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Strategies for the Management of Traditional Chestnut Landscapes in Pesio Valley, Italy: A Participatory Approach

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Abstract: Through an exploratory case study conducted in the Pesio Valley, northwest Italy, this paper proposes a framework for maintaining traditional chestnut production landscapes and addressing future development policies. The main goal was to understand how to promote a bottom-up planning approach, including stakeholder perceptions in traditional chestnut landscape management. To ensure the sustainability of the landscape, current driving forces and their landscape effects were identified by local stakeholders using a focus group technique. Population ageing, local forestry policies directed towards supporting chestnut growers' income, social and economic needs, and land fragmentation are the main driving forces that will influence future chestnut landscapes. The focus group participants built two scenarios of possible future development of the chestnut landscape, one characterized by the disappearance and transformation of chestnut stands, the other by their permanence and maintenance. The most recommended strategies for maintaining traditional chestnut cultivation were chestnut processing, fruit designation of origin, and the cultivation of traditional varieties. This study shows that, to preserve the traditional chestnut landscape, the participation of multiple stakeholders is a useful approach in landscape planning. This methodology could guide decision-makers and planners who desire to implement a participatory approach to a sustainable development program for traditional chestnut landscapes.

Keywords: *Castanea sativa*; local participation; cultural heritage; scenarios; land use; conservation

1. Introduction

In Europe, all agroforestry systems are landscapes managed by traditional agricultural techniques or practices [1,2]. Currently, traditional landscapes are receiving much attention from researchers and planners with multiple aims, including biodiversity preservation and conservation of cultural values [3]. The concept of traditional landscapes is linked to their cultural and historical features, to the maintenance over the centuries of the same land uses and cultivation techniques. As reported by Antrop [4], remnants of traditional landscapes still exist in Europe nowadays, but they have become isolated patches on a large scale and are more and more difficult to recognize. In this context, several authors have outlined that many traditional land use systems have been lost or diminished in the past decades [5,6]. This process is mainly linked to the abandonment or degradation of traditional agricultural systems and forestry management. Moreover, these sites have been subject to

transformations following land abandonment or crop conversion caused by processes towards more intensification and urbanization [7].

Castanea sativa Miller woodlands are an important part of the forestry ecosystem in Italy and are considered a primary food source for middle mountain landscape populations [8]. Moreover, in the Piedmont region (northwest Italy), chestnuts have historically represented one of the most important land use types [9]. Nutritional traits of chestnuts have always been considered valuable and have been particularly appreciated by the local population. In the mountain area of the Piedmont region, since the Middle Ages, many products have been obtained from the chestnut for food use, from the fruit and the flour that is ground from it. Not only the fruit was used, but also the leaves, for the bedding of livestock in stables or for mattresses, and as components of fertilizer. The softer suckers, which grow at the base of the plant, were considered good forage for goats. The tannin from the bark was used for leather tanning. For this reason, the mountain population of Piedmont has been defined as a “chestnut society”, because historically it lived on chestnut products. Fire events in wooded areas, transformations in land uses, and land abandonment in marginal areas are the main cause of increasing unmanaged woodland, linked with the decrease of traditional practices and the loss of biodiversity [10–12]. The current changes of traditional forestry systems are considered a threat linked also to the loss of regional identity and cultural heritage values [13,14]. For this reason, conservation of traditional land use including forestry systems is an international priority. In 2004, the Food and Agriculture Organization (FAO) addressed the relationship between agricultural heritage systems and their landscape and outlined the need to safeguard traditional agroforestry systems as cultural landscapes over time (Globally Important Agricultural Heritage System Project) [15]. Furthermore, the traditional rural landscape has been recognized as both a cultural heritage and a common good by international organizations such as the United Nations Educational Scientific and Cultural Organization (UNESCO) under the World Heritage Convention [16].

Research Aim

The Mediterranean area is characterized by landscape patterns whose composition results from long and complex cultural and historical processes. In particular, the Italian landscape is composed of a rich mosaic of rural and forest landscapes that have been shaped through time [17,18]. The sweet chestnut (*C. sativa* Miller) is the only native species of the genus *Castanea* in Europe. Moreover, the European chestnut forests are concentrated in just a few countries with a long tradition of chestnut cultivation: France and Italy together account for 79.3% of the whole chestnut forest area; Spain, Portugal, and Switzerland (9.7%) are further contributors, and the remaining areas (11.0%) are located in other countries [8]. In Italy, chestnut forests cover an area of 800,000 hectares: 70% of these are managed as aged coppices with around 30–80 trees/ha, the remaining 30% being orchards for fruit production [19]. *C. sativa* is, in general, a tall and vigorous tree; it can exceed 30 m in height and 400 years in age, in exceptional conditions [20].

In the Piedmont region in northwest Italy, the chestnut landscape is a traditional forestry system with historical and cultural value [9]. Piedmont hosts a rich heritage of genetically diverse varieties including many endangered cultivars. Chestnut cultivation has a wide distribution and also involves some very popular cultivars such as “Marrone” [21]. Today the cultivated area has decreased, leading to social, economic, and ecological consequences [22]. Since 1950, several factors have caused the gradual abandonment of chestnut cultivation: the loss of population from mountain areas, the change in people’s diet and culture, and the many pests and diseases that have affected chestnut trees [23]. Moreover, traditional chestnut management approaches (i.e., coppices, high forests, orchards) require continuous labor-intensive inputs. In the absence of management, chestnut stands tend to be invaded by other species and to evolve towards mixed deciduous forests [24]. From this perspective, according to different studies, new integrated approaches to agroforestry system management are needed and the involvement of local stakeholders is considered a priority [25–28]. With the aim to develop integrated plans and policies for the future, a preliminary methodological and multidisciplinary study was

performed, outlining the need to understand thoroughly the perception that stakeholders have of land use changes [23]. Therefore, the present paper mainly focuses on the participatory study and proposes a methodological framework for addressing future policies for chestnut landscape conservation.

2. Material and Methods

2.1. Study Area

The study was carried out in the Pesio Valley, Cuneo province, Italy. The current characteristics of chestnut groves and their location in the territory are the result of the process of regression of chestnut cultivation on a regional scale (Figure 1). In Piedmont, a large area of traditional chestnut is still preserved in the valleys of Cuneo province, and some characteristic elements of this traditional landscape are well-preserved in the Pesio Valley [9]. This area includes many mountain valleys and the Chiusa Pesio municipality ($44^{\circ}19'25''$ North, $7^{\circ}40'37''$ East; 485–2651 m a.s.l.). In Chiusa Pesio, as reported by the Italian Statistical National Institute (ISTAT, 2014), there are 280 farms that grow chestnut trees for a total of 300 ha of cultivated surface [29].

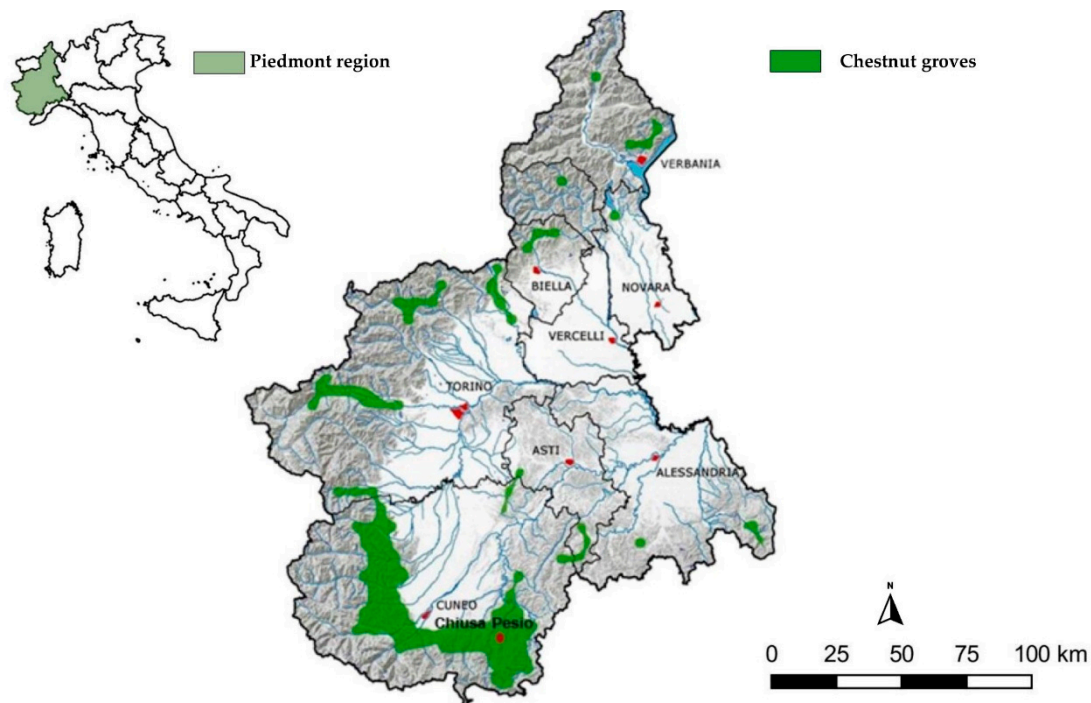


Figure 1. Localization of chestnut groves in Piedmont region (Italy).

The main historical elements that characterize the Pesio Valley landscape are: (i) the cultivation of the Marrone di Chiusa Pesio, a traditional chestnut cultivar used for the production of marrons glacés; (ii) the presence of many other cultivars with different uses (fresh, dried, and candied); (iii) the presence of the Certosa di Pesio, a center of religious and civil life, which has played a fundamental role in the promotion of agriculture and of chestnut cultivation over time; and (iv) the presence of historical rural structures used for chestnut drying [30]. The land use history of the Pesio Valley was strongly influenced by the arrival of the Carthusians in 1173. The monks managed woodlands according to the different altitudinal zones: chestnut was cultivated at low altitudes, mainly for the nuts; beech for firewood at mid altitudes; and silver fir for round timber at higher altitudes. This model of silvicultural management was used by the Carthusians at all their monasteries throughout the Alps and Apennines. In other valleys in the Piedmont region, the chestnut cultivation was limited to only one function [31]. In some areas, local varieties are grown, suitable for drying and flour production. These sites are characterized also by the presence of many architectural structures used for chestnut

drying; some areas have cultivars suitable for processing or fresh consumption (boiled or roasted). In Pesio Valley, chestnuts were intended for different functions. Indeed, in this valley, the cultivation of chestnut was mainly linked with the many and versatile uses of the processed products. Many varieties were traditionally cultivated for certain fruit quality traits that were appreciated by consumers: the sweet chestnut was used in confectionery (candied, syrup, marrons glacés), for production of flour or dried chestnuts, or for fresh consumption (boiled or roasted). The timber is today still sought after in carpentry for the construction of furniture, flooring, paneling or casing, and tannin extraction.

2.2. Methodological Framework

In order to define the main driving forces related to traditional chestnut system changes and their landscape effects, and to evaluate future scenarios, a focus group was used as a local participatory technique [32]. As explained by Gullino et al. (2018), the focus group is a qualitative research technique that involves a small number of stakeholders. The focus group should include the main community representatives and should cover a variety of interests, aspirations, expectations, and points of view [33]. In this exploratory research, different actors with different opinions and different roles were involved as stakeholders. Table 1 lists the participants of the focus group. These were: (i) people who have an economic interest (chestnut growers, agricultural institutions, and chestnut food and wood industrial producers); (ii) people who have governance and planning interests (local administrators, local and regional organizations); (iii) people who have nature and agroforestry interests (protected area managers); and (iv) people who have a research interest (academic researchers). All stakeholders involved had a connection with the traditional chestnut landscape and the ability to influence landscape changes directly or indirectly. In particular, chestnut growers, advised by agricultural consultants, are the main users whose activities contribute directly to land use change. Representatives of public bodies and protected area organizations with their policies and forestry programs contribute directly to governance and planning in the chestnut landscape. In contrast, stakeholders that process chestnut or wood have an indirect connection with the chestnut landscape, such as professionals forest agronomists and researchers. Indeed, these stakeholders are affected by the decisions of chestnut growers and/or politicians. The politicians were included in the category “public body representative”.

Table 1. Number of stakeholders involved in the focus group.

Stakeholder Category	Number of Participants (Number Invited)
Public body representative	4 (5)
Protected area organization representative	2 (3)
Agricultural consultant	1 (1)
Chestnut grower	4 (4)
Freelance professional	3 (3)
Academic researchers	3 (3)
Chestnut nuts industrial producer	3 (3)
Chestnut wood industrial producer	2 (2)
Total	22 (24)

The panel focus group was organized as a one-day meeting with two main goals. The first goal was to identify the main driving forces related to chestnut system changes and their landscape effects (Session 1); the second was to analyze possible future chestnut scenarios (Session 2). Session 1 focused on the importance of the driving forces perceived by each participant. After the presentation of the research aim, all the focus group participants discussed the concept of the traditional chestnut system and the future of chestnut cultivation. Subsequently, they highlighted which current driving forces might alter the chestnut landscape during the next 20 years. Then, each focus group participant was asked to imagine the two primary possible effects of such driving forces, writing them on individual cards. Each participant explained his/her decisions to the others. The focus group organizers collected the cards and immediately composed a poster that displayed the focus group’s perceived driving

forces with their potential effects (positive or negative). Finally, participants assigned a shared score related to the importance of the current driving forces over the next 20 years (from 1 = low importance to 5 = high importance) in relation to the identified effects. In this step, focus group participants as a group decided on a score to assign to each driving force. The assignment of the values was the result of an open discussion among participants and permitted classification of the importance of driving forces.

Session 2 focused on the evaluation of chestnut landscape scenarios. With the aim of identifying future scenarios of the chestnut landscape, in accordance with Loupa Ramos (2010) and Ramirez et al. (2015), several pictures were shown to the focus group participants [34,35]. Subsequently, traditional elements linked to chestnut trees' cultivation were listed and explained to participants. Finally, the participants were asked to think creatively, combining or adding elements to create their own "more probable" scenarios in the next 20 years. In particular, each focus group participant created her/his scenario selecting those elements considered more realistic and achievable. With the aim of analyzing stakeholders' opinions, the disappearance/transformation scenario (Figure 2) and the permanence/maintenance scenario (Figure 3) related to the chestnut landscape were constructed and evaluated.



Figure 2. Representation of disappearance/transformation scenario.



Figure 3. Representation of permanence/maintenance scenario.

3. Results

3.1. Traditional Chestnut Landscape: Driving Forces and Landscape Effects

The analysis of the focus group results allowed the identification of the driving forces affecting the chestnut landscape. In session 1, participants identified many driving forces that could have negative (–), positive (+) or variable (/) effects on the traditional chestnut landscape. Table 2 lists the driving forces identified by the focus group participants in terms of their landscape effects and importance (score). Population ageing, local forestry policies supporting chestnut growers' income, social and economic needs, and land fragmentation are the most important driving forces of the chestnut landscape (score 5/5). Demand from young chestnut growers aged 25–40 years (score 3/5) and the economic crisis of intensive fruit growing (score 2/5) are considered secondary.

Table 2. Importance of driving forces identified by the participants of focus group and effects on the traditional chestnut landscape.

Importance Score (1–5)	Driving Forces	Influence on Landscape over Next 20 Years ('+' = Unanimously Positive Effect; '–' = Unanimously Negative Effect; '/' = Variable Opinions Regarding the Effect)
5	Population ageing	(–) Abandonment of chestnut tree cultivation (–) Changes of land use (–) Forest planning problems (–) Increased abandoned wood areas
5	Land fragmentation	(–) Abandonment of chestnut tree cultivation (–) Abandonment of ancient orchards (–) Management problems (–) Forest planning problems (–) Lack of an origin denomination or a specific protection system (–) Loss of traditions and local knowledge (loss of cultural landscape)
5	Local forestry policies directed towards supporting chestnut growers' income	(+) Conservation of traditional and historical varieties (+) Preservation of cultural and historical values (+) Valorization of traditional landscape features (+) Strengthening of chestnut tree systems (+) Development of forest planning (+) Consolidation of cultivation practices and traditional agroforestry methods connected to quality fruit production (–) Spread of new Japanese hybrids more productive on flat land
5	Social and economic needs	(/) Demand for bigger fruits and stronger varieties (+) Valorization of traditional varieties
3	Demand from young chestnut growers	(+) Preservation of ancient orchards (+) Maintaining forest resources and traditional chestnut trees
2	Economic crisis of intensive chestnut growing	(+) Relocation of chestnut orchards on flat land (+) Increase chestnut cultivation (–) Spread of Japanese hybrids (–) Decrease of local varieties' (–) Loss and deterioration of local and traditional production

Regarding the landscape effects of driving forces, the focus group participants outlined several differences: the abandonment of chestnut cultivation; abandonment of chestnut tree cultivation, changes of land use, forest planning problems and the increased abandoned wood areas are the main negative effects related to the ageing population. The focus group participants outlined that the abandonment of chestnut tree cultivation has led to the increase of invasive species, causing serious ecological problems and threatening local biodiversity. Furthermore, the abandonment of ancient orchards, sometimes still productive; management and forest planning problems; the loss of traditions

and local knowledge; and the lack of an origin denomination related to the fruit are the main negative economic consequences linked to land fragmentation. These driving forces bring only negative effects. Chestnut growers outlined as main driving forces population ageing (score 5/5), land fragmentation (score 5/5), and the economic crisis (score 5/5). They highlighted the negative effects of these driving forces and the consequences of chestnut tree cultivation abandonment. In contrast, local forestry policies, directed towards supporting chestnut growers' income, bring several positive effects for the chestnut landscape: they contribute to increase chestnut cultivation and to preserve traditional cultivation practices and historical chestnut varieties; and, at the same time, they contribute to maintain good quality fruit production. Supporting farm incomes helps strengthen chestnut cultivation and preserve the traditional chestnut growing system. Social and economic needs cause only two positive effects for the chestnut landscape, in terms of chestnut production and cultivation of historical and traditional varieties. The problems with traditional chestnut management encourage the spread of intensive orchards of Euro-Japanese hybrids. Moreover, the relatively high price of chestnut fruits that can be harvested from non-traditional varieties contributes. The traditional product is not adequately valued and therefore the crop is abandoned. Consequently, the mountain landscape and the flat lands where hybrid plants are recently cultivated are changing. The traditional chestnut landscape evolves in the forest and leads to the *C. sativa* cultivar's loss. On the other hand, the presence of new intensive chestnut orchards changes the plain landscape: among cereals or other herbaceous crops and industrial buildings, chestnut-intensive orchards are new elements, recently introduced. Therefore, this land use change can have a positive landscape and environment character for the flat lands, characterized by intensive and monocultural crops.

3.2. Landscape Scenarios

Concerning landscape scenarios (Session 2), focus group participants discussed the future of the traditional chestnut landscape. Disappearance/transformation and permanence/maintenance scenarios were built and evaluated. The abandonment of chestnut tree cultivation was the most probable perceived scenario (53%). Participants hypothesized that after the abandonment, mixed forests would characterize the study area. Of the participants, 41% supposed that high forest and coppices (biomass production function) would increase. Only 6% believed that traditional chestnut groves would probably be restored.

The focus group participants were asked to list the main strategies to improve and maintain the traditional chestnut system over the next 20 years. Abandonment and mixed forests not managed, and managed high forest and coppice (biomass function) were considered the main landscape scenarios related to the disappearance and transformation of the traditional chestnut system. Improving chestnut chain systems and increasing the transformation of products were considered the main landscape scenarios related to permanence/maintenance of the traditional chestnut landscape. Figure 4 illustrates the results of permanence/maintenance of traditional chestnut cultivation.

Almost a third (31%) of focus group participants considered strengthening the chestnut chain system the strategy to conserve the traditional chestnut system, while improved processing of the product, fruit designation of origin, and landscape valorization (21%, 10%, and 10%, respectively) were considered suitable strategies. Quality production valorization (fresh and dried chestnuts), secondary product valorization (honey, mushrooms, wood, and underwood products), touristic activity development, and chestnut cultivation incomes were the other strategies identified by the focus group participants (total equal to 28%). For focus group participants, "valorization" meant the strengthening of production values in monetary terms, able to recognize agricultural good practices and landscape conservation through products selling.

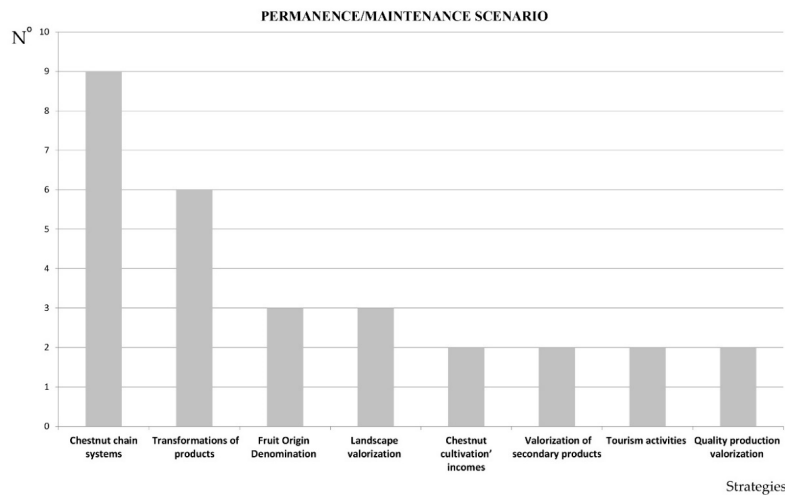


Figure 4. Strategies identified by focus group participants to maintain traditional chestnut cultivation according to the number of preferences received (Nº).

4. Discussion

As demonstrated by García de Jalón et al. (2017), a limited number of stakeholders involved in participatory processes generate discussions helping the evaluation of the relative importance of agroforestry system changes [27]. In this context, several authors have explained that scientific research needs to consider the views of local stakeholders, because they are affected by political and administrative decisions [3,28,36]. In the present study, analysis of the focus group results allowed the identification of shared driving forces with their direct or indirect landscape effects. All focus group participants expressed the need to protect the traditional chestnut landscape over time. The results of this research highlighted that, to valorize and maintain the traditional chestnut landscape, the most important driving forces are the local forestry policies supporting chestnut growers' income, the demand from young chestnut growers, and the social and economic needs and requirements. In contrast, population ageing and land fragmentation were considered the driving forces that are contributing negatively to change the traditional chestnut landscape. Moreover, these driving forces have caused chestnut cultivation abandonment over time and, nowadays, critical issues related to planning and management occurred.

Using a focus group technique, probable future landscape scenarios were discussed and evaluated. The use of scenarios appeared to foster the visualization of landscape transformations, especially for participants not used to thinking about the landscape. Analyzing the results related to the focus group in Session 1 and Session 2, two interesting aspects emerged. The first aspect is related to the effects of the identified driving forces on the traditional chestnut system; the second is related to landscape scenarios. During Session 2, several strategies were identified, one of which was related to chestnut cultivation income, which was one of the driving forces identified in Session 1. It is interesting that during the scenario evaluation, this strategy was considered secondary. Product processing, fruit designation of origin, and landscape valorization were the most commonly identified strategies. The focus group participants identified driving forces and elements that influence (positively or negatively) the traditional chestnut landscape towards a disappearance/transformation scenario or towards a permanence/maintenance scenario. Figure 5 reports the driving forces and the elements linked to landscape scenarios identified by focus group participants to maintain or transform the traditional chestnut landscape. The traditional chestnut landscape is an unstable forestry system that can change as outlined in the two possible scenarios identified. Related to Session 1, land fragmentation, intensive chestnut growing, the ageing population, and the economic crisis are the main driving forces that will contribute to produce a disappearance/transformation scenario. In contrast, local forestry

policies directed towards supporting chestnut growers' income, demands from new chestnut growers, and social and economic needs contribute to generate a permanence/maintenance scenario.

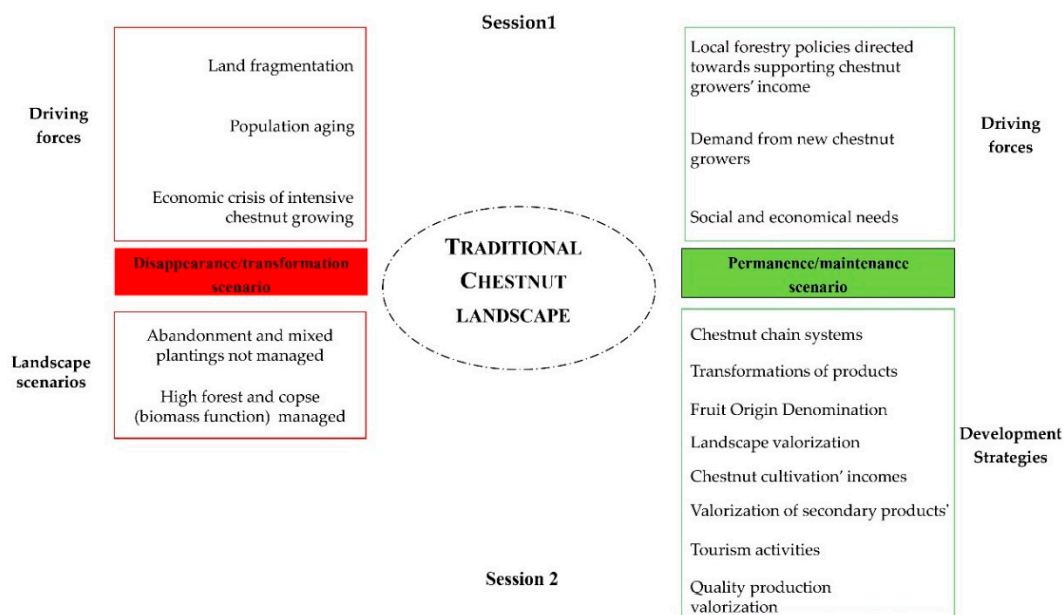


Figure 5. Scheme of the driving forces (Session 1) and the elements linked to landscape scenarios (Session 2) identified by local stakeholders during the focus group discussion that contribute to maintain and transform the traditional chestnut landscape.

Related to Session 2, focus group participants recognized some traditional features as development strategies for maintaining the chestnut landscape. In this challenge, social and economic needs could strengthen and encourage the cultivation of traditional chestnut varieties. By contrast, in relationship to the disappearance/transformation scenario, the focus group participants identified two possible landscape scenarios. In the present study, we have reported in Figure 5 the results acquired in the sessions previously described because we think that these analyses should be integrated with each other. To maintain the traditional chestnut landscape, we can translate the driving forces in specific rural programs and the development strategies in local actions. Therefore, to ensure sustainability of the traditional agricultural landscapes, Gullino et al. (2015) identified strategies and actions reported in the management plan for rural UNESCO sites [37]. With the aim of maintaining the chestnut landscape as a traditional landscape, several strategies identified in this study are the same as for maintaining rural UNESCO sites, including processing, supporting farmers' income, developing tourism activities, and valorizing the landscape.

Gantar and Golobič (2015) and Surova' et al. (2011) affirmed that landscape scenarios could influence attitudes, perspectives, and opinions associated with the traditional landscape [38,39]. The present research has shown that valorization of the landscape and of primary and secondary chestnut products is considered one of the best practices for local stakeholders. In this context, the concept of landscape labeling, as explained by Ghazoul et al. (2009), links specific products with the landscape in which they are produced or obtained [40]. This potential strategy is a tool for a governance approach and holds the promise of rewarding landscape managers and growers for providing products and maintaining goods and services at the landscape level [41]. For chestnut landscape, labeling should be improved, as it highlights its uniqueness and the need for conservation by financing traditional management practices or land uses. During the focus group, the participants recognized landscape labeling as an instrument able to combine traditional elements with product certification on a landscape scale. Labeling in the context of land use commonly implies that special qualities of a landscape justify that the products derived from it are sold at a higher price than those from other areas which do not

have these qualities. Focus group participants thought that landscape labeling could generate sufficient income for traditional cultural landscapes despite lower productivity than in systems where processes are optimized according to the logic of industrial production. Nowadays this is a tool not used or applied for these traditional sites. According to Roe (2016), labeling plays an important role in map production, attaching specific texts to related geographic, ecological, environmental, and traditional elements to provide clear references [42]. For “map production”, Roe recognizes the link between the origin landscape of production and the primary products obtained. As such, people have become more aware of the value of chestnut orchards as multifunctional landscape features. Moreover, the primary and secondary products derived from the traditional chestnut landscape could increase in value in the global market. In this context, the participation of local people is an essential process to identify shared and suitable development strategies [43,44].

The participatory approach contributes to rural landscape planning policy from the local to the regional–national level. Recently, the Piedmont region was identified in the Regional Landscape Plan 76 landscape areas [45]. Thus, the “Pesio Valley” landscape area is included. At regional level, our results were used as tools to identify the “Pesio Valley” area, not only for the geographical definition but for identification of the main dynamics in place and traditional landscape features. Concerning the main dynamics, the driving forces identified by our focus group participants are those highlighted in the Regional Landscape Plan. Moreover, the development strategies are the strategic addresses and guidelines that should be adopted for this landscape area. At national level, the conservation of “traditional rural landscape” is a national priority and some of these cultural sites are nowadays included in the National Register of Historical Rural Landscapes [46]. From this perspective, our study could be considered as a guideline for decision-makers and planners who would characterize the traditional chestnut landscape in the Pesio Valley. For nomination in the National Register of Historical Rural Landscapes, the landscape scenarios identified and the driving forces with their effects are considered preliminary results.

5. Conclusions

Through a case study conducted in the Pesio Valley we developed a framework for maintaining traditional chestnut production landscapes and addressing future development policies. The case study described in this paper reveals the main problems that affect this area and offers possible solutions to promote the conservation and development of traditional chestnut landscapes. Despite the small number of focus group participants involved in the research, the focus group could be considered an approach for landscape planning, primarily in threatened traditional agroforestry systems such as the chestnut landscape in Piedmont.

For the traditional chestnut landscape we have identified two possible future scenarios: a disappearance/transformation scenario and a permanence/maintenance scenario. In the present study, focus group participants identified development strategies for maintaining the chestnut landscape. We think that the identification of strategies should be considered a primary step, to be followed by the translation of these strategies into practice. For traditional chestnut landscapes in the Pesio Valley, the concept of traditional landscapes is linked to cultural and historical features and to the maintenance over the centuries of the same land use. In the present studied area, which has rare chestnut varieties and cultivation techniques, the focus group approach is useful to explore the opinions, knowledge, perceptions, and concerns of a small group of individuals. This qualitative research often serves to subsequently produce an extensive and more tailored questionnaire on the object of investigation to a larger number of respondents. In this context, with the aim to manage traditional chestnut landscapes, other stakeholders, for example the residents of the study area, should also be involved.

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