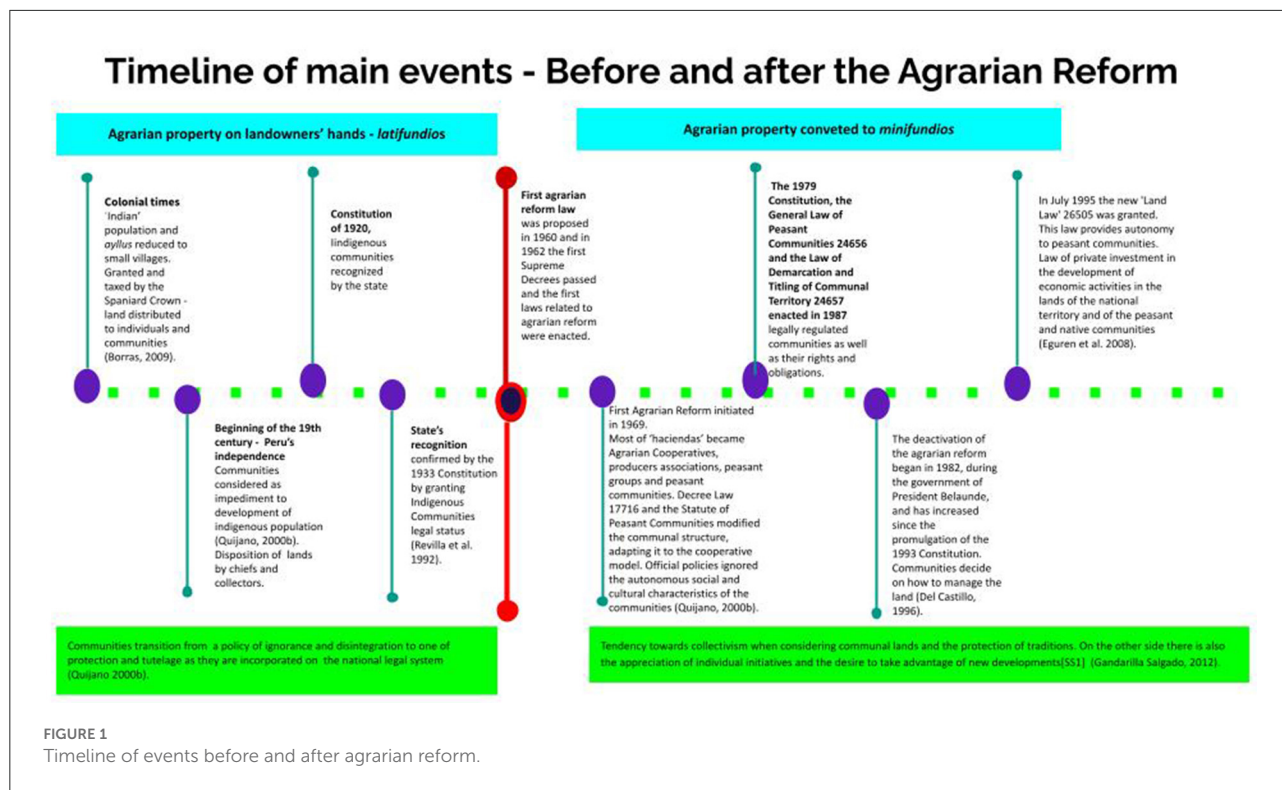
The Andean Region is considered one of the most globally significant centers of crop and animal species adaptation (De Haan, 2021). The region covers around 121 million hectares with an agricultural population of over seven million people in six countries from Venezuela and Colombia to Argentina (Mateo and Tapia, 1987). Socially and culturally, the figure of the *Pachamama* (“Mother Earth”) presides over planting and harvesting, and connotes life, wholeness, unity, fertility, nourishing, and richness. A supernatural being, *Pachamama* is geographically, ecologically, and culturally linked to the mountains (Pease, 1982). At the center of the Andean

space, the Andean Region. They are considered a group that has learned to manage diverse modes of production and communal organization outside western ideas and specific modes of reproduction and sustainability of life. They have great capacity to adapt to the new conditions that are generated by changes in their systems and their ability to cope and adapt to very different political-economic-social systems internally and externally.

cosmovision is the notion of nurturing life, which holistically integrates the local *pacha* (the living, natural collectivity of all beings–space/time), the *runa* (humans), *sallqa* (nature), and *Apus/wacas* (deities) (Tapia et al., 2012).

The Andean cosmovision, and the “harmonious relationship between humans and their environment” together with social and cultural practices in the Andean communities has persisted in the face of colonialism, oppression and exclusion (Ranta, 2018; Gonzales and Gonzalez, 2010). Colonial and mechanistic processes challenged notions and practices of sustainability that were rooted in indigenous places, yet the Andean ayllus or “cultural places” have continued “to be nurtured through the spiritual values of indigenous communities” (Gonzales and Gonzalez, 2010 p. 84). At this time, indigenous peoples and ayllus were reduced to small villages for the purpose of evangelization and their land and natural resources appropriated as the state sought to develop a more commercialized and individual society (Pease, 1989). In the twentieth century, legal change and reform would move in a different direction, for example in Peru where the 1933 Constitution recognized and granted legal status to indigenous communities (Revilla and Price, 1992) and where a comprehensive agrarian reform programme was initiated in 1969 (Figure 1). In recent decades, in agrarian settings characterized by neoliberalism and the reassertion of power by rural oligarchs, indigenous-based movements and organizations in the region have sought to reassert traditional practices and secure greater autonomy and protection. In Bolivia for example a movement of indigenous peoples has organized around the reconstitution of the ayllus, and in Peru movements and organizations have led a sustained struggle for the land and territorial rights of indigenous peoples.

Social practices and economic activities in many parts of the contemporary Andean region, and in our case study settings, continue to be shaped by the Andean agro-centric vision of agriculture as a system (Grillo and Rengifo, 1990). This vision integrates four sub-systems as recurring categories. The first is the use of land that provides soil and water. The second refers to the means of domestication of plants and animals. The third system is related to the construction of a microclimatic infrastructure. The fourth system embraces the techniques of conservation, storage and transportation of foods to ensure effectiveness and continuity of economic production (Grillo and Rengifo, 1990). A cultural principle of “complementarity” belonging to the Andean cosmovision refers to the control and use of ecologically distinct, spatially separated production zones by single ethnic groups. Murra (1975) articulated this idea as “verticality” as a totality of levels arranged “vertically”, one on top of another, forming a macro-adaptation, a system of ecological relations purely Andean (Murra, 1975). Thomas (1973) discusses energy flows, demonstrating that multiple zones were better able to provide sufficient energy than single zones. Golte (1980) suggested that multiple zones are used to smooth out labor demand, thus making labor more efficient



and productive than is possible within a single zone (Brush, 1992). Another cultural principle, the notion of reciprocity, promotes cooperation among and within Andean communities. It determines the roles and activities in agricultural practices (Delgado and Ponce, 2003). One of the most common types of reciprocity is denominated *al partir*: a farming family owns the land and the other works on it in exchange of dividing the profits equally to both groups (Mayer, 1974). *Ayni* is another work exchange arrangement practiced at the family's level (Mayer, 1974). The exchange of labor inside this farming system allows Andean people to work for others without any exchange of money (Delgado and Ponce, 2003). These classifications of reciprocity depend on the climate, topography, and biodiversity of Andean ecosystems' variability (Mayer, 1974).

Theoretical components

Our intersectional analysis for understanding the complex identities of Andean farmers draws on three main theoretical components. First, intersectionality and intersectional analysis is centered on the idea that people do not have fixed, one-dimensional identities (Hankivsky, 2012) but rather experience multiple, layered, and dynamic identities that are derived from social relations, history, and structures of power (Kerr, 2004; Castro Varela and Dhawan, 2009). Intersectional analysis attends to the interactions of identity categories such as sexuality,

ethnicity, age, ability, ethnicity, race, education, marital status, geography, age, etc. (Hankivsky, 2014) and how these shape experiences (Kim-Puri, 2005). These interactions occur within a context of connected systems and structures of power, such as where individuals and groups are members of communities and polities with different state and non-state laws, policies, and systems of governance at different scales (Hankivsky et al., 2014). Analysis is attentive to the complex relationship between mutually constituting factors of social location and structural disadvantage, and maps and conceptualizes determinants of equity and inequity in and beyond sustainable agri-food systems (Grace, 2010) more accurately. Employing such an approach is also in keeping with the recent shift in agricultural studies toward understanding the role of culture and identity in mediating farmer behavior and outcomes (Burton et al., 2020; Settee and Shukla, 2020), and which is likely to be of especial significance in local and indigenous food systems such as in the Andes region.

Critical, intersectional discourse analysis is also useful to practice, as both action and analysis can inform one another (Collins, 2019). It is useful for helping researchers and decision makers move beyond singular identity categories that are typically favored in equity driven analyses to influence public policy (Dhamoon, 2011). Its sensitivity to specific contexts and distinct experiences provides a means of transcending dichotomous and binary thinking about power and differs from some of the more prominent gender and development

and diversity approaches (AWID, 2004; Winker and Degele, 2011). To advance conceptual and methodological richness within critical policy analysis, there is also a growing interest in intersectionality for transcending isolation and linear thinking (Kantor and Apgar, 2013). Intersectional thinking interrogates these identity categories within broader structures and processes of power and shows why the need to transform conventional equity-driven policy analyses is urgent (Hankivsky et al., 2014). AWID (2004) emphasizes on the importance of having a complete analysis of the situations and contexts for planning to achieve full potential. Yet this cannot be categorical or top-down, otherwise, the full-range of vulnerabilities, activities, and experiences of diverse women is unlikely to be recognized (Collins, 1990; Agrawal and Gibson, 1999; Hankivsky and Cormier, 2011).

Second, local resilient agri-food systems provide sufficient, appropriate, and accessible food in the face of disturbances and shocks (Berkes and Turner, 2006) and reduces vulnerabilities. These systems differ, qualitatively and quantitatively, from mechanized industrial agricultural systems, and, not infrequently, practices reflect historical or contemporary relationships within and among ethnic groups, or other culturally specific patterns of symbolism, identity, and meaning making (Berkes and Berkes, 2009). These systems have been largely explored from a top-down perspective, however, overlooking local initiatives and their connections to other levels of the agri-food system, such as policy and governance. The shortcomings of such a narrow perspective indicates a need to understand and analyze local and indigenous initiatives in more depth, to consider more fully the dynamics of the distinctive characteristics of social and natural interactions, and the potential to analyze these for the perspectives of policy and governance. As of yet, agri-food governance and planning has been absent in rural planning and policy making and there is a need to begin considering local or indigenous or traditional agri-food planning for their role in food security.

Calls for linking these systems to territorial or regional policy as well as national policies have been made, as such responses can help secure territorial sustainability. The results can be beneficial both for the rural communities and for solving broader issues affecting urban and rural areas. For example, issues of land use, food production, environmental management may be addressed by linking rural and urban communities in a given region (Berdegu et al., 2014). This local perspective on agri-food systems can support resilient, just, and sustainable food systems and territories through the following precepts: (i) food produced in rural areas contributing to urban areas food supply; (ii) rural watersheds supplying drinking water to urban areas and provide irrigation for urban, peri-urban, and rural agriculture; (iii) organic and agricultural waste resources produced in urban and small rural areas being used to generate energy and fertilizers, which are used in urban and rural areas, respectively; and (iv) preservation and sustainable management

of agricultural lands in rural and peri-urban area for helping enhance water retention, reduce flooding, or mitigate increasing temperatures, thus reducing the climate change vulnerability of both urban and rural areas.

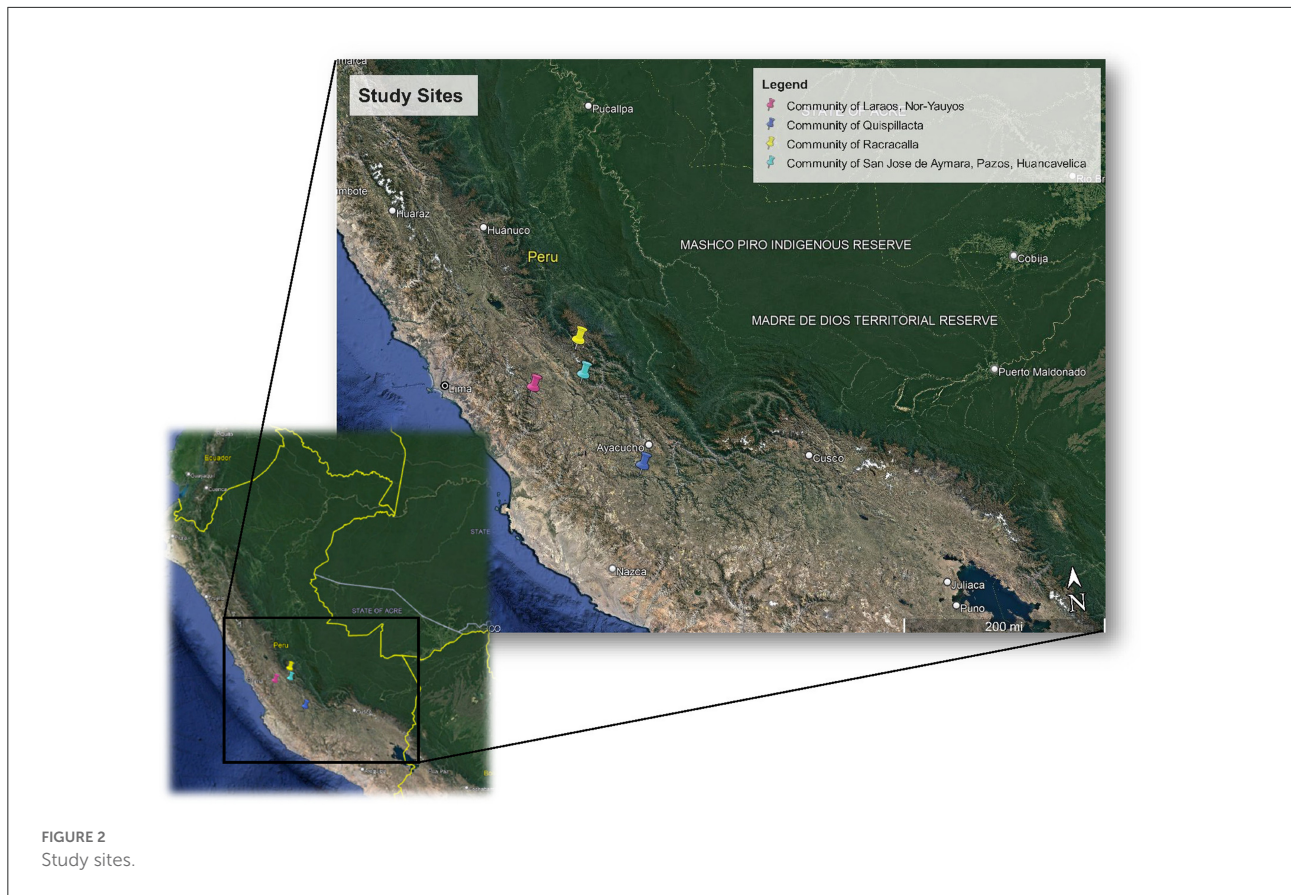
Finally, a socioecological resilience component (Gunderson et al., 1995; Gunderson and Holling, 2002) responds to the ways community culture and identity may be intimately connected to local resources and ecosystems (Rotarangi and Russell, 2009; Walsh-Dilley et al., 2016; Matin et al., 2018), and bound up in the resilience of social ecological systems. In these settings, resilience is generated through power and authority sharing arrangements over natural resources, for example through devolved or inclusive decision-making and governance structures and processes (Ford et al., 2020). These underscore the cultural dimensions of resilience and holistic core concepts of indigenous and local communities, and culturally specific local dynamics, connections to context, language and social relationships (Ensor et al., 2018; Matin et al., 2018).

Materials and methods

Site selection

The study was conducted in five different peasant communities in the Central Andes of Peru; the peasant community of Racracalla, Junin; the peasant community of Laraos, North Yauyos Region, Lima; the peasant community of Quispillaccta, Ayacucho; and the Pazos community, Huancavelica (Figure 2). The selection of the four communities was made to capture variation in: (i) geography (located along the Central Andes–rural or remote community) (ii) community planning (community living based on social and cultural worldviews, resources that include agrobiodiversity, management of resources in integral forms); (iii) physical, social, or economic factors that influence communities' communal practices and behaviors. The selection of the Racracalla and Pazos communities also reflected variation in the levels of poverty associated with these rural communities.

Diverse ecological zones can cover an individual community. These “vertical ecosystems or ecological zones” are denominated the *Quechua*, *Suni*, *Puna* and *Janca* Regions (Pulgar Vidal, 1996). Each zone brings specific characteristics and services. The *Quechua* region lies between 2,300 and 3,500 masl, is temperate and constitutes the center of production of various Andean crops and animal species. The *Suni* or *Jalca* region is cold, very steep, and rainy, and is where communities live. It is highly forested and is the source of water for the *Quechua* region. The *Puna* region is shaped in its widest part by inclined plateaus, and lies between 2,300 and 3,500 masl and includes some of the most productive land in the Central Andes. There are also flat, undulating terrains which are surrounded by several lakes and lagoons. It is used for grazing with the



vegetation used to feed cattle, sheep and camelids such as llamas, alpacas, guanaco and vicuna. In addition, bitter potatoes for processing and medicinal purposes as well as barley are maintained in that area. In the *Janca* or *cordillera* region, lies between 4,800 to 6,768 masl and is the most inaccessible of all eight Peruvian natural regions. The region is icy and snowy areas a permanent feature. It is characterized by a steep and rocky relief covered with snow in the glaciers, and small lagoons have been naturally developed there for storing water. What is common across these ecological zones is the accidented topography, especially at higher altitudes. On the slopes, which comprise more than 75 percent of the Andean territory, the soils are shallow or eroded (Iturri and Amat León, 1999). Regardless of their position, the soils in the highest and coldest areas are poor and thin because the soil forming factors act very slowly (Brush et al., 1994). In addition, the effects of erosion, when occurring in higher regions, have more permanent damaging effects (Brush, 2005).

The peasant community

The management of land or territory in the Peruvian Andes depends on the “Peasant Community”, a core institution

recognized through the agrarian reform programme of 1969. There are around 7,267 peasant communities in Peru, 6,138 of which are legally recognized as sharing ownership of a territory (Diez Hurtado, 1998) through ties of kinship and reciprocity (Hall, 2017). A common history strengthens their identity and unity among communities, and provides for their common practices of rites, agricultural and communal practices (Diez, 2012). The land is not only a factor of production, but also the space or territory on which a living society or culture is reproduced (Hall, 2017). The peasant community’s main attribute is that it preserves its own cultural mechanisms of organization, which are rooted in traditional knowledge (Urrutia, 2003).

Peasant communities in the study have undergone processes of transformation over recent decades. Some communities such as Quispillaccta and Laraos have adopted new communal functions and internal rules, acquiring new ways of using and controlling collective and individual property, territory and resources (Del Castillo, 2006). All communities in the study have kept most of their communal space and land continues to be used in a way that fosters a sense of community and cohesion (Eraso et al., 2012). Two communities, Pazos and Laraos, have introduced new forms of maintaining their resources and communal networks. However, the communities

in this study have maintained some consistency in their internal organization for generations, with agro-centric visions of agriculture and the Andean cosmovision still significant and core to the communities. The control of territorial space, the family property and communal property have not, unlike elsewhere, been a source of internal conflicts (see Table 1 for information about the communities).

Conflict and post-conflict

At the same time, peasant communities in Peru remain marked by the two decades of violent conflict between government forces and communist insurgents. The so-called “internal conflict” lasted from 1980 to 2000 and left 69,280 dead or disappeared, many of whom were peasants and indigenous people with no involvement in militant groups and who were frequently targeted because of “racialized disdain toward rural Indigenous Peruvians” (La Serna, 2012; Heilman, 2018). Peasant highlanders who supported or resisted the insurgency did so for a variety of reasons but one constant, La Serna (2012) notes, was a desire to preserve or return to the local status quo. Yet “many of the values and structures that peasants had begun fighting for in the first place were altered—some of them permanently” on account of civil war conditions (La Serna, 2012, p. 198): for example, expectations around gender roles underwent some change during the conflict in some communities as women came to occupy leadership positions, a consequence of the conflict that appears to have continued in peacetime. In the post-conflict context, highland communities have developed strategies to promote the reintegration of individuals and communities on different sides of the conflict and which emphasize coexistence and “remembering to forget” the past (Theidon, 2012). Rituals such as *pampachanakuy* aim to replace memories of violence and desire for revenge with memories of the past that include coexistence within and between communities (De Vries, 2015).

Data collection and analysis

Data collection and analysis involved multiple steps across four research phases. The purpose of the first phase was to generate a descriptive and thematic account of women’s contributions to planning for local-agri-food systems sustainability and resilience. The second phase aimed to generate a picture of the discourses around men’s and women’s identities vis-à-vis local systems and to propose equity focused policy suggestions. We draw inspiration from McCall’s (2005) intracategorical approach which focuses on a specific group (in our case, the Quechua peasant community) identified and located at the intersections of several categories (age, ethnicity, rurality, socio-economic status, education and marital status) to reveal the complexities of their lived experiences (McCall,

2005). This approach often relies on individuals’ narratives to draw out power relations and social locations embodied in these individuals’ lived experiences (Lepinard, 2014) as well as their intragroup diversities (Manfred and Kets de Vries, 1987). The critical discourse analysis focuses on socio-cultural meaning structures, which are accessed through text, speech or the symbolic aspect of actions, often related to planning, natural resources and culture. This is based on the assumption that reality is constructed through processes of social meaning-making, relying on the use of social practices and knowledge (Foucault, 1973; Keller, 2012). The focus is shifted to the complexity of lived experience and must look for local, specific and historically informed analyses grounded in spatial and cultural contexts.

For phase 1, we conducted a revision of past research carried out with the communities in 2012, 2016 and 2018. The aim was to re-examine data on communities concerning soil erosion control, soil health, biodiversity conservation, water management and community practices. These communities were selected because of their vast knowledge on community planning, conservation of crop biodiversity and close relationship to their Andean Cosmovision (culture and social organization linked to their life experiences and the generation and transmission of knowledge to younger generations).

Based on the information collected, we conducted a critical Discourse Analysis to connect the relationship between three levels of analysis for identifying cases where communities were working in soil conservation and water management (phase 2). We examined newspapers, magazines, posts, interviews, webinars, film narratives, television programs and gray literature for the period 2016–2021 for identifying cases where communities were working in soil conservation and water management. We critically analyzed: (1) the actual text; (2) interesting initiatives happening in the communities—discursive practices; (3) relationships used to produce, receive, and interpret messages (Fairclough, 1995, 2013; Van Dijk et al., 1997; McGregor, 2003).

For phase 3, we conducted ten (10) direct in-depth interviews with key informants for validating and updating information gathered in these initial two steps). Key informants included women and men elders with deep knowledge of reading and interpreting Andean cosmovision principles and concepts, women and men community members with different biographical profiles or identity dimensions (marital status, age, education, socio-economic status). This data was analyzed, and visual, written, and oral data was triangulated and coded by applying the intra-categorical approach to intersectionality (McCall, 2005). Analysis sought to build a picture of the preconceived categories of women’s and men’s social identities, such as through gender, ethnicity, marital status, and age, education and geographical location, and how this was reflected in men’s and women’s contributions to land use planning in

TABLE 1 Community background.

Racracalla

The community of Racracalla was recognized on 20 October 1989 and is located between 3600 and 4800 m above sea level in the Department of Junin. Its territorial extension comprises 14,448 ha: 7,638.18 of which is ancestral land and 6,810 of which was transferred to the community *via* agrarian reform. The territory is accidented and steep in the highlands and has a plain in lower areas. A Quechua community, it has 132 registered members of which 117 are men and 15 women. The territory is organized according to areas of agricultural use, pastures (natural), forests, water resources, spaces not suitable for agriculture, and housing. Agriculture is the main source of income and work. Potato production is the main agriculture activity, with over 450 varieties cultivated in community lands. The community owns cultivated land and there are a few individual landowners in lower areas (communitarian tourism). Production is for subsistence in the first instance. Conservation of native potatoes is a priority and is conducted through the Conservationist Association of Native Potato Producers while surplus is sold in local markets. There is an external conflict with neighboring communities of Comas and Pusacpampa concerning Racracalla's loss of access to grazing areas in the highlands and irrigated land in the valleys. Young people tend to stay in the community, although some choose to migrate.

Laraos (Santo Domingo Qocha de Laraos)

The community of Laraos was recognized on 2 September 1938 and is located around 3,500 meters above sea level in the Department of Lima. Its territorial extension comprises 65,742 ha. Ninety-six percent of this land is puna land used exclusively for grazing. The remaining 4% is located in the Quechua region and dedicated to agriculture and occupies the flanks of the small valley of Laraos upstream and downstream from the town. The landscape is accidented and vertical. The slopes range between 20 and 45 degrees. Agricultural plots are terraced from the top of the valley and along the steep slopes on each side of the watercourse. The river flows into the small lake of Qochapampa with temporary waters. The irrigation channels constitute a masterpiece of hydraulic engineering that allow water to be carried from faraway places to the last corners of the platforms. A pre-Inca (Wari) community, it has 636 registered members of which 319 are men and 317 women.

Agriculture is the main activity: corn is the main crop followed by native potatoes, olluco, mashua. Native potato is only grown in dry and community-owned land. The conservation of cultural practices is revealed in their communal festivities: "Cleaning of the ditches" is celebrated on May 15 each year; other festivities include the "Matachines" and "Quia Quia" celebrated on the third Sunday of June, the Palla Larahuina on August 4, the "Nigeria" on August 30 and the dance of the "Lilies and Huachuas" celebrated on December 25. The community owns cultivated land and there are a few individual landowners in lower areas (communitarian tourism). Production is for subsistence and there are no external or internal conflicts. One of the most challenging issues the community faces is the out-migration of youth to cities or mining communities.

Pazos

The community of Pazos was recognized on 31 January September 1951 and is located around 3,840 m above sea level in the Department of Huancavelica. Its territorial extension comprises 6,700 hectares that are owned by the community. Most of the terrain is not irrigated. The landscape is covered by grasses and shrubbery. Terrain is accidented and steep in the highlands and flat in the valleys. Located in the Suni and Quechua regions, there is a cold and dry climate with abundant seasonal rains in cold and undulating bottoms. A Quechua community, there are 200 registered community members of which 100 are men and 100 women. Despite the harsh climate, barley, beans, olluco, native potatoes, maca, oats and others are cultivated. The preservation of native potatoes is one of the most important activities in the community, cultivated in non-irrigated terrains and community land. The community maintains approximately 350 varieties of native potatoes. Land is owned by the community in the highlands. Lower areas are owned individually by citizens for housing. Community members are also members of the cooperative Agropia which sells the native potatoes to niche markets in Europe. Community members are under pressure to produce for new local and international markets for specific native potatoes varieties (2 varieties). Though the community does not have problems with mining industries, it has experienced external conflicts with other surrounding communities in the past decades. Migration is characterized by the movement of young people to the jungle and mining industry for work.

Quispillaccta

The community of Quispillaccta is located between 3,500 and 5,000 m above sea level in the Department of Ayacucho. Some their cultivable land is also located at lower levels (3,000 masl) near to the Pampas river. Its territorial extension comprises 22,220 hectares. The community has three agroecological zones. In the low zone (below 3,500 m above sea level) is located the mother town Villa Vista (also named as Llaccta). In the middle zone (between 3,500 and 4,000 masl) there are another 10 neighborhoods (Unión Portero, Cuchoquesera, Pampamarca, Catalinayocc, Puncupata, Yuracc Cruz, Llacctahuarán, Pirhuamarca, Huertahuasi and Sobobamba). In the upper part are located the towns of Tuco and Circi, which are 4,000 m above sea level. The localities share a continuous territory; however, each is autonomous in its organization and communal work. The community owns the grazing lands; each family member has customary access to land. Quispillaccta is surrounded by the Cachi and Pampas rivers, of the high headwaters of the Río Cachi basin, however, its springs, lagoons and slopes derive from the water of the rains, hailstorms and the melting of the waters in the mountains. The community depends on two main economic activities: agriculture and livestock. Agriculture is carried out in dry land, under the of rain and in conditions of high climatic variability, for which its production is irregular and limited to a single campaign. On the other hand, livestock is practically for self-consumption or for internal trade. Collective efforts have generated high dividends since the formation of the Bartolomé Aripaylla Association (ABA—Ayacucho). This is a nucleus of Andean cultural affirmation, one more strand of the fabric of the indigenous community of Quispillaccta. The organization has been strengthening Andean agriculture and the recovery of traditional knowledge, the cultivation of ancestral species, the diversification of seeds, the improvement of soils and grazing areas, in the increase of the vegetation cover and reforestation, in the cultivation of medicinal plants, among others. The community was affected by violence during the Internal Armed Conflict, in particular between 1980 and 1991. Security forces carried out mass kidnappings and executions of indigenous peasants (La Serna, 2012). Traces of this conflict are still visible to this day, especially at the level of community organization and its cultural identity.

TABLE 2 Discursive elements in indigenous or community land use planning and national planning.

1. Power and knowledge generation in community planning

- Community members—*comuneros* and *campesinos* mutually depend on one another for maintaining the land and resources for the benefit of the communities. Relations are considered equal and egalitarian and not hierarchical. Knowledge generates diverse power dynamics inside the communities.
- Older men, as heads of the household and community, have more knowledge and life experience and enjoy social privilege over younger, single men. Their power is reflected in the decisions they take in the management of the resources and planning decision-making processes.
- Older men represent the communities at local, regional, and national level because they are perceived as speaking better and able to demonstrate leadership skills and qualities.
- *Comunera* women (widows) represent the household in the community. Their knowledge is respected and followed by older leaders. *Comunera* women have full rights in the community and enjoy power and privileges in the communities.
- Married peasant or *campesina* women that are older hold deep knowledge about planning and are guardians of the knowledge—but do not enjoy the same social privileges of female widows as they are not head of the household.
- Young female daughters without decision-making roles in the community have more formal education and are appreciative of traditional knowledge. Their opinions are heard and followed as they introduce knowledge that integrates traditional knowledge with more technical knowledge. However, their role is that of “innovators” and not of community members. They may have access to land and resources but no control over the land. This is given to them through fathers or widowed mothers.
- Though community members in all communities contribute equally to community land use planning and resource management use planning, the positions they occupy in the communities are unequal distributed. There are men and women who can make decisions and transmit knowledge comfortably (mainly older and head of households). While other only are keepers of knowledge, new or traditional (married and young women). They may have access to land or resources but not control over them. They are represented by older men—fathers or husbands and female mother widows because they are not “formally” members of the community.
- Peasant women suffer different forms of subordination inside the communities, as their status as wives or daughters as opposed to *comuneros* or “*comuneras*” means they cannot access management roles or control over the land. The seed keeping role is assumed as a “reproductive role”. They are also unable to represent the household or community if the head of the household is the husband or father. Nevertheless, peasant (“*campesina*”) women are the main contributors to community planning, food security and biodiversity (crops and animals) conservation.
- Peasant *campesina* women’s contributions to planning for resource management, knowledge generation, conservation and cultural practices do not lead automatically to community membership or land holding in the communities. Knowledge does not necessarily translate or result in holding power in the communities. An older and married women in the community can be a seed guardian or contribute to water management planning, however, she cannot have access or control over the community land.
- Power dynamics in the household are very different to those exercised in the communities as women’s domain is the household and food intake. Food intake depends on the resources the families have and maintain inside the household.
- Married women’s knowledge and visible power in the households is considered as part of their duties to maintain the family (reproductive roles). Diversity means nutrition and food security. Powerful men depend on wives to make decisions at household level because women.
- Younger, educated women create their own spaces (Quispillaccta, Laraos, and Pazos) and acquire decision-making power despite their age and introduce new activities or innovations for promoting equity and representation of women in community planning and community decision making.
- Younger and educated women and men without any management or decision-making role in the communities are respected as they easily can establish intercultural dialogue and communication with outsiders.

2. Linking customary planning to “state or modern planning”

- Peasant communities hold oral knowledge which is guided by the Andean Cosmvision’s principles and influence their ways of living. Though, they are recognized in the legal frameworks of the country, they are not clearly and differentially recognized in policies.
- Peasant communities are heterogeneous not only because of their ecological systems, geographic location and culture. Communities are also diverse on their access and control over resources, socio-economic situation, type of organization and market relations. They are also diverse because of their population characterized by their age, socio-economic status, ethnicity, marital status, etc. The heterogeneity of the communities is represented at individual, household and communities.
- Though, older married men and female widows hold power in the communities, their power is limited to their roles at the community level. Few become national representatives.
- Local conditions of peasant communities are diverse and heterogenous because there is no ideal peasant or *comunero* who can represent the peasant community. They are diverse because their unique knowledge—women or men, social relations, and socio-economic status.
- Policies have not yet considered the communities diversity of activities. Communities plan these at different spaces and time, they are escalated and not conducted at one time.

(Continued)

TABLE 2 (Continued)

- National and sectoral policies do not consider the interrelation and complementarity of communities' activities. Productive activities (crop production, husbandry and forestry depend on each other because one supports the other to produce).
- National policies do not consider the different farming systems or the contribution of the animals (manure or transportation).
- National policies do not consider the influence of agrarian behaviors and organizational systems in the planning of production systems which are determined by natural conditions. This overlooks the use of resources in time and space, and variation of environmental factors (water availability, excessive humidity, etc.) in the production systems.
- National policies have ignored the cultural and historical factors of communities that influence community planning and overlook the communities structures and systems of production as integrated approaches to planning.
- Indigenous, peasant and community planning are ignored in national and sectoral policies. The Ombudsman's Office in Peru nevertheless indicates peasant communities suffer discrimination and exclusion, scant exercise of their duties and rights, limited participation in decision-making, lack of basic services such as health and education. State support is limited or absent. In addition, there is the frequent lack of title to territories (rurality), few protections from land invasion, and communities experience deforestation due to activities such as large-scale cultivation and illegal mining.
- Legal protections and mechanisms have weakened since the early 1990s and do sufficiently not protect the lands and territories of peasant communities. In the 2000s, supreme decrees, legislative decrees and ordinary laws have debilitated communal property, environmental protection in favor of the national economy, extractivist projects and infrastructure.
- Economic interests of large investments are prioritized, emphasizing modern against traditional. Rights protections are weakened to the benefit of investors. legal changes (e.g., Law 30,230, Title III complemented with Legislative Decree 1333) promote the clearing of community land for investment projects.
- Land titling reduces territorial rights of peasant communities. This is in part caused by chaotic regulations and absence of public policies to recognize land titling. Land registration and titling is difficult for peasant communities to achieve. Processes are slow and complex, taking several years to be recognized and usually have to be done in Lima, the capital.
- In 2014, the National Ombudsman's Office concluded that the Peruvian State does not have a public policy suitable for the recognition and certification of the peasant and native communities of the country. Seven structural and institutional issues identified: (i) absence of regulations on community titling; (ii) lack of a governing body to recognize and support titling of communities; (iii) lack of centralized information on the number of peasant communities; (iv) insufficient institutional capacity to recognize and certificate land titling of peasant communities; (v) lack of awareness and knowledge on rights on adaptation of management instruments; (vi) absence of budget prioritization for the implementation of the recognition process and titling of peasant communities.

local agri-food systems. To complement, we conducted semi-structured interviews with a total of 4 women and 3 men from the communities to address the gaps in the literature and policy review (December 2019–December 2021).

In phase 4, reports of national policy documents and planning legislation were reviewed in relation to peasant communities, family agriculture, natural resources and environmental planning. Data collected across previous phases were further triangulated and analyzed after the codification of data in NVivo 12. We used content analysis and applied the critical discourse analysis approach (Fairclough, 1995, 2013; Van Dijk et al., 1997) to analyze the data to identify the multiple social locations, relations, and structures of power, in relation to these identities. This would allow us to understand discursive practices at the micro-level planning processes and their relation to national planning discourses. With these analyses completed, emerging findings were lined up with the main coding themes obtained through the document analysis, allowing gaps to be revealed in relation to women's and men's identities and contributions to planning in local agri-food systems. Key informants and research participants were selected through a purposive sampling strategy that focused on interesting cases that would help shed light on intersectional identities

and generate new and conceptually useful knowledge about each community. The step supports realizing the study aims, where intersectionality is placed in a new context of local or traditional planning. This strategy, which is an appropriate one for qualitative social enquiry, is reflected in our sample size: we do not seek to generalize these findings to Andean communities more broadly (a statistical generalization), but to provide a theoretical generalization that concerns the meanings and feasibility of local or traditional planning for agricultural purposes through an intersectional lens (Seale, 1999).

Results

Findings of our discourse analysis reveal two main discourses around power and knowledge generation at the community level; and modern or state planning at the national level planning. These are summarized in Table 2. We did not identify substantial differences between communities in how identities identified in Table 2 are concretely manifested and how they track principles of the Andean cosmovision and knowledge generation, and their influence on social organization and planning. At

the same time, in [Table 2](#) we present and discuss below aspects of location-specific heterogeneity and multiple social locations.

Women's and men's participation and contribution in community planning

Different groups of women and men contribute equally to land use planning in the communities, despite differences in age, socio-economic status, gender, ethnicity, etc. The preservation and conservation of resources such as for agrobiodiversity, water and soil is in the hands of women. Older women have passed the information to younger women and the generational gap has been closed through ceremonials and payment to mother earth (Pachamama). Community members collectively identify, plan, and carry out activities that meet their collective needs. Despite differences in women's and men's social positions in the communities, they all participate and contribute to planning processes. However, differences still arise when an individual becomes a community member, a *comunero* with rights to receive land from the community. Most women cannot be registered as members in the same way. They are restricted from control over the land by being represented by either their husbands or fathers in the community council. Despite these restrictions, women's contributions and presence in land use planning ensures that natural resources are used efficiently. Thus, the needs of the communities and members are met while taking care of their natural resources. Each year, land use planning begins with land distribution for each household.

The head of the household is usually the father or husband who is registered in the community's registers. A female widow, who is usually older with children, may also represent the household. In exceptional cases a single mother can also represent her household. Women and men with full rights in the community are called "*comuneros* or *comuneras*". Those men or women who are not official members of the community are called "*campesinos* or *campesinas*". This social difference emerges from traditional norms and governance practices in the communities, and shape land access and control ([Figure 3](#)).

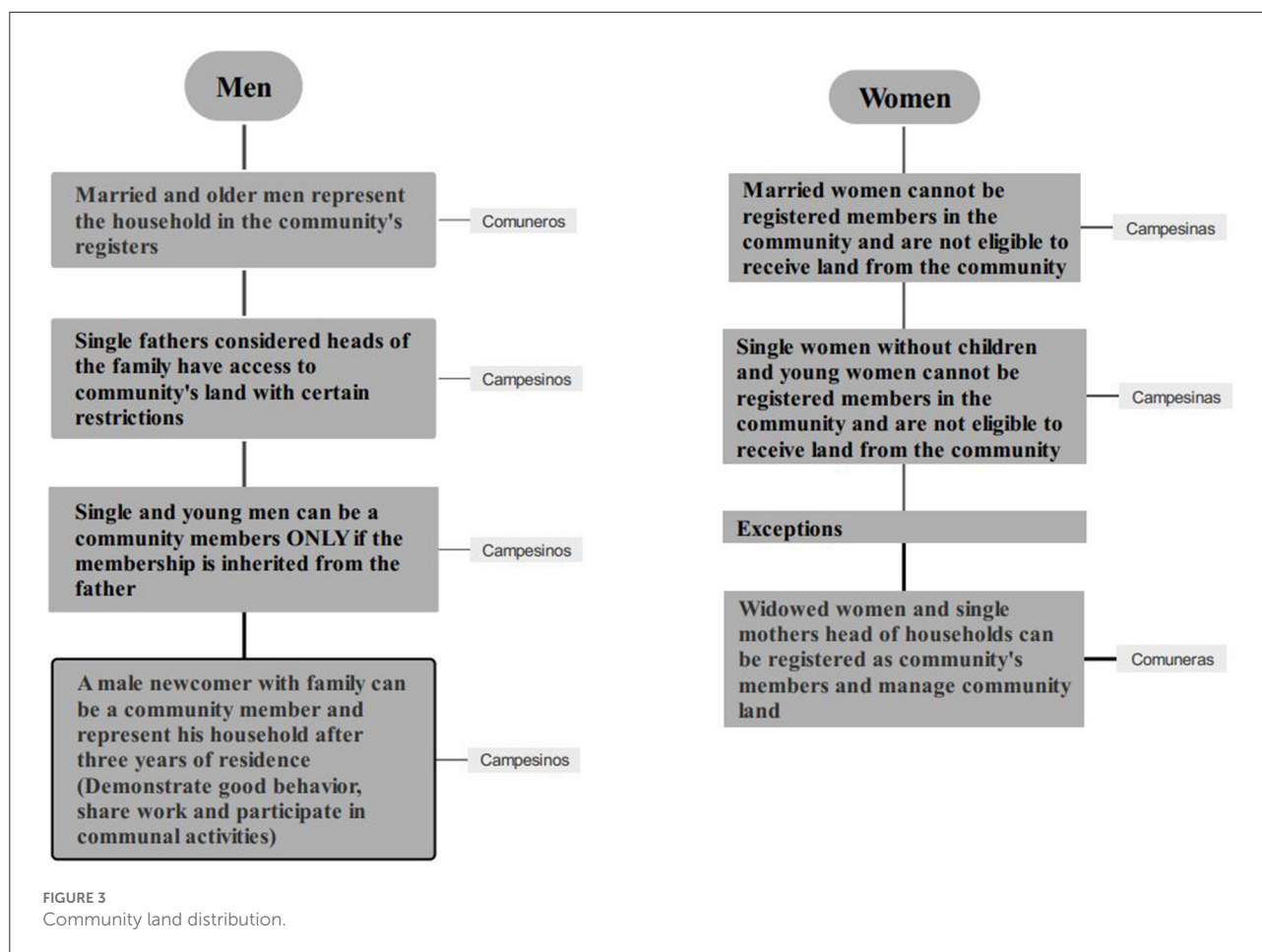
Despite the positions of the different groups of women and men, and the traditional forms of governance in the communities, younger generations—specifically university educated young women are key players for introducing new ideas into communities. They have been able to introduce new knowledge or technology, which has been well received in the communities. Older women and men by contrast depend on traditions and rituals to maintain the natural resources in the communities.

Communal planning

Planning in these communities is conducted under the precepts of the Andean cosmovision and guided by the principles of *Ayni* or Andean reciprocity, and *Minka*, the process through which people work together for a common interest. Ancestors' practices and traditions represent and encourage sharing work, teamwork and collaboration. Planning processes are integral, iterative, and collaborative. Decision-making draws on diverse tools, mostly graphic, oral and written documents. Information, experience, and events accumulated through the years carry a similar level of importance as current information. These are documented chronologically and sequentially. Periodical community assemblies serve to discuss, revise and update information. Planning elements that characterize these discussions are multiple and include for instance the legal status of the community, information on households, and communal activities ([Table 2](#)).

Revising territory and ecosystems through community assemblies is done holistically. Community leaders must guarantee that community members participate equally, and participants give their opinion freely. In the assemblies, community members gather and collectively decide on plot distribution for the year. Registers such as in the form of maps and agricultural calendars are revised by community members to decide on land distribution and use. This is a democratic process and conducted through form of public draw. An equal number of plots are assigned to each household head. Quality of the soil is not similar in all plots however and community members must accept the results of the draw. A "communal approach" to land distribution is adopted which starts with "communal zoning". This reflects respect for the Pachamama and communities' experience of territorial management, which is based on adequate and rational use of all the assets that exist in the community. For example, there should be a balance between healthy soil, water, biodiversity, livestock, wild flora, and fauna. Two interview excerpts with women in the community are illustrative:

... we have to take care of our home as a whole; nothing goes separated or individually. The natural resources including the land we have in the community are the sources of our food, our health, our homes. This is the place where we relate to our ancestors, to the gods and spirits. We and our ancestors have maintained close connection with nature and lived in harmony. We were prepared to read what the stars, the moon and the sun wanted to say to us. Now, we must be more prepared the weather is changing, and we have to be prepared. If we plan together and everybody participates, we can overcome the challenges.



It's the place where we live in harmony with nature [the cosmos, stars, sun, moon, the pikes, etc.]. I respect the Pachamama because it gives us food. She feeds us. In my community, we give our respect or “pago” to the Pachamama. Before we start our work in the fields, we have to ask for mother earth's permission. We have to pay tribute to the land so we can keep our animals and plants in peace and harmony.

Communal zoning

After all elements have been assessed and revised (Table 2), community members focus on the elements that might disrupt the functioning of the ecosystem or territory and which are considered critical for “*buen vivir*” (living well) and food security. *Buen vivir* or *sumak kawsay* in Quechua describes a way of doing things that is community centered, ecologically balanced, and culturally sensitive in order to produce the food for households and the communities. The main zoning elements are zones of crop production; zones of forestry production—introduced

and native; zones of pastures—introduced and native; zones of recuperation; zones of conservation or protection; sources of water (Table 3). Older women play a critical role in sharing their knowledge with community members when it comes to communal zoning. They are in charge of collecting and selecting the seeds, taking care of the llamas and animals in the household, organizing activities for the cleaning of canals. Though, married women are not members of the community, they actively participate in the community's meetings.

In the zoning processes, natural resources converge for the zoning elements to function (Table 4). This is in harmony with the worldviews, culture and the social interweaving for securing food. Although production is specialized by zones, individual production units are located at different altitudinal zones. Community members can cultivate land in different production zones. This supports community work, labor and *Ayni* and can be coordinated vis-a-vis diverse agricultural cycles. The relationships between the community and families are dynamic and symbiotic, which help families access specialized production zones or different production zones.

Families must follow community protocols by making use of each production zone. This can create some differences

TABLE 3 Elements considered in the planning process.

1. Community information: name, status, legal recognition, plan, statutes, bylaws, and accounting books.
2. Geographic information: location, altitude, ecological zone(s).
3. Demographic information: number of families, people per household, children born in the year, people death in the year, etc.
4. Roads or *caminos*: access, type of roads, conditions of roads.
5. Weather patterns documented in maps and calendars: frequency of rain, drought, hail, storms.
6. Cultural activities: festivities, celebrations to the *Pachamama*, canal cleaning, religious festivities, carnivals.
7. Territorial space: number of hectares, forest, community's geographic limits (north, south, east, west), basin or sub-basin jurisdiction.
8. Terrestrial areas: irrigated land, dry land; natural pastures: irrigated or non-irrigated land; cultivated pastures: irrigated and non-irrigated land. Location of land: around the community, low, middle and higher altitude (*altura* or *puna* and/or *cordillera*).
9. Types of land: dry, irrigated, cultivated, resting (*descanso*), abandoned, natural pastures, terraces, *andenes*.
10. Types of water resources: peaks or *nevados*, lake, lagoons, basins, canals, *diques*, *acequias*, ponds, ditches, wetlands, *champas*.
11. Communal activities: community level/community associations/social groups/school activities/producers associations/family level.
12. Soil conservation and forestation: rehabilitation of terraces, construction of terraces, infiltration ditches, gully control, live fences, contour furrows, planting with native, exotic or fruit trees, composting.
13. Water management and crop production: lagoons, *cochas*, *acequias*, drainage channels, irrigation channels, irrigation systems, irrigation canals, water harvesting, spring maintenance—*faenas*, cultivated pastures in dry land, cultivated pastures under irrigation, natural pastures in dry land, natural pastures with irrigation, crops in dry land, crops with irrigation, family and school gardens, pest and disease control, seed storage.
14. Livestock management: alpacas, llamas, sheep, improved and native cattle, small animals. Livestock breeding, fish (trout) ponds, fences, corrals, sheds, and fodder conservation.
15. Wetlands management: natural pastures, rotation of plots parcels or *topos*.
16. Community activities: conservation of main areas—park, school, health center, storage sites, accessing roads, wells, canals or *acequias* and sanitary landfills.
17. Community management: community plans, bylaws and regulations, accounting books, organized archives, maps, calendars, etc.
18. Community facilities: water reservoirs, seed storages, irrigation and drainage channels, terraces, living fences, native trees, exotic trees, fruit trees, watering systems, cultivated pastures, irrigated cultivated pastures, irrigated natural pastures irrigated crops, vegetable gardens, alpacas, llamas, vicuñas, guanacos, sheep, improved cattle, creole cattle. This also includes small animals (guinea pigs, hens), fences, corrals or paddocks, sheds, silos (for manure and fodder conservation), wetlands, etc.
19. Other infrastructure: community house, housing, small church or *capilla*, schools, health center, mothers' club, latrines, communal kitchen, drinking water, community and family wells, sanitary landfill (dumps).
20. Other community possessions: vehicles, tractors and implements, communication community center.
21. Activities for community work (*ayllu*): soil management and conservation, water management, crop management, livestock management (herding, transport, migration, meadow management).

among community members, but community mechanisms help mitigate tension such as the agricultural calendar for helping generate common agreement on the factors including the distribution of plots and cultivation. Community members also have to plan shared work or labor, as they are usually involved in two planting seasons: the small and early season (*campana chica*) and the big or main season (*campana grande*). Even though most activities are led by men, the most important activities are conducted by women: depending on the plots they have for the year as a household, women plan which crops and seeds they will plant and at what time and ecological zone; and depending on the weather patterns and reading of biological indicators women make recommendations to the community on what, when and where to plant the seeds. When agreements are completed, the duality and complementarity principles of the Andean cosmovision are fulfilled. Communities confront problems of which climate and variability in weather patterns are

the most frequent themes. These are considered in community zoning. As one community member described,

...respect for the land is understanding occurring changes in the climate and weather. Natural forces such as climate change and weather variations are expressions of mother earth. She wants to transmit her voice now that people are not respecting her and are abusing her. Those who live in the communities know we must be in the field all the time. The plants and animals need to be observed. Changes in the weather and climate can present overnight and unexpectedly.

Traditional knowledge is complemented with modern knowledge and new technologies. These have been useful for strengthening agricultural practices in the communities for dealing with intense, short and unpredictable changes

TABLE 4 Main elements of communal zoning.

Zoning elements	Description
Zones of crop production	Areas used for crop production and located along different altitudinal zones.
Zones of forestry production—introduced and native species	Trees, shrubs and different species of cactus are identified. Introduced species of eucalyptus sit along the riverbanks or as live fences at lower altitudes. Native species (<i>quinual</i> , and <i>aliso</i>) are found at higher altitudes. Native shrubs and cacti are in middle altitudes forming living fences.
Zones of pastures—introduced (temporal) and native species (temporal and permanent)	Permanent (native species at higher altitudes) and temporal (introduced species at lower altitudes) pastures for livestock production. Permanent pastures are found throughout the year and includes permanent grasslands and puna grass cover or <i>ichu</i> . Seasonal grazing areas operate all throughout the year at different altitudes to protect <i>bofedales</i> or watersheds and managed pastures.
Zones of conservation or natural protection	National administrated protected natural areas inside the communities with biological diversity and with associated values of cultural, scenic, and scientific value.
Sources of water	Lagoons, ditches, wetlands, and temporary bodies of water. They serve as habitat for birds, fish and drinking water for the communities and animals in the community.
Sources of biodiversity	Seeds, flora and fauna need to be preserved, maintained and exchanged to sustain the biodiversity existent in the different zones.

in the weather, water supply and climate. For instance, young professionals—women and men—have been returning to the communities after periods away and bringing new knowledge with them. Some examples include the three agronomist sisters returning to the Quispillaccta community. In the context of COVID-19, in-migration has also increased, with young people suffering from unemployment in the cities and lack of food. This is the case of the Laraos, Pazos and Quispillaccta peasant communities.

Participatory diagnosis and prioritization: The territory, ecosystems, and community living interface

Once all information for the different zoning elements is shared, community members proceed to identify the problems, challenges and needs they have in these zones (Table 5). They to identify what solutions might address the challenges and needs. These are based on an evaluation they conduct on the conditions of the main natural resources. A combination of traditional practices and introduced practices are considered. In relation to agricultural and livestock production, the main resources that need attention are considered as priority areas for the year (Table 3).

Communities consider the preservation and transmitting of their traditional knowledge, cultural customs, and natural resources to younger generations is critical for creating the conditions for improving their lives. It is of central importance for communities that they maintain the pool of biodiversity, health of the soil, and that a sufficient

and adequate supply of water is provided to crops. Doing this will involve women and men elders that are especially familiar with Andean ways of prediction related to reading signs of nature, stars, planets, and the sun and moon as a crucial planning element. This helps communities confront current challenges such as climate change, weather variations and water scarcity. Cultural and community practices contribute to that balance and support the conservation of resources:

...in our community, we aspire a better future for our children. They need to enjoy what we have in the communities, they need to live well while they co-exist with nature, as it was with our ancestors. It is the reason we also preserve the teachings from our ancestors. We work together to envision how our children will live in the future, what should we do to make it happen. We must think about what we need to amend, what we should not repeat doing...

The conservation and maintenance of natural resources is a community priority and are conducted through worldviews, women's knowledge, and cultural practices. Every decision that is made is based on the agri-food system, with each element viewed as connected to one another. For example, communities must determine what area of land will be cultivated, what piece of land needs to be conserved or put to rest, what type of treatment it needs. Such processes reaffirm notions of property, spaces, or areas the communities possess; their communal territory—agriculture and livestock as well as the people who are part of the community. These exercises help them to confirm delimitations or borders they manage, for instance to prevent conflicts with other communities. This holistic approach to agri-food systems is closely related to the ecosystems in the

TABLE 5 Identification of problems and solutions.

Zoning elements	Problems, challenges and needs	Solutions
Zones of crop production	<ul style="list-style-type: none"> - Soils degraded by crop cultivation and overgrazing - Soils with erosion—moderate and severe - Unused and deteriorated terraces or <i>andenes</i> - Soils contaminated by plagues (nematodes, insects, fungus, etc.) - Low fertility of soils 	<ul style="list-style-type: none"> - Soil erosion control - Production of organic fertilizers and pesticides - Integrated Pest Management - Construction of fences—live stones - Reconstruction of terraces - Multi-cropping - Rotation of crops and use of natural fertilizers
Zones of forestry production	<ul style="list-style-type: none"> - Excessive flooding in times of rain - Dried soil because of excessive sunlight 	<ul style="list-style-type: none"> - Protection of riverbanks with improved trees (eucalyptus), native shrubs and trees. - Propagation of tree and shrub species - Installation of living fences in plots at lower altitudes
Zones of pastures	<ul style="list-style-type: none"> - Degraded pastures by excessive grazing - Degraded pastures in wetlands - Unused and deteriorated terraces or <i>andenes</i> 	<ul style="list-style-type: none"> - Grazing management in wetlands or <i>bofedales</i> - Restoration of degraded pastures in wetlands - Improvement of terraces and <i>andenes</i>
Zones for restoration	<ul style="list-style-type: none"> - Areas degraded by overgrazing - Soils with severe erosion - Areas of pastures degraded - Soil degraded by water ditches 	<ul style="list-style-type: none"> - Communal recuperation of pasture areas - Soil erosion control - Restoration of pasture areas - Recovery of soil degraded by water ditches
Zones of conservation or natural protection	<ul style="list-style-type: none"> - National protected natural areas in the community 	<ul style="list-style-type: none"> - Communal maintenance of protected natural areas
Sources of water	<ul style="list-style-type: none"> - Maintenance of water structures 	<ul style="list-style-type: none"> - Cleaning of canals and acequias - Maintenance of lagoons, lakes, springs, etc.
Sources of biodiversity	<ul style="list-style-type: none"> - Crops damaged by drought and frosting - Degeneration of seeds as a result of diseases and insects - Seed preservation - Limited number of crops 	<ul style="list-style-type: none"> - Enhancing the community seed bank - Promoting multi-cropping and live fences with other crops (<i>Olluco</i>) - Enhancing community seed storages - Seed exchange with other communities

communities. The principles of the Andean cosmovision (*ayni*, *ayllu* and *minka*) have influence on the preservation of traditional practices.

Traditional practices have occasionally been improved with new and adapted technologies, and technologies from Inca and pre-Inca cultures. In all cases, the precepts of the Andean cosmovision and connections to the gods, nature and the *Pachamama* remain. The adoption and adaptation of new practices is also undertaken by younger generations—women and men—with university education or training. For example, formal programmes in the late 1990s engaged with communities through conservationist associations in the control of soil erosion and the preservation of water to give more importance to local and traditional agricultural engineering. The conservationist associations have been present in Andean communities and these are usually led by older men and women. Overall, existing and new practices are undertaken and incorporated in ways that are consistent with community heritage and tradition.

Planning for resource management in agri-food production

The use of local technology facilitates the management and use of the land and water systems as well as genetic diversity while minimizing climatic and weather risks. Technology has been adopted and adapted with attention to the ecological systems in which the agri-food system is a part. Ancestral, introduced or hybrid technologies hold ecological characteristics to control mechanical and biological processes. These technologies are also mechanical.

Land use

Plot cultivation is the center of people's lives and the place where a sustained a constant relationship with nature is indistinguishably interwoven with the land and its health. As a result, cultural practices such as *ayni*, *ayllu* and *minka* are performed on the plot. Family and community members share work and resources to maintain genetic diversity. They control

and minimize risks associated with ecological variability, water scarcity, and soil degradation. The use of plots is subject to rotation in *aynocas*³ (Laraos, Pazos and Racracalla) to maintain soil fertility and quality and to control insects and pests.

Soil conservation

Conserving the land and keeping it healthy is achieved through a variety of practices, for example, tillage systems are used in combination to minimize soil erosion and prevent losses in productivity, pest control and water run-off. For example, the “*barbecho*” tillage system for lower altitudes in areas with water availability and conducted in the small planting season “*campaña chica*” between June and August. It consists of turning compact masses of crop-free land to be converted in loose soil. Another ancestral practice is cultivation in terraces or *andenes*, which were built in the pre-inca period to control drought. The terraces can reduce soil erosion and protect crops from frost, as well as promote the diversity of food species, such as potatoes and grains. Terraces also diminish surface runoff and act as sponges by promoting water penetration and infiltration.

Water management

Water management in the communities is done collectively but relies on young men to maintain the structures of water and women to secure the sources of water. If the water proceeds from rainfall, the community decides on its maintenance or building different structures. For water runoff control they build or maintain stripes containment and embankments. For the same purpose in the streams and springs, communities maintain the “*acequias*”, ditches or drains, or canals to spread the water to flood by gravity cultivated areas and natural pastures (Laraos, Racracalla, Quispillacta and Pazos). It depends on the source of water, and volume of water that can be available in each community. Communities design the use and maintenance of a series of techniques related to water management. These are closely associated to soil management and the control of runoff caused by rainwater, soil formation and agroclimatic sources. The modification of the physical geography, especially on slopes, is the result of the evolution and adaptation of tillage tools and practices. Modifications include for example the use of Inca “*cochas*” structures that store water in natural lagoons in the high areas as watering holes.

Biodiversity management

Women of different ages are engaged in these activities and they start with seed selection (post-harvest practice and bartering) and varietal identification (plant selection and plant

marking in the field). Older, married and Quechua speaking women in the communities play a crucial role in contributing to planning regarding what to plant and what seeds to use. They select best seeds for the next season. Men also participate in the activities, but it is women’s decisions that contribute to the preservation and maintenance of the seeds and livestock. Multi-cropping helps the peasant producers use crops as insect repellents or live fences. Communities use plants, animals, physical phenomena, and stars as indicators of behavior of time for predicting climatic occurrences. Through these phenomena they forecast the next agricultural year. It is nature that determines the optimal time for planting, harvesting and livestock management. Preparing the soil and land according to the indicators allows Andean peasants to anticipate or delay the planting season. Community seed banks are led and organized by the community to maintain, at household and community levels, agrobiodiversity and practices related to its use. This traditional knowledge is transmitted from generation to generation as diversity of crops is achieved at long term. Communal banks serve as seed sources for replacing those seeds lost in the fields. This is important for families’ nutrition because crop diversity carries nutrient diversity.

Older, married and Quechua speaking women are in charge of plant health. They consider taste, color, resistance to diseases and insect pests, adaptation to soil, and agro-climatic aspects. They preserve seeds through local or traditional methods. Younger married women pair with their husbands to travel by foot for exchanging seeds. The older women in the community select the seeds and transmit their knowledge and seed selection skills to their daughters. Older women know the value and differentiate the use of plants for nutrition, food security, health, and income. As a result, they acknowledge which crop and varieties should be preserved and maintained in the household and community. Women take into consideration a plant’s multiple uses, providing a balance to the market-oriented pressures that emphasize high yields and uniformity.

Cultural practices

Ayllu is the basic unit of the social organization in the community, where the community owns the communal lands that are produced and maintained. *Ayni* is a reciprocal work system family among the members of the *ayllu*, destined to agricultural work, management of water structures and upkeep of biodiversity. It is based on helping one another on the basis of reciprocity if needed. In return, the hosting family serves meals and drinks. *Minka* is another type of collaborative work. It synthesizes relationships of reciprocity, commitment, and complementarity. The community comes together to work, for example, toward the planting season or raising the harvest. It is always greeted with a large meal or a commitment for reciprocity.

³ The *aynoca* land, located in the hills, is cultivated for some years and left to rest for other years.

Bartering with other communities at different locations and altitudes strengthens networking and diversification of foods. This also helps communities exchange seeds and maintain a genetic diversity of crops and livestock. *Faenas*, cleaning of canals, acequias or aqueducts are Inca traditions. They are based on communal work where all members of the community participate: men, women, boys, girls, and the elderly. Field work takes place after a communal assembly and unfolds in a festive atmosphere, accompanied by music, consumption of fermented beverages and chewing of coca leaves. The activities are held every year to clean all water supply structures.

Discussion of results

Diverse relationships and intersectional interactions in the Andean agri-food system have been identified in local planning processes. These relations and interactions are fostered between Andean women and men of diverse ages and identities (age, marital status, socio-economic background, education, etc.) and biophysical or social-ecological systems. They are also among and between the diverse groups of women and men in the community (comunera women, campesina women, campesino men, comunero men), between communities (different altitudinal locations), institutions and policy making. These relationships reproduce power dynamics and representations in the territory ecosystem context.

Social-ecological relations and social interactions

Findings support the presence of dynamic, iterative forms of feedback between the Andean ecosystem and its social system (Levin et al., 2013). On the social side, the use and sharing of these resources in socially and environmentally sustainable ways supports the functioning and conservation of local agri-food systems in the Andes through collective action and agency (Isbell, 2005). However, adaptation and adoption of technologies are subject to environmental conditions, such as climate stress, as Mayer (2002) has shown, and reflected in the interfacing of the system's biophysical and social components that support the delivery of different services (Carpenter et al., 2001; IPCC., 2019). These include provisioning (such as food, raw materials, water, and medicinal resources), supporting biodiversity, habitat, and cultural (reciprocity, collective living, worldviews, relationship with nature) services (Sarapura et al., 2016). At the same time, services such as land use, soil health, soil erosion control, biodiversity upkeep and water management are regulated through community planning and implementation.

Andean women and men of different ages understand and value the relationships and interactions of traditional and

emic knowledge systems of land-use and natural resource management (Tapia, 1996). Interactions with nature are rooted on collective land ownership and worldviews of reciprocity, collectivism, and respect (Berkes, 2018). While different groups are considered as contributing on an equal basis, this unfolds without recognition of the different experiences of women and men in relation to agriculture and food production. As results indicate, there is differentiation in men's and women's contributions that are shaped as well by gender intersections with other categories, such as education, and age.

Older men make decisions for and represent the communities in trainings, national and regional events (agricultural fairs, national conversations, field demonstrations). They are also considered the knowledge keepers and initiators of the "conservation community groups" in Racracalla. Communities' knowledge and biodiversity keepers are older women who speak Quechua (Racracalla, Pazos) and do not have formal education. They keep and transmit the knowledge (emic knowledge) and practice the culture according to the cosmovision perspectives. They are in charge of passing the knowledge and traditions to younger women. Though they are highly valued in the communities, they are not considered in policies and programming.

Young men and women professionals (Quispillacta, Laraos) who bring ideas to the communities have no access and control over the land and other resources. There are still absent in national and regional programs. Young women and men (Laraos, Pazos, Racracalla) have access to elementary schools in the communities. Parents have to send their children to closer cities (Concepcion, Huancayo, Pampas) to be in high school or university. The lack of technical or agricultural schools forces them to emigrate to other cities. Young professionals (men and women) who finish university come back to the communities (Quispillacta and Laraos) and introduce new ideas and innovations. They have some influence on the communities' planning (Laraos and Quispillacta), however, they may not have access to and control over the resources as they still are presented in the communities by their fathers or widowed mothers (Laraos and Quispillacta).

As such, women position themselves in the communities and in terms of their relations with nature or the ecological system. Older women without formal education and speaking Quechua hold strong oral and practical knowledge for agri-food system sustainability while young women with higher education qualifications help innovate these practices with new knowledge and where planning processes are documented in Spanish. Inclusion of older women and the interactions they have in the decision-making processes is critical for sharing knowledge and information with younger generations.

Intersectional interactions and social relationships inside and outside the communities

Findings yield a dynamic picture of the role of local and indigenous culture in agri-food systems, where local beliefs, rules and norms simultaneously enable forms of planning, decision-making and management for system sustainability and resilience while also marginalizing and constraining opportunities for some individuals and groups. They reveal how more equitable or less equitable forms of resilience (Matin et al., 2018) arise in communities through planning and decision-making processes that are culturally inscribed. For instance, the way younger women and younger single men may formally participate in planning processes but have limited influence and voice because of their position in the communities, and how this reinforces their limited and unequal access and control over resources. Power dynamics are reinforced further through hierarchical and exclusionary relationships with external institutions and actors, where some groups have not yet had the chance to represent their communities and to engage with external actors.

This illustrates again the need for resilience perspectives to be sensitive to the relations, interactions and power dynamics among groups are locally or contextually embedded. Individual and social identities are relationally constructed, coevolving, and adapting with the ecosystem context (Díaz et al., 2015). On the one hand, interactions among peasant people strengthens self-organization for sustainable use of their natural resources (Tapia et al., 2012). This is characterized by informal institutional arrangements, self-governance and informal norms. In principle, everyone has a voice regardless of their status or representative role they have in the communities. On the other hand, these voices are expressed, heard and followed with mixed and contradicting implications for peasant peoples' lives and their representation in agricultural or environmental policies. In national policy and programming, their lives and experiences are reduced to single characteristics of wives, daughters, or sons without considering their knowledge. These findings support recent calls (Matin et al., 2018) for the integration of equitable resilience concerns, and we suggest here an identity component, alongside existing resilience indicators to improve practice, policy and programming in favor more equitable outcomes.

Outside of these communities, Andean peasant producers have been treated in policy and programming as homogenous groups, as poor and suffering from discrimination. Their practices and customary laws do not cohere with the country's statutory laws (Sarapura et al., 2016). They are ignored in national decision making and planning processes as well as at policy making and agricultural laws. The problem is particularly for married women peasant farmers, who are considered the knowledge keepers and biodiversity guardians. They still lack

access to basic rights and unequal distribution of resources which is reflected in the traditional sociocultural norms that entrench gender roles and unfair treatment within formal and informal institutional environments. In general, peasant women who are married, single, and young remain the poorest, have higher levels of illiteracy, and are the largest monolingual demographic group in Peru (Deere and Leon, 2003; Sarapura et al., 2016). Young women who are educated and integrate traditional knowledge with modern ideas are still not considered in the national policies and are not provided with any support to continue their work and fully access their rights. Due to their limited access and control over land and resources, they have limited encounters, if any, with agricultural training and technology (Sarapura et al., 2017). They also have lower levels of basic education because local schools are predominantly for elementary schooling. These inequalities remain insufficiently dealt with in agriculture policy and programming which also reflects a narrow understanding of men and women that is not sensitive to intersecting identities. The intersecting identities of peasant people—different groups of women and men in agriculture are largely ignored by external actors in relation to the environment, biodiversity, ecology and natural resource management, and is reflected in terms such as “Andean women” or “Andean youth” that are insensitive to heterogeneity and difference.

These homogenizing approaches in policy and programming reproduce unequal power relations between peasant and non-peasant people and foreclose possibilities for supporting sustainable livelihoods in contexts where access to rights, resources and opportunities for younger people is routinely denied. Even when these groups have been included in external planning and implementation processes, these processes have been overly idealistic and community heterogeneity is overlooked (Wilkinson, 2011). Consequently, views and needs of women and other representatives of marginalized groups are not considered.

Intersectional policy implications in the sustainability and resilience of agri-food systems

For policy, integrating intersectional analysis in social, economic, political, cultural and environmental strategies in local agri-food planning and programming can help make visible the range of intersecting identities in local or traditional agriculture in the Andes that interact to shape resilience. There is, we suggest, an urgency to consider the complex relationship between systems of disadvantage and privilege and the diverse groups of women and men with intersectional standpoints along various social identities and lived realities as an area for further research in local or traditional and indigenous planning

(Masterson et al., 2017). The holistic approach to agriculture and connection to individual and community wellbeing, their diverse knowledges, and diverse ways of being of the different groups of women and men in communities remain to be included at the national level in planning and policy making processes and remains a deficit in the planning literature.

Rights-based practice may offer a potentially useful and culturally sensitive avenue for tackling resilience inequities (Ensor et al., 2015, 2018; Walsh-Dilley et al., 2016). Emerging from development practice and taking inspiration from grassroots and social movement campaigning, a body of rights-based practice demonstrates how such approaches may work directly with communities (Cornwall and Nyamu-Musembi, 2004; Gready and Ensor, 2005; Gready, 2008; Pena et al., 2008; Ako et al., 2013; Coulibaly et al., 2020) to promote transformations in social and political arrangements at different scales through a range of processes, such as advocacy, lobbying, critical consciousness raising and capacity building. Often combining human rights norms with conceptions of rights and entitlements grounded in community traditions and practices, rights-based approaches support marginalized groups to advance claims and demand accountability from the state, private actors and within communities. Rights-based projects with Andean peasant and indigenous communities might seek to modify, contest or negotiate local norms, rules and practices that reify existing and intersectional identities which generate inequities for young women and men (Carella and Ackerly, 2017; Cornwall, 2017; Koutouki et al., 2018). For instance, by challenging tokenistic forms of participation in local planning so that marginalized actors might contribute to agenda setting and decision making. There is precedent for such practices in the Andean region already, for example, the way some women attempt to draw on a combination of external legal frameworks and traditional value systems and traditions in order to formulate intra-cultural critiques of local norms and practices for enhancing their autonomy and participation in local decision making (Sieder and Barrera, 2017).

Engaged and action-oriented research projects might seek to identify and share lessons and good practice, that may also be replicated regionally and elsewhere. In practice research, PAR may be particularly useful for example for strengthening intercultural dialogue (Salas and Tillmann, 2022) where tools emerge and are in agreement with the communities engaged and may be structured in terms of space, time and knowledge. Spatial methods can support a focus on local perceptions of the environment through community mapping, territory and zoning profiling of the locations (e.g., forest). Time methods help express the conceptions of time such as to include daily cycles of agricultural activities or the annual calendar of the celebration of festivals. Knowledge methods provide ways of organizing and explaining the various specific fields of local knowledge such as the ethno-classification of wild foods, matrix of hierarchization

of seeds and drawing of the vision of the future of the terraces, to name a few (Salas and Tillmann, 2022).

At the same time, rights-based projects would work with communities to advocate for more substantive forms of participation and decision-making so that national policy processes and programming might better reflect community heterogeneity. One resource that may be of particular use as a normative instrument for addressing resilience inequities in local and indigenous agri-food systems is the recent UN Declaration on the Rights of Peasants. It provides framework that is sensitive to the ways intersectional identities in rural communities shape access to rights, in particular around gender, ethnicity, age and class, and might be leveraged in both community identity work and as an instrument for seeking inclusion in decision making, appraising national processes and outcomes, and developing alternatives (Hoddy, 2021). In practice, decisions about whether and how to embark on these projects is guided by routine strategic context analyses which appraise the social and political opportunities and constraints that emerge dynamically in a given context, and where action might be most productively focused (Vincent, 2018). For example, how groups might exploit existing social and political opportunities to exert pressure policymakers and government actors into taking action. Overall, the approach may provide a framework not only for understanding inequities as rooted in social and political arrangements, but how these might be addressed in practice through social, political and cultural processes for change (Ensor et al., 2015).

At the same time, institutional capacity to foster inclusion, representation of Andean women and men in planning is weak. Too narrow a focus on gender and sex in the context of indigenous planning misses more complex forms of diversity and heterogeneity which then fail to be reflected in policy and governance (*The Economics of Ecosystems Biodiversity*, 2018). There is a place for intersectional analysis in planning, which can bring about a conceptual shift in how Andean people, practitioners, and policymakers interpret and analyze social categories, their relationships, and interactions. This analysis goes beyond gender issues, requiring consideration of the complex relationship between mutually constituting factors of social location and structural disadvantage to correctly map and conceptualize determinants of equity and inequity in and beyond local agri-food. The processes of analysis can foster spaces for learning from each other, critical analysis, and reflection. These iterative processes help to move away from individual categories of gender or socio-economic status to consider the intersections of multiple categories such as ethnicity, race, age, and context. Policy processes can be informed by new understandings of structures of inequality and exclusion at macro levels and initiatives developed in concert with peasant farmers to address these. This is becoming ever more urgent under conditions of climate hazards and

risk (Folke, 2006; Folke et al., 2010). Entry points for policy, programming and practice include local community “innovators” or “promoters” in communities who had once left the communities and returned. They may assist intercultural planning and local agricultural entrepreneurship strengthening. Governance and policy processes should foster spaces to ease inequities and disrupt aspects of power. Their ways of knowing and being should be the core of governance and policy making processes to disrupt the structural relations of power and exclusion these groups have gone through several generations.

Conclusion and recommendations

The challenges peasant people face in agri-food system sustainability and resilience reflect their access to rights, resources, and opportunities (Adger et al., 2011). Government and development programs still adopt patronizing and paternalistic roles through projects that are planned for the short or medium term. These actions are detrimental, unfavorable, and are rejected by local and global ethics of justice and sustainability. The different groups of women and men in the Andes deserve better. They need to be valued for what they have done and achieved to harmoniously safeguard their bio-cultural and ecosystem heritage for agricultural purposes (Ruiz-Mallén and Corbera, 2013; Bruchac, 2014). They have developed and enhanced ways to maintain their resources across generations. By having secured local sustainable and resilient agri-food systems through planning processes, we suggest a paradigm shift and new forms of rights-based engagement are needed to that engage with heterogeneous contexts and the root causes of inequities in Andean agriculture. As an area for future research, efforts at building policy evidence must be informed by the perspectives of all groups and with a responsiveness to gender and its intersection with other social determinants such as age, socio-economic status, education, marital status and ethnicity among others. Moving beyond gender and social determinants, intersectional analysis focuses on the diversity of interacting social contexts, forces, factors and power structures that shape and influence social and ecological interactions. Attention to intersectionality in planning will influence policy processes in favor of recognizing and responding to Andean people’s relative power and privileges vis-à-vis their status, empowerment, and wellbeing. As Bacchi and Eveline (2010) state, “policies do not simply “impact” on people; they “create people” Bacchi and Eveline (2010) (p. 52). Therefore, these must

include social locations, and access to power and resources (Hankivsky et al., 2014).

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The study was reviewed and approved by University of Guelph. The participants provided oral and written consent to participate in the study.

Author contributions

SS-E designed the study and contacted the study participants. SS-E and EH conducted the literature review, conducted the interviews with key informants as well as women and men in the communities, and conducted the data analysis and the reporting. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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