

## Article

# The Importance of Keeping Alive Sustainable Foraging Practices: Wild Vegetables and Herbs Gathered by Afghan Refugees Living in Mansehra District, Pakistan <sup>†</sup>

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- <sup>†</sup> This paper is dedicated to the memory of first author's father (Afsar Khan Manduzai), who, as many others Afghans, fled to Pakistan in 1980; Afsar has been one of the key study participants of this survey and unexpectedly passed away on 18 December 2020, while this paper was in its final preparation phase.



**Citation:** Manduzai, A.K.; Abbasi, A.M.; Khan, S.M.; Abdullah, A.; Prakofjewa, J.; Amini, M.H.; Amjad, M.S.; Cianfaglione, K.; Fontefrancesco, M.F.; Soukand, R.; et al. The Importance of Keeping Alive Sustainable Foraging Practices: Wild Vegetables and Herbs Gathered by Afghan Refugees Living in Mansehra District, Pakistan. *Sustainability* **2021**, *13*, 1500. <https://doi.org/10.3390/su13031500>

Academic Editor: C. Ronald Carroll  
Received: 5 January 2021  
Accepted: 26 January 2021  
Published: 1 February 2021

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**Abstract:** The issue of foraging for wild food plants among migrants and relocated communities is an important one in environmental studies, especially in order to understand how human societies rearrange their practices linked to nature and how they adapt to new socioecological systems. This paper addresses the complexity of Traditional/Local Environmental Knowledge (LEK) changes associated to wild vegetables and herbs across four different groups of Afghan refugees living in Mansehra District, NW Pakistan, since 1985. Via interviews with eighty study participants, forty-eight wild vegetables and herbs were recorded, representing both the past and present wild plant gastronomic heritage. The majority of the quoted wild plant ingredients were only remembered and no longer actively used, thus suggesting an important erosion of LEK. Moreover, the number of wild vegetables and herbs currently used by Afghan Pashtuns engaged in farming activities is much higher than those reported by the other groups. The findings indicate that practiced LEK, i.e., knowledge that is continuously kept alive via constant contact with the natural environment, is essential for the resilience of the biocultural heritage, which is, however, also influenced by the rearrangement of social life adopted by refugees after relocation.

**Keywords:** wild food plants; herbal teas; ethnobotany; LEK; Afghans; refugees; Pakistan; cultural adaptation

## 1. Introduction

The ethnobotany of migrants, i.e., the exploration of wild plants and herbal teas used by relocated communities has become the focus of an increasing number of studies during the past two decades, aimed at exploring how Traditional/Local Environmental Knowledge (LEK, [1]) and attached gastronomic heritage [2] change after relocation.

During the past two decades, several scholars have undertaken the task of exploring the food systems of migrants (for example [3–7]), and specifically their plant-related knowledge and practices ([8], and references therein), particularly in the USA [9–11], Latin America [12–15], the UK [16,17], and the European Union [18–22], as well as in Northern Africa [23]. To our knowledge, no research has thus far considered the LEK of migrants forcibly relocated because of war, and very few studies have addressed the issue of migrants' plant knowledge in Asia [24].

Northwest Pakistan has undergone profound changes in its social structure over the past several decades due to the arrival of a significant number of war refugees from Afghanistan beginning in 1979; however, little attention has been paid to the analysis of their customs, especially in terms of LEK systems. In 2017, 1.4 million registered Afghan refugees were living in Pakistan [25]. Since the late 1990s, a considerable number of Afghan refugees have moved out of refugee camps to peri-urban areas, and in 2011, 67% of them lived in urban or rural areas, while the remaining 33% still resided in 54 refugee camps [26]. The majority of the Afghan diaspora lives in Khyber Pakhtunkhwa (KP), the Northwest Province of Pakistan, which borders Afghanistan and has both environmental and socio-cultural configurations similar to those of that country. Moreover, in this province, the geoclimatic and environmental conditions (i.e., the presence of Pakistan's most extensive forest as well as mountain pastures) make possible the continuation of some pastoralist activities, which were performed by the refugees before having to leave their native country.

This paper aims to fill the gap in the environmental, anthropological, and ethno-biological literature, focusing attention on Afghan war refugees and the effects of their forced migration on their foraging practices and wild plant use/gastronomy. In doing so, the paper documents and compares the uses of wild food plant ingredients among four distinct ethnic Afghan refugee groups in Mansehra in order to assess how different cultural adaptation strategies may have affected their LEK linked to wild plants.

The objectives of this study were to record the wild plant portion of the LEK and gastronomic heritage, i.e., the wild food plants and herbal teas as remembered or still used, among four groups of Afghan refugees in Mansehra District, to compare the data among the four communities, and to discuss possible explanations for differences among the diverse strategies of cultural adaptation that the considered communities adopted.

## 2. Materials and Methods

### 2.1. Study Area and Communities

The study was conducted in Mansehra District, NW Pakistan, from January to March 2020 (Figure 1). The district occupies an area of 4579 square kilometers, consisting of mainly plains and hills. Mansehra is located between 34°14' and 35°11' latitude and 72°49' and 74°08' longitude. Mansehra District is surrounded by lush green high mountains and plain agricultural land. Mountain elevation varies between 2000 m in the South to over 4500 m in the North. In Mansehra, the climate is moist temperate: the mean maximum and minimum temperatures recorded are 34 °C and 2 °C, respectively.

Administratively, the Mansehra District belongs to the Hazara Division of the Khyber Pakhtunkhwa (KP) Province of Pakistan. According to the 2017 census, the total population of Mansehra District is approximately 1.5 million [27] and the predominant language, according to the 1981 census, is Northern Hindko, with Pashto spoken by about 15% of the population [28]. The population is largely Muslim, with a small number of Hindus and Sikhs.

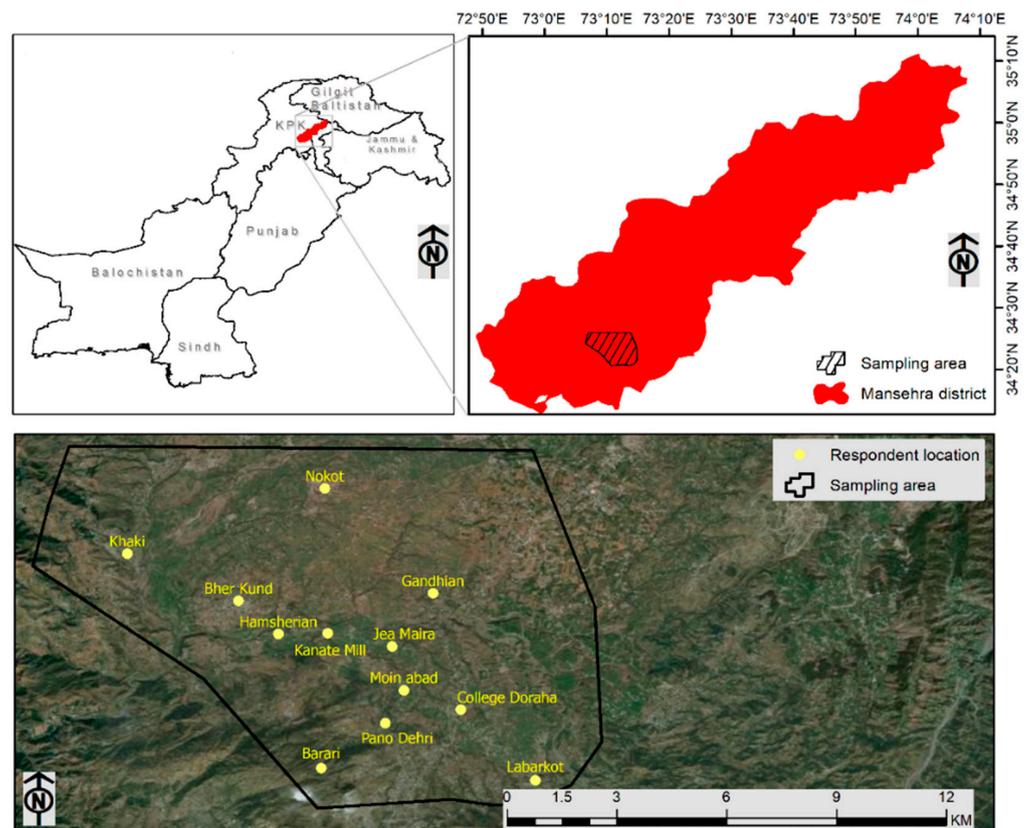


Figure 1. Map of the study area and visited valleys.

## 2.2. Informant Selection and Field Study

A total of 80 interviews with individuals ranging between 50 and 80 years of age were conducted among the four major refugee groups, belonging to three distinct ethnic groups, residing in the area of Mansehra District. They included: Pashtun Afghans who live outside refugee camps (PAs), Pashtun Afghans still living inside camps (PCs), Kochi Pashtun Afghans (KOs), and Uzbek Afghans (UZs). All the refugees arrived in Pakistan from diverse areas of Afghanistan, mainly from the areas of Balkh and Kunduz in the North and the areas of Logar, Jalalabad, and Paktika in the East, at the beginning of the 1980s, following the Russian invasion of Afghanistan. The interviewee sample is further described in Table 1.

Study participants were selected by snowball sampling, starting from elderly community members, who could be perceived as LEK holders. All the interviews were conducted by the first author (Figure 2) in the spring of 2020, in the two main local languages spoken by the community members (Pashto and Farsi/Persian). The ethnobotanical information was gathered from in-depth interviews after obtaining prior verbal informed consent and the *Code of Ethics* of the International Society of Ethnobiology (ISE) [29] was strictly followed. The interviews focused on current and past uses of wild vegetables and other herbal ingredients, which included information on plant folk names, details of use, and procurement. Mushrooms as well as wild fruits were excluded in the current survey, because they are cognitively well separated from the category “herbs” in the local folk taxonomy and because of the difficulties in eliciting information about food items, which are normally not collected during the spring. Particular attention was paid to record the medicinal perception of wild plant-based preparations [30,31].

**Table 1.** Characteristics of the study participants.

Group	Pashtuns Living Outside Refugee Camps (PAs)	Pashtuns Living Inside Refugee Camps (PCs)	Pashtun Kochis (KOs)	Uzbeks (UZs)
Arrival in the present area	1979–1985	1979–1985	1979–1985	1979–1985
Approx. number of community members	10,000	6000	4000	2000
Living environment	Plain area	Plain area	Plain areas in winter, mountain pastures in the summer	Plain area
Native language	Pashto	Pashto	Pashto	Uzbek
Other known languages	Persian	Persian	Persian	Pashto and Persian
Religion	Sunni Islam	Sunni Islam	Sunni Islam	Sunni Islam
Marriages	Strictly endogamic	Strictly endogamic	Strictly endogamic	Strictly endogamic
Subsistence economy	Horticulture	Foreign remittances	Pastoralism	Horticulture and butcher's shops
Estimated socioeconomic status	Middle low	Middle low	Low	Low
Number of interviewed study participants (males/females)	20 (14/6)	20 (19/1)	20 (20/0)	20 (20/0)

**Figure 2.** First author interviewing Kochi study participants.

### 2.3. Botanical Identification

The wild plant specimens that could be collected during the field survey were identified by taxonomists at COMSATS University. The nomenclature follows World Flora Online [32], while family assignments follow the Angiosperm Phylogeny Group (APG) IV [33]. The herbarium specimens were deposited at the herbarium of COMSATS University Islamabad (Abbottabad Campus). For the quoted wild plants for which no specimens

could be collected, identification was hypothesized on the basis of photographs, plant descriptions, and similarity of the recorded folk plant names with those previously recorded in field ethnobotanical and plant ethnolinguistic surveys conducted in Persian/Dari- and Pashto/Pathan-speaking areas [34–43].

#### 2.4. Data Analysis

Data on the recorded wild plant ingredients among the four considered groups were represented using a Venn diagram and the Jaccard (similarity) Index (JI) for each pair of datasets [44]. JI was calculated using the following formula:

$$\text{JI} = \frac{\text{number of plants used by both group A and group B}}{\text{total number of plants used by groups A and B}}$$

### 3. Results

#### 3.1. The Wild Food Plants of the Afghan Diaspora in NW Pakistan

The recorded wild plant ingredients used in the past or currently used are reported in Table 2; the table also includes also two specific cultivated plants (*Papaver* and *Brassica* spp.), whose quoted food/herbal use remarkably diverge from their “usual” ones in both the Middle East/South Asia and “the West”.

**Table 2.** Wild vegetables and herbal teas recorded among the Afghans living in NW Pakistan.

Botanical Family, Taxon, and Voucher Specimen Code	Vernacular Name	Procurement	Used Parts	Preparation and Perceived Healthy Properties (Treated Diseases)	FQ PAs	FQ PCs	FQ KOs	FQ UZs
<i>Achillea santolinoides</i> Lag. and possibly other <i>Achillea</i> spp.#, Asteraceae	Zawal	fA	Aerial parts	B: boiled in milk, anti-cough	++ *		+ *	
<i>Alkanna tinctoria</i> (L.) Tausch., Boraginaceae, CUHA205	Surkhakay	Bm	Roots	F: powdered, sprinkled on crude or fried egg, and given to eat to a mother who just gave a baby, believed to be a reconstituent and relieving internal wounds; decoction, topically applied for earaches	++		+ *	
<i>Allium carolinianum</i> DC. #, Amaryllidaceae	Piazake	fP	Leaves	F: boiled and then fried (sometimes mixed with other greens), or sometimes consumed raw	+		+++	
<i>Allium rosenbachianum</i> Regel #, Amaryllidaceae	Kheza	fA	Leaves	F: fried	+ *	+ *	++ *	
<i>Amaranthus hybridus</i> L. and possibly other <i>Amaranthus</i> spp.#, Amaranthaceae	Qarqarra	fP	Leaves	F: boiled, then fried with onions and tomatoes, and eventually chilies (in mixtures with other greens)	+++	++		
<i>Artemisia scoparia</i> Waldst. & Kitam., Asteraceae, CUHA10	Tarkha	fA	Whole plant	B: cold macerate (let macerate one whole night outside under the stars), abdominal pains *	+ *	+ *	++ **	
<i>Berberis lycium</i> L., Berberidaceae, CUHA204	Kwaray	bm	Roots	B: cold macerate, drunk, as a remedy against backache, headache, bone aches, stomachache, anti-cough, to heal internal/external wounds, heel cracks	+++	++	++	

Table 2. Cont.

Botanical Family, Taxon, and Voucher Specimen Code	Vernacular Name	Procurement	Used Parts	Preparation and Perceived Healthy Properties (Treated Diseases)	FQ PAs	FQ PCs	FQ KOs	FQ UZs
<i>Berberis</i> sp.#, Berberidaceae	Spar aghzye	fA	Aerial parts	B: decoction, menorrhagia	+ *			
<i>Brassica rapa</i> L., Brassicaceae, CUHA206	Teepar	cultivated	Seeds	B: roasted (wrapped in piece of cloth and placed inside burning embers) and then consumed as a galactagogue	++			
<i>Calotropis procera</i> (Aiton) Dryand#, Apocynaceae	Spalmai	fA	Leaves	B: crushed and topically applied, anti-lice	+ *			
<i>Camellia sinensis</i> (L.) Kuntze#, Theaceae	Sheen Chai	bm	Leaves	B: tea is used to lower cardiovascular complications and body fats	+++	++	++	++
<i>Cannabis sativa</i> L., Cannabaceae, CUHA16	Da bhang bootay	bm	Hashish ( <i>charas</i> )	SM: smoked and inhaled, aphrodisiac	+ *		++ *	++
<i>Capparis spinosa</i> L.#, Capparaceae	Kevera	fA, br	Young leaves and flower buds	F: boiled, then fried with onions, tomatoes, and eggs; sometimes preserved dried	+	+ *	++ *	
<i>Capsella bursa-pastoris</i> (L.) Medik., Brassicaceae, HUP9204	Pathosnara	fP	Leaves	F: boiled and then fried (in mixture with other greens)	++			
<i>Caragana ambigua</i> Stocks#, Fabaceae	Makhey	fA	Young fruits	F: eaten raw			++ *	
<i>Centaurea</i> sp.#, Asteraceae	Kuragh	fA	Aerial parts	B: decoction, antidiabetic	++ *		+ *	
<i>Chenopodium album</i> L., Amaranthaceae, CUHA21	Shorakay	fP	Leaves and young shoots	F: boiled, then fried with onions and tomatoes, and eventually chilies (in mixtures with other greens)	++			
<i>Cichorium intybus</i> L.#, Asteraceae	Shamakay, Shenguly	fA	Seeds	B: decoction, anti-pyretic	+*	+ *	++ *	
		fP	Leaves	F: boiled, then fried (mixed with other vegetables)	++			
<i>Cuminum setifolium</i> (Boiss.) Koso-Pol.#, Apiaceae	Krawsay	fA	Leaves	B: tea, anti-cough, esp. in cows and sheep		++ *		
<i>Descurainia sophia</i> (L.) Webb ex Prantl., Brassicaceae, CUHA207	Khaksher	fA	Seeds	B & F: decoction or seeds consumed as such, as an antipyretic and cold reliever in children	++ *			
<i>Ephedra</i> sp.#, Ephedraceae	Mauraze	fA	Leaves	B: tea, sometimes considered anti-cough	+ *		+++ *	
<i>Ferula</i> sp.#, Apiaceae	Khore	fA	Young shoots	F: boiled and fried	+ *		++ *	
<i>Fumaria indica</i> (Hausskn.) Pugsley., Fumariaceae, CUHA188	Pappra	fA	Fresh plant juice	B: crushed, macerated in cold water, left overnight under the stars/sky, and drunk in a small glass before breakfast, as an antidiabetic and blood purifier	++ *		+ *	

Table 2. Cont.

Botanical Family, Taxon, and Voucher Specimen Code	Vernacular Name	Procurement	Used Parts	Preparation and Perceived Healthy Properties (Treated Diseases)	FQ PAs	FQ PCs	FQ KOs	FQ UZs
<i>Heliotropium</i> sp.#, Boraginaceae	Ajdum	bm	Roots	B: decoction, aphrodisiac, backache, joint aches	++			
<i>Lamium amplexicaule</i> L., Lamiaceae, HUP9208	Char gul bootay	fP	Leaves and flowers	F: boiled, then fried (mixed with other greens)	++			
<i>Malva nicaeensis</i> All., Malvaceae, HUP9201	Panderak	fP	Leaves	F: boiled, then fried (alone or with mixed greens), often considered a strengthening food for women during pregnancy; preserved dried	+++	++	+	
<i>Medicago arabica</i> (L.) Huds., Fabaceae, HUP9202	Peshtaray	fP	Leaves	F: boiled, then fried with onions (mainly mixed with other greens); preserved dried	+++	++	++	++
<i>Myrtus communis</i> L.#, Myrtaceae	Maloogan	bm	Leaves	SM: dry leaves are placed on embers—the resulting smoke is considered an anti-Evil-Eye mean (esp. for those babies and children, who are most beloved)	+			
<i>Olea europaea</i> subsp. <i>cuspidata</i> (Wall. & G.Don) Cif.#, Oleaceae	Khowan	fP	Leaves	F: leaves were used to prepare tea in times of famine	+*			
<i>Paliurus spina-christi</i> Mill.#, Rhamnaceae	Zrerra	fA	Roots and seeds	B: decoction, hepatitis		++*		
<i>Papaver somniferum</i> L., Papaveraceae, CUHA211	Post/Ghoza	cultivated	Pericarp and latex	B: decoction of the pericarp, as an anti-cough; the latex is ingested as an aphrodisiac and anti-insomnia	+*	+*	+*	++
<i>Peganum harmala</i> L., Nitrariaceae, CUHA150	Spelanay	bm	Seeds	SM: seeds are sprinkled on embers and their smoke is considered able to counteract the Evil-Eye F: seeds with white sugar are ingested as anti-cough	++	++*	+*	
<i>Plantago lanceolata</i> L., Plantaginaceae, HUP9207	Bartang	fA	Seeds	B: boiled in milk drunk as an anti-diarrheal, anti-cough, and for curing bronchitis	++*			
<i>Plantago ovata</i> Forssk., Plantaginaceae, CUHA153	Asphagoul	bm	Seeds	F: consumed raw with white sugar in order to treat dysentery and hematuria	+++	+	++	++
<i>Polygonum</i> sp.#, Polygonaceae	Bandakey	fA	Young shoots	F: fried	++*			
<i>Portulaca oleracea</i> L., Portulacaceae, CUHA72	Warkharay	fP	Aerial parts	F: boiled and then fried (in mixture with other greens)	++	+*	++*	
<i>Punica granatum</i> L., Lythraceae, CUHA78	Annar	bm	Fruits	B: decoction of the fruit epicarp is used as anti-diarrheal for children; F: fruit pulp with seeds are consumed as blood purifier *	++		+	++

Table 2. Cont.

Botanical Family, Taxon, and Voucher Specimen Code	Vernacular Name	Procurement	Used Parts	Preparation and Perceived Healthy Properties (Treated Diseases)	FQ PAs	FQ PCs	FQ KOs	FQ UZs
<i>Quercus baloot</i> Griff., Fagaceae	Serei	fA	Seeds	B: decoction, anti-pyretic	+ *			
<i>Rosa</i> spp.#, Rosaceae	Gulab	fA	Leaves	B: cold macerate, thrust quencher	+ *			
<i>Rumex crispus</i> L., Polygonaceae, HUP9205	Shalkhay	fP	Leaves	F: boiled and then fried, sometimes considered as a remedy for treating constipation	+++	+	++ *	
<i>Salvia</i> spp.#, Lamiaceae	Gulbakhor	bm	Aerial parts	B: decoction, aphrodisiac for females	++			
<i>Stellaria media</i> (L.) Vill., Caryophyllaceae, HUP9203	Kashi	fP	Leaves	F: boiled, then fried (with other greens)	+			
<i>Trachyspermum ammi</i> (L.) Sprague., Apiaceae, CUHA203	Sperkai	bm	Fruits	B: tea, abdominal cramps and dysentery (also for sheep and cows *)	+++	++	+	+ *
<i>Trigonella foenum-graecum</i> L., Fabaceae, CUHA209	Malkhawaze	bm	Seeds	F: eaten raw for relieving gastric troubles *	+		+	
<i>Vitex negundo</i> L.#, Lamiaceae	Marwandaie	fA	Leaves	B: decoction, aphrodisiac for females	+ *			
<i>Withania coagulans</i> (Stocks) Dunal., Solanaceae, CUHA170	Khamzoora	fA, fP	Seeds	F: rennet for making cheese	+ *	+ *	+++	
			Leaves	B: tea, anti-cough/cold *		+		
Unidentified taxon	Sukre	fA	Whole plant	B: cold macerate, blood purifier	++ *			

#: identification conducted upon pictures, folk names, and plant description only; bm: ingredient bought at the local market; br: brought from the home country; f: foraged; A: in Afghanistan; P: in Pakistan; \* uses only remembered from the past in Afghanistan; B: beverage; F: food; SM: smoked; FQ: frequency of quotation; PAs, PCs, KOs, UZs: see Table 1; + rarely quoted (less than 10% of study participants); ++ commonly quoted (10–40% of study participants); +++ very commonly quoted (more than 40% of study participants).

A total of forty-eight plants were recorded, of which two could not be identified, since they refer to wild ingredients, which were only used in the past in Afghanistan and no specimens, pictures, or very detailed descriptions of them could be obtained. Table 2 presents the recorded ingredients along with their plant origin, local names, procurement, preparations, uses, and quotation frequencies among the four considered groups.

Very few wild vegetables were used as *edible medicines* ([30,31]: ad hoc prepared dishes consumed in order to obtain a specific healing effect), while most quoted herbal teas were also used therapeutically. Study participants did not report any adverse effects linked to the use of the quoted wild plants.

Most of the quoted ingredients were only remembered (Figure 3), while most of the quoted plants were foraged (during the past in Afghanistan and currently in Pakistan), although an important number—especially dried wild herbal teas—were bought from markets in the host country. The most frequently quoted ingredients were wild amaranth (*Amaranthus* spp.), *Berberis lyceum*, ajwain (*Trachyspermum ammi*), spotted medick (*Medicago arabica*), and psyllium (*Plantago ovata*).

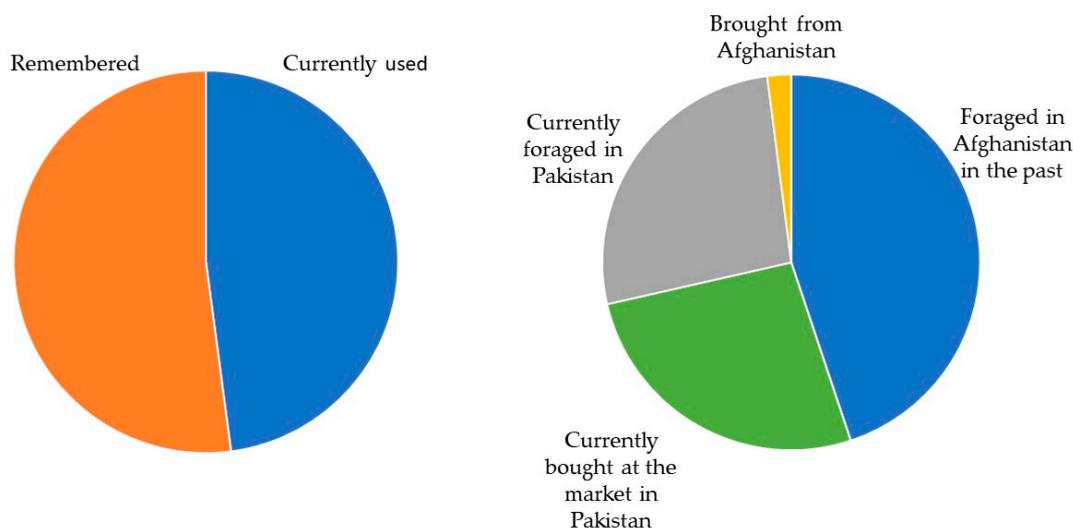


Figure 3. Remembered vs. currently used wild ingredients and their procurement.

Figure 4 and Table 3 show the overall comparison of the wild plant ingredients quoted by the four considered groups, in which we can observe that the diversity of wild plant ingredients quoted by Pashtuns living outside the camps ( $n = 46$ , 25 currently used) was much higher than that of wild plants quoted by Kochis ( $n = 27$ , 11 currently used), by the Pashtuns living in refugee camps ( $n = 19$ , 9 currently used), and by Uzbeks ( $n = 7$ , 6 currently used). In particular, the JI between PAs and KOs overall wild ingredients was remarkable and higher ( $JI = 0.55$ ) than that between both Pashtun groups ( $JI: 0.36$ ).

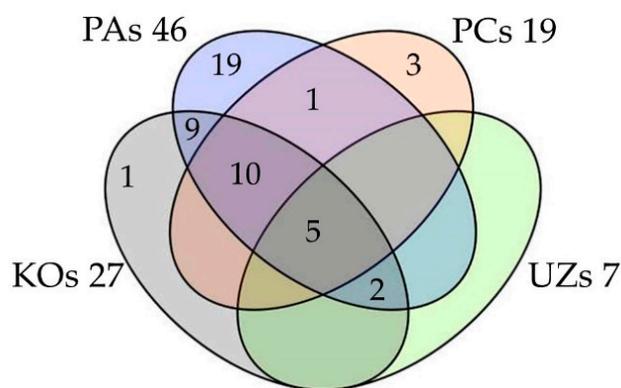


Figure 4. Venn diagram showing the cross-cultural comparison of the overall quoted wild food plants.

Table 3. Jaccard Similarity Indexes (JI) of the quoted wild food plants quoted by the four considered groups (the highest value is marked in bold).

	PAs	PCs	KOs	UZs
PAs	-	0.36	<b>0.55</b>	0.15
PCs	0.36	-	0.48	0.24
KOs	<b>0.55</b>	0.48	-	0.26
UZs	0.15	0.24	0.26	-

The following paragraphs will try to address some possible explanations for this remarkable difference, assuming that before relocation the refugees had a similar life and socioeconomic profile, and that the LEK of the four groups while living in Afghanistan was similar. This assumption is reasonable given the fact that, four decades ago, Afghans were

engaged in small-scale subsistence agropastoral activities, both in the rural north and in the east of their country, areas from which most of the study participants moved.

### 3.2. Wild Vegetables

Interviews revealed a remarkable resilience of foraging practices among Pashtuns with regard to farming activities, exclusively related, however, to wild leafy vegetables growing close to courtyards. Women are the main foragers of widely available weeds, which they gather, using just their hands, from anthropogenic areas close to cultivated plots. Once the wild vegetables are brought home, they are washed with water several times and then boiled in hot water for 10–20 min; after boiling, the water is drained and the boiled vegetables are fried with tomatoes, onions, garlic, and possibly chilies (*gadwad saba*). Generally, this second stage takes about 10–15 min and the dish is served with whole wheat bread (*tandoori nan*), normally baked by elderly women at home in clay ovens.

Moreover, boiled wild vegetables are often also used as a filling for the national Afghan dish called *bolani* (a flat-bread, normally baked with a vegetable filling, Figure 5).



**Figure 5.** Foraged weeds (*Amaranthus*, *Chenopodium*, and *Portulaca* spp.) and *bolani* filled with them.

In addition, study participants also revealed that they sometimes use a combination of wild vegetables with some cultivated leafy vegetables, most commonly spinach (*Spinacia oleracea*). Furthermore, most of the informants living outside the refugee camps reported the preservation of some wild vegetable plants such as mallow and alfalfa (*Malva* and *Medicago* spp., respectively), which are dried on mats in direct sunlight; after drying, these vegetables are stored in a porous cloth bag or a piece of cloth for use in the off season, just putting them back in water.

Dried wild vegetables are especially used during the winter and times of financial insecurity as well.

The majority of the study participants from the community of Afghan Pashtuns living outside the refugee camps also reported a few wild plants used as *edible medicines*; in particular, cooked dock leaves (*Rumex* sp.) are considered a remedy for constipation, while processed mallow (*Malva* sp.) leaves are considered to be a strengthening food for pregnant women. The most popular homemade beverage among all Afghans living in the study area is green tea (sheen chai), which is additionally recognized as a medicine for lowering body fat and cardiovascular problems. Moreover, the Kochi community used to prepare green tea with wild *Withania* leaves and Pashtuns living outside the camps wild *Olea* leaves.

Overall, the plant knowledge of Afghan refugees seems to have been heavily affected by their relocation. The data show an overarching reduction in foraged wild plants growing in the mountains due to their transfer into a new (plain) natural environment.

The wild plants still regularly foraged by Pashtun refugees living outside the refugee camps are for the most part weeds, i.e., synanthropic species growing in anthropogenic environments (*Chenopodium*, *Lepidium*, *Lamium*, *Malva*, *Medicago*, *Portulaca*, *Rumex*, and *Stellaria* spp.); they are easily accessible around the settlements in the fields and sometimes in the corner of courtyards, and the continual practice of foraging them has kept the LEK attached to weeds alive. In fact, despite the occurrence of weeds in their settlements as well, Pashtuns living inside the refugee camps no longer retain much LEK.

Another reason could be that they “do not need” to gather wild vegetables, as they mainly live on remittances sent from abroad. A 71-year-old woman from this community underlined her view in this way:

*“These wild plants are normally used as fodder for animals; I don’t like to eat the animal food, it’s an embarrassing food for us. We don’t use wild food plants anymore and their consumption is a story of former times”.*

This statement seems to also entail an internalized bias possibly derived from the majority of inhabitants living in urban environments, according to whom the eating of weeds is a custom of a poor and turbulent past that has to be eliminated. This latter aspect deserves a more detailed discussion concerning the role played by trauma in keeping gastronomic heritage linked to everyday domestic cuisine (and not to festival dishes).

In Caruth’s psychoanalytic theory of trauma, for example, it is not the experience itself that produces a traumatic effect, but rather the remembrance of it [45]. Active forgetfulness, in this case, is a dynamic ability to overcome traumatic and negative memories, which is a necessary condition for the culture of a minority group to support and develop itself further [46]. Aarelaid-Tart (2006) argued that, in a situation of cultural trauma, people inhabiting an unfamiliar cultural space start to speak of traditions not being kept, or for which no one is able to practice them under the new circumstances [47]. Our findings could potentially explain the increase in cultural disorganization and disorientation among the studied Afghan Diaspora as a direct result of traumatic cultural changes. Recent systematic reviews demonstrated that experiencing forced resettlement due to war conflicts and acute political crises was a traumatic event for relocated residents [48–50]. Traumatogenic social changes are not limited to their destructive effect on society at the macro level, as they also directly affect functioning at a micro-scale, specifically on the knowledge and practices of individuals. Wartime displacement from Afghanistan to neighboring Pakistan involved a significant disruption of the everyday life of relocated ethnic groups, the collapse of social networks, threats to beliefs and values, the loss of a familiar environment, disconnection from the local community, and especially a concentrated loss of resources. On the other hand, according to Hunt and Gekenyi [51], refugees are often traumatized more by their arrival and reception in the unknown country than they are by the events they witnessed or experienced in their home country. Positive adaptation in the face of forced relocation, therefore, may be drawn from individual strength, local community support, strong culture roots, and broader social and political forces of the host country [52].

Moreover, the LEK retained by Uzbek Afghan refugees, who relocated to semi-urban areas and mainly work as butchers, dramatically declined. This group quoted the lowest number of wild ingredients (Figure 4). One of the study participants (51-year-old man) from this community commented:

*“Since foraging requires time, I prefer easily accessible vegetables in the market”.*

This shows that this group possibly went through an acculturation to the urban mainstream, also given the fact that several male community members run butchers’ shops.

Also Kochis, who are mobile pastoralists [53], do not substantially forage anymore, as they ironically buy cultivated vegetables from the market when they live in the plains during the cold months and take these vegetables with them to the pastures when they move there with their herds in the spring.

Among the four considered groups, Kochis therefore also had the highest proportion of remembered plants (Table 2), possibly because their relocation to Pakistan heavily affected the opportunity of practicing their LEK in the mountain environments where they keep their herds, which in Afghanistan were higher and much more extensive. This group seems to have opportunistically kept their mobile pastoralism (in a semi-mobile, transhumant way in Pakistan) in order to be able to trade animals as a survival strategy, but they seem to have lost many foraging practices that they used to have in their home country.

The memories and narratives of wild food plants are also different among the four studied groups. The community that mostly engaged in foraging (Pashtuns living outside

refugee camps) remembers with nostalgia those wild food plants that they can no longer find in Pakistan. A 45-year-old woman stated:

*“I wish I could find my home country wild vegetables here in Mansehra, I cannot forget their delicious taste”.*

Only one of these wild food ingredients (wild caper), which seems to not be available in Pakistan, is procured from Afghanistan relying on a network of relatives and attached informal exchanges still ongoing to and from Afghanistan, as a 60-year-old man explained:

*“A few days ago I asked my daughter on a phone call to bring me some dried wild capers from Afghanistan and upon her arrival she gave them to me. I fried these along with a few eggs and they tasted delicious”.*

After four decades of living in the new host environment, Afghan refugees highlighted as remembered fifteen wild food plants, of which the identity of a few of them could only be hypothesized on the basis of their folk names and plant descriptions: this was the case, for example, for plants referred to as *bandakey* (*Polygonum* sp.) and *kheza* (*Allium rosenbachianum*).

### 3.3. Herbal Teas

Considering herbal ingredients, adaptation to the new socioecological environment in Pakistan involved a deeper loss of LEK. This may also be due to the accessibility to pharmaceuticals in Mansehra District. Afghan refugees currently use a very small number of plants in comparison with what they remembered from their home country.

The large majority of the quoted herbal teas have been evaluated by modern pharmacological and phytotherapeutical studies; the most common currently utilized herbal ingredients included *Trachyspermum*, *Berberis*, *Alkanna*, *Brassica*, *Cannabis*, *Pegamum*, *Plantago*, *Myrtus*, and *Heliotropium* spp., while slightly more than half of the quoted herbs were only remembered as being used in the past in Afghanistan. The few currently used herbal ingredient plants quoted by the refugees are, however, rarely gathered from the wild and more often bought in dried form from Pakistani markets.

Looking closely at the dynamics of the four groups, it also emerges that in this domain Pashtuns living outside the refugee camps partially continue to use a number of medicinal plants. As pointed out by one informant, a 50-year-old Pashtun man living outside the camps:

*“I use to buy available medicinal plants in the local market; I believe these plants are safe and are better than modern science based medicines”.*

A 40-year-old male Afghan Pashtun refugee living in a camp instead commented:

*“We prefer modern science instead of herbs since the effect of medicines is fast and they are readily available”.*

A 60-year-old male Uzbek Afghan study participant confirmed this view:

*“We prefer to go to doctor nearby in case of ailment and distress”.*

The LEK regarding the use of herbal ingredients among pastoralist Kochi refugees has also been eroded and they are nowadays completely dependent on pharmaceuticals. As one of the informants (28-year-old man) pointed out:

*“Our forefathers used these medicinal plants, in this present time we mostly prefer to go to private clinics when we are in the plains, while we take cough and fever syrups with us when we move to mountain pastures”.*

Refugees procure a number of dried herbal ingredients for teas from their homeland. These include *Heliotropium* sp., an indigenous plant from the home country that is perceived to relieve back and joint pain and act as an aphrodisiac for both men and women, *Alkanna tinctoria*, which is considered an important external and internal wound healer, and *Salvia* spp. that are strongly perceived as aphrodisiacs for women.

Despite the importance of the transnational flow, the interviewees pointed out that the possibility of obtaining plant materials from Afghanistan has decreased drastically in

recent years, due to the new border policy shaped by Pakistani authorities, who allow only Afghans having a passport with a valid visa to move into Pakistan. A 54-year-old male Afghan refugee described this phenomenon:

*“When it was financially feasible I used to travel to my home country regularly, and on my journey back I used to bring some dried medicinal plants and even dried wild vegetables, but since the new borders policy changed I have been unable to travel regularly to my home country; it is very costly now, thus I have abandoned the use of these plants”.*

The analysis of this procurement strategy and its recent changes, therefore, suggests a progressive weakening of the tie that binds refugees with their motherland, which proceeds hand in hand with a greater reliance on the resources present in the new location, especially in local Pakistani markets. This phenomenon has a further impact on the process of transformation and erosion of the LEK of the refugees.

The majority of the study participants interviewed shared very little information about the use of herbal and other domestic ingredients for treating domestic animals. The most commonly quoted herbal teas still used by the study participants included *Trachyspermum*, *Glycyrrhiza*, *Paeonia* spp., and an unidentified lichen. The majority of the veterinary plants and other domestic remedies were quoted by less than one-third of the informants, mainly pastoralist Kochis, thus suggesting that this kind of biocultural heritage is seriously threatened. One possible reason for the loss of traditional knowledge regarding the use of natural remedies to treat domesticated animals may be that most diasporic Afghans—apart from Kochis—keep very few animals at home.

### 3.4. Socioeconomic Factors Influencing the LEK of Refugees

The data presented in the tables and the figures should, however, be contextualized into a broader discussion about the changes undergone by LEK and read in light of the complex process of resettlement of refugee communities. This process entails environmental, physical, economic, and sociocultural factors, and in particular a radical change in household economy [54], in particular for Pashtun refugees. The present situation sees a substantial continuation of the kind of activities conducted in the homeland for Uzbek Afghans, who have historically played a crucial role in urban areas and in particular as traders [55], and for the Kochis, who have been historically linked with pastoralism and nomadism [53]. Pashtun refugees faced the biggest economic and cultural challenge. While relocation of communities is still a key political topic for the future of both Afghanistan and Pakistan [56], most of the informants were farmers forced from their lands and relocated in refugee camps. In the new, difficult environment [57], adaptation strategies have involved different solutions that are epitomized by the distinction between Pashtuns living inside and outside the camps. Nowadays, while Pashtuns living in camps and also Uzbeks base their daily life on an urban economy, Pashtuns living outside camps and Kochi pastoralists continue their main occupations in the host country conducting horticultural and pastoralist activities, respectively. The preservation of greater LEK among the latter groups suggests the importance of everyday exposure and dependence on the environment and its biodiversity, whereas the other two groups have relied more on what market relationships can provide.

The importance of frequent exposure to the natural environment in retaining LEK is also demonstrated by the gap in LEK that emerges among the different groups. Pashtun women living outside refugee camps gather wild plants and possibly acquire knowledge by doing this, while in the other communities, women mostly stay at home and no longer forage.

The difference is seen not only on the level of currently collected wild food plants, but also those that are just a remembrance of the name. Of nineteen remembered wild plants, 10 were remembered solely among the Pashtuns living outside the camps, the group that has retained everyday contact with nature. The relationship of farmers to their land and the natural environment is embedded in their culture, and when this tie is broken, by removing the person from everyday interaction with nature, “signs and

stories” related to the place [58] are rearranged and newly written. Foraging and the use of wild plant ingredients belong to tacit knowledge, described by Hungarian philosopher Michael Polanyi (1966, [59]) as a skill that connects the mind with the body and, in our case, the environment in which the body functions. The lack of interaction with the natural environment prevents tacit knowledge from not only developing further (both in the natural environment and in the kitchen), but even continuing to thrive close to the level it did while nature was still present in the semi-sphere of the person. Ecosemioticians Timo Maran and Kalevi Kull have highlighted that “human culture is a part of the ecosystem” [60]; from that, the ecosystem shapes human culture.

All the Afghan refugees are similarly affected by the Pakistani cultural environment, in terms of economic expectation, cultural models, and social practices [61]. Yet, the most urbanized groups (Pashtuns in camps and Uzbeks) are experiencing a tremendous erosion of their LEK, i.e., they have lost the opportunity to interact with the natural environment in the new host country. The results of this study clearly indicate that if people are removed from a familiar ecosystem and not provided something comparable in return, communication between the culture of those people and the environment ceases to exist, which affects not only current environmental and culinary practices and relationships, but also the memories of past relationships. The trauma of relocation magnifies the withdrawal from the natural environment, changing even past cultural codes related to the environmental domain. As culture is rooted in nature, without these roots culture is in danger of collapse.

Our research points out that the expectations of modernity [62] have lured the younger generations away from an agropastoralist economy, causing a rapid disintegration of their daily interactions with the environment and a loss of gastronomic heritage as well. The hegemonic effect [63] of Pakistani culture is also evident in the marginalization of traditional herbal practices, which are preserved in an active form very rarely and especially only by those refugees (i.e., Kochis) who live for many months far from healthcare centers and urban facilities.

#### 4. Conclusions

The data presented in the current article show that the four Afghan refugee communities living in NW Pakistan still practice a few foraging activities and these are linked to their gastronomic heritage too. This knowledge-practices-beliefs system, which, however, is mainly alive in the memories of refugees, should be valorized, preserved, or even re-activated with the aim of fostering social sustainability and inclusion.

The study shows also that Afghan refugees, who share a similar migration history and live in the same natural environment, do not necessarily forage and subsequently utilize wild vegetables and herbs in the same way. The cultural makeup of communities is critical to the articulation of the links among their social dimension, the wild food systems, and the local flora.

More importantly, this study suggests that continued exposure to the new natural environment plays a crucial role in keeping foraging and wild food plants-centered gastronomic practices alive, and that, conversely, a long-stay in refugee camps or engaging in urban activities may lead to the erosion of LEK. These findings suggest that policy-makers should pay particular attention in shaping strategies linked to migrants and refugees. Long stays in refugee camps in particular may be detrimental for their cultural heritage and ultimately for their empowerment and well-being and should therefore be avoided. Finally, the study shows also that the rearrangement of refugees’ social life has a significant effect on their nature knowledge.

**Author Contributions:** Conceptualization, A.P.; data curation, A.M.A. and K.C.; formal analysis, S.M.K., A.A., M.H.A., M.S.A., and A.P.; funding acquisition, A.P.; investigation, A.K.M.; methodology, A.M.A. and A.P.; validation, A.P.; writing—original draft, A.K.M. and A.P.; writing—review and editing, J.P., M.F.F., R.S. and A.P. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research was partially funded by the University of Gastronomic Sciences, Pollenzo, Italy.

**Informed Consent Statement:** Informed consent was verbally obtained from all the study participants; the field study was conducted strictly following the International Society of Ethnobiology *Code of Ethics* [29].

**Acknowledgments:** Special thanks are due to all study participants of the different groups who generously shared their knowledge.

**Conflicts of Interest:** The authors have no conflict of interest.

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