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Agroforestry in the Andean Araucanía: An Experience of Agroecological Transition with Women from Cherquén in Southern Chile

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Abstract: Agroforestry is a practice used for the establishment of integrated production systems as an economic alternative. In Chile, the most significant experiences have been developed with rainfed farmers in the central zone, where the arboreal component is the predominant one. This study analyses the agroecological transition process of a group of women from the Andean foothills of southern Chile in the establishment of an agroforestry system based on rosehip. The field work was developed in 4 stages: (1) problem survey and definition of strategy; (2) identification of an alternative market; (3) perception of the data collection work and; (4) implementation of a demonstration unit; which included (a) workshops and meetings for discussion, reflection, and feedback on what had been done and to agree on the actions to be implemented; and (b) the development of different activities to implement the actions agreed in the workshops and meetings. The results of this research show that agroecological projects open doors to the participation, visibility, and valorization of women's work while moving towards sustainable agroforestry systems integrated into the landscape.

Keywords: agroecology; peasant women; rosehip; local knowledge; socio-ecological transition

1. Introduction

Since its origins in Latin America, agroecology has been oriented “to agricultural development more sensitive to the complexities of local agriculture . . . with an emphasis on the reproduction of the family” [1] (p. 33), [allowing] “That the communities help themselves to achieve a collective improvement of rural life at the local level” [2] (p. 182). Agroecological research, therefore, is “research that responds to the needs, aspirations and knowledge of local people” [1] (pp. 33, 34) and, to date, has generated sufficient knowledge and evidence for the establishment, among others, of biodiverse production systems in which various components are integrated for multiple purposes in which production is compatible with conservation of agroecosystems and landscapes.

An example of this is agroforestry, which can be considered an, “integrated land use that is particularly adapted to marginal areas and low-input systems” [3] (p. 229). Agroforestry is recognized for its potential particularly in marginal areas, where small-scale farmers cannot afford to adopt modern technologies requiring large financial investments. As a result, agroforestry can be particularly beneficial to small farmers who have very limited or no social or political power and those, “who have been overlooked by agricultural research” [3] (p. 230). Among the challenges these systems face, it is important to consider that agroforestry systems are ecosystem-specific and in certain low-quality soils

the choice of appropriate plant species may be limited. Therefore, most agroforestry systems need a few years before the first returns can be observed.

For the Chilean context, the agroforestry initiatives developed by the National Forestry Institute of Chile (INFOR), under the Ministry of Agriculture, with small and medium-sized agricultural producers—owners of more than 8 million hectares in the country who allocate a low percentage to establish forest plantations (less than 2 ha between 2005 and 2010)—have considered, in their approach, the cultural identity and life system of such producers, the conservation of natural resources and the permanence of peasant families in the countryside, thus, avoiding migration to the city, as a central element of development rural [4]. The most accepted agroforestry systems by rainfed landowners have been silvopastoral systems (44.4%) and windbreaks (43.7%) [5] (p. 297).

Most resources in forestry research have been directed towards integrating trees into agricultural systems; however, agroforestry also plays an important role in forest conservation, for example as an alternative for the management of invasive plants, such as rosehip.

Rosehip is worldwide known for its various properties and multiple uses of its fruit and seed [6]. Considered as a non-timber forest product of high commercial value [7]—Chile being the largest exporter—the harvesting of its fruit, for subsequent sale, is not without controversy since they are obtained from invasive plants that compete with other native plants and invades cattle meadows decreasing its value. This condition has generated a contradictory situation, since on the one hand, harvesting is promoted to strengthen the food industry of this product and, on the other hand, the elimination of the plant is encouraged to stop the degradation of native forests and the areas' livestock.

The economic importance of rosehip for many peasant and indigenous families in southern Chile justifies its cultivation under an agroforestry system integrated into the forest as a use strategy that attempts to reconcile both positions. With the establishment of the crop, the pressure on native forests would be lessened through the controlled production of rosehip in places where other types of crops are not feasible.

The development of agroforestry in Chile has involved the participation of peasants or farmers in the identification, design, and execution of research activities [4] (p. 22) and the perspectives of different social actors, from producers to the community and State institutions, who have recommended the association between farmers [8]. Furthermore, it has been recognized that the implementation of an agroforestry system depends, obviously, on the interest and commitment of the producer, as well as the professionals' assessment of the sector as a determining factor in the advancement of agroforestry systems, due to the fact that they are immersed in local problems experienced by small farmers [9].

However, there are few records of agroecological-based agroforestry experiences in the mountain ranges of Araucanía developed by peasant women from the cultivation of the rosehip. Therefore, the objective of this work is to determine the aspects that facilitate and hinder an agroecological transition in initiatives with the aforementioned characteristics.

1.1. Agroforestry Systems in Chile

The small and medium silvopastoral owners of Chile live, mainly, between the regions of O'Higgins in the north and Los Lagos in the south, where the greatest industrial silvopastoral development is concentrated [5]. Its farms are located in rainfed areas with preferably forest and livestock aptitude soils. They dedicate a large part of their soils to extensive livestock farming with sheep and cattle, and to annual crops, such as wheat and barley [5]. Its farms, especially rain-fed ones, due to the pressures submitted to soils with VI and VII use capacity (livestock and forestry) are eroded as a result of over-cutting and the low protection of arboreal or shrubby vegetation resources. This situation has caused that 49.1% of the soils of the national territory, equivalent to 36.8 million hectares, are found with some degree of erosion in some regions, such as Coquimbo in the north with 84% of the soils eroded, Valparaíso with 55%, and O'Higgins with 52% [10].

The most significant agroforestry experiences developed in Chile are those established by INFOR, since the beginning of the 20th century, which has oriented its work to smallholders (forest farmers). Agroforestry can be developed with these small landowners as systems and technologies for land use and natural resources in which woody species (trees, shrubs, palms, etc.) are deliberately used under a system of comprehensive management with agricultural crops and/or animal production, in some form of spatial arrangement or temporal sequence, which can provide interesting economic alternatives [4]. The woody component is included with the agricultural uses of the same farm in order to achieve a synergism between all its productive components that result in an improvement in both the productivity and sustainability of the system, as well as promoting various environmental and noncommercial benefits.

The inclusion of trees in the traditional agricultural systems of Chilean agriculture is not only aimed at recovering the rural landscape, improving its beauty and aesthetics [4], but also helps to recover soils and water systems, and to deliver, through the introduction of woody components, an additional economic alternative that can improve the profitability of the agricultural business.

In the Chilean context, the silvopastoral systems that best reflect the cultural reality and the economic and environmental needs of the forest peasantry [4] (pp. 22–24), are:

- a. Silvopastoral system with tamarugo (*Prosopis tamarugo*), a native and endemic species of northern Chile, particularly in the Pampa del Tamarugal located 70 km east of the city of Iquique in the Tarapacá Region of northern Chile.
- b. Silvopastoral system with forage woody species from Chile, such as *Atriplex* spp. and *Acacia saligna* in the semi-arid zone of northern Chile. In the central-south zone, meanwhile, there is the case of *Chamaecytus proliferus*, better known as tagasaste.
- c. Silvopastoral system with hawthorn (*Acacia caven*) in the Maule Region. This management involves maintaining a tree cover that gives protection to the meadow, with a canopy cover between 40–50%, which will allow to improve the pasture production, improve animal production, and to give protection to the soil, especially in those hillside situations where removing the protective tree cover causes erosion and soil loss.
- d. Silvopastoral system with poplar (*Populus* spp.) whose main advantage is that it grows in fertile soils that, with irrigation, allows the development of a natural or artificial meadow (in the first seven years of rotation) capable of sustaining an important livestock mass for the owners. In the central zone of Chile (Maule Region), this system combines poplar with corn cultivation in the inter-row during the first three years, and then pastures its plantations throughout the rotation. In the southern zone (Los Lagos Region), meanwhile, studies have been carried out in which the poplar has been combined with different forage species. This management experience has also been used for the recovery of degraded or unproductive soils in arid soils. Small and medium producers use it especially in fertile or humid soils, since it allows them to use these soils in a productive way. Poplars are also used massively in windbreaks to protect grasslands and crops.
- e. Silvopastoral system with radiata pine (*Pinus radiata*) in the coastal dryland of the O'Higgins Region. Systems better evaluated in terms of profitability and, in addition, from the social point of view allow: to obtain periodic income as a result of annual crops and animal production, greater roots of the owners in their lands, avoiding migration to the cities, which causes marginal poverty and changes in agricultural culture.
- f. Silvopastoral system with pine contorta (*Pinus contorta*) in the Aysén Region, Chile, is the extensive livestock activity, based on land covered with native grasslands of regular to poor quality, with low productivity for the production of meat and/or wool, and with eroded soils due to overcutting and low protection with perennial vegetation on them.

Within the traditional agroforestry practices used in Chile, it has been possible to identify those that, based on the combination of crops with livestock, trees can play a passive or active role, depending on the edaphoclimatic conditions [11]. Where there are water and/or soil limitations, trees are found

in smaller proportions and associated with crops and forage. In areas with better environmental conditions, trees play an important role in maintaining productivity, helping to improve family income. Traditional practices are common and only differ in their spatial arrangements depending on environmental conditions and sociocultural characteristics. Traditional practices include the following:

- a. *Protein banks*: These are forage shrub species cultivated on smooth and steep slopes, on platforms or terraces, usually in demarcated and protected plots.
- b. *Grazing on farmland*: Grazing is done in rows or *melgas* planted on soft slopes and plains. Each area, shaped like a terrace, is separated by fences made with rocks and/or cobblestones and live fences made with bushes. After the harvest, animals are left to graze these areas to allow the regeneration of soil fertility.
- c. *Family gardens*: This is one of the most common practices in the Chilean highlands. Family gardens are located on land near the farmer's house or outside family farms on small plots known as *hijuelas* or planks. Generally, square or triangular in shape, the rows are built with a combination of mud and rocks that serve to regulate water flows. Fruit trees are planted to provide food and wood, as well as shade and protection from low temperatures and frost. Crops are grown in the inter-rows, with live fences to regulate the fallow, the rotation of the crops, and the application of guano.
- d. *Windbreaks and live fences*: Used mainly in the Norte Grande region of Chile, trees are located along the boundaries of farms as a form of demarcation and to protect crops from the wind.
- e. *Mixed cultivation of trees and grasslands*: This is used in areas where irrigation is possible for the cultivation of grasslands. Trees or shrubs provide forage, usually leguminous plants, which are also used for their fruits and for firewood.

Agroforestry practices in agricultural communities are particularly important as a form of land tenure inherited from the colonial era. They are located in the Coquimbo regions and are associated with areas with severe environmental limitations.

- f. *Non-irrigated farmland*: These are plots that the community gives to a member for cultivation. Their size depends on the family's labor capacity. They are demarcated with live fences, usually cactus. After being used for several years, usually for the cultivation of coriander, anise, and wheat, they are used for livestock grazing, mainly goats. The more degraded lands have been turned into forage forests using species such as *Atriplex nummularia* and/or *Acacia saligna*.
- g. *Protective and productive forest areas*: These are found especially in ravines where natural forests already exist or trees are planted to protect animals from the sun or rain, for firewood, or to protect water resources.
- h. *Spinal grazing*: This is the most common agroforestry practice in the central area and has existed throughout history in the Central Zone of Chile. It is carried out with hawthorn (*Acacia caven*) steppes. Hawthorn is a nitrogen-fixing leguminous tree that provides a natural canopy under which goats and cattle can graze on the wide variety of high-quality forage that grows below it. However, it is also used to produce charcoal, which, along with excessive grazing, has put the land at risk of erosion.

The establishment of agroforestry units together with small forest producers is not without limitations and difficulties. For the experiences in Chile, the following barriers are worth mentioning [12] (p. 264):

1. Lack of interest from private operators to participate in the establishment of agroforestry systems, due to the low economic outlook, as the density in the establishment of the forestry component has to be reduced and the management of the whole system is complex.
2. Producers' limited knowledge and valuation of integrated systems of agroforestry production, especially the medium- and long-term management of the system.

3. Limited knowledge from the institutions that manage mechanisms and incentives to promote agroforestry. There is a disparity of criteria and approaches between regions and areas, and a lack of knowledge of the proposals available.
4. Lack of uniformity of approval criteria is required, as well as the management and design of the agroforestry systems to be presented according to the context, the tools and the incentives available.
5. Limited technical capacity for the correct application of the proposed agroforestry systems, which needs to be improved to ensure an adequate relationship between the agroforestry production system and the site conditions.

1.2. Rosehip: Harvesting and Sale of an Invasive Species Valued as Non-Timber Forest Products (NTFP)

In Chile, as in many other countries in the world, NTFPs in both forests and agroforestry systems have great social significance, due to the strong reliance on unskilled labor for their collection and processing. Additionally, the largest collection and use of NTFPs is carried out in rural communities, mainly peasant and low-income communities [13]. In agroforestry systems, the collection and selling of NTFP represents 18.92% of the total activity. This activity (especially harvesting tasks) is mostly done by women (49.35%) and has an important contribution of young labor (22.08% of workers are under 18 years of age). Moreover, this activity represents 19.11% of total family income for the small owners that collect and sell the product [14].

NTFPs have experienced significant and sustained growth in the last 20 years, and this has been reflected in significant advances in new commercial ventures destined for the national and international market and, to a lesser extent, in research and development actions focused on value aggregation. Until 1969, rosehip was eliminated by farmers, as it was considered a fairly invasive weed. That year, CIDERE BIOBIO, a development institution in the region of Bio Bio, found a productive destination becoming a new export item for the country: dehydrated rosehip. The first exports of this fruit were made in 1970 [15].

However, the promising economic development of the export process contrasts with the low production levels achieved in the other areas that make up the production model, with gaps that put its sustainability at risk. The main issues are due to a lack of information on the quantification of production and consumption, and of sustainable extraction methods and techniques, the absence of management plans, as well as insufficient information on value chains and marketing processes. Additionally, market failures are often associated with information asymmetries, monopsonies, moral hazard, and adverse selection. These combined with high transaction costs, territorial dispersion, and excessive fragmentation in the value chain, are all factors that generate problems that should be addressed by public policies [16] (pp. 357, 358).

Land owners can agree with groups of rosehip pickers on a fee to access the property and carry out the harvest. However, the purchase price for pickers does not reflect the effort and work generated by this activity, with intermediaries being the ones gaining the most, i.e., 20–30% of the purchase price [17]. For this reason, the same pickers process the rosehip for family consumption and for sale in urban centers or municipal markets, allowing them to sell a product with greater added value at a better price [18]. Rosehip pickers have then two possibilities of selling their product: to primary buyers, which is handled as a formal marketing process where the pickers sell their production at a previously agreed value; and to local or private consumers (direct sale) for the production of jam or homemade infusions, products that can be consumed by themselves or sold in local markets or fairs. This last option is significantly less adopted than the export-related marketing dynamic. Thus, it is necessary to eliminate the link between pickers and intermediaries within the value chains, facilitating direct negotiation between the picker and the final buyer with an agreement on the price that benefits both.

However, it must be recognized that adopting the fair-trade framework allows us to expand the concept of trade, commonly considered as a strictly technical and profit-maximizing activity, by adding essential elements of sustainable development [19]. This value chain presents interesting opportunities

to raise quality requirements, prices, continuity of supply, and more generally, best practices in national and international trade [20].

Some experiences of commercial cultivation of rosehip have been developed: the COESAM company has approximately 1700 plants and vertically integrates the entire marketing chain: production, processing, and export [8], as well as a research field characterized by a monoculture production logic in which *in vitro* propagation has been promoted [21], fertilization [22,23] and weed control [24] with inputs of synthetic origin. This system then obviously ceases to be a NTFP and cannot be considered an agroforestry system. However, due to its low profitability, this system is not largely adopted [8], with more than 90% of the rosehip marketed in the country of wild origin, which reiterates its status as NTFP.

In the municipality of Melipeuco (along with those of Loncoche and Toltén in the Araucanía Region), specifically in the Llaima area, NGOs and Mapuche associations collaborated with public institutions (e.g., Programa Servicio País of the Chilean state, local municipalities, and regional universities) within the framework of an intra- and extraterritorial intervention whose objective was to contribute to the territorial self-management of Mapuche communities under a scheme that tends to balance the spheres of sustainable development [25]. This led to an associative commercialization initiative of non-timber forest products (NTFP), among them rosehip, which sought to link the various fruit pickers of the territory in an association and, thereby, generate a significant volume to sell the products at a better price. Within this initiative focused on the development of Mapuche communities in the Llaima area, this study was carried out to trial the establishment of an agroecology-based agroforestry system with women from the Cherquén area in the municipality of Melipeuco.

2. Materials and Methods

The experience documented in this study corresponds to one of the six groups of peasants and farmers in the municipality of Melipeuco, and members of the Prodesal Alto operational unit, with whom a participatory action research initiative was carried out with the purpose of designing endogenous development strategies based on socio-ecological potential (Figure 1). Three main reasons highlighted the need to undertake this study. Firstly, the women in the area identified the need to have control over their properties during any initiative undertaken involving their participation. Secondly, the women themselves expressed interest in participating in this study, that differs from other studies and initiatives in the area geared towards supplying a rosehip collection center. Thirdly, in the study area the design of agroforestry systems is not common, making the study even more of a novel experience in evaluating an agroforestry system based on shrub species considered invasive.

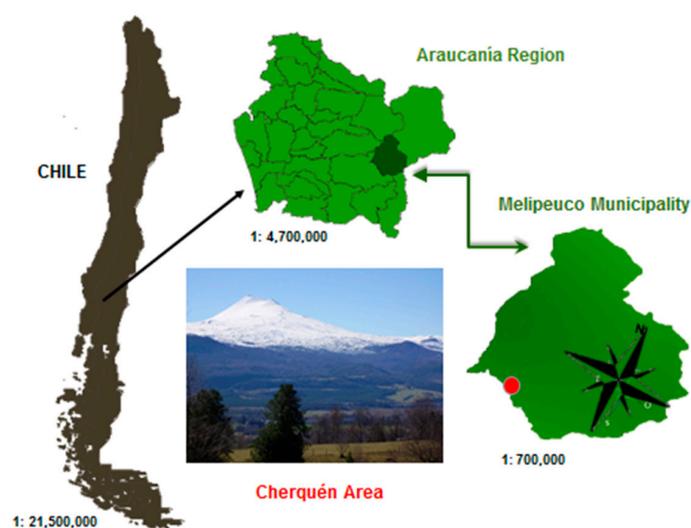


Figure 1. Study location.

The municipality of Melipeuco is located in the foothills of the Araucanía Region, 92 km east of the city of Temuco (regional capital). Its geographical location is between 38°35′–39°00′ S and 71°24′–71°52′ W. This municipality has the particularity of having parts of two Protected Areas, Conguillío National Park and China Muerta Natural Reserve, which occupy approximately 2/3 of the municipality. Located in the sub-basin of the Allipén river, it is naturally delimited by mountain ranges of the southern ends of the Cordillera de Las Raíces to the north; the Nevados del Sollipulli and the Curacalco hills, to the south; the Cordillera de Los Truenos and Cordillera Colorado to the east and the Llaima volcano to the west.

It has a temperate rainy climate with temperatures ranging between 1 °C in the coldest months in winter and 23 °C in the hot summer months, with temperature differences between the valleys and the mountains. Precipitation varies between 1000 and 2500 mm annually with two dry months in the summer. Land uses are mainly forests with 52.98% of the territory of the municipality, while agricultural activity occupies only 0.03% [26].

The main economic activity is agriculture (includes hunting, livestock, and forestry), which is carried out mainly in the valleys and is concentrated on soils with low fertility used by small landowners for self-sufficiency. Cattle farming is the most frequent activity, together with the exploitation of native forests, which historically has been practiced to obtain wood, firewood, and construction. In recent years, the collection of NFP and tourist activity has been valued [27].

The Cherquén area is located to the southwest of the Melipeuco municipality. The group of women involved in this study lives in the highlands (Cherquén Alto). The collaboration evolved from an initiative created by the Women's Service of the Ministry of Planning (now replaced by the Ministry of Women and Gender Equity and the Ministry of Planning is called the Ministry of Social Development and Family) as an opportunity to create spaces for reflection of the working life of women. Within this collaborative space, each woman could define her work experience and her work project according to the labor market in her community, with the support offered by the program to improve her working conditions and employability. Their complementary objective was to develop social skills for work and to reinforce among the participants their identity as heads of household and as working women.

2.1. Participatory and Needs-Based Research

Understanding the dynamics that occur in agroecological systems requires integrative analytical approaches that allow the articulation of the various epistemic sources from which agroecology draws upon. Such methodological strategies are defined on the basis of the inclusion of the various actors who possess complementary forms of knowledge within the objectives outlined in a research study. A central element in this type of research, then, is participation in such a way that it gives the different actors a state of horizontality when defining a research strategy [28]. Participatory research is a methodological proposal with a defined action strategy, which involves its beneficiaries in the production of knowledge. It is a combination of research, education, learning, and action [29]. The purpose of this type of research [30] is the people themselves, and not the advancement of science, to know and analyze a reality in its three constitutive moments: the objective processes; the perception of these processes in people; and the experience within their structures. Participatory research is characterized as qualitative research in which quantitative elements can be included, but always within the context of a qualitative problem. Another fundamental characteristic of this type of research is the importance of working together with the various institutions that make up the social fabric of a territory. The researcher, as the subject of the investigation, embarks then together with the other actors, in the process of research, learning, and action, maintaining the scientific criteria of precision in observation and analysis, combining them with the interests of the community. Participation is visualized in the design and execution of the research, but also in the use of the results for the actions, by the subjects [31].

From the epistemological point of view, agroecology understands agroecosystems as a result of the co-evolutionary process between social and natural systems. It is important to consider that “environmental factors influence the suitability of particular aspects of social systems and, in turn,

social systems influence the suitability of particular aspects of environmental systems” [32] (p. 171). Social systems can be subdivided into systems of knowledge, values, organization, and technologies, which co-evolve with environmental systems. Each of these systems is related to all the others and each one changes and influences the change of the others (Figure 2).

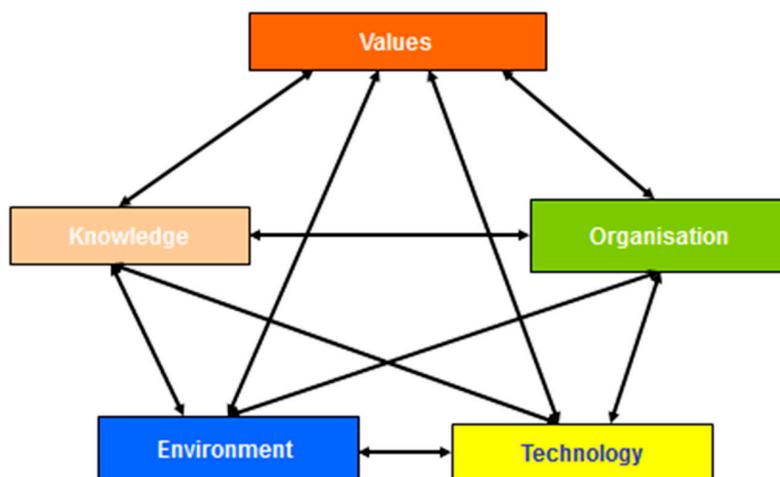


Figure 2. Elements that constitute the social and natural systems in coevolution. Source: [32].

The elements of a coevolutionary interaction adapted to agroecosystems [33] are as follows:

- The environment is understood as the biophysical environment in which the members of a group find local material resources for their subsistence.
- The values involved in the beliefs and worldviews that give an identity to a group aimed at articulating their life plans in relation to their environment and appropriate resources.
- Knowledge refers to the repertoire of abilities and skills with which a group appropriates “pieces” of its environment.
- Technology focuses on productive practices, including the different uses and management of natural resources (collection and exchange).
- The organization referring to all forms of collective action aimed at the sustainable management of its resources.

Table 1 illustrates how these principles were applied in this study.

Table 1. Constitutive elements of coevolution principles adapted and applied to this study.

Factors	Adaptation	Operationalization	Application
Environment	Local resources	Understood as the biophysical environment in which the members of a group find local material resources for their subsistence.	Rosehip
Technology	Cultural techniques and practices	The production practices, including the various uses and management of natural resources (collection and exchange).	Agroecological management of the farm
Organization	–	Referred to all forms of collective action aimed at the sustainable management of its resources.	Workshops
Values	Life plans	Beliefs and worldviews that give an identity to a group aimed at articulating their life plans in relation to their environment and appropriate resources.	Control of the farm
Knowledge	Local Knowledge	Repertoire of abilities and skills with which a group appropriates “pieces” of their environment.	Production systems

For the development of this participatory research, a consensual and planned work strategy was carried out with various local actors in the municipality of Melipeuco: peasants and farmers, leaders of municipal social and professional organizations, the Local Economic Development Unit, UDEL, and PRODESAL. This strategy included the women of Cherquén and consisted of the following elements [34]:

- a. *Local initiatives*: These refer to the fact that any process that one wishes to implement, transition to or go through must emerge as an initiative of the farmers involved, since they will be the ones who will permanently demand and ensure compliance with the objectives set, in addition to deciding the pace of its achievement. As a result, there will be a greater commitment on their part, as they are managers of their own development process. The fact that the initiative arises from the peasants themselves is of real importance, since relationships of equality and exchange that are necessary in an agroecological process are generated more naturally and spontaneously, leading to increasing levels of involvement that translate into higher degrees of participation and prominence during the process.
- b. *Accompaniment program*: The program must respond to the needs of all the actors involved and it must also consider their creative capacity. Actors are immersed in a socio-economic context where development programs are often conceived only as a productive project. Trained professionals are expected to provide support in the implementation of techniques that are not degrading natural resources. However, social relationships that occur in the community are also to be considered, as they allow the integration of the groups of peasants with the wider society. This process of accompaniment facilitates mechanisms of interpretation of state bureaucracies, thus, facilitating the self-management of peasant groups.
- c. *Mobilization of the subjects of change*: This represents support that should be able to mobilize people in order to organize them either formally or informally. As a result, it could then be possible to channel the proposals for change designed by the peasants themselves.
- d. *Choice of the technical proposal*: From the productive point of view, the choice of the technical proposal is decisive to support an agroecological process. It also constitutes a quantitative evaluation factor and a possible cause of the success or failure of a project. However, it should not only respond to a merely productive objective. Because of its agroecological nature, the technical proposal to be implemented should be one that at least considers the use of local resources, that respects biological cycles and the reproduction of these, and that does not generate more waste than the agroecosystem itself can recycle. Therefore, the choice of a suitable technical proposal is of great importance, mainly due to three aspects: (1) the agrarian nature of both the economy and the social relations of the peasant; (2) it must be in line with the agroecological nature as a complete process; and (3) the socio-economic importance that the productive dimension acquires in rural development projects. However, its implementation will have a beneficial impact on the achievement of agroecological objectives if it is implemented within a broader strategy that involves the parallel redesign of the property or farm, with limited financial investments initially, and where production is implemented based on the resources and inputs that are available locally.
- e. *Presence of local markets*: The support and promotion of local fairs so that they become local market places based on the trust of the social networks established in the region, may constitute a concrete action that facilitates the establishment of autonomous relationships between the peasants and the market, where the latter constitutes the final destination of the produce rather than where factors affecting production are mobilized. Therefore, it can be suggested that a strategy that would allow timely access to a local market is to be preferred, as it has the potential to promote short circuits. Another potentially successful strategy could be focusing on organic production, considered also traditional, that is based on reduction of costs as a result of the use of local inputs (or the gradual independence from external inputs). This approach also includes the possibility of selling at a premium price, depending on the characteristics of the market,

which is expected to have a positive impact and support the economy of peasant families in spite of the influence of the large-scale national agri-food production.

f. *Empowerment of peasant farmers*: One of the key elements to establish a strategy of agroecological transition is the power that is believed in hands of the peasants involved in agroecological processes. The generation of any type of knowledge, whether theoretical and/or practical, methodological and/or technological, must be assimilated and appropriated by the peasants with whom researchers and other professionals are working and accompanying, even more so when this knowledge has been generated from the local culture, as a product of the interaction and dialogues of knowledge between peasants and technicians. The process of empowering peasant farmers includes the following aspects:

- Assimilation of techniques and technologies: all technologies and agricultural practices that are implemented to manage the natural resources of the agroecosystem, whether external or locally generated, must be incorporated by the farmer in a constant process of education, in order to grant autonomy and control over production processes. As a result, the adoption of new technologies must be understood as a process of assimilation based on local experiences.
- Adequate tools: the construction of adequate tools should be in line with peasants' approaches, so as to allow the interpretation of a technical language often not understood by peasant farmers. Despite having been generated on the basis of traditional and local knowledge, tools often end up being a one-way interpretation of agroecosystemic contexts, where the technician obtains greater (sometimes absolute) benefits from the information gathered. Therefore, the generation of cumbersome and complex methodological tools that only manage to accumulate information, hindering its interpretation and analysis, should be avoided.
- Access to information: access to clear and timely information continues to be an obstacle to the development of peasant groups when selling the surplus production that the support institutions themselves, both technical and financial, demand of them. Therefore, an empowerment strategy must be generated so that information regarding fair prices and local markets is managed and administered by the farmers themselves without the intervention of intermediaries or third parties.
- Decision-making power and negotiation: in order to facilitate development, peasant communities must achieve decision-making power and negotiating capacity when deciding the central elements of a program and directing the processes in which they are included. Agroecology can and should play a central role, since the methodologies used enhance peasants' participation in the projects that it supports. Participation must be understood as a negotiation between the different actors involved (internal and external), where the constant and permanent appropriation and assimilation of both methodological and technological elements are fundamental, generating decision-making powers, together with determination and control over the processes that are carried out autonomously, respectful and in line with peasants' logic and organizational structures.

Once the elements considered in the accompaniment strategy carried out at different stages were defined, the study was evaluated through the analytical categories designed to eliminate the gap between the theoretical agroecological proposal and its consequent conceptual transformation [35], considering that the discipline of agroecology "is being built in reciprocity to social and political movements and processes" [36] (p. 18). This framework of analysis has been proposed as a theoretical approach for the analysis of experiences of agroecological transition with groups of peasant women in the Chilean context [37]. The variables used were: localized knowledge; temporality, uses, and customs of the territory; socio-political power and relations; inductive practices from the local; and economic alternatives to the hegemonic model. Results will then be discussed in line with these variables.

2.2. Study Phases

The present study was developed in 4 stages:

- (1) identification of the problem and definition of a strategy,
- (2) search for an alternative market,
- (3) perception of collection work and,
- (4) implementation of a demonstrative unit.

Each stage consisted of: (a) workshops/meetings for discussion, reflection, and feedback on what was done and to agree on the actions to be implemented; and (b) the development of different activities for the implementations of the actions agreed upon in the workshops and meetings (Figure 3).

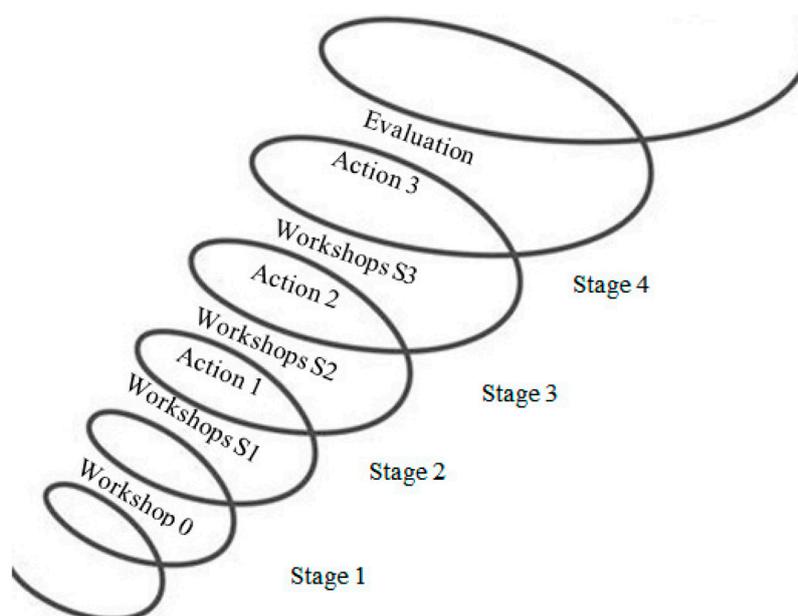


Figure 3. Stages of the study.

2.2.1. Identification of the Problem and Definition of a Strategy

This was carried out with the Women's Group in the Cherquén area. The first discussion workshop was aimed at collectively identifying the problem and elaborating a dedicated action strategy.

2.2.2. Search for an Alternative Market for the Sale of Rosehip

This consisted of a micro-market study to find out the purchasing conditions established by the two organizations that, at that time of the study, acquired rosehip from the direct sale from peasants and farmers. This information was shared in workshops for analysis and discussion about the possibilities of meeting the conditions and requirements of these organizations. Subsequently, the participants collectively agreed to determine their women's perceptions of the work of harvesting rosehip and the labor conditions.

2.2.3. Perception of Collection Work and Conditions for Collective Work

A discussion group was held with the women members of the group, using a semi-structured approach. The information obtained was recorded and transcribed to be later categorized through content analysis. The results obtained were analyzed and discussed in discussion groups with the women, and it was agreed to carry out a single demonstration unit, of a small size, on the farm of one of the participants.

2.2.4. Implementation of the Demonstration Unit

The unit consisted of the establishment of an agroforestry system integrated in the forest landscape (park) in the Cherquén area with the establishment of rosehip bushes alternated with native prairie. Plant clumps were obtained from the collection sites usually used by the women participants, previously selected for site characteristics similar to the one selected for planting and attributes such as color and size of fruits. The seedlings were planted following topographical keylines at a distance of 1.5 m above the row and 3 m in the inter-row, where then guano was incorporated at the time of planting (Figure 4). Finally, a workshop was held where a general evaluation of the experience was made.



Figure 4. (A) Rosehip plantation: collection locations; (B) mugrones; (C) contour lines; (D) plantation of a rosehip mop, and incorporation of guano (manure).

3. Results

3.1. Identification of the Problem and Definition of a Strategy

The problem was defined as a matter related to “combating the theft” of rosehip by pickers from other parts of the country who, without the authorization of the owners, entered the farms to collect rosehip fruits. The women of Cherquén, who carry out the harvest and collection work, expressed the possibility of establishing production systems in places closer to their homes that would allow them to regain control of their property, while at the same time making home care tasks compatible with their farming activity (e.g., feeding, upbringing). The definition of a collective strategy, then, consisted in that prior to carrying out any productive economic initiative, women wanted to be sure of their capacities and possibilities to carry out the activity. Therefore, the advantages and disadvantages of an associated rosehip sale, the conditions for an association, and the technical requirements of a rosehip culture were discussed. As a result, participants agreed to carry out a search for alternative rosehip buyers.

3.2. Identification of Alternative Channels for the Commercialization of Rosehip

The background obtained from the interview with the managers of the two commercial entities and potential buyers are outlined in Table 2.

Results indicate the importance of having a minimum level of organization for the commercialization of rosehip and, thus, meet the requirements established by commercial entities. This information was share among and analyzed by the women, eliciting the following comments (Table 3).

Table 2. General description of commercial entities as buyers of products made from rosehip.

Commercial Entities	Buyer 1	Buyer 2
Description	Organic farmers association that markets its members' products but is complemented by the offer of organic products produced by third parties. They are approx. 30 partners and within some of its objectives it promotes organic agriculture, shares knowledge with agroecological farmers.	Cooperative that emerges as a fair-oriented commercial initiative. Producers can be organizations of artisans and peasants or companies with good social policy.
Requirements (jam)	The products marketed are from partners or external producers. The elaborated product must have organic certification. They mark up the price of the products marketed by 35%. The freight is not included in this percentage, so it must be paid by the association or the producer, influencing the final price. Labelling must carry everything that the law stipulates. A certificate issued by the certifying entity is required.	To market the products, producers can be members of the cooperative or a producer related to the cooperative. The price of the products is marked up by no more than 20%. Products must have the approval of the Health Service. The freight is paid by the producer or the cooperative and the cost must be applied to the price of the product. The ideal solution is to deliver the product in small jars.

Table 3. Main opinions and perceptions of women regarding the conditions established by the companies that buy rosehip.

Participants	Comments
Participant 1	<i>"For us it is super complicated, because imagine that they tell us how many kilos from 30,000 to more and for example I do not consider myself a collector and I believe that we are far from that, for the reason that I personally do not always go out to collect. A person who is a collector takes advantage of the season and leaves from 9 in the morning and returns at 6 in the afternoon, that is what a collector is. And we are more like nothing an entertainment or suddenly to make some extra pesos, but it is not the strong one like us as a family".</i>
Participant 2	<i>"We have no serious commitment to. It is that we cannot either, because suddenly we have to do one thing and others that things to do, the truth is that the harvest of rosehip is not the strength of us". "It would more than make oil deliver oil is not a bad idea, but it is more expensive to do a project, so we train, and get resources pa ' buy the machines must have a room where you work, where they meet the requirements of health and all that". "Maybe we could organize ourselves as a Prodesal group and ask ourselves to help us in that because it is something innovative, it is something new, to be able to obtain resources, to see what possibilities there are of making a small group".</i>
Participant 3	<i>"Of course I can tell you if it is okay, but we cannot assume you, well, personally, and I think that the girls are going to share with me. I can tell you if, if I am going to and if I don't comply there is the issue, that is if I commit I have to comply and it is not the idea if I say yes, but I do not comply, because one is supposed to take responsibility. And this is far from reality, 12,000–30,000 kilos. And the price is perhaps not bad either, if you sell it for \$ 150 per kilo, you have \$ 15,000 in a bag, but you don't collect all that." "This is fine, but the issue is that for us too, or because pa ' start if we think of oil and the whole subject, think that we have to be trained for that, because this is not to say one wants to produce oil, if we do not know how we are going to produce it. If one had access to all things well but, unfortunately, we do not have access, unless we just sell the raw fruit, it is the only thing we can do".</i>
Participant 4	<i>"And another thing, now, if we have a commitment, this commitment must be fulfilled, but what do we get out of making a commitment if on the radio they say that the musket season begins and all the people start to remove the muskets that there are? over her so how are we going to fight, telling them not to remove our muskets". "We would lack the resources to start, because for example to start with oil we would have to be trained and from that we would already have to enter to organize ourselves, enter to request training". "If we had the opportunity, where we train and come up with a project to buy the machines and all would be good pa ' us, those opportunities must not lose".</i>

The opinions and comments expressed by women highlight the difficulty of meeting the requirements of companies, specifically, with delivery volumes. They express a high sense of responsibility for the fulfilment of commitments between them, the convenience, and need to receive aid such as subsidies and training.

3.3. Determination of the Endogenous and Exogenous Factors that Impact on the Organization

The background obtained from the group discussion held with the women of the community of Cherquén is presented in Table 4 below:

Table 4. Summary aggregate of the endogenous and exogenous factors that impact on the organization.

Categories	Subcategories	Comments	Inferential Transcription
Perception of collection work	Sacrifice	<i>"When you go too far to collect"; "We must leave the house alone with the children"</i>	Long distances that must go, leaving neglected to the children.
	Priority	<i>"You have to stay longer in the house to do lunch, toilet and take care of the daughters"</i>	It prioritizes the tasks of the home and the care of the children.
Rosehip for sale	Price	<i>"It is not very fair, hard work sacrifice and little profit"</i>	Payment for the fruit of rosehip is not the proper for the work that requires the collection.
	Request	<i>"A direct delivery, without intermediaries"; "A person who makes the contacts for a direct delivery"</i>	Need for external support to achieve direct delivery of the product to final buyers.
Income source for farmers	-	<i>"It is a good source for people who need extra pesos, it is one more entry, as a support"</i>	Selling rosehip fruits generates extra revenues that support the economic costs of production.
Rating of the collection work	-	<i>"They do not value so much the sacrifice that people make to collect"; "They are interested in buying it no more, because they are the ones who win"</i>	Lack of interest of the intermediaries to know about what that implies the work of collection.
Peasant Organization	Initiative	<i>"There has been no thought of organizing to sell rosehip, if there was a better offer perhaps there would be interest and with direct buyers"</i>	Scarce interest of organization for the sale of rosehip fruits, but if the payment conditions improve, would be an incentive to join.
-	Experience Women's Group	<i>"We need to organize, is that people are difficult, it is difficult to agree"; "There is also a lack of more motivation from the board to do something"; "It will happen that outside support is lacking"; "I am the president and we have not thought organized nothing else"</i>	Lack of internal coordination within the group; little incentive from the board and need for external support to regroup; demonstration of poor leadership.
-	Experience with other organizations	<i>"They always cooperate, and the others don't"; "When some help, there they all arrive"</i>	Lack of cooperation and unity within the organization.

Results highlight a number of aspects that should improve with internal coordination as well as cooperation and cohesion within the group. These also include the difficulties in harvesting rosehip products and how such activity can be time consuming. All these factors affect a possible organization of the women for the collective sale of rosehip.

3.4. Establishment of Agroforestry Systems with Rosehip

These were implemented through the planting of vine branches in contours on the property of one of the women (Figure 5).

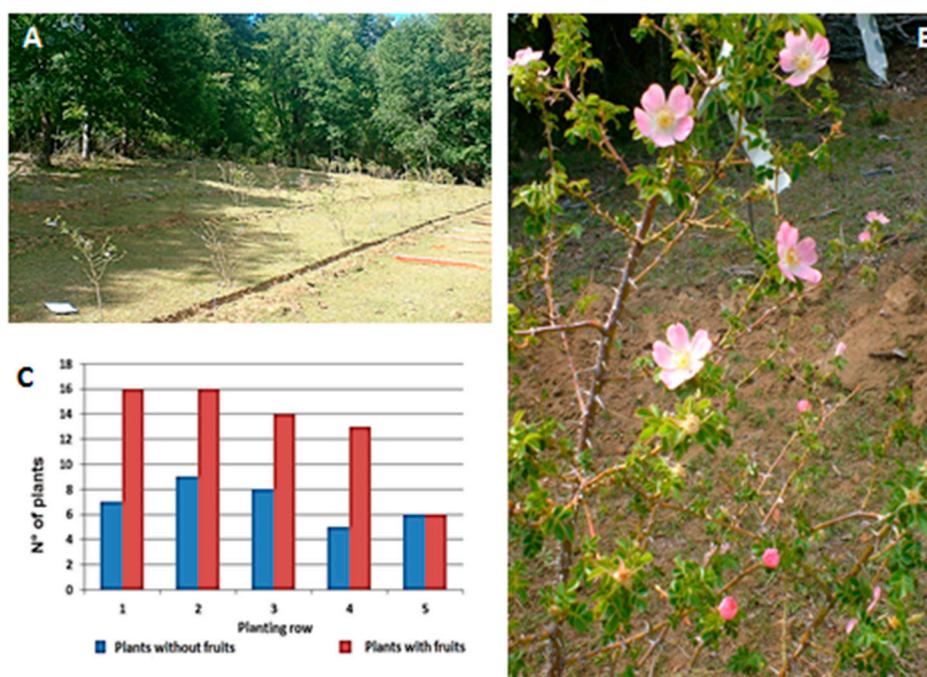


Figure 5. (A) Agroforestry system with rosehip: plantation incorporated into the landscape; (B) rosehip plants in flower; (C) number of rosehip plants with fruits (red) and without fruits (blue).

The system is integrated into the landscape that is made up of laurifolio-type forest dominated by Patagonian oak (roble, *Nothofagus obliqua*), maqui (*Aristotelia chilensis*), lingue (*Persea lingue*), laurel (*Laurelia sempervirens*), palo santo (trevo, *Dasyphyllum diacanthoides*). Species density allows, on the one hand, to carry out handling (pruning) and harvesting tasks and, on the other hand, the growth of native species in the prairie and free movement of animals. The majority of established plants presented fruits at the time of this study.

4. Discussion

4.1. Local Knowledge

Agroecology “is based on a set of knowledge and techniques that are developed by farmers and their experimentation processes” [36] (p. 6). In addition, agroecology proposes socio-ecological aspects [2] as an essential component of agroecological systems. As a result, it adopts the principle of pluri-epistemic knowledge, under which not only scientific knowledge is recognized for decision-making [38], but also the epistemologies of each culture are incorporated as generators of valid and useful knowledge for the sustainable development of the territory, leading to development options and approaches that are “consistent with its values and goals” [38] (p. 198). Therefore, it is essential to recognize the knowledge potential of traditional agricultural cultures, without excluding formal social and biological knowledge developed by conventional agricultural sciences, in order to improve agroecosystems with the contributions of traditional and modern knowledges [39].

The epistemological trajectory of agroecology, as well as the approach to the understanding of culture, fosters the dialogue between the unilinear and multilinear understandings of knowledge, recognizing the relevance of “transforming the dominant relationship between nature and culture or between nature and society, it is necessary to distance oneself from the relationship established by western logocentrism between nature and culture, or between nature and society” [40] (p. 146). Thus, knowledge is not only due to the recognition of the knowledge of the other in an equal way, but also to the responsibility that comes from managing information. Therefore, access to information

is not due to a neutral motivation of knowledge, but rather to a commitment in which “it plays a role in restoring the ecological balance of agroecosystems” [41] (p. 67).

The joint work between the different actors involved in this study reveals the following aspects:

- a. The importance of the knowledge of women and their families reflected in aspects related to their environment that allowed the correct choice of places to obtain the seedlings that were used in the rosehip plantation, as well as the criteria used for the selection and the attributes of the fruit. This is in line with what has been experienced with other groups of peasants from the Huechepún area in the Melipeuco municipality that, because of the lack of scientific knowledge, use an endemic tree to feed their livestock [42,43].
- b. Complementing the knowledge of professionals who are knowledgeable about tools and committed to the process, promoting important synergies when implementing technical proposals. The technicians’ skills, such as the management of orchards and the implementation of the contour lines facilitate the application of knowledge for specific objectives. This highlighted the importance of the dialogue of knowledge and the local dimension applied within an agroecological approach, enriching and complementing the knowledge of different actors [44] in the improvement of agroecosystems.
- c. The responsibility implied by the handling of the information, e.g., conditions demanded by the companies that buy rosehip contributed to decision-making for concrete actions. Accurate and timely information on these conditions, i.e., volume and price, allowed safeguarding the response capacities of women.

4.2. Temporality and Customs of the Territory

Seasonal cycles are the relevant time for traditional peasant activities, which recognize the natural cycles in the process of food production. This looks different from the idea of agriculture based on the use of land, which adopts an industrial agriculture approach to the production of material goods and commodities: intensification of work and increasing production rates [45]. This study refers directly to the concept of territoriality that is the way the space beyond the geographical reference of the place is inhabited [46]. Thus, time and space, being categories widely analyzed by different theoretical approaches highlight the challenge in understanding approaches to land use and the customs of peasant communities [47]. As a result, with the recognition of the concept of territoriality, this study contains cultural and social signifiers that mark the relationship “between the natural environment and human activity (. . .) the reduction of the territory to a cartographic issue is a highly abstract simplification that does not respond to the verifiable empirical demands of the concept of human reality” [48] (p. 42). The territory has then a subjective character and can be considered “the space within which the sociocultural relations of a group take place” and as such it is [48] (p. 48). The complexity of the factors at play in this context are then associated with the geographical and environmental conditions, as well as with the social ties and the activities carried out during the study.

Similarly, time or the historical dimension, which is linked to knowledge, recognizes the transmission of rural knowledge orally from generation to generation, when contemporary knowledge is present, originating in a different temporality that has been implemented and changed according to the transformation of the environmental conditions of the field. Space and time determine how agricultural production, rest, and harvest are lived, experienced, and felt. It is the way in which one lives in the space and the subjectivity of a producer; the result of “a cultural baggage that depending on the scale, is projected from the community the producer belongs to: the nucleus or family unit, the rural community, the region and, finally, the ethnic or cultural group” [49] (p. 71). The agroecological approach tends to understand the productive cycles of the land in harmony with the traditional cycles marked by environmental, climatic, social, and cultural conditions, as opposed to modernity, characterized by “the dismemberment of the social life of the local context and its increasing determinations by translocal forces; and the space/time distancing or the separation of space and place” [40] (p. 68).

The agroecological experiment carried out in this study in relation to space and time highlighted how women dwell, experience, and feel their agricultural production line, rest, and harvest. Women recognized in the rosehip harvest a task that can complement income, rather than the main source of income. They also did not seem to want it to become the main source of income. The time allocated for the harvest is marginal because there are other priorities in agricultural work, family and domestic work. They did not identify themselves as pickers or gatherers and were not exclusively devoted to this activity. This collection activity corresponds then to ecological-economic exchanges developed with the natural environment and as a result, the establishment of rosehip productions (either as monoculture or in agroforestry systems) would mean a change in the current interaction with natural socio-economic environment [49]. Therefore, the scale and the agroecological management agreed among the women for the establishment of rosehip production on the farms would correspond to a projection of this interaction with their environment [49], which is attempted to replicate, rather than the current situation.

As mentioned above, the economy of the families in this territory is based on forestry (wood and firewood) and livestock activities. In this case, the establishment of a productive unit focused on the production of rosehip for commercial purposes represents a process of appropriation, objectification, and assimilation carried out by a group (or community) in order to create a commodity from a natural good, which must respect the ways of life of said community [50]. In the case of the rosehip in this territory, the secondary transformation of this resource into oil for cosmetic use has constituted an important element for the economy of these families. Productive concentration or hyper-specialization runs the risk of putting pressure on agroecosystems to the point of eroding the dissipative structures that they constitute (e.g., soil and biodiversity). This is common in productive development strategies based on quality certifications or seals, such as designations and indications of origin that focus on the product rather than on the socio-ecosystem. However, the holistic view of the agroecological approach focuses precisely on the socio-ecosystem where the participation of all actors is sought to establish common attributes that define an agri-food product that circulates through value chains and networks [51]. In this respect, diversification of socio-ecosystems and the products introduced in value chains can then represent an effective agroecological strategy with the aim to strengthen livelihoods, improve food security, and promote food sovereignty [52] (p. 44).

4.3. Sociopolitical Power and Relations

In the framework of agro-industrial production, where the use of monoculture and the concentration of land ownership lead to the impoverishment and confinement of locally producing communities and small-scale farmers [53], the socio-political proposal of agroecology takes full relevance based on the concept of equality [41]. Without falling into the idealization and exoticization of the peasant subject, the agroecological perspective recognizes that “peasant communities are not exempt from disputes, social conflicts and internal hierarchies, with gender inequalities being the most evident” [45] (p. 11). However, there are evidences of the awareness of the importance of the kinship legacy, class-consciousness, cultural identity, and “the intragenerational awareness or rejection of any form of exploitation in a historical moment linked to a possible generational domination” [54] (p. 2).

Today we live in times when colonial relations are visible in our societies, in which, in turn, there is a concern for recovery by rediscovering and re-engaging with people’s roots and history, valuation by cultural traits, and the need to reinvent or build relationships based on equality. In this line of thought, decolonial and de-patriarchal approaches are modern strategies “to understand the complexity of this global crisis that is closely linked to the dominant structural myopia paradigms and knowledge (pre)built around the conventional scientific thinking” [55] (p. 96). From a socio-political perspective, agroecology focuses on “reviewing and relating the approaches to social change, from the personal and micro to the institutional and macro” [56] (p. 246), with the aim that these views are then reflected in a social reality of a sustainable nature.

The proposal for socio-political relations within an agroecological framework fosters social diversity, the intensity of knowledge and autonomy in relation to independence with respect to external inputs. As a result, agroecology becomes a tool that supports the struggle of political movements that aspire to food sovereignty [57].

The relevance of agroecology in the fight for food sovereignty in the current context of unsustainability of food systems is then highlighted and not only glimpsed through the pressures exerted by the “large agri-food transnationals [that] make it impossible all agroecological dynamics of social transition” [56] (p. 246) and also hinder relations between producers, distributors, and consumers. On the other hand, in relation to food sovereignty, the relationship between producers and consumers is a fundamental point, while the right to healthy food, free from agrochemicals, for healthy communities represents the strong link between those who produce and those who consume. This relationship can be understood as “an extensive democratization of our sociocultural relationships with a view to achieving a sustainable social or socio-vital metabolism” [56] (p. 250).

This study has contributed to reconfiguring equality relationships in the following aspects:

- a. Gender issues: although the greater female presence in rosehip harvesting has been highlighted, in reality that most projects of this type are planned and executed by men (professionals and farmers). In this study, the perceptions and opinions of the women involved have been collected, which are the fundamental input in the decision-making process.
- b. Independence from the use of external inputs: both the valorization of local knowledge and the dialogue of knowledges established with professionals have highlighted the feasibility of establishing an agroecology-based agroforestry system with rosehip using local resources and without the application of inputs of synthetic origin.
- c. Food autonomy: this was reflected at various stages during the study, from the moment in which the women have revealed the undervaluation that is carried out with respect to the work of harvesting the rosehip, to facing the monopsony and establishing a negotiation process without intermediaries.
- d. Relations at the institutional level: participants reviewed these relations, since they are the ones that demand technical assistance from institutions, and organization and training on specific topics that can benefit their work.

4.4. Inductive Practices at Local Level

This study adopts the perspective of agroecology as a holistic approach and a systemic strategy that has the potential to “stop the degrading and degrading forms of production of nature and society, causing the current ecological crisis” [57] (p. 42). This is a challenge that must necessarily be established through inductive practices at a local level, in order to contribute to the construction of sustainable societies.

The novelty of the agroecological approach is that it has the ability to recognize and rescue what was overwhelmed by modern agro-industrial systems, looking at memories of languages and practices locally, forms and knowledge that appear as a remedy to heal the current ecological and social crisis. In this scenario, the local dimension stands as the carrier of an endogenous potential that, through the articulation of peasant and scientific knowledge, advances towards the implementation of alternative agriculture systems that tend towards ecological and sociocultural biodiversity [57].

Currently, although the rural scene is not dichotomous, distinct opposite features of land work can be observed: one is based on exploitation and over-production that leads to ecological fatigue; and another achieves, from the knowledge of the recovery cycles of natural resources, a comprehensive production that does not respond to immediacy but is projected in the long term and that is variable depending on local determination and contexts. Thus, “traditional farmers have developed and inherited complex agricultural systems, adapted to local conditions; where successful native agricultural strategies are a tribute to the creativity of small farmers” [41] (p. 61) who develop their own technology, under pressure or need and with their own resources [58], since it is accepted that

local cultures interact with their own local ecosystem, as well as with landscapes and local biodiversity, resulting in a complex array of specific interactions and synergies [49].

Undoubtedly, agroecology is capable of releasing ancestral knowledge and putting it into local practice. However, to use local resources correctly people need to have a cognitive system and knowledge that allows the connection between the tangible (material life) and the intangible (symbolic life) [59]. Language keeps local knowledge alive, since through orality the memory of the peoples is transmitted in space and time. In this sense, the agroecological approach must pay attention to the signs, symbols, concepts, and perceptions that make up the traditional cognitive system of the communities involved [60]. These principles underpin the importance of traditional knowledge, where “popular wisdom” carried out in rural practice is a source of observation and knowledge through dialogue with local knowledge established by agroecological approaches.

4.5. Economic Alternatives to the Hegemonic Model

Agroecology aims to promote the development of own, local economic systems that are based on reciprocity and that maintain a harmonious relationship with nature, with the firm intention of improving the quality of life within indigenous and sociocultural systems, and also achieving greater equality [61].

In contexts of social and environmental imbalance, like the one of this study, the agroecological perspective proposes to return to the traditional concepts of solidarity, reciprocity, and cooperation, in coherence with an economy that respects the production cycles of the land, the territory, maintains the ranges of production that are more suitable to the local context, and do not rely on agrochemicals. This position challenges, among other things, the current system to take distance from the anthropocentric bias of the western market societies and, by adopting a biocentric ethical approach, promote new forms of production and consumption that do not follow the logic of accumulation, but pay attention on basic needs [62]. The construction of these new economies, which are not subjugated to the dilemma between the environment and economic growth, requires a new social order that contemplates ecological sustainability, participatory democracy, and environmental rationality [41]. The definition of a counter-hegemonic economic alternative to capitalism must, on the one hand, be adapted to the ecological systems of the world and, on the other hand, be based on a new rationality that considers the value of the territory, the identity and autonomy of cultural diversity, and people’s quality of life [38]. In this logic, the market spaces must maintain cycles of exchange and commercialization that favor the local environment [63], under the model of production of self-consumption and surplus. This is important to achieve greater equality because it ensures that agroecology does not become a discourse of goods of consumption of the elite and privileged urban middle classes, as it tends instead towards a more equitable model of healthy food distribution [64].

Although it is true that the study promoted the search for alternatives to the conventional purchasing companies, the possibilities of integrating rosehip in short value chains were scarce. This was not only because there are only two suitable companies, but also because of the aspirations expressed by women, who did not consider undertaking a larger-scale initiative. The labor that the harvest requires to them, the summer heat, the characteristics of the plant, the undervaluation of their labor, and the fact that they do not recognize themselves as pickers influenced the development of this study towards approaches for two different added-value products: on the one hand, the processing and sale of rosehip oil extracted from the fruit of the rosehip and, on the other, the production and sale of traditional rosehip jam. In both cases, what women proposed was the establishment of exchanges that value labor and the identity of their land and that, being extractive in nature, can transition to organic production respecting the cycles and uses of the territory, with benefits that can be distributed between the women themselves and the local communities.

4.6. Barriers to and Drivers for Agroecological Transition

Finally, the study highlighted key barriers to and drivers for agroecological transition. The main barriers are constituted by current socio-economic structures and gender issues, such as the lack of value chains adequately supporting the rosehip production activities and the lack of recognition of women's labor and contribution to the economy of rosehip plantations. In line with results from similar studies, these aspects are particularly relevant in rural contexts and areas further away from the main centers of consumption where there is a need for better integration of operations within the local value chains and commercial outlets [63,65] (p. 126).

On the other hand, the study reinforces that the integration of knowledge between the women involved in the study and the researchers, as well as all actors along the value chain constitute the key drivers for agroecological transitions. This is in line with similar studies that highlighted the relevance and role of local knowledge in agroecological transition processes, where the recovery of traditional agroecological knowledge should not only be considered the resuming of the cultivation of certain old varieties, but also the mobilization of "a collective knowledge linked to the management and use of said products that, inserted in an agroecological process of a territorial dimension, will contribute to strengthening social ties" [66] (p. 126). In this respect, this study also highlights the importance of knowledge integration in fostering social cohesion and identity, while at the same valuing cultural roots and diversity [28,67,68].

5. Conclusions

This study of an agroecological transition highlighted the potential that women and their families own, especially with regard to the establishment of the agroforestry system with rosehip using agroecological principles. The experience showed that the practices carried out in such agroecosystems projected in the rosehip plantation were successful and pertinent. Specifically, the use of vine branches as plant material to reproduce, use of guano (manure) as fertilizer, and integrating the system into the landscape evidenced that the practices developed by women and their families allow us to establish a culture of rosehip outside logic conventional industry that puts pressure on monoculture, the use of synthetic fertilizers and more complex propagation systems that have proven to be unnecessary for the requirements of rosehip production [8].

The study highlighted the suitability of open, reflective, and iterative methodological strategies or design in which the continuous exercise of feedback and self-criticism allows participants to reorient and redirect the processes towards the objectives. Dynamic approaches, such as the spiral one adopted in this study, are widely adopted in participatory research. Each loop corresponds to a phase that, like the activities and actions carried out in each one of them, can be repeated (iterated) to achieve the objectives and, thus, finish a cycle to start a new one, which, according to the becoming of their own activities and actions can take unexpected and diverse directions. In this study, it is worth noting the change in direction that the research took in phase three, due to the analysis of the results obtained from the discussion group, where participants agreed to establish an agroforestry rosehip system in only one of the farms as a demonstrative unit.

This type of research with communities effectively contributes to finding solutions collectively with the participation of the various actors involved. The establishment of agroforestry-based agroecological systems with rosehip by means of participatory approaches that really involve farmers from their design constitutes an interesting tool for the agroecological transition in rural areas. Further studies need to be carried out to deepen the knowledge about community-led approaches and how researchers can facilitate and support the redesign of socio-economic systems based on equality and food sovereignty of the communities involved.

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