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**Viewpoint**

# Forgotten crops, future crops? Perspectives and potential of minor varieties and underutilised crops in diversified food systems

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## Abstract

The ongoing global decline in agrobiodiversity poses significant threats to the long-term sustainability of food security. Currently, the vast majority of global calorie production relies on just a handful of commercial crop species, while thousands of traditional varieties and minor species remain underutilised. Unlocking the potential of these overlooked genetic resources through innovative approaches offers a promising pathway to enhance food and nutrition security and improve resilience across the food systems. However, reintroducing forgotten crops into contemporary food systems is limited by numerous systemic challenges. This study explores the barriers and facilitators inherent to these crops, namely inconsistent nomenclature, misaligned policy frameworks, supply chain disruptions, and the physicochemical variability of traditional varieties. At the same time, factors such as higher nutritional density, unique organoleptic characteristics, deep socio-cultural connections, and emerging market opportunities support their wider adoption. Shifting food systems towards greater diversification with forgotten crops demands a holistic and multidisciplinary approach that integrates agronomy, policy, economics, food science, and ethnobotanical studies. Without addressing these complex and interconnected barriers, efforts to revitalise agrobiodiversity initiatives remain fragmented and inadequately matched against systemic risks. As such, there is an urgent need for coordinated strategies that recognise the full value of these crops and systematically overcome the obstacles for food systems transformation.

**Keywords:** forgotten crops, underutilised crops, minor foods, diversification, food security, food systems, landraces, value chains, heritage, diversity



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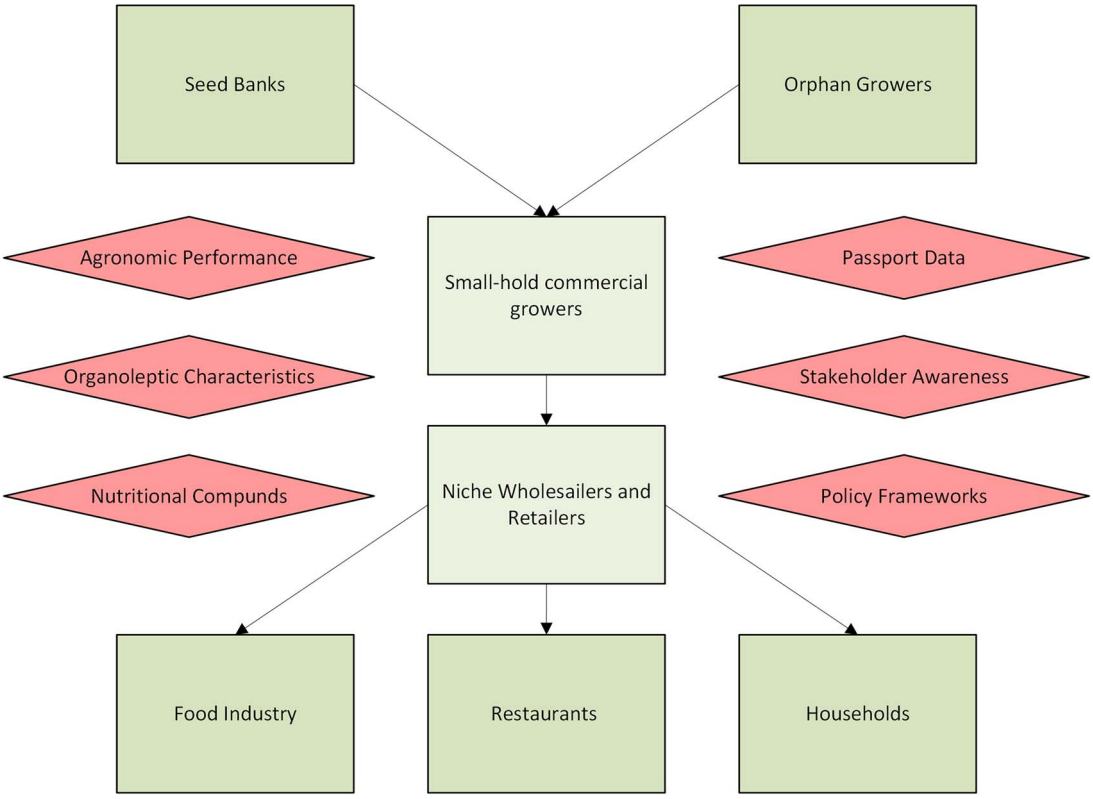
## Graphical abstract




## Introduction

The global decline in agrobiodiversity poses serious risks to food and nutrition security, dietary diversity, and food systems stability (Antonelli et al., 2023; UNICEF, 2024). Since the Green Revolution, agricultural systems have become increasingly homogenised, prioritising high-yielding improved crops as a strategy for elevating food security. However, this success was forged at the expense of crop diversity. Over 7,000 edible plant species are known, and more than 400 have historically been cultivated as crops (Antonelli et al., 2023). Yet, today just 16 species account for up to 80% of global calorie production, including wheat, maize and rice (Ulian et al., 2020). This disappearance of agricultural diversity has pushed many minor and traditional cultivars and lesser-known species out of food systems and consequently, off consumer plates. Many of these neglected crops and underutilised cultivars hold significant economic, societal, and technological potential, which could be harnessed through innovative agri-food development programmes (Antonelli et al., 2023). Agrobiodiversity loss, driven by intensive agricultural practices and reinforced by structural factors within global food systems, has been recognised as a major threat to sustainable food and nutrition outcomes (Antonelli et al., 2023). This narrowing of the global crop base also carries nutritional risks for consumers. Reliance on a small number of dominant staples reduces the diversity of substrate and micronutrients available in the diet, particularly where imported crops are used to alleviate seasonality and replace animal protein consumption. These consumer-level implications further underscore the importance of conserving and reintroducing diverse crops. Beyond nutritional and ecological consequences, agrobiodiversity loss can erode food system sovereignty. A reliance on a handful of globally traded crops concentrates control within a limited segment of the value chains, reducing local autonomy, constraining consumer choice, and increasing vulnerability to shifts in global markets (Baldermann et al., 2016). Furthermore, the increasing adoption of plant-based nutritional guidelines in many countries worldwide, particularly across the European Union, intersects with these trends and has important implications for metabolic health and overall consumer well-being. Emerging evidence suggests that when guidelines are operationalised through a relatively narrow range of plant species, they may exacerbate both crop and gut microbiota homogenisation, which in turn is associated with heightened risks of metabolic disease and cognitive decline (Hanley-Cook et al., 2025).

To address these challenges, global organisations such as the FAO (Food and Agriculture Organisation) of the UN (United Nations) advocate for more diverse diets and the promotion of sustainable food production and consumption practices, including the revival of forgotten crops, (UNICEF, 2024). Recognising the value of forgotten crops, landraces, minor varieties, underutilised species, and other traditionally maintained cultivars within food systems can contribute to preserving agrobiodiversity, by raising awareness and encouraging conservation through use (Ulian et al., 2020). At the local level, the diversity of forgotten crops matters because long-cultivated traditional crops and varieties often carry beneficial adaptive traits. Globally, their continued adaptation to a changing climate depends on *in-situ* conservation. Further exploration and integration of these crops could enhance food diversity and nutrition security and increase the sustainability of the food systems locally and globally (UNICEF, 2024). Despite their advantageous traits, many traditional cultivars are marginalised to minor roles today (Antonelli et al., 2023). This is predominantly

due to the fact that traditional varieties have not undergone intensive breeding programmes, resulting in the appearance of spontaneous characteristics (Maxted et al., 2014). Furthermore, there are systemic inconsistencies across definitions for terms describing forgotten crops, which could function as barriers to their wider utilisation (Berg, 2009). This lack of uniformity can limit their usability across the food industry; simultaneously, this can enhance other forgotten crops valorisation initiatives. Moreover, through policy and agenda-setting, governments and non-governmental organisations shape how forgotten and minor species and varieties are perceived, thereby influencing the flow of funds, information, and goods across food supply chains (Lara & Ryan, 2025). In order to understand more clearly how the food systems operate in relation to these crops and how they interact with standard crop developments, an interdisciplinary approach is required (Chaudhary et al., 2018).

This paper therefore provides a multidisciplinary overview of the issues faced by forgotten crops, examining the barriers and facilitators that influence their integration into modern supply chains. By synthesising perspectives from across the food systems, this paper aims to direct attention towards these neglected resources and encourage coordinated interventions from all stakeholders. In doing so, it seeks to support the preservation of agrobiodiversity and contribute to the development of more diverse, sustainable, and resilient food systems.

## Nomenclature issues

The successful utilisation of forgotten crops and landrace varieties depends on their visibility to stakeholders across the food value chains. A central challenge lies in the inconsistent terminologies used to describe these crops (see Figure 1). Terms such as "heritage," "traditional," "underutilised," and "landrace" are often used interchangeably in the literature and in practice, which can create confusion and communication barriers between researchers, growers, policymakers, food industry, and consumers (Azam-Ali et al., 2024; Berg, 2009).

The complexity is further compounded by inconsistent classifications among seed banks and international databases (Villa et al., 2005). Misaligned definitions can contribute to issues such as mislabelling, misrepresentation, data inaccuracies, or even food fraud. Of these terms, only "landrace" has a botanically grounded definition: "a dynamic population(s) of a cultivated plant that has historical origin, distinct identity and, as well as often being genetically diverse, locally adapted and associated with traditional farming systems" (Villa et al., 2005). These definitional challenges are further complicated by regional differences in how traditional crops are categorised, valued, and discussed within food systems, as illustrated by contrasting Global, European, and U.K. contexts.

These ambiguities in classification are mirrored by regional differences in how traditional crops are perceived across food ways . Across the world, regionally indigenous crops and other traditional varieties embedded in cultural food systems often serve as focal points for research, investment, and valorisation. In these contexts, terms such as "indigenous crops" or "traditional crops" are used, referring to non-native species that have been integrated into cultural food systems over time (Kuhnlein et al., 2009).

In the U.K., the situation is distinct compared with many other European countries and much of the rest of the globe. The U.K. has no truly indigenous crops and, despite its long agricultural history and its role as a hub for crop exchange, many valuable forgotten crops and cultivars have been permanently lost (Lara & Ryan, 2025). Compared with many other European nations, U.K. now retains far fewer traditional crops and less landrace diversity.

Elsewhere in Europe, retail and food industry discourse frequently embraces colloquial terms such as "ancient," "heritage," or "heirloom" which are often used to describe traditional cultivars predating varieties developed through modern agri-food development (Negri et al., 2009). This viewpoint is especially evident in ideas and practices around "ancient grains" which, in the case of wheat, all examples simply refer to non-hybrid cultivars of bread wheat or other wheat species (like spelt—which is botanically less "ancient").

While "underutilised" and "forgotten" are often used as broad and overarching terms, there are distinctions between promoting improved *versus* unimproved varieties and between historically cultivated species and newly introduced ones (Lara & Ryan, 2025). In agricultural research and development, the label "underutilised species/variety," along with related terms such as "orphan crops," typically refers to species that remain outside mainstream commercial markets yet hold promise for future agri-food development (Azeez et al., 2018). In this context, species might be chosen and focused on, in order to create new commercial varieties, including the development of resilient varieties through novel techniques like gene editing (Azeez et al., 2018). Similarly, improvement in practices may span from more organic-farming approaches to the development of new advanced farming technologies and applications. Some crops, particularly underutilised legumes, can also play an active role in improving the sustainability of practices due to their physicochemical characteristics (Semba et al., 2021).

Peas, for example, are a focus in a significant proportion of research on forgotten crops because they are, along with broad beans, the longest-grown European bean/pulse crops, which marks them as the predominant species in this category to have varieties promotable as "heritage," and for having any historically adapted landraces (Lara & Ryan, 2025). Furthermore, beans and other legumes have promising agri-food characteristics like nitrogen fixation and high protein and fibre contents (Stagnari et al., 2017). As such, the terminology debates in the U.K. are slightly different, and the quest to track down and valorise landraces are rarer and more difficult (as they are mostly lost or forgotten and often not collected with adequate information, as opposed to other regions of the globe). Broad beans illustrate this aspect well, within much of Europe, their cultivation is largely confined to allotment gardeners and smallhold producers, whereas in other regions they constitute a significant commercial crop. Within agricultural development frameworks, species with minimal or no historical cultivation in Europe may also be introduced as novel underutilised crops, provided they demonstrate climatic and geographical suitability. Such introductions can subsequently be prioritised for selective improvement. Overall, a great problem is that the nomenclature inconsistencies within and between countries and sectors in describing crops lead to insufficiencies in the flow of information and investments, ultimately limiting their valorisation potential.

## Changing production and consumption trends

Global demand for sustainably produced food continues to grow, a trend also evident across Europe and the U.K. (Piñeiro et al., 2020). In response, some businesses in the Global North are

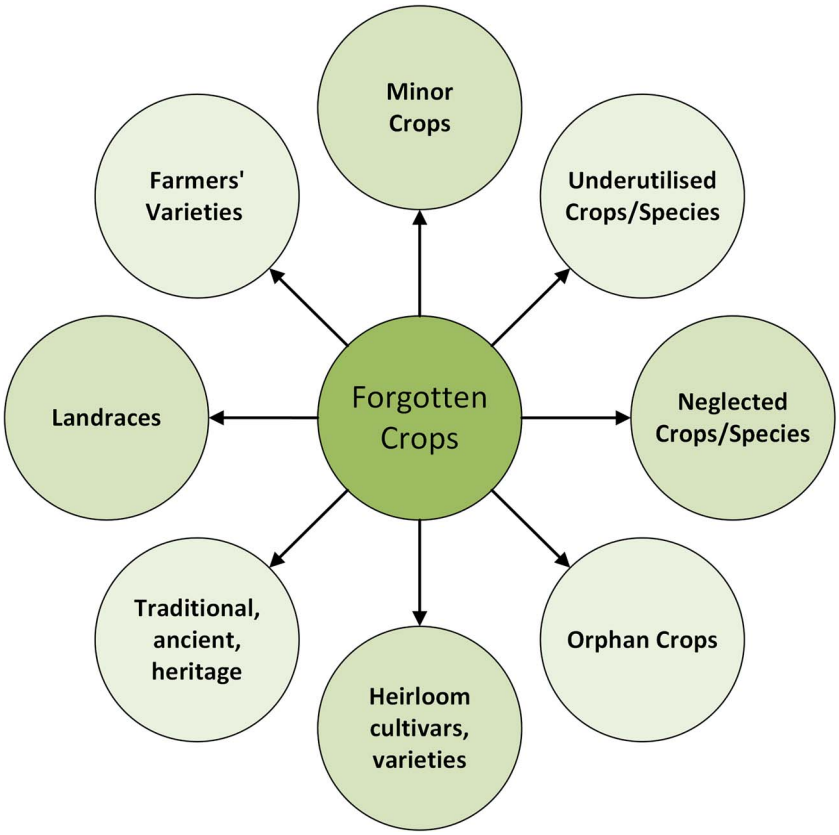



**Figure 1.** Typical variations in terminologies used to describe forgotten crops.

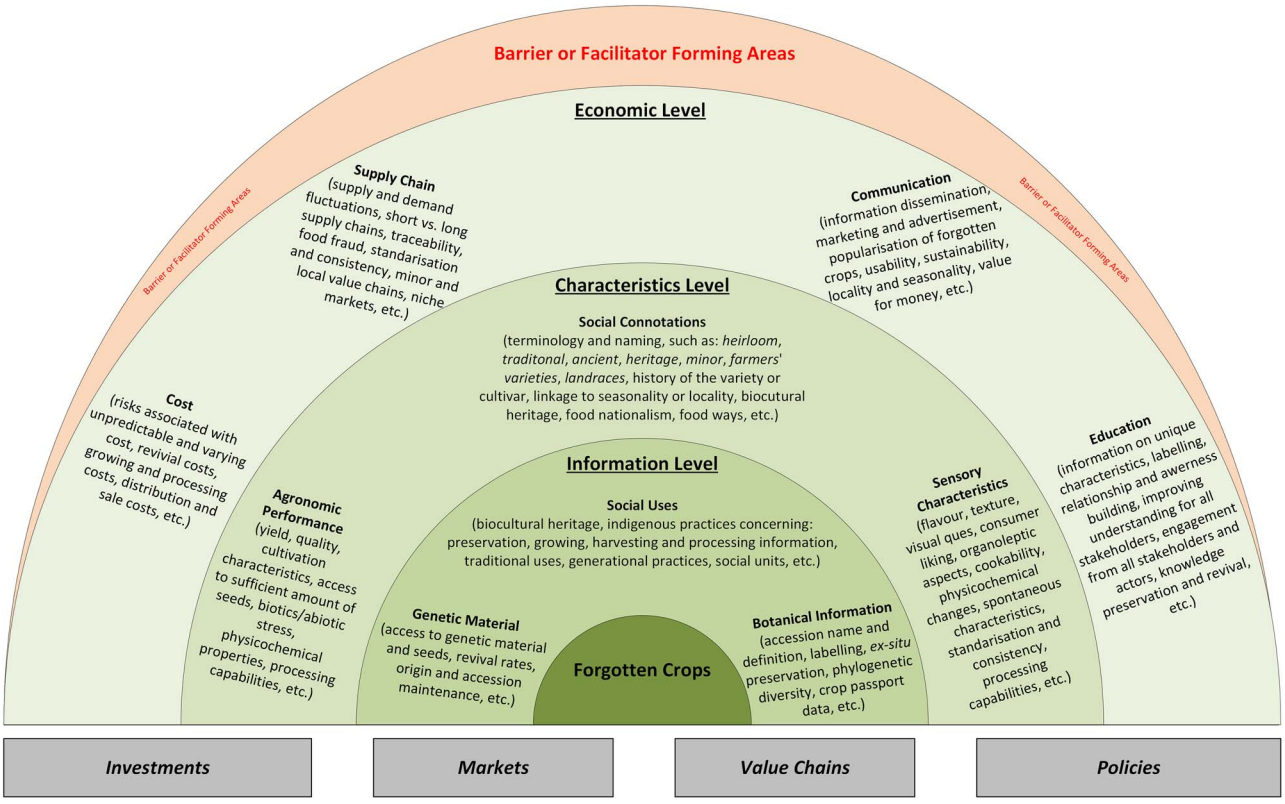



**Figure 2.** Key domains shaping the formation of barriers and facilitators to forgotten crop use, spanning economic, characteristic and information levels, and their connections to the four paradigms; investments, markets, value chains and policies.

already active in niche markets distributing lesser-known grains, pulses, and other legumes. While this does not yet indicate widespread consumer adoption, it does highlight early business engagement with more diversified food portfolios. These crops are often linked to perceived value, such as superior nutrition, sustainability, or cultural heritage, which can facilitate charging premium prices and improve farm-level profitability (Sánchez et al., 2022). Therefore, diversification of product portfolio with underutilised species could increase the value chain's economic prosperity (Negri et al., 2009; Sánchez et al., 2022).

This also suggests that these crops may hold hidden economic potential, particularly when they are positioned as "premium" foods. At the same time, in many other contexts, consumers may be unwilling or unable to pay higher prices, for example, due to wider economic pressures and a generational loss of basic food literacy and cooking skills, which could constrain such valorisation strategies. All of which inadequately decrease the potential of recognition for these hidden social traits at the retail and household levels (Raggi et al., 2022). Furthermore, crops grown in diversified farming systems might simply be their improved cultivar versions and reflect little or no connection to the actual historical varieties. Still, the consumers' emotional attachment to these foods could be utilised to facilitate supply chain diversification.

Despite these emerging trends, the transition from niche interest to mainstream adoption remains highly uncertain for forgotten crops. Consumer perceptions, cultural familiarity, and retail-level positioning all play a decisive role in shaping demand, yet these factors are unevenly distributed across contexts. The visibility of these crops in markets is closely tied to how they are framed, whether through narratives of sustainability, heritage or innovation, which can either support or constrain their acceptance This highlights the need for further empirical work to understand how consumer behaviour, market incentives, and supply chain structures interact to influence the future trajectory of forgotten crops in modern food systems.

## From seedbanks to kitchens, sourcing forgotten crops

Sourcing forgotten crops, particularly at a commercial scale, presents multiple challenges. Historically, farmers maintained seed diversity through on-farm seed saving, which contributed to the emergence of landraces uniquely adapted to specific local conditions. However, the rise of commercial seed markets and chemically intensive agriculture since the early 20th century has marginalised these practices, leading to the decline in the presence of many traditional varietals. Desperate efforts to save these old varieties, alongside the protection of newly established levels of food security, have led to the worldwide spread of seed banking initiatives (Pingali, 2017).

Today, there are approximately 1,750 gene/seed banks around the world, collectively safeguarding over 7.4 million plant genetic resource accessions. These gene banks are distributed across more than one hundred countries and include key international and regional centres such as those managed by the Consultative Group on International Agricultural Research system, which alone holds around 773,000 accessions. While the total number of accessions is large, it is estimated that only about 25% to 30% are genetically unique, with the remainder representing duplicates or closely related samples (Antonelli et al., 2023).

In the U.K., the use of farm-saved seed remains common for several major crops. Estimates suggest that approximately 45% of wheat, 32% of winter barley (excluding hybrids), 34% of spring barley, 32% of oats, and 50% of oilseed rape (excluding hybrids) planted on U.K. farms are from saved seed. Under the U.K.'s implementation of Plant Breeders' Rights regulations, small farmers (as defined by the EU) are exempt from paying royalties on farm-saved seed. This exemption may offer an incentive for the preservation and continued use of locally adapted crop varieties, particularly among smaller-scale and resource-conscious producers (Martin et al., 2009; Spataro & Negri, 2013).

Still, on-farm seed saving for minor crops in the U.K. is limited, reflecting the scarcity of surviving diversity, particularly among crop landraces (Maxted et al., 2014). Institutions such as the Heritage Seed Library, the John Innes Centre, and Science and Advice for Scottish Agriculture maintain over three hundred landrace/heritage crop varieties of mixed origin, most cultivated solely for research and conservation, including some rare wheat, pea, and barley cultivars. These collections are suited through collaboration between small-scale growers, often referred to as "seed guardians" and managing organisations, some of which, such as the Warwick Crop Centre, also engage in breeding and development to promote historical species and varieties. By contrast, across Europe, traditional cultivars and landraces are often preserved within community seed banks supported by networks like the European Coordination-Let's Liberate Diversity (EC-LLD), with some accessions also duplicated in global repositories such as the Svalbard Global Seed Vault in Norway (Vernooy et al., 2015). Complementing these physical collections, digital tools such as the *Radiant* mobile app, function as knowledge hubs and decision-support platforms, promoting awareness, cultivation and consumption of neglected and underutilised crops by connecting farmers, researchers and consumers, linking local crop choices to formal resources like the CropBase-EU databse.

Simultaneously, it is exceedingly difficult to map the existing Landrace growing areas, especially as their geographical positioning data is limited, as opposed to, for example, wild plants. This poses some revival issues as landraces cultivated outside of their geographical region might not perform as well. Majority of the mentioned "conservation sites" can be found within just a few regions. For example, the Scottish Isles like Orkney and Shetland are predominately where traditional varieties and landraces of cabbage, oats and bere barley can be found (Martin et al., 2009). However, lack of appropriate investments can lead to problems with seeds translocation/re-introduction. Raggi et al. (2022) report that twenty-five distinct landrace varieties of major crops (predominantly peas, wheat, oat, barley) are currently cultivated in the U.K., across 264 designated sites, however, the total number of landraces present in either the U.K. or the EU remains undetermined. Within wider European context, countries such as Spain, France, Italy or Turkey are where most landraces (usually legumes such as peas and chickpeas) and other minor horticultural crops (apples, plums, pears) are still preserved informally and *in situ,* in contrast to the more limited *in situ* presence observed in the U.K. Beyond their agrobiodiversity advantages, these landraces also have significant cultural value and contribute to regional heritage, helping to maintain the emotional cycle of heritage seed preservation within European food systems (Lara & Ryan, 2025).

Appropriate investment and popularisation can be viewed as diversification facilitating. Crop/variety "improvement" or "promotion" can be potentially "fast tracked" by the coordination of revival/breeding approaches and geneticists, with socio-economists, agronomists, nutritionists, food industry professionals, and gastronomists, thus highlighting the multidimensional and interdisciplinary nature of the food diversity problem (Azam-Ali et al., 2024). Pre-breeding programmes for forgotten

crop development are another avenue for food system diversification that requires more investments. Nevertheless, once a heritage variety or landrace is modified, for example, through a pre-breeding program, it may no longer be classified under these terms but would become a new improved cultivar. As such, many businesses selling traditional varieties of crops rely on their improved cultivars, only utilising their cultural heritage characteristics and consumers' emotional attachment for promotion, with little to do with actual forgotten-crop statuses. In many cases, emotional attachment is leveraged for promotional purposes, with limited connection to the actual forgotten-crop statuses of the varieties involved. Beyond potential implications for business or research utilisation, a lack of geographical detail can also undermine efforts to highlight the cultural significance of a crop (Maxted et al., 2014). Additionally, most seed banks require formal genetic material exchange contracts, meaning that non-institutional agreements may not be recognised and acquisitions are often limited to only a small number of seeds per accession, with unspecified revival rates.

Taken together, these factors illustrate that moving forgotten crops from conservation settings into commercial supply chains remains a complex and resource-intensive process. Addressing these constraints will require coordinated action across conservation, breeding, policy, and market systems.

## Agri-food characteristics

Many underutilised cultivars possess distinct sensory and nutritional traits that can appeal to consumers, industry actors, and chefs alike. Unlike commercial cultivars bred for uniformity and high yield, traditional varieties often exhibit greater variability in physicochemical aspects, often manifested through greater variations in appearance, flavour, and organoleptic characteristics (Dwivedi et al., 2016; Westling et al., 2019; Medina-Lozano & Díaz, 2020).

A particularly illustrative example is the case of the Spanish melons (*Cucumis melo* L.), where the landrace cultivars have outperformed the commercial cultivars for desirable sensory traits such as sweetness, fibrosity, and firmness (Escribano & Lázaro, 2017). Swedish horticultural landraces, such as apple and pear have also shown better flavour and texture profiles, creating a great potential for possible utilisation in gastronomy (Westling et al., 2019). Such sensory diversity offers opportunities for food innovation and premium positioning for businesses. Chefs play a critical role in unlocking the culinary potential of these crops through tailored preparation methods. However, this same variability poses challenges for industrial food processors, particularly when it comes to standardisation, efficiency, and scalability (Dwivedi et al., 2016; Westling et al., 2019). In this context, commercial cultivars almost always outcompete the forgotten and minor crops under intensified agricultural systems (Sánchez et al., 2022). However, studies have shown that some forgotten crops and landraces are likely to produce more nutritionally dense foods than the improved cultivars, especially when cultivated under traditional farming systems (Medina-Lozano & Díaz, 2020; Medina-Lozano et al., 2021).

Beyond their cultural and agronomic relevance, many minor crops also provide important nutritional benefits, particularly in areas affected by nutrition insecurity (Ulian et al., 2020). For example, the once widely present cactuses (Cactaceae) across Mexican cuisines, such *as Carnegiea tetetzo* L., *Cereus chiotilla* L. or the introduced legume—pigeon pea (*Cajanus cajan* L.)—as an alternative protein and fibre source, used to be household staples, providing essential minerals and vitamins, dietary fibre, and water, especially important for people living in water insecure areas. These food sources have been diminished for commercial commodity crops like wheat and maize. In African contexts, numerous edible shrub species within the Leguminosae-Papilionoideae subfamily, such as *Argyrolobium tomentosum*, and other Fabaceae, including the Bambara groundnut (*Vigna subterranea* L.) present significant potential as future staple crops in periods of food and nutrition insecurity (Ulian et al., 2020).

Landraces of crops such as wheat (*Triticum aestivum* L.)—(Hussain et al., 2015), lettuce (*Lactuca sativa* L.)—(Medina-Lozano et al., 2021), tomato (*Solanum lycopersicum* L.)—(Massaretto et al., 2018), and chickpea (*Cicer arietinum* L.)—(Torutaeva et al., 2014), often exhibit higher nutritional density than their commercially bred relatives. For example, wild and semi-domesticated varieties of lettuce had 21% and 8% higher ascorbic acid content, respectively, in comparison to their commercial relatives (Escribano & Lázaro, 2017). The superiority of certain forgotten crops lies not only in their nutritional composition and bioactive compounds, but also in their inherent resistance to abiotic and biotic stresses. In contrast, highly productive commercial cultivars may lack such resilience, particularly in contexts where further *ex-situ* crop development is pursued (Dwivedi et al., 2016; Sánchez et al., 2022). Still, these aspects might only be well suited for utilisation across scenarios other than for direct human consumption. As noted earlier, the rationale for diversification extends beyond the introduction of entirely new species to include the revalorisation of forgotten varietals of existing commercially utilised species.

## Policy challenges

Despite growing interest in this area, policy frameworks often fall short in supporting the integration of forgotten crops into modern food systems. Small-hold growers, gardeners, and allotment holders are the primary stewards of landrace diversity (Lara & Ryan, 2025; Maxted et al., 2014).

In the U.K., there are programmes such as the Sustainable Farming Incentive (DEFRA, 2025) and the Agricultural Transition Plan which refer to biodiversity but rarely focus explicitly on underutilised crops. While the 2022 U.K. Government Food Strategy also acknowledges the importance of agrobiodiversity, implementation mechanisms remain vague. In the European Union, there are programmes such as Realising Dynamic Value Chains for Underutilised Crops and DIVERSICROP (Harnessing the potential of underutilised crops to promote sustainable food production) underpinned through the Common Agricultural Policy.

Despite these programmes, additional limitations arise from the EU Crop Lists and the U.K.'s National Lists, along with Distinctness, Uniformity, and Stability (DUS) and Value for Cultivation and Use (VCU) registration requirements, which stipulate that varieties must exhibit these characteristics —criteria that many forgotten crops and traditional varieties are unable to fulfil (Lara & Ryan, 2025; Maxted et al., 2014; Veteläinen et al., 2013). Nonetheless, these regulatory constraints do not preclude opportunities for market and research initiatives to promote such crops. A relevant example is the successful introduction of quinoa into the British food system in recent decades, where it has become an established staple, marketed with references to local tradition, for example, "British-grown-quinoa" or "local-quinoa," exemplified by the "Shropshire-quinoa" case (Bazile & Baudron, 2015).

Another possible limitation is based on food safety regulations, specifically dictated by the Food Standards Agency (FSA, online,

2023). Products made from "novel" crops might have to be accompanied by more rigorous documentation due to lack of historical consumption (FSA, 2024).

Despite emerging global and European policy frameworks and the increasing popularisation of forgotten crops, the state of play in much of the Global North remains challenging for their revival. This is especially evident in the U.K., where existing policy and food-system structures still create significant barriers to the wider reintroduction of minor and traditional crops. By contrast, in countries such as the previously mentioned Italy, stronger culinary traditions and a more ingrained culture of everyday engagement with food may help to sustain connections between consumers, producers, and place. This, in turn, can support locally oriented food-security policies and create more favourable conditions for the preservation of minor crops than are currently cultivated across the U.K. A good example of this is the Italian *National Plan for Agrobiodiversity* (Piano Nazionale sulla biodiversità di interesse agricolo) and many other regionally tailored policies that focus on biocultural heritage across micro food systems (Negri and Torricelli, no date). There are also multiple other examples of European policies in place, outlined by Veteläinen et al. (2009) in their "European Landrace Conservation" report. Another European/EU policy (FED/2013/330-241), titled "Strengthening Capacities and Informing Policies for Developing Value Chains of Neglected and Underutilised Crops in Africa," provides insight into more widely distributed approach to the diversification of continental supply chains. These and other policy ideas could form the basis for future diversification-incentivising practices globally, in Europe and Britain, alike.

## Conclusion

Diversifying food systems through the reintroduction of forgotten, underutilised, and landrace crops remains a critical but underexplored opportunity to address food and nutrition security, enhance resilience, and support cultural and agroecological sustainability. As discussed throughout this article, these crops hold significant potential, yet they remain marginalised due to systemic barriers across multiple levels of the food systems (see Figure 2).

While challenges persist, ranging from limited access to seed material, agronomic variability, regulatory hurdles, and gaps in market infrastructure, each of these areas also presents a potential entry point for targeted interventions. Forgotten crops offer unique nutritional compositions, sensory qualities, and climate-adaptive traits, and their integration into value chains can bring social, economic, and environmental co-benefits. However, any attempt at revitalisation must go beyond isolated efforts and be embedded within broader, cross-sectoral strategies.

The emotional, cultural, and historical significance of many of these crops should not be overlooked. Food is embedded within place, identity, and memory. The loss of these crops is not only a nutritional or ecological issue, but it also represents a gradual erosion of food cultures, farming practices, knowledge systems, and food ways that have evolved over generations.

In conclusion, the repositioning of forgotten crops within modern food systems requires coordinated, interdisciplinary action involving researchers, farmers, policymakers, and food systems' stakeholders, including the food industry and chefs. Greater investment, clearer policy frameworks, and deeper engagement with consumers and producers are essential to drive this transformation forward. The aim is not simply to recover what has been lost, but to build food systems that are more diverse, equitable, and responsive to the challenges of the future.

## Data availability

Data sharing is not applicable to this article as no datasets were generated or analysed during the study.

## Author contributions

Szymon W. Lara (Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Supervisions, Validation, Visualization, Writing—original draft preparation writing—review & editing)

## Study funding

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## Conflicts of interest

The author declares that there are no known competing financial or other interests or personal relationships between the author and the publisher, project supervisors and the institutions that could have appeared to influence the work reported in this paper.

## Ethical approval

Ethical approval was not required for this perspective article.

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