

Article

Wild Food Plant Knowledge and Agroecosystem Resilience Across the Urban–Rural Gradient in Northern Italy

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Abstract

Peri-urban belts are where most metropolitan residents actually meet farmland, and where urban food policy and agroecological transition physically overlap. They are also where wild food plants (WFPs) grow: on verges, ditch bank, and field margins, the interstitial biodiversity that complements cultivated crops. We ask whether the knowledge that makes those plants usable survives peri-urbanisation, and whether it can serve as a proxy for the resilience of the surrounding agroecosystem. Two Northern Italian landscapes with comparable perennial monoculture but opposite positions on the urban–rural gradient were compared through a diachronic design: the peri-urban lowland of the Trevigiano (Veneto), inside the dispersed-city fabric of the Venice–Padua–Treviso region and under rapid Prosecco expansion, and the Langhe (Piedmont), a UNESCO-listed hill district of low settlement density whose agriculture is nonetheless fully industrialised around wine grapes, hazelnuts, and tourism. Interviews with 74 informants were conducted through complementary designs: a cohort-structured approach in the Trevigiano and actor-diversified and diachronic interviews in the Langhe, recorded 13 folk food taxa in the Trevigiano against 43 in the Langhe (Jaccard 0.19). The peri-urban repertoire is thin and mostly inert: recognition survives while practice does not, with gaps of up to 86 percentage points between the two, and only *Humulus lupulus*, anchored in ritual, dialect, and a commercial product, is transmitted intact. The non-peri-urban repertoire is broader and still mobile, relocated by younger foragers onto unmanaged refugia and partly professionalised. The proxy, however, has a precondition. WFP knowledge indexes a healthy agroecosystem only where the land is clean enough to gather from, and the Trevigiano is not: informants avoid treated margins. The one EU instrument that would have banned pesticides in public green areas was withdrawn in 2024. We conclude that peri-urban planning should treat edges, unmanaged interstitial land, and treatment transparency as food-system infrastructure, and propose paired habitat and knowledge indicators for peri-urban agroecological assessment.



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1. Introduction

Most people who live in a metropolitan region never set foot on a farm. They do, however, walk along ditches, cycle past vineyards, and take the dog onto a verge at the edge of a housing estate. The peri-urban belt is where the urban population physically encounters agriculture, and it is also where a particular kind of biodiversity lives: the plants that grow in agroecosystems without being sown, field margins, hedgerows, canal banks, road verges, the untidy corner where two land uses meet. These wild food plants (WFPs) complement cultivated crops with micronutrients, phytochemicals, and fibre that commoditised diets deliver poorly [1,2], and gathering them is one of the oldest ways in which people read a landscape [2].

There is a strong claim in the literature that WFPs contribute resilience to food systems: they are what communities fall back on when harvests, incomes, or supply chains fail, and the knowledge of where and when to find them is a reservoir that can be drawn on under stress [3,4]. The claim has been documented in war and economic collapse [3], under pandemic disruption [5], and across long-term climatic and economic extremes [6]. It is a good claim. But it carries a condition that is rarely examined in the places where most Europeans now live.

A reservoir is only a reservoir if it is still there, and if you can safely drink from it. WFPs deliver resilience through a coupled system with three parts: habitat, which the plants require; local ecological knowledge (LEK), which makes them edible, safe, and desirable and which requires transmission; and access, which includes both physical entry and the belief that what grows there is fit to eat. Any of the three can fail on its own. Plants can be abundant while the knowledge of them evaporates. Knowledge can survive intact while the habitat that made it operational is mown, sprayed, or built over. And both can survive while nobody dares gather, because the margin sits between a treated vineyard and a road. That third failure mode turns out to matter more than we expected.

Ethnobiology has largely moved past a simple story of decline. Gómez-Baggethun and Reyes-García argue that change in traditional ecological knowledge should be read as a reconfiguration, with some domains contracting, others stable, and others expanding under identical pressures [7,8]. Reyes-García and colleagues showed, for the Iberian Peninsula, that uses tied to culinary appreciation and to the pleasure of gathering resist abandonment, while purely subsistence uses collapse [9]; Łuczaj and co-authors described the same divergence continent-wide as a passage from famine food to delicatessen [10]. Read through resilience theory, these are descriptions of a system reorganising rather than dying, and the useful question becomes which components persist, which adapt, and which are transformed [11,12].

That question maps onto the persistence–adaptability–transformability triad [11,12]. LEK sits at the centre of all three, since it is the medium through which the experience of past variability is stored and made available to present decisions, the memory component of adaptive management [13], or what Barthel and colleagues, working in cities, call social–ecological memory [14]. Memory carried by practice rather than by text has an awkward property: it needs occasions on which to be used, or it fades.

Meanwhile, a distinct literature has established that gathering is ubiquitous in cities and largely invisible to those who govern them [15–17]. Urban foragers use formal and informal green space alike [18], combine provisioning with cultural ecosystem services [18,19], and are met by regulation that ranges from silence to prohibition [15,20]. Recent work has gone further, examining the ecological impacts of urban gathering and the role foragers' own knowledge plays in limiting them [21], and showing that foraging is one of the few remaining routes by which urban dwellers have sustained, seasonal contact with nature [22].

A new demographic has appeared alongside the old one: foragers who learned from books, courses, social media, and guided walks rather than from a grandmother [23,24].

This is where a tension emerges that our data speak to directly. The new urban forager is, in one sense, a success story for reconnection. In another, they are curiously disconnected from the agroecosystem they forage in. They know species and recipes; they rarely know what was sprayed on the field upwind last week, when the verge was last cut, or who decided that. Their practice has been re-rooted in culture and leisure while remaining uncoupled from the management decisions that determine whether the plants are there and whether they are safe. The knowledge that once encoded a working relationship with a productive landscape has become, in places, a knowledge of plants without a knowledge of the system.

Urban foraging research has been sophisticated about the dense city and comparatively quiet about the peri-urban belt: the transition zone that is neither dense enough to be urban nor continuous enough to be rural, where farming persists under urban pressure and where most walkable open land actually is [25,26]. The gap matters, because this is agricultural land (an object of agroecological transition [27]), part of the urban foodshed (an object of urban food policy [25]), and the main gathering ground of metropolitan populations (an object of foraging research).

Northern Italy offers a clean comparison. The Veneto lowland around Treviso is the canonical case of the *Città diffusa*, a low-density mesh of small towns, detached houses, industrial sheds, retail strips, and farmland gravitating on the Venice–Padua–Treviso region, with no clear boundary between settlement and countryside [28]. As that fabric consolidated, the agricultural matrix was simplified by Prosecco: the area under the denomination in the province of Treviso rose from roughly 28,000 to 43,000 hectares between 2010 and 2020, with intensive herbicide use and the systematic clearing of exactly the ditch banks, hedgerows, and verges that had been the gathering habitat.

The Langhe, in Cuneo province, invert the spatial arrangement and partly converge on the ecological outcome. One point needs stating plainly, because the word “rural” invites the wrong picture. The Langhe are rural in settlement terms only. They are a low-density hill district, remote from any metropolitan area and historically poor. Nevertheless, their agriculture today is industrialised and export-oriented, organised around two perennial monocultures, wine grapes and hazelnuts, and around a third economy, tourism, that has grown on the back of the first two [29]. What distinguishes them from the Trevigiano is therefore not the intensity of land use, which is comparable, nor traditionality of farming, which has largely gone, but the absence of urban settlement pressure on the same surfaces. The transformation took four decades and was driven by the international success of the wines and by the 2014 UNESCO inscription of the vineyard landscapes [29]. Barolo-designated Nebbiolo alone rose from about 1175 to 2149 hectares between 1991 and 2018, largely at the expense of valley-bottom meadows, willow stands, and woodland, with hazelnut orchards expanding alongside. The result is a landscape at once more monocultural and more patrimonialised: prosperous, aesthetically protected, gastronomically celebrated, and impoverished in precisely the marginal habitats where WFPs grow. It is, in short, an industrial agroecosystem with a heritage designation and a tourist economy, not a surviving peasant countryside; the comparison we draw is therefore between two intensified agroecosystems that differ in their exposure to settlement, not between an intensive and an extensive one.

The overall purpose of this study is to examine how peri-urbanisation affects the coupled habitat–knowledge–access system that sustains wild-food gathering and to assess under what conditions WFP-related LEK can contribute to the evaluation of agroecosystem resilience. The comparison is designed around two industrialised agricultural

landscapes that differ principally in their exposure to settlement pressure. Four research questions guide the analysis: (RQ1) How have WFP knowledge and practice changed diachronically in the Trevigiano and the Langhe? (RQ2) Which components of the habitat–knowledge–access complex persist, adapt, transform, or fail in each landscape? (RQ3) Under what conditions can WFP-related LEK provide useful information about agroecosystem resilience and the usability of agricultural margins? (RQ4) What planning and agroecological-transition measures follow from these patterns? Two working hypotheses guide the comparison: first, that peri-urban settlement pressure acting together with intensive agriculture produces stronger discontinuities between knowledge and active gathering than agricultural intensification alone; and, second, that access to unmanaged or extensively managed interstitial habitats, trust in site safety, and diversified transmission channels favour the persistence or reconfiguration of gathering practices. Accordingly, the specific objectives are to document the WFP repertoires used now and formerly in both areas, identify the principal modes of persistence and reconfiguration, evaluate the conditions under which WFP-related LEK remains informative, and derive the implications for peri-urban planning and agroecological transition.

2. Materials and Methods

2.1. Study Areas

The Trevigiano study area comprises rural and semi-rural municipalities of the province of Treviso, Veneto, north-eastern Italy (Table 1 and Figure 1). The province covers about 2480 km², bounded to the north by the Prealps, east by Friuli Venezia Giulia, south by the Metropolitan City of Venice, and west by Vicenza. Two rivers cross the plain, the alpine-fed Piave and the karst-fed Livenza, and, together with a dense network of secondary canals and drainage ditches, they historically supplied the principal gathering habitats. The climate is temperate and mild. The area sits inside the polycentric Venice–Padua–Treviso region and shows the classic morphology of the *Città diffusa*: settlement, light industry, and farmland interpenetrate at a fine grain, and no informant in this study lived more than a few hundred metres from the built-up land. Agriculture is dominated by viticulture, above all, the Prosecco denominations, alongside cereals and fodder.

Table 1. Comparative profile of the two study areas.

Feature	Trevigiano (Veneto)	Langhe (Piedmont)
Position on urban–rural gradient	Peri-urban; embedded in the polycentric Venice–Padua–Treviso metropolitan region (<i>città diffusa</i>)	Rural in settlement terms only; low-density hill district, no metropolitan area within daily commuting distance, but capital-intensive and export-oriented agriculture plus a large tourism economy
Landform	Alluvial lowland, 2480 km ² provincial area, dense canal and ditch network (Piave, Livenza)	Marl hill mosaic, 200–800 m a.s.l., Tanaro, Bormida and Belbo catchments
Dominant agricultural system	Prosecco viticulture, cereals, fodder; area under Prosecco in the province rose from c. 28,000 to 43,000 ha, 2010–2020	Nebbiolo, Dolcetto, Barbera viticulture and hazelnut orchards; Barolo Nebbiolo rose from 1175 to 2149 ha, 1991–2018
Non-crop habitat	Ditch banks, canal margins, road verges, arable margins; subject to herbicide, bank clearance and municipal mowing	Woodland edges, dry-stone terraces, hedgerows, meadows, valley-bottom truffle grounds, oxbows, and ponds
Patrimonialisation	Prosecco hills of Conegliano and Valdobbiadene inscribed by UNESCO in 2019 (outside the lowland study sites)	Vineyard Landscape of Piedmont: Langhe-Roero and Monferrato, UNESCO 2014 [29]; 10,789 ha across 29 municipalities
Informants (n) and datasets	34 (17 born before 1970; 17 born after 1970); one diachronic dataset	40 (14 aged over 68; 16 middle-aged sectoral actors; 10 foraging-tourism participants); two datasets, a shared corpus (n = 30) and an independent diachronic survey (n = 10)
Wild vascular food taxa recorded	13	43

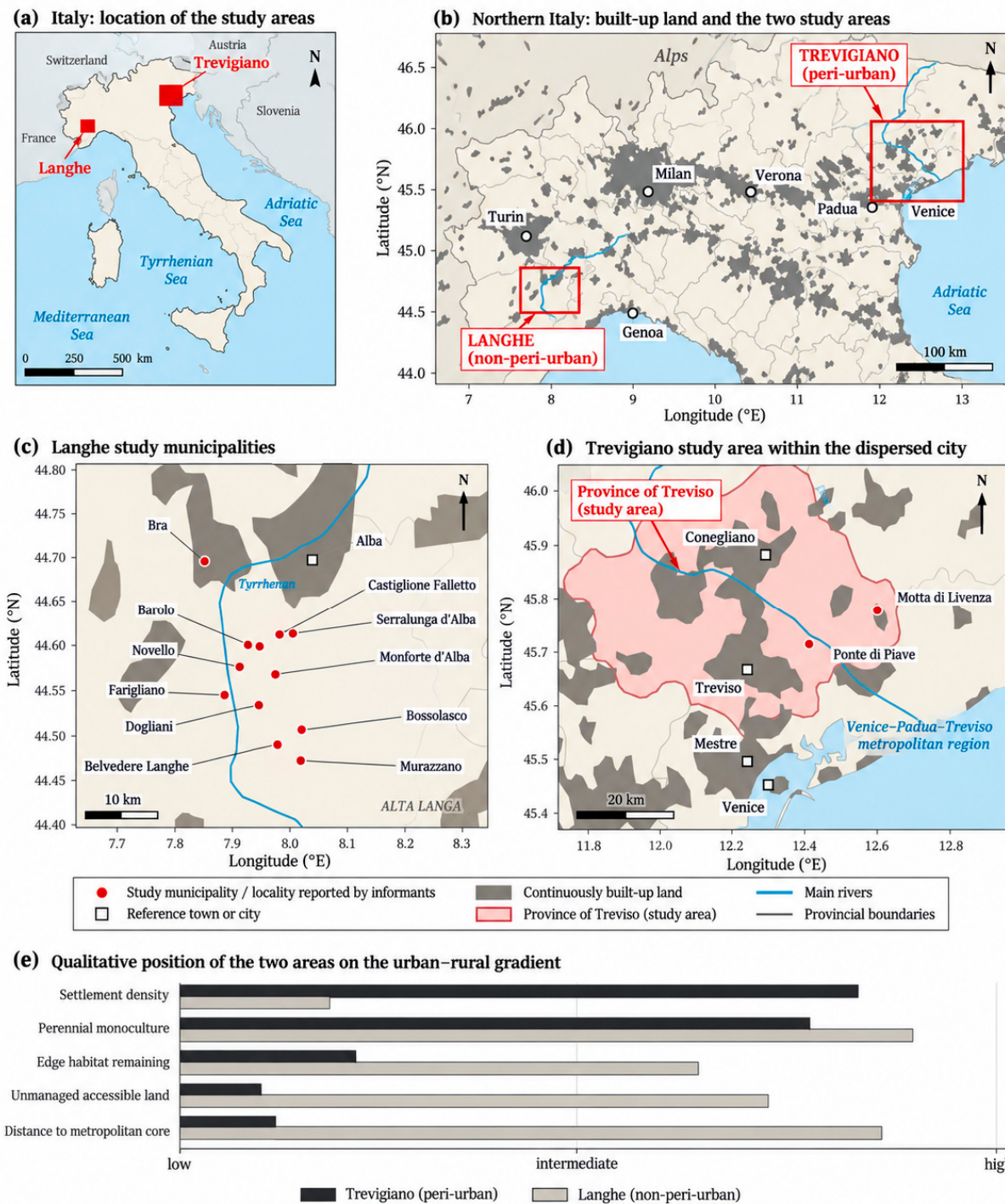


Figure 1. Study areas. (a) Location of the two areas within Italy. (b) Northern Italy, with continuously built-up land shown in dark grey: the Trevigiano box falls inside the continuous settlement mesh of the Venice–Padua–Treviso region, the Langhe box in a landscape where built-up patches remain small and discrete. (c) The twelve Langhe municipalities in which interviews were carried out; Alba is shown for reference. (d) The province of Treviso, the Trevigiano study area, within the dispersed city; individual gathering sites are not mapped, both because the survey was province-wide and to protect informant privacy, and the two localities shown are places named by informants (Ponte di Piave, for its hop-based brewery, and Motta di Livenza). Coordinates are geographic (WGS84); base geometry from Natural Earth 1:10 m administrative, urban-area, and river layers, except panel (a), which uses the 1:10 m country layer at reduced scale. (e) Qualitative position of the two areas on the urban–rural gradient, summarising settlement density, extent of perennial monoculture, remaining edge habitat, availability of unmanaged accessible land, and distance to the nearest metropolitan core.

The Langhe study area comprises hill municipalities of the province of Cuneo, Piedmont, spanning the Bassa Langa of the Barolo zone (Barolo, Monforte d'Alba, Serralunga d'Alba, Castiglione Falletto, Novello), the Dogliani and Farigliano district, and the Alta Langa (Belvedere Langhe, Bossolasco, Murazzano), with further interviews in Bra, Alba, and neighbouring parts of Asti province and the Turin plain. The landscape is a marl-based hill mosaic: vineyards, hazelnut orchards, dry-stone terraces, mesophilous woodland on north-facing slopes and shaded ridges, valley-bottom truffle grounds of black poplar, hornbeam, downy oak, willow, and lime, and a residual network of wetlands, oxbows, and artificial ponds. Population density is low, settlements small and nucleated, and Turin lies well beyond daily commuting distance for most informants; in settlement terms the area is unambiguously rural. Its agriculture, however, is not extensive or traditional. It is a capital-intensive, export-oriented system built on two perennial monocultures, wine grapes and hazelnuts, with mechanised inter-row management, routine plant protection, and, since the 1990s, a large and still growing wine and food tourism sector. Since 2014, six sub-areas have been inscribed on the UNESCO World Heritage List, covering 10,789 hectares across 29 municipalities within a buffer zone of 101 [29]. The area therefore contrasts with the Trevigiano on settlement and access, not on agricultural intensity (Table 1).

2.2. Field Data Collection and Ethics

Field data were collected between 2021 and 2023 in the Langhe and Trevigiano areas (Figure 1).

In Trevigiano, the design was explicitly diachronic, using 1970 as the cohort boundary, that being the conventional threshold for mass consumption, supermarket retail, and dietary globalisation in the Italian countryside. Seventeen informants born before 1970 (five men, twelve women) were interviewed face to face with a semi-structured protocol, in the field wherever possible, so that plants could be handled and gathering sites visited. Seventeen born after 1970 (three men, fourteen women) were reached in two stages: a focus group of ten established which taxa were locally salient now and in the past, after which a structured photo-elicitation instrument was administered. It presented botanical photographs of the salient taxa and recorded, for each, whether the informant recognised the plant, had ever eaten it, liked its flavour, and used it habitually in cooking; open questions followed on preparation, gathering technique, gathering site, and associated memories. A final block of closed items elicited attitudes towards loss and return. Several informants belonged to the same household across cohorts, which let transmission within families be assessed directly.

In the Langhe, two complementary datasets were collected. The first ($n = 30$), the shared corpus described above, combined a semi-structured ethnobotanical protocol with elderly residents ($n = 10$, aged 68 to 91, in Dogliani, Farigliano, Barolo, Monforte d'Alba, Belvedere Langhe, and Bossolasco), interviews on land use and environmental change with truffle hunters, truffle traders, fishermen, winegrowers, and local administrators ($n = 10$, aged 27 to 82), and interviews with participants in foraging-based tourism and customers of restaurants using wild greens ($n = 10$, aged 26 to 65). A further group of residents aged 20 to 30 was approached opportunistically; only a minority knew that wild greens were gathered locally and none gathered or ate them, so this group was not retained as a quantitative stratum. The second dataset ($n = 10$), independent of the first in informants and in fieldworkers, applied an explicitly diachronic protocol comparing present practice with the situation before the 1980s, stratified into informants younger than 55 ($n = 6$) and older than 55 ($n = 4$), all resident locally for at least fifty years and all currently or formerly gathering wild plants for food. Only the elderly ethnobotanical subset ($n = 10$) and the independent diachronic gathering subset ($n = 10$) contributed systematic taxon-level data.

The remaining 20 Langhe participants contributed contextual qualitative material on land use, environmental change, tourism, commercialisation, and transmission, but were not included in taxon citation frequencies.

The University approved the study of Gastronomic Sciences, Pollenzo (approval code UNISG24092024). Prior informed consent was obtained verbally from every participant, after explanation of the aims of the research, the intended use of the data, and the right to withdraw at any point. The Code of Ethics of the International Society of Ethnobiology [30] was followed throughout. Informants are identified by initials, sex, age, and municipality only, and no other personal data were retained. Statements reported verbatim in Section 3 were recorded in Italian or in local dialect and translated by the authors.

2.3. Botanical Identification, Nomenclature, and Historical Comparison

Because much of the fieldwork proceeded through photo-elicitation and free listing rather than the collection of fresh specimens, botanical identification started from recorded folk phytonyms, cross-checked against described morphology, habitat, phenology, and culinary treatment. Names were first matched against the standard regional reference literature: Scortegagna's *Flora Popolare Veneta* [31] for the Trevigiano, and the Piedmontese floristic and ethnobotanical literature for the Langhe. Every candidate identification was then compared against Penzig's *Flora Popolare Italiana* [32], the foundational national compilation of Italian folk phytonyms, to verify that each vernacular-to-scientific correspondence is attested independently of our dataset and is not a local idiosyncrasy or a researcher's inference.

For the Langhe, identifications were additionally checked against herbarium vouchers collected during earlier ethnobotanical missions in Piedmont and the Western Italian Alps, and against the taxa and folk names reported in previous field studies by our group in the upper Varaita valley and among the Brigasc, Kyé, and Provençal communities [33,34]. Where a Langhe folk name corresponded to a taxon already vouchered in those missions, the earlier voucher was treated as corroborating evidence. Habitat continuity was assessed for selected taxa against Vignolo-Lutati's 1929 floristic and vegetational survey of the Langhe, with its 1932–1960 appendices [35], and against the Piedmontese collections of Giacinto Abbà [36]. This historical layer is what lets habitat persistence and knowledge persistence be treated as separate variables instead of being conflated.

Accepted names, authorities and family placements follow Plants of the World Online (POWO) [37], consulted for every taxon; morphological plausibility was checked against *Flora d'Italia* [38], and synonyms in the original field notes were updated accordingly. Where the original field record required a nomenclatural or identification correction, or where the attribution of a folk name to a taxon remains uncertain, the entry is flagged in Tables 2 and 5. Fungi, recorded in the Langhe but not systematically in the Trevigiano, are reported separately and excluded from vascular counts and similarity indices. Cultivated ornamentals and vegetables gathered in a semi-wild state are marked as such and excluded from wild taxa counts.

2.4. Data Analysis

For each area, we compiled the full list of folk taxa, recorded local names, plant parts used, and culinary or medicinal preparations. Citation frequency is the number of informants independently reporting a taxon within a given interview set. For the Trevigiano cohort comparison, knowledge (recognition), past consumption, and current habitual use were computed separately for each birth cohort and, where the original protocol allowed, for each sex within cohort; since the four sex-by-cohort denominators are small and uneven, cohort-level figures are the primary basis for interpretation and group-level percentages are reported as recorded. Cross-site overlaps between the documented

repertoires were described using the Jaccard index on wild vascular taxa only. Because sampling frames and elicitation protocols differed between the two study areas, the index is used descriptively and is not interpreted as a standardized estimate of population-level ethnobotanical similarity.

Qualitative material was coded thematically in two passes. The first coded perceived drivers of change into four families, namely, habitat loss, agrochemical contamination and mistrust, interrupted transmission, and market substitution, which emerged inductively in both areas. The second coded reported responses against the persistence–adaptability–transformability triad [11,12], asking of each behaviour whether it continued a prior practice unchanged, modified it while retaining its function, or replaced it with a functionally different configuration. Taxa were also classified by anchoring, that is, by whether their use was embedded in a calendar ritual, a dialectal idiom, a commercial product or a commercial gastronomic offer; anchoring turned out to be the strongest correlate of persistence in our material.

3. Results

3.1. Informants

The 74 informants break down as follows. In Trevigiano, there were 34 split evenly between cohorts: 17 born before 1970 (5 men, 12 women) and 17 after (3 men, 14 women). The strong female predominance in both reflects the gendered division of gathering and domestic cooking that informants themselves described for the pre-1970 period and, in the younger cohort, a differential willingness to take part. In the Langhe, there were 40 informants: 14 aged over 68, custodians of the pre-mechanisation repertoire; 16 middle-aged actors in the wine, truffle, and land-management economy; and 10 participants in foraging tourism or restaurant clientele. The two designs are therefore asymmetric, cohort-symmetric, and knowledge-focused in the Trevigiano, and actor-diversified and practice-focused in the Langhe. That is a limitation for statistical comparison and an advantage for the resilience question, because it exposes both the vertical (generational) and the horizontal (sectoral) channels through which knowledge can be kept or rerouted.

3.2. Wild Food Plants of the Peri-Urban Trevigiano

Fourteen folk taxa were recorded in the Trevigiano. Thirteen are wild or semi-wild vascular plants used as food or domestic medicine; the fourteenth, *Avena fatua*, appears only in a children's game and is excluded from the food repertoire (Table 2). Thirteen taxa is a thin repertoire by Italian standards, and the thinness is itself the first result. Five were selected for a quantitative cohort comparison based on the focus group: *Silene vulgaris*, *Humulus lupulus*, *Picris hieracioides*, *Cichorium intybus*, and *Papaver rhoeas*.

Table 2. Wild and semi-wild food folk taxa recorded in the peri-urban Trevigiano (Veneto, Italy). Accepted names follow POWO; folk phytonyms were verified against Scortegagna's *Flora Popolare Veneta* and Penzig's *Flora Popolare Italiana*.

Accepted Name (POWO)	Family	Local Name(s)	Part(s) Used	Recorded Uses
<i>Silene vulgaris</i> (Moench) Garcke	Caryophyllaceae	<i>Sciopéti</i> , <i>Carléti</i> , <i>Strigoli</i>	Leaves; flowers	Omelette; <i>Risotto coi carléti</i> ; ravioli filling; flowers battered, fried, and sugared
<i>Humulus lupulus</i> L.	Cannabaceae	<i>Bruscàndoli</i>	Young shoots; female cones	Omelette (<i>Fortaia coi bruscàndoli</i>); risotto; savoury pies; cones for beer, liqueur, and grappa; cones as a sleep aid

Table 2. Cont.

Accepted Name (POWO)	Family	Local Name(s)	Part(s) Used	Recorded Uses
<i>Picris hieracioides</i> L.	Asteraceae	<i>Aspràsene, Radicio pelošo</i>	Basal rosettes; flowers	Boiled and mixed with bitter greens to sweeten; with eggs; soups; savoury pies; flower syrup for sore throat.
<i>Cichorium intybus</i> L.	Asteraceae	<i>Cicoria selvatica, Radicio mato, Pissacàn, Castracàn, Grumolo</i>	Leaves; roots	Raw in salads; boiled; roots dried, roasted, and ground as coffee substitute; roots in infusion.
<i>Papaver rhoeas</i> L.	Papaveraceae	<i>Rosole, Peverazze, Papàver, Prévere</i>	Pre-flowering rosettes; seeds; petals	Boiled and pan-fried; ravioli and savoury pie filling; <i>Lasagne di rosole</i> ; seeds in bread and cakes; petal syrup.
<i>Plantago lanceolata</i> L.	Plantaginaceae	<i>Orece de liévero</i>	Leaves; roots	Pesto with almonds, garlic, and oil; natural colouring for fresh pasta; dried roots as substitute for dried mushrooms
<i>Urtica dioica</i> L.	Urticaceae	<i>Ortiga</i>	Young shoots; roots	Omelette; pasta; risotto; roots in hair preparations
<i>Taraxacum officinale</i> F.H.Wigg. agg.	Asteraceae	<i>Pisacàn, Dente de leon</i>	Leaves; flowers	Salads; cooked greens
<i>Matricaria chamomilla</i> L.	Asteraceae	<i>Camamila</i>	Flower heads	Infusion
<i>Robinia pseudoacacia</i> L.	Fabaceae	<i>Acacia, Gaggia</i>	Inflorescences	Battered, fried, and sugared as a seasonal sweet
<i>Wisteria sinensis</i> (Sims) Sweet	Fabaceae	<i>Glicine</i>	Inflorescences	Battered and fried, served salted or sugared (ornamental, gathered semi-wild)
<i>Rosa</i> spp.	Rosaceae	<i>Rose</i>	Petals	Battered, fried, and sugared
<i>Lemna minor</i> L.	Araceae	<i>Paverina</i>	Whole plant	Famine food, gathered from ditches and retting pits; no longer used
<i>Avena fatua</i> L.	Poaceae	<i>Avena selvatica</i>	Spikelets	Not eaten; used in the children's game gallo, gallina, o pulcino

Silene vulgaris, known as *Sciopéti* or *Carléti*, is gathered in cultivated fields and along canals in spring and early summer. The leaves, which informants describe as tasting of fresh peas, go into omelettes, into the *Risotto coi carléti*, and into ravioli filling; the white flowers are battered, fried, and sugared as a children's sweet. *Humulus lupulus*, *Bruscàndoli*, is gathered as young shoots from hedgerows and ditch banks in spring, eaten in omelettes, risotti, and savoury pies, and embedded in local idiom and calendar custom, notably the *Fortaia coi bruscàndoli* of the 25 April campsite gatherings. *Picris hieracioides*, *Radicio pelošo*, is taken as basal rosettes in spring; rough and stinging when fresh, tender and sweet once boiled, it was used specifically to temper the bitterness of mixed wild green dishes, and also in soups, egg dishes, and savoury pies. *Cichorium intybus* goes under several names: *Cicoria selvatica*, *Radicio mato*, *Pissacàn*, *Castracàn*, and, in its late-autumn rosette form, *Grumolo*: leaves raw in salads, bitterness varying with the season of gathering, roots dried, roasted, ground, and brewed as a coffee substitute. *Papaver rhoeas*, *Rosole*, is cut as pre-flowering rosettes with a knife, deliberately leaving the root so the plant returns next

year, then boiled and pan-fried as *Peverazze*, or used to fill ravioli and savoury pies, or layered in *Lasagne di rosole*; the petals yield a cough syrup.

Eight further taxa were recorded qualitatively. *Plantago lanceolata*, *Orece de liévero*, grows beside the vines; the leaves make a pesto with almonds, garlic, and oil, or colour fresh pasta, and the dried roots once substituted for dried mushrooms. *Urtica dioica* goes into omelettes, pasta, and risotto, despite being dismissed locally as goose fodder. *Taraxacum officinale* agg. and *Matricaria chamomilla* are still universally recognised but seldom gathered. The flowers of *Robinia pseudoacacia* and of the ornamental *Wisteria sinensis*, and the petals of *Rosa* spp., are battered and fried as seasonal sweets. *Lemna minor*, *Paverina*, is remembered only as a famine food and is gathered no longer. The domestic medicinal attributions recorded for *Papaver rhoeas*, *Picris hieracioides*, *Plantago lanceolata*, and *Urtica dioica* track closely those documented for the same taxa across Italy [39], which tells us the Trevigiano repertoire is a local dialect of a national pharmacopoeia rather than an isolate, and, therefore, that what has been lost here is not idiosyncratic.

The cohort comparison (Table 3, Figure 2a) is not a uniform decline. It is a system in which one component, knowledge, has held up considerably better than the other, practice, and in which the taxa that kept both share a specific property.

Table 3. Knowledge, past consumption, and current use of the five focal taxa in the Trevigiano, by sex and birth cohort. Values are reported as recorded in the field protocol; n.r. = not recorded for that group. Because group denominators are small and unevenly distributed, cohort-level readings are the basis for interpretation (see Section 2.4).

Taxon (Local Name)	Group	Knows (%)	Has Eaten (%)	Uses Now (%)	Preference Vote (Whole Sample)
<i>Silene vulgaris</i> (sciopéti)	Men, pre-1970 (n = 5)	80	n.r.	n.r.	12%
	Women, post-1970 (n = 14)	86 (12/14)	64 (9/14)	29 (4/14)	
	Men, post-1970 (n = 3)	0	0	0	
<i>Humulus lupulus</i> (bruscàndoli)	Men, pre-1970 (n = 5)	100	100	100	64%
	Three of four sex-by-cohort groups	100	n.r.	n.r.	
	Remaining group (women)	86	n.r.	n.r.	
<i>Picris hieracioides</i> (radicio pelošo)	Women, pre-1970 (n = 12)	75	n.r.	highest of all groups, but low	0%
	Men, pre-1970 (n = 5)	20	n.r.	n.r.	
<i>Cichorium intybus</i> (cicoria selvatica)	Men, pre-1970 (n = 5)	100	n.r.	40 (2/5)	18%
	Women, pre-1970 (n = 12)	83	n.r.	c. 0	
<i>Papaver rhoeas</i> (rosole)	Men, pre-1970 (n = 5)	100	100	100	6%
	Women, pre-1970 (n = 12)	92	n.r.	67	
	Women, post-1970 (n = 14)	86 (12/14)	n.r.	0	
	Men, post-1970 (n = 3)	n.r.	n.r.	0	

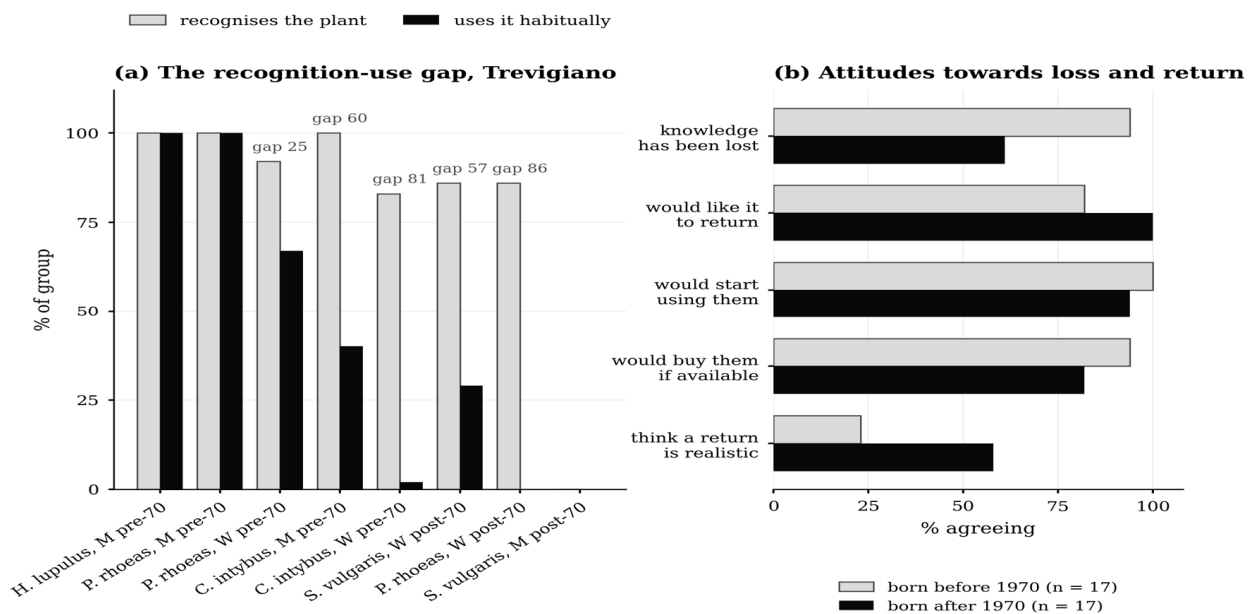


Figure 2. (a) Recognition of the plant versus habitual culinary use, by taxon and by sex-and-cohort group, for the Trevigiano groups in which both values were recorded; the gap between the two bars is the signature of knowledge retained without practice. No man born after 1970 recognised *Silene vulgaris*, hence the absent bars. (b) Attitudes towards the loss and possible return of gathering, by birth cohort.

Humulus lupulus is the only full persistence. Three of the four sex-by-cohort groups recognised it universally, and, among men born before 1970, recognition, past consumption, and current habitual use all stood at 100%. Sixty-four per cent of the whole sample named it their favourite wild green. It is also the only taxon here anchored simultaneously in a calendar ritual (the 25 April *Fortaia*), in a dialectal saying still in circulation, and in a commercial product, since local craft breweries use wild-gathered hop inflorescences.

At the other pole, *Picris hieracioides* is close to gone on both counts: recognition peaked among women born before 1970 at 75%. It fell to 20% among men of the same cohort, no group reported substantial current use, and it received no preference votes at all. Its role in the repertoire had been narrowly functional, to sweeten mixed bitter greens. When the composite dishes stopped being made, the function became unintelligible, and the plant went with it.

Between the poles sits the configuration that matters most for our question: high recognition, and near-zero use. *Papaver rhoeas* was recognised by 12 of 14 women born after 1970 (86%). Nevertheless, nobody in that cohort, of either sex, uses it habitually, against 100% current use among men and 67% among women born before 1970, a gap of 86 percentage points across a single generational boundary (Table 3, Figure 2a). *Cichorium intybus* was recognised by 83% of women born before 1970 and used habitually by essentially none of them, while men of the same cohort combined universal recognition with 40% use. These plants survive in memory and have dropped out of practice.

Silene vulgaris shows a different pattern. The pattern observed for *Silene vulgaris* differs from those described above. Recognition peaked not in the older cohort but among women born after 1970 (86%, 12/14), of whom 64% had eaten it and 29% still use it; no man born after 1970 recognised the taxon. The gradient is not monotonic, then, and what residual practice remains in the younger cohort rests almost entirely with women. A single sex within a single cohort is a narrow base on which to carry a tradition.

Attitudinal responses (Table 4, Figure 2b) confirm that informants perceive these changes in knowledge and practice as a loss and reveal a marked gap between their desired

and expected outcomes. It was found that 94% of the older cohort and 61% of the younger agreed that the knowledge and use of these greens have been lost. All younger informants and 82% of older ones wanted the practice back; 33 of 34 said they would start using the plants in everyday cooking; 94% and 82%, respectively, would buy them if supermarkets stocked them. And, yet, only 23% of the older cohort and 58% of the younger thought a return to common use realistic. One elderly man dissented outright, and his dissent is worth quoting because it names what the aggregate figures cannot: “I hope these traditions do not come back. I remember the years when my sister and your grandmother went gathering herbs along the canals and in the fields. Those were years of poverty. Of course I am glad when your grandmother serves me a plate of rice with bruscandoli now and then, but I would not want it to go back to how it was, because that would mean going backwards instead of improving our quality of life” (G.G., male, 80). The younger informants divide along the same fault line: “We are too used to the kinds of food we know, and most young people would not be willing to put new products into their diet” (I.Z., female, 28); against “I think that if you found them in the supermarket people would buy them, because the younger generations do love things healthy and natural” (A.M., female, 46). The willingness is there. What informants doubt is that there is a route back.

Table 4. Attitudes towards the loss and possible return of wild green gathering in the Trevigiano (n = 34).

Statement	Born Before 1970 (n = 17)	Born After 1970 (n = 17)
Knowledge and use of these wild greens have been lost	94% agree	61% agree
I would like their use to return to everyday life	82% yes (3 indifferent)	100% yes
I would start using them in my everyday cooking	100% yes	94% yes (1 no)
I would buy them if they were sold in supermarkets	94% yes	82% yes
I think it is realistic that they will return to common use	23% yes	58% yes

3.3. Wild Food Plants of the Non-Peri-Urban Langhe

Forty-three wild vascular folk taxa were recorded in the Langhe across the two interview sets, together with three fungal taxa reported separately (Table 5). The elder subset (n = 10, aged 68–91) gave a compact and remarkably consistent repertoire of ten taxa, dominated by *Humulus lupulus*, locally *Livertin* (9/10 citations), *Borago officinalis* (8/10), *Urtica dioica* (7/10), and *Taraxacum officinale* agg. (6/10), followed by *Primula veris* and *P. vulgaris* (4/10), *Cichorium intybus* (4/10), *Lactuca serriola* (2/10), *Sanguisorba minor* (2/10), *Portulaca oleracea* (2/10) and *Equisetum arvense* (2/10). Of these, only *Cichorium intybus* was reported by the elders alone and by nobody in the younger diachronic set, and it is marked accordingly in Table 5.

Table 5. Wild and semi-wild folk taxa recorded in the Langhe (Piedmont, Italy). Citation frequencies refer exclusively to the two Langhe subsets in which systematic taxon-level elicitation was conducted (n = 20: elderly ethnobotanical subset, n = 10; independent diachronic gathering subset, n = 10). The other 20 Langhe participants contributed contextual qualitative data and are not included in citation frequencies. Cit. tot = total citations across both Langhe interview sets (n = 20 informants); Eld. = of which citations from informants aged over 68 (elder subset, n = 10); - = none. * = taxon cited by elderly informants only. † = folk name whose attribution to this taxon remains uncertain; ‡ = nomenclatural or identification correction applied to the original field record (both flags are explained in Section 2.3).

Accepted Name (POWO)	Family	Local Name(s)	Part(s) Used	Recorded Uses	Cit. Tot	Eld.
<i>Alkekengi officinarum</i> Moench	Solanaceae	<i>Archikengi</i>	Berry	Raw; jam	3	-
<i>Allium ursinum</i> L.	Amaryllidaceae	<i>Agljo orsino</i>	Leaves	Pesto	3	-
<i>Arctium lappa</i> L.	Asteraceae	<i>Bardana</i>	Root	Raw	1	-
<i>Asparagus</i> L. sp. †	Asparagaceae	<i>Asparago selvatico</i> , <i>Asparagina</i>	Spears, stems	Boiled; raw	6	-
<i>Blitum bonus-henricus</i> (L.) Rchb. ‡	Amaranthaceae	<i>Farinello</i> , <i>Farinaccio</i>	Leaves, stems, inflorescence	Boiled	3	-
<i>Borago officinalis</i> L.	Boraginaceae	<i>Borragine</i> , <i>Burase</i>	Leaves	Salad; pan-fried; boiled; ravioli al plin filling	14	8
<i>Capparis spinosa</i> L.	Capparaceae	<i>Cappero</i> , <i>Tàpari</i>	Flower buds, fruits	Salted; pickled	2	-
<i>Capsella bursa-pastoris</i> (L.) Medik. †	Brassicaceae	(recorded as <i>rosetta basale</i>)	Stem, rosette	Raw; soup	5	-
<i>Cichorium intybus</i> L. *	Asteraceae	<i>Cicoria selvatica</i>	Leaves; roots	Raw in salad; roots dried, crushed, and brewed as coffee substitute	4	4
<i>Corylus avellana</i> L.	Betulaceae	<i>Nocciola selvatica</i> , <i>Nisurin</i>	Fruits	Dried	1	-
<i>Crataegus monogyna</i> Jacq.	Rosaceae	<i>Biancospino</i>	Flowers, leaves	Dried for infusion	2	-
<i>Equisetum arvense</i> L.	Equisetaceae	<i>Equiseto</i> , <i>Coa d'caval</i>	Sterile stems	Dried for infusion	4	2
<i>Fumaria officinalis</i> L. †	Papaveraceae	<i>Fumaria</i>	Leaves	Soups; infusion for menstrual pain	1	-
<i>Humulus lupulus</i> L.	Cannabaceae	<i>Luppolo</i> , <i>Livertin</i> , <i>Lüvertin</i>	Young shoots; female cones	Boiled; with eggs (omelette or scrambled); savoury pies; ravioli filling; cones in beer	12	9
<i>Hypochaeris glabra</i> L.	Asteraceae	<i>Costola liscia</i>	Leaves	Salad; pan-fried	2	-
<i>Lactuca serriola</i> L.	Asteraceae	<i>Lattuga selvatica</i>	Leaves	Salad	7	2
<i>Lapsana communis</i> L.	Asteraceae	<i>Lassana</i>	Leaves	Salad; soup	1	-
<i>Malva sylvestris</i> L.	Malvaceae	<i>Malva</i>	Leaves	Salad; soup; pan-fried; decoction	4	-
<i>Matricaria chamomilla</i> L.	Asteraceae	<i>Camomilla</i>	Flower heads	Dried for infusion	8	-
<i>Melissa officinalis</i> L.	Lamiaceae	<i>Melissa</i>	Leaves	Dried; salads; cakes; omelettes; flavouring in craft beer	10	-
<i>Microthlaspi perfoliatum</i> (L.) F.K.Mey.	Brassicaceae	<i>Erba storna</i>	Seeds	Condiment	1	-

Table 5. Cont.

Accepted Name (POWO)	Family	Local Name(s)	Part(s) Used	Recorded Uses	Cit. Tot	Eld.
<i>Papaver rhoeas</i> L.	Papaveraceae	<i>Papavero, Pasadona, Rosoline</i>	Pre-flowering rosettes, stems	Boiled; pies; salads; filling for crescione	11	-
<i>Parietaria judaica</i> L. †	Urticaceae	<i>Parietaria</i>	Leaves	Soups	4	-
<i>Plantago lanceolata</i> L.	Plantaginaceae	<i>Piantaggine</i>	Leaves	Salad; pan-fried; boiled	2	-
<i>Portulaca oleracea</i> L.	Portulacaceae	<i>Porcellana, Portulaca</i>	Leaves, stems, seeds	Raw; boiled; pesto	6	2
<i>Primula veris</i> L./ <i>P. vulgaris</i> Huds.	Primulaceae	<i>Primule</i>	Flowers	Salad; sweet omelette	9	4
<i>Prunus spinosa</i> L.	Rosaceae	<i>Prugnolo, Galliture</i>	Fruits	Raw; jam; liqueur (Brignolino)	3	-
<i>Pulmonaria officinalis</i> L.	Boraginaceae	<i>Polmonaria</i>	Leaves	Dried and salted for winter; respiratory infusion	6	-
<i>Reichardia picroides</i> (L.) Roth/ <i>Scorzonera</i> L. sp. †	Asteraceae	<i>Scarza, Scarzo</i>	Root; rosette	Raw in mixed salads; boiled; pesto	2	-
<i>Robinia pseudoacacia</i> L. ‡	Fabaceae	<i>Gaggia</i>	Inflorescences	Battered and deep-fried	3	-
<i>Rosa canina</i> L.	Rosaceae	<i>Rosa canina, Canina</i>	Hips; flowers	Raw after frost; jam	8	-
<i>Rubus ulmifolius</i> Schott/ <i>R. fruticosus</i> agg.	Rosaceae	<i>Mora</i>	Fruits	Fresh; jam	1	-
<i>Salix alba</i> L. †	Salicaceae	<i>Salice</i>	Bark	Salicylate infusion; biodynamic field preparation	1	-
<i>Sambucus nigra</i> L.	Adoxaceae	<i>Sambuco</i>	Inflorescences	Battered and fried; syrup	4	-
<i>Sanguisorba minor</i> Scop.	Rosaceae	<i>Pimpinella</i>	Leaves	Salad; with cooked vegetables	4	2
<i>Tanacetum balsamita</i> L.	Asteraceae	<i>Erba di san Pietro, Erba d'san Pè</i>	Leaves	Salad; omelette	5	-
<i>Tanacetum vulgare</i> L. †	Asteraceae	<i>Archibus</i>	Leaves	Digestive liqueur (arquebuse type)	2	-
<i>Taraxacum officinale</i> F.H.Wigg. agg.	Asteraceae	<i>Tarassaco, Lancianchume, Lanciancione</i>	Leaves, root, flowers, buds	Salad; omelette; root raw or boiled; minestrone; torta pasqualina; buds salted as capers; flower syrup for cough	15	6
<i>Tussilago farfara</i> L.	Asteraceae	<i>Tossilago</i>	Leaves, flowers	Dried; infusion with milk and honey for cough	4	-
<i>Urtica dioica</i> L.	Urticaceae	<i>Ortica</i>	Young leaves	Boiled; raw pesto; ravioli al plin filling	15	7
<i>Valerianella locusta</i> (L.) Laterr.	Caprifoliaceae	<i>Valerianella, Sarset</i>	Leaves	Salad	2	-
<i>Veronica anagallis-aquatica</i> L.	Plantaginaceae	<i>Veroniche</i>	Leaves	Salad	1	-
<i>Viola odorata</i> L. and allied spp.	Violaceae	<i>Viole</i>	Flowers	Salad; omelette	7	-

Table 5. Cont.

Accepted Name (POWO)	Family	Local Name(s)	Part(s) Used	Recorded Uses	Cit. Tot	Eld.
Cultivated taxa gathered semi-wild (excluded from counts)						
<i>Beta vulgaris</i> L.	Amaranthaceae	<i>Coste, Erbette</i>	Leaves	Boiled	5	-
<i>Tropaeolum majus</i> L.	Tropaeolaceae	<i>Nasturzio</i>	Leaves, flowers	Salad	4	-
Fungi (reported separately, excluded from vascular counts)						
<i>Boletus edulis</i> Bull.	Boletaceae	<i>Porcini</i>	Basidiome	Raw; pan-fried	6	-
<i>Macrolepiota procera</i> (Scop.) Singer	Agaricaceae	<i>Mazza di tamburo</i>	Basidiome	Fried	7	-
<i>Cantharellus cibarius</i> Fr. †	Cantharellaceae	<i>Galliture</i>	Basidiome	Preserved in oil; in ragù	3	-

The cultural centrality of *Livertin* in the Langhe matches that of *Bruscàndoli* in the Trevigiano, and the two are the same species. Every elder who mentioned it linked it to eggs, in omelettes or scrambled, and several traced the dish back through their mothers and grandmothers. *Borago officinalis* and *Urtica dioica* form the *Ripieno* pair that fills the *Ravioli al plin*, the emblematic pasta of the district. *Primula* flowers are remembered in sweet omelettes; *Taraxacum*, *Sanguisorba minor*, and *Cichorium intybus* in salads; chicory roots dried, crushed, and brewed as coffee during and after the Second World War; *Equisetum arvense* dried for infusions and associated by informants with the damper meanders of the Tanaro; and *Portulaca oleracea* tasting of spinach, growing everywhere, eaten raw or pan-fried. The pairing of shoots with eggs recurs almost verbatim across informants: “*Livertin is eaten with eggs, it makes little difference whether as an omelette or scrambled; my mother used pimpinella in salad or with cooked vegetables*” (S.F., male, 75, Farigliano). The wartime coffee substitute is remembered with the same precision by the oldest informant in the study: “*In my family, during the war years and afterwards too, chicory roots were dried and then crushed and used in place of coffee*” (A.A., male, 91, Dogliani).

The diachronic subset (n = 10) produced a broader, explicitly specialist-weighted repertoire of 42 wild vascular taxa, reflecting the inclusion of younger active gatherers, including a naturopath, a farmer, and a producer of plant-based ointments. Most frequently cited were *Papaver rhoeas* (11 citations across two folk names), *Melissa officinalis* (10), *Taraxacum officinale* agg. (9), *Matricaria chamomilla* (8), *Rosa canina* (8), *Urtica dioica* (8), *Viola odorata* and allies (7), then *Asparagus* sp. (6), *Borago officinalis* (6), and *Pulmonaria officinalis* (6). Uses run well past the kitchen, with dried *Pulmonaria* and *Tussilago farfara* for respiratory infusions, *Fumaria* for menstrual pain, *Crataegus monogyna* and *Melissa officinalis* as calmatives, *Tanacetum vulgare* in a bitter liqueur, and *Salix alba* bark as a salicylate source and, on one biodynamic holding, as the basis of a field preparation. Several of these taxa, *Melissa officinalis*, *Tanacetum balsamita*, and *Sanguisorba minor* among them, belong to the group used nationally as herbs and aromatics rather than as bulk greens [40]; that whole category is absent from the Trevigiano record.

The relationship between the two Langhe subsets is the key result here, and it inverts the age gradient one would expect. The elder repertoire is narrow, food-centred, household-scale, and reported almost entirely in the past tense. The younger specialist repertoire is broad, medicinally inflected, professionally oriented, and reported in the present. The reason elders gave for stopping was not that the plants had gone. All four informants over

55 in the diachronic subset said they had stopped because they no longer trusted the ground near vineyards, hazelnut orchards, and easily reached margins, given how intensively it is treated, and had switched to market produce instead. Their knowledge is intact. A risk judgement ended their practice. Two statements show how tightly the judgement is bound to specific ground rather than to the plants themselves: *“With primrose flowers you can make excellent sweet omelettes; nowadays you have to be careful not to gather them along the busy roads, so that they are not dirty. . . with nettles and borage you can make the filling for the plin”* (M.R., female, 87, Dogliani); and *“In spring you make a really good primrose omelette; it used to be easier to find these plants, now there are fewer and fewer places to go”* (T.E., male, 78, Monforte d’Alba). Neither informant says the species has gone. Both say the usable ground has.

Younger gatherers met the same chemical landscape by moving rather than stopping. They located and now use refuge areas abandoned by agricultural work, typically along secondary watercourses where the slope is too steep for machinery and agricultural interest is nil, and reported gathering there without worrying about uptake. That is adaptation in the strict sense: function retained, spatial and social configuration changed. Several of the same people had also turned gathering from a household activity into a professional or semi-professional one, teaching it, selling gathered material, or working it into naturopathic and cosmetic products, which is transformation rather than adaptation.

The land-use and tourism sets corroborate this from other angles. Truffle hunters and traders reported declining yields, attributed to the summer drought and to the abandonment of woodland maintenance, along with the unregulated felling of truffle-bearing trees, chiefly poplar, oak, willow, lime, and hazel, in marginal ground next to vineyards. *“When I went for truffles as a young man the woods were far better kept; now even the dogs struggle to get through, there is nobody left who maintains the woods”* (P.B., male, 62, Dogliani). *“In recent years it is harder and harder to find truffles in quantity; it rains less and less, or too much at the wrong moment. Sometimes the ground is so dry the dogs cannot dig”* (G.C., male, 52, Dogliani). The expansion of the second monoculture was reported with equal matter-of-factness: *“Everyone talks about vineyards, but in recent years a great many hazelnut groves have been planted; a lot of them have still to come into production, and when they do, hazelnut prices will certainly fall”* (M.C., male, 71, Dogliani). A fisherman in Bra described the near-disappearance of the oxbow lakes he used, as flow regimes grew more erratic: *“I used to go fishing often in the lanche, but now, with the constant floods, those narrow stretches of water have almost disappeared and it has become very hard to find a place to fish the way I like”* (S.C., male, 82, Bra). A biodynamic winegrower in Serralunga d’Alba described the deliberate reversal of simplification on his own land: hedgerows between rows, fruit trees introduced, some vines grubbed up for medicinal herbs, ancient cereals, and maize, and woodland retained and opened by a four-kilometre path—that is, in effect, a privately funded reconstruction of the habitat conditions gathering depends on. An informant who had migrated from Apulia to the Turin area reported a long-term contraction of gatherable land through cementification, sharper competition for fungi, and the loss of the interstitial spaces between the wood and field where most of the gathering had happened, noting that the woodland area had increased over fifty years while the gatherable interstitial habitat had decreased. Patrimonialisation itself divides opinion in ways that matter for governance: *“At last an area that has been producing value for a long time is recognised on paper, and this way it will also be protected over time”* (F.B., female, 47, Monforte d’Alba), against *“They did not need to come and tell us that we have such an important heritage in our hands; we have always managed on our own, we knew it already”* (G.F., male, 77, Monforte d’Alba). The second statement is a familiar objection in heritage policy, and it has a practical edge here: designation has protected the appearance of the landscape without protecting the marginal habitats that gathering depends on.

The historical sources document the habitat side independently of recall. Vignolo-Lutati already described, in 1929, a marked contraction of woodlands in favour of vineyards in the lower Langhe in front of Alba, and observed explicitly that the resulting conditions, suitable in themselves for certain spontaneous flora, acted so extensively across the surface as to modify the landscape unfavourably and to lead to the rarefaction and disappearance of many species. For the taxa we could trace, the contraction is legible. *Arctium lappa*, which Vignolo-Lutati reported along roads and in waste ground at Barbaresco, Alba, and Costigliole, and, more frequently, on the left bank of the Tanaro, appears in Abbà's Piedmontese collections without comparable local specificity. *Veronica anagallis-aquatica*, which he described as frequent in damp places at Alba along the Tanaro and the Cherasca, between Castiglione and Monforte, at Serralunga, and between Murazzano and Bossolasco, is documented by Abbà only from a few groups in the Novara plain. Present-day gatherers still cite both, but from a much narrower set of sites than the historical record describes. Knowledge of these plants has outlasted the breadth of their accessible habitat.

3.4. Cross-Site Comparison of Repertoires

The two documented repertoires overlap far less than their proximity and shared intensification would suggest. Of 13 wild vascular food taxa in the Trevigiano and 43 in the Langhe, 9 are shared: *Humulus lupulus*, *Urtica dioica*, *Taraxacum officinale* agg., *Cichorium intybus*, *Papaver rhoeas*, *Plantago lanceolata*, *Matricaria chamomilla*, *Robinia pseudoacacia*, and *Rosa* spp. The raw Jaccard similarity between the two documented taxon lists is 0.19 (9/47). Because the two field datasets were generated through different elicitation and sampling designs, this value is used here strictly as a descriptive measure of repertoire overlap, rather than as a standardized estimate of population-level ethnobotanical similarity. *Silene vulgaris*, the emblem of the Venetian repertoire, appears in the Langhe material exactly once, and, revealingly, as an ingredient on a restaurant menu, reported by a customer rather than a gatherer.

The shared core is precisely what the European comparative work identifies as the pan-Italian and pan-European constant [10,41,42]: hedgerow climbers, nitrophilous ruderals, and Asteraceae rosettes of disturbed ground plausibly account for much of the observed overlap. Beyond this shared core, the two documented repertoires differ markedly in their habitat associations. The Trevigiano repertoire is a lowland one associated primarily with canals, ditch banks, arable margins, and irrigation networks, and it includes an aquatic famine plant, *Lemna minor*, with no hill counterpart. The Langhe repertoire, by contrast, includes taxa associated with woodland edges, dry slopes, hedgerows, meadows, stream banks, and ruderal habitats, including *Prunus spinosa*, *Rosa canina*, *Crataegus monogyna*, *Sambucus nigra*, and *Corylus avellana*. This contrast should not be interpreted as a standardized difference in community-level repertoire richness, because the Langhe sampling deliberately included highly knowledgeable and specialist gatherers. It does, however, show that the taxa documented in the two datasets are distributed across different ranges of habitat associations.

For the resilience analysis, we therefore do not infer ecological resilience directly from the numerical difference of 13 versus 43 taxa or from the Jaccard coefficient. Rather, repertoire composition is interpreted together with independent evidence on habitat accessibility, continuity of practice, intergenerational transmission, and the spatial relocation of gathering described in the following sections. In this sense, the Trevigiano dataset documents a repertoire concentrated largely among disturbance- and edge-associated taxa, whereas the Langhe material documents a broader range of habitat-associated taxa and knowledge carriers. This compositional difference is treated as one component of the comparative social-ecological pattern, not as a quantitative measure of "response diversity."

3.5. Comparative Resilience Profile

Table 6 sets the two cases against the persistence–adaptability–transformability triad and is the synthesis on which the rest of this paper rests. Three differences carry the argument.

Table 6. Comparative resilience profile of wild food plant knowledge in the two study areas, coded against the persistence–adaptability–transformability triad of social-ecological resilience. The classification is interpretive, derived from the thematic coding described in Section 2.4, and is not a quantitative metric. Cross-site differences in documented repertoire size are descriptive because sampling and elicitation protocols differed between the two study areas.

Dimension	Trevigiano (Peri-Urban)	Langhe (Non-Peri-Urban)
Dominant resilience mode	Memory-based: knowledge retained, practice largely discontinued	Adaptive and partly transformative: knowledge and practice both retained, spatially and socially redistributed
Shape of discontinuity	Generational and abrupt; located in households of the post-1970 cohort, deepening after 2010	Spatial; knowledge persists in both age classes, practice withdrawn from distrusted ground and relocated
Persistence	Strongest documented persistence in <i>Humulus lupulus</i> , with recognition, consumption, and habitual use maintained across the focal cohort comparison	<i>Humulus lupulus</i> , <i>Borago officinalis</i> , <i>Urtica dioica</i> , <i>Taraxacum</i> agg. cited by the large majority of elders
Adaptability	No comparable spatial relocation of gathering was documented; accessible unmanaged gathering sites were reported as increasingly limited	Spatial relocation documented: younger gatherers re-map gathering onto unmanaged refugia, particularly along secondary watercourses and other agriculturally marginal sites
Transformability	Product-level only: craft beer from wild hop cones, cultivated grumolo chicory, commercial poppy seed	Practice-level transformation: professional and semi-professional uses (naturopathy, plant-based products, and teaching), restaurants, guided foraging walks, and tourism; household food-security dependence was not quantified.
Transmission channel	Vertical (household) only, and interrupted	Vertical narrowed; horizontal channel opened via gastronomy, tourism and peer networks.
Carriers of knowledge	Households; residual practice concentrated in one sex within one cohort	Elders, younger gatherers, professionals, chefs, guides, and tourism operators
Documented repertoire and habitat associations	13; almost exclusively disturbance-tolerant generalists	43; generalists plus woodland, shrub, meadow and riparian specialists
Reported constraints on gathering	Loss and intensive management of edge habitats, municipal mowing and canal-bank clearance, together with limited accessible unmanaged land	Perceived agrochemical risk and loss of trust in accessible gathering ground; additional reported pressures include woodland-management change, drought, and loss of wetland/interstitial habitats
Age-related risk judgement and behavioural response	No comparable age-specific spatial relocation was documented. Younger cohorts showed markedly reduced practice despite substantial residual recognition, while accessible unmanaged gathering sites were reported as increasingly scarce.	All four informants aged >55 in the diachronic subset reported withdrawing from gathering because they no longer trusted readily accessible ground near intensively managed vineyards and hazelnut orchards. Younger active gatherers instead relocated gathering to unmanaged or agriculturally marginal refugia, particularly along secondary watercourses and steep areas, which they perceived as more suitable gathering sites.
Contemporary demand and engagement	Strong latent demand: 94% and 82% of the two cohorts would buy these greens if available, while only 23% and 58%, respectively, considered a return to common use realistic	Active contemporary engagement documented through paid participation in foraging walks, restaurant demand, professional uses and first encounters with wild foods outside household transmission

First, we have the shape of the discontinuity. In Trevigiano, it is generational and abrupt; informants describe not a gradual descent but a clean cut, and place it in the households of those born after 1970, deepening again in the generation born after 2010. In the Langhe, it is spatial; knowledge persists in both age classes, but the older class has withdrawn from ground it distrusts while the younger has relocated the practice.

Second, we have the compensating mechanisms. In Trevigiano, the only compensations we recorded are commodity-mediated and operate on the product rather than the practice: craft breweries using wild-gathered hop cones, cultivated *Grumolo* chicory sold in local markets, and commercial *Papaver rhoeas* seed for garden sowing, of which informants remarked that the resulting plants taste different and less good. In the Langhe, compensation operates on the practice itself, through relocation to refugia, restaurants specialising in wild greens, guided walks such as the *Livertin Experience* promoted within the *Biodiversità Stellata* partnership led by the municipality of Alba, and informal expert-led excursions run by individual practitioners. Several Langhe informants met wild greens for the first time in one of those settings rather than in the family, which means a horizontal transmission channel has opened where the vertical one narrowed [23,24].

Third, we have the breadth of the residual base. In Trevigiano, continued practice rests on one fully persistent taxon and a thin, sex-restricted residue in a second, with the rest retained only as recognition. In the Langhe, it rests on a broad repertoire spread across several categories of actor: elders who know without practising, younger gatherers working relocated sites, professional users, chefs, guides, and tourism operators. A system with several partly independent carriers of the same knowledge is, by construction, less exposed to the failure of any one of them (Table 7).

Table 7. Selected verbatim statements from informants, grouped by theme. T = Trevigiano, L = Langhe. Statements were recorded in Italian or in local dialect and translated by the authors; ellipses mark omitted material; no other alteration was made.

Theme	Informant	Original Statement (Italian/Local Dialect)	English Translation
Habitat: loss of gatherable ground	T.E., M, 78, Monforte d’Alba (L)	<i>“In primavera si fa una buonissima frittata di primule, una volta era più facile trovare queste piante, ora ci sono sempre meno posti in cui andare”</i>	<i>In spring you make a really good primrose omelette; it used to be easier to find these plants, now there are fewer and fewer places to go.</i>
	P.B., M, 62, Dogliani (L)	<i>“Quando da giovane andavo per i tartufi, i boschi erano tenuti molto meglio; ora fanno fatica a passare pure i cani; non c’è più nessuno che mantenga i boschi.”</i>	<i>When I went for truffles as a young man, the woods were far better kept; now even the dogs struggle to get through, there is nobody left who maintains the woods.</i>
	S.C., M, 82, Bra (L)	<i>“Una volta andavo spesso a pescare nelle lagune, ma adesso con le continue esondazioni queste sottili aree sono quasi scomparse ed è diventato molto difficile trovare una zona in cui pescare come piace a me”</i>	<i>I used to go fishing often in the lanche, but now, with the constant floods, those narrow stretches of water have almost disappeared, and it has become very hard to find a place to fish the way I like</i>
Trust: agrochemical and traffic contamination	M.R., F, 87, Dogliani (L)	<i>“Con i fiori delle primule si possono fare ottime frittate dolci, adesso bisogna fare attenzione a non raccogliercle lungo le strade trafficate perché non siano sporche. . . con le ortiche e la borragine si può preparare il ripieno dei plin”</i>	<i>With primrose flowers you can make excellent sweet omelettes; nowadays you have to be careful not to gather them along the busy roads, so that they are not dirty. . . with nettles and borage you can make the filling for the plin</i>

Table 7. Cont.

Theme	Informant	Original Statement (Italian/Local Dialect)	English Translation
Intensification: the second monoculture	M.C., M, 71, Dogliani (L)	<i>“Si parla tanto di vigne, ma negli ultimi anni sono stati piantati molti nocciuoli, parecchi devono ancora entrare in produzione e quando lo faranno, i prezzi delle nocciole scenderanno sicuramente.”</i>	<i>Everyone talks about vineyards, but in recent years a great many hazelnut groves have been planted; a lot of them have still to come into production, and when they do, hazelnut prices will certainly fall.</i>
	G.C., M, 52, Dogliani (L)	<i>“Negli ultimi anni è sempre più difficile trovare grandi quantità di tartufi: piove sempre meno o troppo, nei momenti sbagliati. A volte il terreno è talmente secco che i cani non riescono a scavare.”</i>	<i>In recent years it is harder and harder to find truffles in quantity; it rains less and less, or too much at the wrong moment. Sometimes the ground is so dry the dogs cannot dig.</i>
Transmission: household to household	S.F., M, 75, Farigliano (L)	<i>“I livertin si mangiano con le uova, cambia poco se in frittata o strapazzate, mia madre usava la pimpinella nell’insalata o con le verdure cotte”</i>	<i>Livertin is eaten with eggs; it makes little difference whether as an omelette or scrambled; my mother used pimpinella in salad or with cooked vegetables.</i>
	A.A., M, 91, Dogliani (L)	<i>“Nella mia famiglia, durante gli anni della guerra e anche in seguito, le radici di cicoria venivano fatte essiccare per poi essere frantumate e utilizzate in sostituzione del caffè”</i>	<i>In my family, during the war years and afterwards too, chicory roots were dried and then crushed and used in place of coffee.</i>
Memory of poverty as a barrier to return	G.G., M, 80 (T)	<i>“Spero che queste tradizioni non ritornino; mi ricordo gli anni in cui mia sorella e tua nonna andavano a raccogliere le erbe lungo i canali e nelle campagne. Erano anni di miseria. . . vorrei non tornasse come un tempo perché vorrebbe dire tornare indietro, invece che migliorare la qualità della vita”</i>	<i>I hope these traditions do not come back. I remember the years when my sister and your grandmother went gathering herbs along the canals and in the fields. Those were years of poverty. . . I would not want it to go back to how it was, because that would mean going backwards instead of improving our quality of life.</i>
Latent demand	A.M., F, 46 (T)	<i>“Penso che se si trovassero al supermercato la gente le comprerebbe perché comunque le giovani generazioni amano il sano e naturale”</i>	<i>I think that if you found them in the supermarket, people would buy them, because the younger generations do love healthy and natural things</i>
	I.Z., F, 28 (T)	<i>“Ritengo che siamo troppo abituati alle tipologie di alimenti che conosciamo e la maggior parte dei giovani non sarebbe disposta ad inserire nuovi prodotti all’interno della loro dieta”</i>	<i>We are too used to the kinds of food we know, and most young people would not be willing to put new products into their diet.</i>
Horizontal transmission: tourism and media	G.P., M, 58, Alba (L)	<i>“Nel 2021, appena si è potuto uscire nuovamente dopo il periodo di isolamento obbligatorio, la voglia di uscire e di stare a contatto con la natura era davvero forte. Un mio amico mi ha consigliato questa iniziativa: Livertin Experience. . . e mi sono subito iscritto.”</i>	<i>In 2021, as soon as we could go out again after the compulsory isolation, the urge to be outside and in contact with nature was really strong. A friend recommended this initiative, the Livertin Experience. . . and I signed up straight away.</i>
	L.R., F, 26, Turin (L)	<i>“Mi sono appassionata al mondo del foraging leggendo e guardando video online. . . non pensavo che l’asparago selvatico potesse essere così buono”</i>	<i>I became passionate about the world of foraging by reading and watching videos online. . . I never thought wild asparagus could be so good.</i>

Table 7. Cont.

Theme	Informant	Original Statement (Italian/Local Dialect)	English Translation
Patrimonialisation	F.B., F, 47, Monforte d'Alba (L)	"Finalmente viene valorizzata sulla carta una zona che produce valore già da diverso tempo, in questo modo la zona sarà anche tutelata nel tempo"	At last an area that has been producing value for a long time is recognised on paper, and this way it will also be protected over time.
	G.F., M, 77, Monforte d'Alba (L)	"Non dovevano arrivare loro a dirci che abbiamo tra le mani un patrimonio così importante, abbiamo sempre fatto da soli, lo sapevamo già da prima"	They did not need to come and tell us that we have such an important heritage in our hands; we have always managed on our own, we knew it already.

4. Discussion

4.1. Two Modes of Resilience, Not One Trajectory of Loss

When analysed against the persistence–adaptability–transformability triad, the two study areas do not represent two points on a single trajectory of decline. Rather, they represent two social–ecological systems in which different components of the habitat–knowledge–access complex have persisted or been reconfigured through different compensatory mechanisms.

The peri-urban Trevigiano shows what we would call memory-based resilience. Knowledge held up better than practice, and the distance between the two is the signature of the case: 86% of younger women recognise *Papaver rhoeas* and none of that cohort cooks it; 83% of older women recognise *Cichorium intybus* and essentially none use it. This is a social–ecological memory that has outlived its occasions [13,14]. It has real option value, since it could, in principle, be reactivated, and the attitudinal data show the latent demand is large. But unexercised memory degrades, and our data show where. The second cohort still recognises. Informants report that the generation born after 2010 does not. The mechanism is simply the absence of occasions on which the knowledge gets used.

The rural Langhe shows adaptive and partly transformative resilience. Knowledge and practice both persist, redistributed. Elders keep the knowledge and have stopped practising on a risk judgement; younger gatherers keep both and have moved to refugia; a subset has professionalised; and gastronomic and tourism intermediaries have opened a horizontal channel to people who never received any of it vertically. That is a system reorganising, not failing, and it matches what Gómez-Baggethun and Reyes-García describe as reconfiguration, some domains contracting while others expand under the same pressures [7].

The comparison also clarifies what governs persistence taxon by taxon. In Trevigiano, the one fully persistent taxon, *Humulus lupulus*, is anchored, at once, in a calendar ritual, a dialectal idiom, and a commercial product. The two closest to extinction, *Picris hieracioides* and *Plantago lanceolata*, had purely instrumental uses inside composite dishes and narrowly local folk names. Anchoring outside the household, in ritual, language, or market, is what lets a use survive the interruption of household transmission. It is the same mechanism Reyes-García and colleagues found when culturally appreciated and recreationally gathered uses resisted abandonment while subsistence uses collapsed [9], and it explains why the passage from famine food to delicatessen rescues a subset rather than the whole [10].

4.2. Habitat: The Elimination of the Foraging Niche and Changes in Habitat-Associated Repertoire Breadth

Both areas share one driver, and it is the one agroecological management can most directly address: the elimination of the edge habitat. WFPs are overwhelmingly the species

of transition: ditch banks, hedgerows, road verges, field margins, woodland edges, stream banks, fallow corners, the shifting line between two land uses. This is not incidental. It is what makes them available at all, because these are the surfaces non-owners can actually reach. Informants in both areas converge on the point with striking precision. In the Trevigiano, they name the clearing of the *Roe*, the wild shrub thickets along canals whose removal for bank stabilisation and tidiness destroys the exact conditions in which *Humulus lupulus* shoots. In the Langhe, an informant with fifty years of comparative experience observes that the woodland area has increased while the gatherable interstitial habitat has decreased. That formulation captures the ecology exactly. The total green cover is a poor proxy for foraging habitat, because forage grows on edges, not in interiors.

The consequence is visible in the composition of the documented repertoires. The Trevigiano material is dominated by disturbance-tolerant and edge-associated taxa, whereas the Langhe material includes taxa associated with a broader range of woodland, shrubland, meadow, riparian, and ruderal habitats. Because the sampling and elicitation designs differed, we do not treat this contrast as a quantitative measure of ecological response diversity. Rather, it indicates a difference in the breadth of habitat associations represented in the two documented repertoires. In resilience terms, such compositional breadth is relevant conceptually because systems drawing on taxa associated with different habitat conditions may have more pathways through which provisioning practices can persist or be reorganised under disturbance [12,27].

Trevigiano adds a specifically peri-urban intensifier. The margin habitat there is destroyed not only by agricultural herbicide but by the maintenance regimes of public and semi-public land: verge mowing for traffic safety, canal bank clearance for hydraulic management, and a widely shared preference for a clean, healthy, harmoniously ordered landscape, which informants named in those words. That is the peri-urban condition in one sentence. Agricultural intensification and municipal landscape management work on the same surfaces, in the same direction, under different institutional logics and separate budgets, and neither actor thinks of itself as managing a food resource, because in neither planning framework is a verge food.

There is a direct implication for the agroecological assessment. Existing frameworks measure the landscape diversity, semi-natural habitat cover, and connectivity as proxies for functional biodiversity, meaning pollination and pest regulation [27]. The same features are the substrate of wild food provisioning, but that service goes unmeasured because it never appears in yield accounts and because its beneficiaries are not the landowner [1]. Wild food falls into an accounting gap between agronomy, which does not count what it did not sow, and urban food policy, which counts only what enters a market. Closing it would cost little: the taxa are known, they are easy to survey, and their presence is a sensitive indicator of how margins are managed.

4.3. The Proxy Has a Precondition: Trusted and Gatherable Land

Here, we have to be careful with our own argument. WFP-related LEK can contribute to assessing the condition of an agroecosystem only where the potential gathering ground is both accessible and trusted as suitable for food collection. Where the perceived chemical risk renders otherwise available habitat socially unusable, the indicator becomes confounded: the reduced gathering may reflect ecological change, loss of trust in site safety, or both, and the reservoir metaphor quietly fails: the plants are present, the knowledge is present, and the resource is still unavailable.

The Langhe material isolates the variable. Four elder informants had stopped gathering not because plants were gone but because they judged the accessible ground to be chemically compromised, and had switched to buying vegetables. The Trevigiano shows

the same reasoning in a different register, in the observation that sites near treated vineyards and roadsides have to be avoided and that what remains is steadily less. Mistrust behaves differently from scarcity, and worse. Scarcity is visible, contested, and, in principle, reversible by restoration. Mistrust is invisible, unverifiable by the gatherer, and asymmetric: one suspicion of spraying removes a site permanently, and no observable evidence brings it back. It therefore produces abandonment well beyond actual contamination, and it does so precisely among the most knowledgeable gatherers, who are also the most aware of drift.

The Trevigiano is a landscape in which intensive plant protection and uncertainty regarding treatment exposure are highly relevant to gatherers' assessments of site safety. Between 2010 and 2020, the area under Prosecco in the province rose from roughly 28,000 to 43,000 hectares, and the intensification of plant protection that accompanied it became a matter of regional public controversy, with pesticide use in the Veneto wine districts repeatedly raised in the press and in local politics. Set that against what the European policy framework promised. The 2020 Farm to Fork Strategy committed the Union to halving the use and risk of chemical pesticides, and halving the use of the more hazardous ones, by 2030 [43]. The instrument meant to deliver it, the 2022 proposal for a Regulation on the Sustainable Use of Plant Protection Products, would have made those targets legally binding, mandated integrated pest management, and, crucially for our argument, banned pesticide use in sensitive areas including urban green space used by the general public, with a three-metre buffer [44]. The European Parliament rejected the text in November 2023, the Council failed to agree, and the Commission announced the withdrawal in February 2024 and formalised it that March [45]. Directive 2009/128/EC remains in force; the binding 50% target does not.

We draw two things from this. The first is factual: the single European instrument that would have made peri-urban public green space reliably gatherable was withdrawn, and nothing has replaced it. The second is analytical. In the Trevigiano, the peri-urban condition and the chemical condition compound each other rather than merely coexisting. The margin habitat is squeezed by settlement and by municipal tidiness; what margin survives sits next to intensively treated vineyards; and an actor manages the verges themselves with no mandate to consider whether anything growing there might be eaten. A gatherer in that landscape faces not one constraint but three, and only the first is about plants.

None of this means peri-urban gathering is unsafe. Urban foraging research has repeatedly found trace-metal and pesticide concentrations in the gathered material to be lower than assumed, and foragers themselves practising quite sophisticated site selection [18,21]. That is rather the point. The binding constraint is informational, not toxicological. People are making risk decisions with almost no data. Publishing where and when public and semi-public land is treated would cost little, restore usable ground at a stroke, and make the LEK proxy interpretable, because one could then distinguish a repertoire that has contracted. After all, the habitat went from one that has contracted because trust went.

4.4. Refugia, New Foragers, and the Peri-Urban Deficit

The most instructive finding in the dataset is the Langhe refuge dynamic. Younger gatherers did not accept their elders' withdrawal. They re-mapped the territory, finding and using ground abandoned by agricultural work, typically along secondary watercourses too steep for machinery and of no agricultural interest. In landscape-ecological terms, these are unmanaged residual patches whose value comes precisely from being unprofitable. The same logic appears weakly in the Trevigiano, in the persistence of *Humulus lupulus* along the last unmanaged stretches of the canal bank.

Therefore, the operative variable is not the total area of green space. It is the existence of accessible, unmanaged, or extensively managed interstitial land, and, at present, such

land is produced by accident, as a by-product of unprofitability, rather than by design. In the Langhe, the topography and the abandonment of unprofitable parcels generate it abundantly, not because farming there is gentler, since it is not, but because steep, machine-inaccessible ground has no value to an industrialised vineyard and hazelnut economy and is, therefore, left alone. In the peri-urban Trevigiano, where every surface is cultivated, built, or maintained, it is scarce and getting scarcer. This is the sharpest structural contrast we found and, we would argue, the central peri-urban deficit: peri-urbanisation does not merely reduce the quantity of open land; it eliminates the specific category of land, unmanaged and accessible, on which an adaptive response depends. The Langhe could adapt spatially because there was somewhere to go. The Trevigiano could not, and its resilience defaulted to memory.

The reconfiguration through gastronomy and tourism deserves a more guarded reading. In the Langhe, wild greens have re-entered public visibility through restaurants, guided walks, and paid experiences, and several informants first met them there rather than at home. This is genuine revalorisation; it opens a horizontal transmission channel where the vertical one narrowed; it demonstrably brings new people in, which is consistent with what has been described for the new urban foragers of Berlin and Vienna, who typically learn from courses, books, and online sources rather than from kin [18,21–23]. Our tourism informants describe exactly that route. *“In 2021, as soon as we could go out again after the compulsory isolation, the urge to be outside and in contact with nature was really strong. A friend recommended this initiative, the Livertin Experience, and I signed up straight away”* (G.P., male, 58, Alba). *“I became passionate about foraging by reading and watching videos online. When I heard about this initiative in Alba, I left immediately with two friends. I was very satisfied; I never thought wild asparagus could be so good”* (L.R., female, 26, Turin). Neither learned from a household. But it also changes what the practice is. Gathering becomes an experience purchased rather than a competence held. The mediating figure is a guide or a chef, not a grandmother. The taxa that benefit are the ones with culinary distinctiveness, not the ones with nutritional or ecological weight.

And it decouples the practice from the ordinary landscape. This is the disconnection we flagged at the outset. A foraging walk sold as an experience does not require that the ditch outside one’s house be gatherable; a restaurant serving *Silene vulgaris* does not require that anyone in the surrounding suburbs still knows how to find it. The new foragers know plants extremely well. What they mostly do not know, and what our elder informants did know, is the management system that determines whether those plants will be there next spring and whether they are safe: who cuts the verge, on what cycle, what was sprayed upwind, and when the canal bank is due for clearance. Reconnection to nature and reconnection to the agroecosystem are not the same thing, and current trends are delivering considerably more of the first than of the second. A knowledge system that survives only as a commercial offer has traded the breadth of carriers for dependence on a market. That is a different risk profile, not an unambiguous gain. It is worth asking why the commercial channel opened in the Langhe and not in the Veneto plain. Part of the answer is that the district is the birthplace of the gastronomic movement that gave humble, seasonal, place-bound foods a public vocabulary of quality [46]; the Trevigiano has never acquired such a vocabulary for its wild greens, which remain tied, as G.G.’s statement shows, to an unresolved memory of poverty.

4.5. Recommendations for Peri-Urban Planning and Agroecological Transition

The practical claim implicit in all this is not that gathered greens will feed cities. It is that the conditions making gathering possible are very nearly a complete specification of an

agroecologically well-managed peri-urban landscape, and that the state of the associated LEK is a sensitive early indicator of whether those conditions hold.

Consider what a gatherable peri-urban landscape requires: unsprayed or minimally sprayed field margins, which is a pesticide-reduction objective [43,44]; structurally complex hedgerows and ditch banks maintained on multi-year rather than annual cycles, which is a habitat-connectivity and pollinator objective; accessible interstitial land with clear and permissive access rules, which is a green-infrastructure and environmental-justice objective [17,20]; transparency about treatment regimes, which is a governance objective, and, per Section 4.3, the precondition for the resource being usable at all; people walking in the agricultural landscape and knowing its seasons, which addresses the extinction of experience [47]; and the intergenerational transmission of place-based ecological knowledge, which is the co-creation and sharing of knowledge that agroecological frameworks name as a core principle [27]. Each is separately justified in existing policy. Gathering is the practice in which all of them become simultaneously legible.

The diagnostic value is what our comparison most clearly supports. Trevigiano informants did not describe an abstract loss of tradition. They described herbicide on arable margins, the asphaltting and periodic clearance of country roads, the uprooting of canal-side shrub thickets, supermarket chains replacing local markets, and year-round supply replacing seasonal availability. That is a precise, testable list of landscape and food system changes, produced by people with no reason to frame anything agroecologically. Langhe informants produced an equally precise complementary list: deforestation for vineyard and hazelnut expansion, drought and altered flow regimes, the unregulated felling of truffle-bearing trees in vineyard-adjacent marginal ground, and agrochemical intensity on accessible land. Read together, these amount to the LEK equivalent of a landscape-scale environmental assessment, obtained at the cost of some seventy conversations. This is the sense in which LEK is an instrument for data-driven agricultural decision-making, and not only an object of conservation.

On that basis, we propose five measures. First, edges should become a named management category in peri-urban planning, with maintenance regimes for verges, ditch banks, and field margins set on multi-year cycles and mowing timed to allow flowering and seed set, rather than to a tidiness standard. Second, a proportion of peri-urban interstitial land should be intentionally left unmanaged and accessible, replicating by design the refugia the Langhe produce by accident of topography, since it was the absence of that land category which blocked an adaptive response in the peri-urban case. Third, treatment regimes on public and semi-public land should be spatially transparent and publicly accessible, since mistrust rather than contamination is what binds. Fourth, gathering should be addressed explicitly in green-space regulation, moving from the current default of prohibition or silence towards permissive frameworks with sustainability guidance, as urban foraging scholarship has recommended for a decade [15,16,20,21]. Fifth, WFP presence and gatherability, together with the recognition-to-use ratio in the resident population, should be adopted as paired indicators in peri-urban agroecological assessment. The first tracks habitat, the second tracks knowledge, and their divergence is an early warning that the two have come apart.

Two further measures address transmission rather than habitat, and both came from informants. Several Trevigiano interviewees argued for foraging instruction in primary schools and pointed to the local educational garden as a working precedent; the same people noted that the appeal lies partly in the contrast with a screen-mediated childhood. Others proposed something more prosaic: explanatory material on wild and semi-wild greens at the point of sale in supermarket produce sections, plus stronger weekly local markets as an outlet for those who would not know how to gather. Given that 94% and

82% of the two cohorts said they would buy these greens if they could, the demand-side constraint looks considerably weaker than the habitat and access constraints, which is, itself, a finding. The peri-urban bottleneck is not motivation. All of this is consistent with the position taken in international assessments of agroecological transition, that the knowledge and cultural dimensions of a food system are constitutive of its sustainability rather than decorative additions to it [48]; what our two cases add is that those dimensions can be measured, cheaply, by asking people what grows in their ditches and whether they still eat it.

5. Conclusions

Can a peri-urban landscape still feed its foragers? On our evidence, barely, and not in the way the non-peri-urban one can, even though the agriculture there is no less industrialised. In the peri-urban Trevigiano, the repertoire has contracted to thirteen mostly generalist taxa, recognition has outlasted practice by margins of up to 86 percentage points, the single fully persistent use is the one anchored in ritual, dialect, and a commodity, and compensation happens only through purchased products. In the Langhe, whose vineyard and hazelnut agriculture is fully industrialised and whose third economy is tourism, knowledge and practice both persist across age classes but have been redistributed, as elders withdraw from ground they distrust, younger gatherers relocate to unmanaged refugia, and gastronomy and tourism open a horizontal channel where the vertical one narrowed. The documented repertoires show limited raw overlap (Jaccard = 0.19), with the shared taxa consisting predominantly of disturbance-tolerant and widely distributed species. Because the sampling protocols differed, this value is interpreted descriptively rather than as a standardized measure of between-site knowledge similarity.

Three variables account for the difference, and all three are manageable: access to unmanaged, accessible interstitial land, which enabled the adaptive response in the Langhe and whose near-absence blocked it in the Trevigiano—this, not total green cover, is the land category on which gathering depends; trust in the chemical safety of accessible ground, which can render a reservoir unusable without altering it at all; and anchoring, since uses embedded in ritual, language, market, or gastronomy persist while purely instrumental household uses do not.

WFP-related LEK may therefore serve as a sensitive indicator of the condition and usability of peri-urban agroecosystem margins, provided that habitat accessibility and perceived chemical safety are considered alongside knowledge itself. Where uncertainty about treatment makes otherwise suitable land socially unavailable, the reduced gathering cannot be attributed to ecological degradation alone. That condition is currently unmet and, since the withdrawal of the EU pesticide regulation in 2024, unaddressed by binding policy. The practical agenda follows. Treat edges, unmanaged interstitial land, and treatment transparency as food-system infrastructure rather than as residual surface; adopt paired habitat and knowledge indicators; and recognise that reconnecting urban dwellers to nature, which foraging courses and wild-food restaurants do rather well, is not the same as reconnecting them to the agroecosystem, which almost nothing currently does. Our informants overwhelmingly want the practice back. Far fewer expect it. Whether they are right depends less on cultural revival than on whether the margins of the peri-urban landscape get managed, over the coming decade, as a habitat rather than as a surface to be tidied.

6. Limitations and Future Research

Several limitations should be considered when interpreting the findings. First, the three datasets were generated through different sampling designs: cohort-structured and

photo-elicited in the Trevigiano, actor-diversified and primarily free-listed in the shared Langhe corpus, and free-listed and specialist-weighted in the Langhe diachronic survey. These differences preclude a formal statistical comparison of the prevalence between the two study areas. The two Langhe datasets are also unequal in size and purpose, and the broader repertoire documented in the diachronic subset partly reflects the inclusion of highly knowledgeable gatherers rather than representing an estimate of district-wide knowledge. Accordingly, the Jaccard index is interpreted descriptively as repertoire overlap rather than as a standardised measure of population-level similarity, while the resilience classification presented in Table 6 remains interpretive rather than quantitative.

The sample sizes are modest and the Trevigiano sample is strongly female-skewed, particularly in the post-1970 cohort, where only three men participated. Sex-disaggregated percentages in this stratum should therefore be regarded as indicative. Botanical identification in the Trevigiano relied primarily on folk phytonyms, photo-elicitation, described morphology, habitat, and the comparison with ethnobotanical reference sources rather than the systematic collection of voucher specimens. The diachronic component also relies partly on retrospective accounts rather than repeated longitudinal observation, introducing the possibility of recall and retrospective idealisation. Finally, agrochemical residues were not measured in plants, soils, or gathering sites. The study therefore documents the perceived chemical risk and loss of trust in gathering sites, rather than demonstrating actual toxicological exposure or contamination.

Future research should address these limitations through matched and standardised sampling protocols across peri-urban and non-peri-urban landscapes, allowing a stronger quantitative comparison of knowledge, use, and repertoire composition. The longitudinal repetition of the interviews would help distinguish continuing change from retrospective reconstruction and determine whether the recognition–practice gap is widening, stabilising, or reversing. Systematic voucher-based botanical surveys in the Trevigiano would strengthen taxonomic verification and permit a direct comparison between ethnobotanical knowledge and contemporary floristic availability.

A particularly important next step is to combine ethnobotanical interviews with direct pesticide-residue analyses of gathered plants, soils and potential gathering sites. Such work would allow the perceived chemical risk to be compared with the measured exposure and would clarify when the withdrawal from gathering reflects actual contamination, uncertainty regarding treatment, habitat degradation, or interactions among these factors. The spatial mapping and repeated monitoring of unmanaged or extensively managed refuge habitats would also help establish whether the relocation strategy documented among younger Langhe gatherers represents a durable form of adaptation.

Finally, future studies should examine the durability of emerging horizontal transmission pathways. Professional practitioners, gastronomy, guided foraging, tourism, and peer networks may provide alternative channels where the household transmission has weakened, but it remains unclear whether these mechanisms generate broadly distributed intergenerational knowledge or primarily maintain specialised communities of practice. Repeating the present comparison with harmonised methods and incorporating younger generations would provide a direct test of whether contemporary wild-food knowledge is undergoing continued erosion, stabilisation, or social-ecological reconfiguration.

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