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Homegardens in north-eastern Portugal: former features, roles, gendered knowledge and practices

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Abstract – This study describes general homegardens former features and primary functions in a protected rural area of the North-eastern Portugal, the Natural Park of Montesinho, and focuses on fundamental socio-cultural roles intertwined with economic and ecological purposes registered during a three year period, from 2002 to 2005, using ethnographic methodologies. The gendered nature of local homegardens is also discussed: former homegardens used to be female domains managed according to female values and ideals. Thus, gendered knowledge and women's intentions and practices are reported throughout the text.

Homegarden practices have maintained for a long time traditional knowledge, local culture and techniques and plant varieties. The complex structure and intertwined roles of Montesinho homegardens have been neglected by research and rural development professionals, perhaps because women, who were the primary experts and knowledge holders, were often marginalised

Changes in rural societies and the modernisation of lifestyles have affected homegardens' relevance, roles and management and have influenced gardeners' behaviour, the persistence and transmission of traditional knowledge and homegardens prevalence as important garden sites.

However, some participants considered that with new economic opportunities such as agritourism and organic produce, and the limited alternatives in rural areas, that situation could reverse in the medium term. . In this instance, transmission of homegardening knowledge and practice would be vital.

Key Words: *Homegardens, Traditional knowledge, Gender knowledge, Natural Park of Montesinho, North-eastern Portugal*

Homegardens do nordeste transmontano, Portugal: características, funções e saberes diferenciados

Resumo – Este estudo descreve as características dos homegardens duma zona rural do Nordeste Transmontano, Portugal, incluída no território da área protegida do Parque Natural de Montesinho. Aborda os vários papéis fundamentais desempenhados por estes espaços na cultura local, recorrendo a informação compilada através de metodologias etnográficas durante três anos (2002- 2005).

Também se analisam as relações de género e o modo como afetam o uso dos recursos e a gestão destes espaços: os antigos homegardens eram domínios femininos administrados segundo os valores e ideais das mulheres. Assim, os conhecimentos, as práticas e os objetivos das mulheres são registados e discutidos ao longo do texto.

Por outro lado, a gestão e maneio dos homegardens favoreceram a manutenção dos saberes e práticas inerentes à cultura local, bem como das técnicas agrícolas e variedades antigas. No entanto, a complexa estrutura e as funções destes espaços não foram tidas em conta pelos programas de investigação e desenvolvimento rural. A razão pode estar no facto das mulheres, detentoras dos saberes e modos de fazer, terem sido sempre marginalizadas.

As mudanças ocorridas nas sociedades rurais e a globalização afetaram a sua relevância e influenciaram o comportamento dos diferentes atores, a transmissão de conhecimento e a prevalência dos homegardens. As recentes oportunidades e alternativas previstas para as zonas rurais (i.e. agroturismo, produtos biológicos e de denominação de origem) podem reverter esta situação a médio prazo. Nesse caso, para recuperar algumas das funções dos homegardens será vital recorrer aos conhecimentos tradicionais

Palavras-Chave: *Homegardens, Conhecimentos tradicionais, Relações de género, Parque Natural de Montesinho, Nordeste de Portugal*

Huertos familiares del nordeste de Portugal: características, roles y relaciones de género en el manejo y en los conocimientos

Resumen – Este estudio describe las características de los huertos familiares en una zona rural protegida del nordeste de Portugal, el Parque Natural de Montesinho, Enfoca los roles fundamentales en la cultura local, recopilados con la ayuda de metodologías etnográficas durante tres años (2002 a 2005).

Las relaciones de género y el modo como afectan el uso de los recursos y la gestión de los huertos también se discute: los antiguos huertos familiares eran dominios femeninos administrados de acuerdo a los valores y los ideales de las mujeres. Por lo tanto, el conocimiento, las prácticas y los propósitos de las mujeres son reportados.

Su manejo ha favorecido la manutención de los conocimientos y cultura local, de las técnicas y prácticas, de las variedades, a lo largo del tiempo. Sin embargo, la compleja estructura y los roles de estos espacios no han sido muy considerados en los programas de investigación y desarrollo rural, quizás porque las mujeres, las principales titulares de los conocimientos y maestrías, han sido a menudo marginadas.

Los cambios en las sociedades rurales y la modernización del cotidiano han afectado la pertinencia de los huertos, sus funciones y gestión y han influido en el comportamiento de los diferentes actores, en la transmisión de conocimientos y la prevalencia de los huertos tradicionales. Nuevas oportunidades (i.e. agroturismo, productos orgánicos y de denominación de origen) pueden revertir esa situación en el medio plazo. En este caso, la transmisión de conocimientos y prácticas será vital para recuperar algunas de las funciones de los huertos.

Palabras Clave: *Huertos familiares, Conocimientos tradicionales, Relaciones de género, Parque Natural de Montesinho, Nordeste de Portugal*

Introduction

Homegardens have been analysed and defined from several perspectives (e.g. ecological, economic, social, land use, conservation) depending on the objectives of the research. It is generally accepted that they are multipurpose gardens characterised by their proximity to dwellings and involving the management of botanical and animal species that are distinct from the wider agricultural system (Hoogerbrugge and Fresco 1993; Eyzaguirre and Linares 2004; Kumar and Nair 2004). Homegardens have also been distinguished from commercial horticulture and arable cropping by the following characteristics: (i) they are rarely the main source of household income; (ii) they provide a combination of products for subsistence and cash; (iii) they occupy small plots, sometimes of inconvenient sizes and unsuitable for cropping; (iv) they require flexible labour inputs and particular productive strategies, reflecting both local (traditional) techniques and a more general agricultural

technology; (v) and they are frequently managed by women (Hoogerbrugge and Fresco 1993; Lok 2001; Reyes-García et al. 2010; Vogl and Vogl-Lukasser 2003; Vogl and Vogl-Lukasser 2004).

Despite their socio-cultural functions in rural communities, for some time, homegardens have been primarily studied from economic or ecological perspectives. This focus on one or two functions overlooks key factors and approaches to homegardens. For instance, cultural heritage in the form of traditional agricultural knowledge and practices are basic determinants of plant-use and also influence homegardens layout and composition. Moreover the term 'use' is rather complex and also involves cultural connotations (Schneider 2004). Knowledge about plants and cultivation, as well as the decision-making process are affected by status, gender, age, individual or collective expectations, and aesthetic preferences. Some gardening practices and homegardens purposes sustain local culture, can be profit generators and contribute to different complementary rural activities (e.g .agrotourism, educational and cultural events), as well as to rural development.

Many authors have contributed to homegardens' characterization and have reported their fundamental roles in different regions of the world, (e.g. Albuquerque et al. 2005; Kumar and Nair 2004; Maroyi 2009; Shillington 2008; Sunwar et al. 2006). Nevertheless, in Europe, particularly in the Iberian Peninsula, homegardens' research is quite recent and still limited (Reis-Garcia et al. 2012).

Since 2000 to 2010, wider research projects concerning ethnoflora, popular uses and traditional knowledge were carried out in North-eastern Portugal, Iberian Peninsula, Europe (Carvalho 2010; Carvalho et al. 2001; Carvalho et al. 2007; Carvalho and Frazão-Moreira 2009). Among many other different interesting research subjects homegardens activities have first caught our attention.

This paper describes general homegardens former features and primary functions in a protected rural area of the North-eastern Portugal, the Natural Park of Montesinho, and focuses on fundamental socio-cultural roles intertwined with economic and ecological goals registered during a three year period from 2002 to 2005, using ethnographic methodologies. The gendered nature of local homegardens is also discussed: former homegardens used to be female domains managed according to female values and ideals. Thus, gendered knowledge and women's intentions and practices are reported throughout the text.

Materials and methods

Study Area Background

The north-easterly part of Portugal (usually known as *Nordeste Transmontano*) (see Figure 1) is a mountainous area beside the Spanish border, with small villages scattered over a diverse landscape mostly influenced by harsh climatic and soil conditions and human activities carried out for a long time (Carvalho and Frazão-Moreira 2011). The most north-eastern extremity of this Portuguese region corresponds to a protected area created in 1979, known as Natural Park of Montesinho, and covering 734 km2. In 2002, the core territory of the park comprised 80 small rural communities (administratively grouped in 30 parishes) and about 7,000 inhabitants (Carvalho 2010). With a precarious or nonexistent road system up to the 1990s, a great number of Montesinho rural communities have been largely isolated from the most important villages of the region, those to the south and west (Carvalho 2010). Besides environmental conditions and isolation, social, economic, and land use constraints are responsible for the most important rural characteristics of this territory (Rodrigues 1998; Rodrigues 2000; Frazão-Moreira et al. 2009).

Figure 1 - The Portuguese North-eastern region and the Natural Park of Montesinho.

People's adaptive management of natural resources has built a multifunctional landscape. In the past, villages' subsistence was based mainly on pastoralism (cattle, sheep and goats) and sustainable farming systems with specific gardening techniques. Wild plants and arable crops provided food and primary health care for human and animals and supplied other basic needs, such as fuel, domestic tools, handicrafts, farming tools and equipment, textiles and building raw materials. At times, surpluses were traded or sold, generating extra income (Carvalho 2010; Carvalho and Morales 2013).

Up until the end of the twentieth century, ordinary homesteads usually had at least two cows (*a junta*) for beef production and agricultural labour, several sheep and goats, poultry, rabbits, and a number of pigs, depending upon household size. Many villages collectively managed a herd of cattle (*a boiada*), a sheep flock (*o gado*), a flock of goats (*a cabrada*), hay meadows (*lameiros*) and other pasturage. Each neighbour would contribute to collective tasks in proportion to the number of animals they had (*a vezeira*). The bull (*o touro do povo*) and the boar (*o varrão*) were communal property. The pigs were fattened for slaughter in November, December or January, depending upon when the ambient temperature was sufficiently low.

Throughout recent history, the region has faced periods of economic and social depression (especially before the 1930s and in the 1960s, according to elder informants) that have affected people' s welfare, caused several migratory flows, and decreased population density, particularly in some communities (Ribeiro and Lautensach 1989; Brito 1996). During the last quarter of the twentieth century more than 75% of the rural region's workforce was committed to full-time agricultural activities. This number has decreased in recent years to 17% of people in full-time agricultural employment (INE 2001, 2002). Approximately 6% of the population of this north-eastern region gains its income exclusively from agriculture (INE 2013). Today's farming is mostly a part-time and complementary activity, but gardening is still an important resource to households in the rural areas.

Three decades of rural development policies and successive EU Common Agricultural Policy (CAP) reforms have imposed serious constraints on the mosaic of farming activity. Community lifestyles and many traditional skills have become obsolete. Within this context, overall importance of agriculture has decreased and this activity has been considered no easy task, with no competitive advantage, no extra benefits and low incomes. Today, Portuguese rural society is characterised by lower demographic density, an aging population and outmigration from inland rural areas by younger people. Nevertheless, at the time of this survey (2002-2005) some middle-age people have returned to their origins, and elderly men and women continued to live in the rural communities and tended their homegardens.

Sampling and data collection

This homegardens study-case is part of the research conducted in the natural park territory (Carvalho 2010) and it is based on ethnographic methods used to record ethnobotanical information. Previous fieldwork (Carvalho et al. 2001) suggested that those communities located in the core of the park, still having a population of over fifty inhabitants and a history of agropastoral activities until very recently (2000-2002) had the most remarkable gardens and should provide valuable insight into homegardens. Thus, all the small villages (n=25) meeting the three above mentioned conditions were selected and corresponded to 31% of the total of the communities within the park boundaries.

As gardeners' skills and practices, rather than gardens, were our focus, informants have been chosen from amongst those who were considered knowledgeable and skilful by their neighbours, and met two criteria: i) they had an active homegarden; ii) they permanently lived in the community. Combining snowball and intentional sampling strategies (see Martin 1995; Alexiades 1996; Albuquerque et al. 2014), sixty participants, representing thirty five homegardens, from the twenty-five small villages chosen, were intentionally selected and interviewed.

Selected informants (85% women) were aged between forty-two and ninety years old (average age 68 years-old) and were housewives, farmers, farm labourers, services workers and returned migrants, either still active or retired.

One hundred eighty two semi-structured interviews (n=182) were carried out during each of the four seasons of the year. Prior informed consent was received before undertaking the interviews. People were first asked to describe their homegarden history, features (e.g. location, number of plots, technologies used, and sources of species), number of different plants grown, parts used, and management. To clarify information and to discuss details, participant observation was conducted in all homegardens. To cross-reference information group discussions between gardeners and their neighbours has been carried out at participants' houses and gardens or at the village council building.

For each wild and cultivated species mentioned and/or present in the gardens, voucher specimens were collected (see Martin 1995), identified and classified using Portuguese, Iberian or European floras (Castroviejo 1986-2014; Franco 1971-1984; Kays and Dias 1996; Tuttin et al. 1980). Several plant-made objects, seeds, and fruits were gathered and labelled and photographs were taken and deposited in a database. All the data, including local names and folk uses, were entered into a FileMaker Pro6 database with entries by species, informant and small village. Seed samples, voucher specimens, and every object gathered were deposited in the Herbarium of the Department of Biology, Escola Superior Agrária de Bragança (Portugal).

Results and discussion

For the period considered (2002-2005), this study-case has documented that homegardens in Montesinho were not the main source of gardeners' income but provided produces for basic nutritional needs of households and produces to trade

in local market, as observed by other authors worldwide (e.g. Hoogerbrugge and Fresco 1993; Lok 2001; Vogl and Vogl-Lukasser 2003 and 2004; Albuquerque et al. 2005; Kumar and Nair 2004; Maroyi 2009; Shillington 2008; Sunwar et al. 2006).

Moreover, Montesinho homegardens had additional and unique characteristics related to the architecture of the settlements, local culture and gardeners' perceptions and strategies that defined the different types reported.

In most circumstances, houses in the ancient settlements of the natural park territory are densely packed in small valleys, preventing extreme diurnal temperature variation during cold winters and hot summers (Figure 2), which precluded the establishment of gardens around or adjacent to homes. Furthermore, since the 1930s and for various reasons, including war periods effects, low population density and emigration flows, the region has experienced a persistent shortage of agricultural labour (Ribeiro and Lautensach 1989). These factors have reinforced the collective management of resources (e.g. land, water and workforce) according to long established rules, some of which prevail to the current day.

Figure 2 - Montesinho old architecture: housing and cortinha in Rio de Onor.

Among all the different kinds of agricultural sites found in Montesinho (e.g. pasturage, cropland, forest, plantations, orchards, gardens) only two fit into general conceptions of homegarden formerly described in literature (Hoogerbrugge and Fresco 1993; Eyzaguirre and Linares 2004; Kumar and Nair 2004). These two field types are locally known as *cortinhas* and *hortas* and although nowadays their management may have changed, typology and most of the assumptions recorded during this study-case are still established, namely the communal controlling reported for *cortinhas* and the importance of *hortas* produces for households.

Montesinho homegarden typology and general features

Local homegarden typology registered was complex and depended largely on the location of the garden in relation to the house, its age, structure, and management.

Cortinhas were/are fields usually surrounded by fences, hedges or ditches and cultivated on communal lands located in or very near the village, often at the riverside. They were set in the most fertile lands, varying in size from around two to three hectares and divided into smaller plots, the majority in the 0.01-0.05 ha area range. A good example of this kind of arrangement was/is observed in Rio de Onor (Figure 3), a *cortinha* of around two hectares consisting of 206 plots, corresponding to 37 households (Brito, 1996).

Figure 3 - Cortinha in Rio de Onor, Natural Park of Montesinho: in summer, before harvesting and cortinha opening to cattle (A); in early spring during collective land preparation (B); in spring, planting of individual plots (C); in winter cultivated with fodder (ferranhas) and cabbages (D).

Cortinhas were, and still are, partially under collective management. Seeds, seedlings, tools and produce belong to individuals or households. However, the division of plots, cultivation techniques (such as adding manure, ploughing, sowing or, sometimes, harvesting) and irrigation are all managed collectively, according to community rules. Inside the *cortinhas*, permanent boundaries surrounding the individual plots are not allowed, though temporary rows of maize, cabbages or sunflowers can be used to delimit small pieces of land. Each year, the community council establishes an annual schedule for land preparation. It organises the irrigation calendar, decides the best period for spring and autumnal land preparation and

when access to tractors and animals is allowed, in other words, when the *cortinha* is opened (*a abertura da cortinha*). In fact, it is open for only a short period (in late spring and autumn), after which only manual labour was/is allowed in order to avoid causing damage to neighbouring plots.

Participants have made it clear that collective land use and management of these gardens has a long history in this region. It was implemented in order to optimise the use of soil, water and labour resources, as well as to facilitate land preparation and animal consumption of crop residues twice a year. Indeed, there is anthropological and historical evidence that these plots have been cultivated for more than three centuries (e.g. in Rio de Onor and Moimenta) and the traditional knowledge and cropping practices associated with them are part of a heritage transmitted down the generations (Dias 1984; Brito 1996). Ownership or usufruct rights of the land in *cortinhas* are inherited. However, land distribution was/is based on mutual agreement about water management and plot boundaries. Plots are delineated according to cultivation needs, so that each individual household will have sufficient number of plots for all the crops it needs and/or is accustomed to growing. If the inherited plot is too small to accommodate the number of potential claimants, there are communal rules that will limit land division to preserve its agricultural value.

Labour was/is provided by household men, women and occasionally children or by work exchange between neighbours (*entre-ajuda* or *torna-jeira*), especially during peak periods in spring and autumn. Manual irrigation according to the requirements of each species, crop rotation, and application of cattle or green manure were reported to be regular and necessary tasks. Modern agricultural practices, such as agro-chemical inputs and mechanised farming equipment, were mentioned to be used occasionally in *cortinhas*. Land preparation, using machinery pulled by tractor and other heavy tasks were usually performed by men. Some equipment using animal traction, mainly for transport and cultivation, were/are handled by both men and women.

Cortinhas had an important function within the farming system, particularly when farmers kept animals. People raising different animal species, such as cattle, poultry, sheep and pigs, typically cultivated plots specifically to satisfy the needs of their animals and to avoid or reduce the risk of losses due to difficult climatic conditions, pests or diseases, and local market restrictions. Increasing the number of cultivated small plots was a risk aversion strategy that ensured the survival of animals first and foremost. Only when the needs of the animals during severe winters or summer drought were met, were the crops used for human consumption.

Species commonly grown in *cortinhas* included fodder crops such as turnips, beetroots, rye, wheat and barley that were mainly consumed fresh and not ripe (*ferranhas* or *ferrejos*). These crops could be sown in several plots with a delay of some weeks and harvested on a day-to-day basis, according to need. Common *cortinhas* plants used for both human consumption and fodder were/are cabbages, pumpkins, corn, and potatoes. There were/are also fruit trees (e.g. apple, pear, quince, cherry, and hazelnuts), vineyards, and craft species (e.g. wild roses, blackberries and sallow) forming hedges along boundaries.

Sometimes *cortinhas* were/are unfenced. In that case they are called *veiguinhas*. The difference in naming these fields only depends on the material presence of a fence. Gardens purposes, their management strategies and characteristics were/are the same in both cases.

The second type of Montesinho' homegardens known as *hortas* were and still are usually found behind or in front of the house, but they also may be set on narrow strips of land around the main house and out-buildings. Due to local ancient architecture, only some modern houses, mainly built in the last forty years, have space for gardening immediately surrounding the home. Most of the older houses do not have such spaces for *hortas*: there are private small plots within the village cluster that are considered to be the *horta*, or the communal *cortinha* is the sole opportunity for cultivation.

These *hortas* can vary in size and shape, from single narrow strips along the front and the side of houses to approximately 0.1 hectare plots behind the house. The larger ones (0.1 ha) are often divided into smaller parcels, sometimes alternated with cellars, yards and homes (Figure 4).

Figure 4 - Hortas in the Natural Park of Montesinho can vary in size and shape (A). In more recent houses hortas tend to surround the main building B. Examples from Espinhosela, Moimenta, Quintanilha and Tuizelo.

A wide variety of perennial and annual plants was/is grown in *hortas*. Cultivated species grow side by side with spontaneous germinators or those intentionally transplanted from the wild. This diversity of species ensures the subsistence of the nuclear family as well as fodder for small-scale animal husbandry throughout the year. Some vegetables, such as different types of cabbages and leafy greens, can even be harvested in mid-winter. Those perennial herbs that can be damaged by cold or frost, mainly spices or medicinal plants, can be protected during high-risk periods by shelters made of straw, twigs or cloth.

Hortas are ordinarily organised in several layers and beds depending on size, slope, soil fertility, or access to water (Figure 5). Perennial ornamental plants, fruit trees or isolated trees (such as chestnuts, quinces, bay trees, fig trees, and

willows) are found in the middle of the plots, planted in hedges or at the garden's boundaries. The most fertile beds and those in the best location are employed for annual or biennial food crops, such as kale (*Brassica oleraceae* var. *acephala*), onions, garlic, common beans, peas, chickpeas, tomatoes, and sweet peppers. Spices, medicinal, aromatic and symbolic plants are grown in beds, containers or flowerpots near the houses, alongside walls or stone enclosures (Figure 6). These species can also grow wild under trees or in non-cultivated corners of the yard. Because some of these species have antiseptic and disinfectant, repellent, or magical or symbolic properties, they are planted in the backyard, next to the cellar, the barn, the hen house, the pigsty or the sheep pens. For example, elder (*Sambucus nigra*) avoids reptile and rodent damage in grain and fruits stored inside barns; mastic thyme (*Thymus mastichina*) and winter savory (*Satureja montana*) repel insects; dog rose (*Rosa canina*) prevents illness in cattle or pigs; houseleek (*Sempervivum tectorum*) - a fleshy leafed species that grows wild in roofs, old walls or is cultivated in containers - protects against lightning strike; and mountain rue (*Ruta montana*) and Egyptian rue (*Ruta chalepensis*), planted at the left side of the main entrance, ward off evil-eye.

figure 5 - A wide range of perennial and annual plants is kept in hortas, in the territory of the Natural Park of Montesinho.

Figure 6 - Many plants are grown in beds, containers or flowerpots near the houses, alongside walls or stone enclosures. Natural Park of Montesinho.

In the case of *hortas*, most of the tasks were reported to be performed by women helped occasionally by children. During the studied period (2002-2005), traditional agricultural practices prevailed upon the modern ones. Moreover, gardening was seen to be very time-consuming as labour was mostly manual and there was many different species to deal with. Sometimes men could help with land preparation.

At the moment, some people perform such tasks using small tractors and motocultivators which are mainly operated by men. Animal traction was and still is widely used in *hortas*.

Montesinho homegarden purposes and functions

Cortinhas are not the typical homegardens as described by other authors (e.g. Hoogerbrugge and Fresco 1993; Lok 2001; Vogl and Vogl-Lukasser 2003, Albuquerque et al. 2005; Kumar and Nair 2004; Maroyi 2009; Shillington 2008; Sunwar et al. 2006) as they are neither situated near the house, nor do they have the same management strategies as *hortas*, gardens in the spaces immediately surrounding houses, very similar to homegardens mentioned in above cited literature.

Despite the differences in location and management (communal or private), *cortinhas* play a similar role to *hortas* and to the descriptions of homegardens found elsewhere. Specifically, *cortinhas* are also systems of permanent land use where those species that need much attention but little space were/are grown. Both *cortinhas* and *hortas* are fertile and irrigable cultivated plots, smaller than the local arable fields (average area 0.3 ha) and are intensively managed. The two

types have multiple uses, including supplying a wide range of edible produce, fodder, medicinal plants, green manure, firewood, and craft materials.

Traditional and environmentally sustainable agricultural techniques are frequently used in both gardens. For instance, local varieties of rye, wheat and cabbages that are cold tolerant and well adapted to poor and rocky soils are favoured by some gardeners. The risks of soil exhaustion and water shortage are minimised by preparing cultivated areas according to irrigation needs, crop rotation, multi-cropping, as well as manuring, composting, and/or digging crop residues into the soil. Some elements of modern farming practices have been adopted, such as using tractors or plastic containers instead of draft animals, baskets or wooden boxes. Nevertheless, chemical fertilizers and pesticides are avoided or employed only in limited contexts. Instead, plant species known to repel vertebrates and arthropods are common. For instance, onions are grown with carrots to repel rodents; thyme and different species of mint with lettuces and other green leafy vegetables to avoid predation by aphids.

Considering informants' discourses in 2002-2005 and author's observations over time, local homegardens contribute not only to family welfare and the aesthetics of the home, but also to human and animal food security and to household income. Moreover, some generate surpluses that might be exchanged with friends and neighbours or traded and sold in local markets. Given the informal exchange networks that have characterised rural areas for centuries, this surplus has been a significant contributor to the household economy for a long time. For instance, wool, flax, baskets, or chestnuts were previously exchanged for valuable products that did not grow locally, such as olive oil, citric fruits (orange and lemons) and almonds (Carvalho 2010). With the ease of buying such products in the 2000s, this practice has died out.

Montesinho' homegardens also play fundamental socio-cultural roles that intertwine with economic and ecological functions and are key features of North-eastern Portuguese culture. Local recipes often rely on homegarden produce. Food in general and some meals in particular are the basis of exchange, hospitality and friendship. Some examples are the special collective meals shared by all community members during peak farming periods, such as the harvest of hay, grain, potatoes, chestnuts and grapes, as well as seasonal foods prepared for family and neighbourhood on particular days of the year (e.g. Christmas, Easter, All Saints Day and the patron saint's day).

Religious ceremonies and rites, pagan rituals related to the seasons of the year and the agricultural calendar, and symbolic gestures often make use of homegarden produce. A strong correlation between people's beliefs and homegarden diversity and composition was found in this study. Many species which were used to bless homes, animals and crops, and those that protected the household were (sometimes still are) cultivated in homegardens. Churches and church services demanded many different plants depending upon each village's traditions and beliefs. For example, sometimes only white flowers were used for worshipping the Virgin Mary. Depending on the village, wheat spikes, rosemary, bay or olive tree branches were/are used for Easter religious ceremonies. During the Palm Sunday (*Domingo de Ramos*) service, each churchgoer prepared a frond (*o ramo*) that was blessed by the priest, brought home and kept for an entire year to protect the family, the house and the farm.

The selection of essential plants for these symbolic uses was determined by a wide range of criteria closely related to the knowledge and skills of the gardener as well as how this knowledge was transmitted between generations. Mothers used to teach their daughters which plant was appropriated for each season and different occasion. Intergenerational knowledge transmission was and is considered of great importance for maintaining biological diversity, cultural heritage, and people's status and welfare. Several participants emphasised this idea evoking proudly their grandmothers and mothers' practices and advices. They also mentioned the lack of interest from the younger people which, according to them, may cause the gradual erosion of traditional knowledge, local agricultural practices and culture (Frazão-Moreira and Carvalho 2014).

The region used to have particular perspectives on land use rights, land tenure and value that affected attitudes to gardening and productivity. Historically, certain plots were inherited by families for generations and their market value did not exceed their emotional and genealogical value to those families. Several informants explained that inherited land should be well preserved because it represents an important and unique patrimony established through generations of labour input.

The value of a plot of land is also influenced by the type of vegetation cover (e.g. oak forest, pasture, scrubland, or crop) and the degree of abandonment. Most interviewees expressed negative feelings about abandoned and unproductive land. They all mentioned that emotional attachment, aesthetic appreciation, and the value attributed to property with productive land were important motivators for gardeners.

It was generally accepted by younger participants that gardening is beneficial to the mental and physical health of elders. The majority of people living in this rural area or interviewed during this study were women over the sixty years old, however most of them were still active and in charge of their gardens. Homegardens may have been a contributing factor for the well-being of these elderly people, helping to maintain good physical condition and, above all, an agile mind and good mental health.

Floral composition and diversity of Montesinho homegardens

In total, 206 taxa, both cultivated and wild were recorded in the studied gardens (*cortinhas* and *hortas*). An array of herbs, shrubs and trees, as well as different plant parts, was and is used by householders for a variety of purposes that can be grouped into distinct use categories. For the considered period (2002-2005), the most numerous use categories were: folk and veterinary medicine (49% of the inventoried species), human consumption (45 %), plants used in a social and cultural context (35 %), and animal fodder (30 %). Many of the species

inventoried in this study were considered multipurpose and could be allocated to more than one use category.

Some species were present in almost every *horta* and *cortinha* and were highlighted by the informants as being particularly useful. A few of these key species were considered '*plantas valiosas*' (lit. 'worthy plants') by the locals and were widely recognised as having nutritional and/or pharmaceutical properties (Frazão-Moreira et al 2009; Carvalho and Morales 2013; Barros et al. 2011 and 2013.). This folk classification included wild species intentionally brought from the woods as well as cultivated plants, such as spices, medicinal and aromatic species, several varieties of cabbages and vegetables, flowering and ornamentals plants, with high resistance to drought, cold or poor soil conditions. Some examples are bay, fennel, mints and lemon balm, wild strawberry, wild roses, peonies, arum lilies, daffodils, primroses, violets, pansies, old landraces of common beans, peas, cowpea and chickpea, and several succulent shrubs and herbs (Table 1).

Floral composition and diversity may differ considerably between *cortinha*s and *hortas* and according to use (Table 2). This study found that every plant grown in the *cortinhas* could also be cultivated in *hortas*, however generally in smaller plots. Although there is no strict rule, informants reported that the reverse does not apply: some species were grown only in *hortas*. Land in *cortinhas* was generally ploughed by men, whose priorities and plant knowledge were quite different from their wives, thus, several useful wild plants that were cultivated and managed by women in *hortas* were removed in *cortinhas* because men perceived them as weeds.

Diversity and composition seemed to be related to different types of animal production. In the sampled gardens (both *cortinhas* and *hortas*), the most diverse and largest were those belonging to people raising cattle and pigs. According to the plant inventories, households without cows or pigs do not grow approximately 25% of the cultivated species and 40% of total plants commonly found in homegardens. Furthermore they maintain 50% fewer plots than in those households with cows or pigs. Where households cultivated both types of gardens, *cortinhas* were less diverse and more given over to providing fodder, particularly when the owners were breeders or were involved in small-scale animal husbandry.

Table 1 - Key species inventoried in the surveyed Montesinho homegardens, main place of growing, management and use category

Botanical Family	Scientific name	Local name	English name	Main Growing Site [1]	Gendered Management [2]	Main Use Category [3]
AMARALYDACEAE	*Allium cepa* L.	cebola	onion	H/C	WM	Food/Medicinal
	Allium sativum L	alho	garlic	H/C	WM	Food/Sociocultural
AMARANTHACEAE	*Beta vulgaris* L.f. *crassa* (Alef.) Helm	beterraba forrageira	fodder beet	C	WM	Fodder
	Beta vulgaris L.var. *conditiva* Alef.	beterraba	beetroot	H	Women	Food
	Chenopodium ambrosioides L.	té	Mexican tea	H	Women	Medicinal
APIACEAE	*Foeniculum vulgare* L.	fiolho	fennel	H	Women	Medicinal
ARACEAE	*Zantedeschia aethiopica* L. (Strengel)	jarro	arum lily	H	Women	Sociocultural
ASTERACEAE	*Dendranthema x grandiflorum* (Ramat) K.	crisântemo	chrysanthemum	H/C	Women	Sociocultural
	Helianthus annuus L.	girassol		C/H	WM	Fodder
	Lactuca sativa L.	alface	lettuce	H	Women	Food
	Tanacetum parthenium (L.) Sch. Bip.	hortemis	feverfew	H	Women	Sociocultural/Med
BRASSICACEAE	*Brassica napus* L.var. *napus*	nabo	turnip	C	WM	Fodder/Food
	Brassica napus L. var. napobrassica	raba	rutabaga	C	WM	Food/Fodder
	B. oleracea L.var. *acephala* DC	couve galega	kale	H	Women	Food
	Brassica oleracea L.var. *capitata* L.	coração de boi	cabbage	C/H	WM	Food/Fodder
	Brassica oleracea L. var. *costata* DC	couve portuguesa	Portuguese cabbage	C	WM	Food/Fodder
	Brassica oleracea L.var. *italica* Plenk	bróculos	broccoli	H	Women	Food
	Brassica oleracea L.var. *sabauda* L	lombarda	Savoy cabbage	C/H	Women	Food/Fodder
CRASSULACEAE	*Hylotelephium telephium* (L.) H. Ohba	bela-luz	orpine	H	Women	Sociocultural
	Sempervivum tectorum L.	carne-junta	houseleeks	H	Women	Sociocultural
CUCURBITACEAE	*Cucurbita ficifolia* Bouché	abóbora chila	figleaf gourd	H	Women	Food

	Cucurbita maxima Duch.	abóbora menina	winter squash	C/H	WM	Food/Fodder
	Cucurbita pepo L.	abóbora porqueira	pumpkin	C/H	WM	Food/Fodder
FABACEAE	*Cicer arietinum* L.	grão de bico	chickpea	H	Women	Food
	Phaseolus vulgaris L.	feijão verde e seco	common beans	H	WM	Food
	Vicia articulata Hornem.	Lentilhas, erv parda	lentill	C	Men	Fodder
	Vicia faba L.	favas	broad bean	H	WM	Food
	Vicia sativa L. subsp. *sativa*	ervilhaca	common vetch	C	Men	Fooder
	Vigna unguiculata (L.) Walp.	feijão-frade	cowpea	H	Women	Food/Fodder
GERANIACEAE	*Geranium robertianum* L.	erva de S. Roberto	herb Robert	H	Women	Medicinal
HYPERICACEAE	*Hypericum perforatum* L.	pericão	St. John's wort	H	WM	Medicinal
JUGLANDACEAE	*Juglans nigra* L.	nogueira	walnut	H	WM	Medicinal/Food
LAMIACEAE	*Calamintha nepeta* L.	nêveda	catmint	H	Women	Medicinal
	Glechoma hederacea L.	malbela	ground-ivy	H	Women	Medicinal/Food
	Melissa officinalis L.	cidreira	lemon balm	H	Women	Medicinal
	Melittis melissophyllum L.	bertónica	bastard balm	H	Women	Medicinal
	Mentha spicata L.	hortelã-pimenta	spearmint	H	Women	Medicinal/Food
	Mentha suaveolens Ehrh.	mondrastos	applemint	C	WM	Medicinal
	Mentha x gentilis L.	hortelã da horta	marsh mint	H	Women	Food
	Mentha x piperita L.	cravo verde	peppermint	H	Women	Medicinal/Socio
	Rosmarinus officinalis L.	alecrim	rosemary	H	Women	Sociocultural
	Satureja montana L.	segurelha	winter savory	H	Women	Food
	Thymus mastichina L.	sal puro	mastic thyme	H/C	WM	Sociocultural
	Thymus vulgaris L.	tomilho	common thyme	H	Women	Food
LAURACEAE	*Laurus nobilis* L	louro	bay	H	Women	Food/Sociocultural
MALVACEAE	*Malva sylvestris* L.	malva	mallow	H/C	WM	Medicinal/Socio
OLEACEAE	*Syringa vulgaris* L.	lilás	lilac	H	Women	Sociocultural
PAEONIACEAE	*Paeonia* sp. pl.	peónia	peony	H	Women	Sociocultural
POACEAE	*Avena sativa* L. subsp. *sativa*	aveia	oat	H	Women	Sociocultural
	Hordeum vulgare L.	cevada	barley	C	WM	Fodder
	Secale cereale L.	centeio	rye	C	Women	Fodder
	Triticum aestivum L.	trigo	wheat	C	Women	Food/Socio
	Zea mays L subsp. *mays*	milho	maize	C	Women	Food/Socio
POLYGONACEAE	*Rumex obtusifolius* L.	azedas	sorrel	C/H	Women	Food/Medicinal
ROSACEAE	*Fragaria vesca* L. subsp vesca	amiródio	wild strawberry	H	Women	Medicinal
RUTACEAE	*Ruta chalepensis* L.	ruda	Egyptian rue	H	Women	Sociocultural
SOLANACEAE	*Capsicum annuum* L.	pimento	pepper	H	WM	Food
	Lycopersicon esculentum Miller	tomate	tomato	H	Women	Food
	Solanum tuberosum L.	batata	potato	C/H	WM	Food
VERBENACEAE	*Aloysia citriodora* Palau	limonete	lemon verbena	H	Women	Food/Medicinal

[1] Place of cultivation or growing: Cortinhas (C); Hortas (H); H/C primary in hortas, but sometimes in cortinhas too; C/H primary in cortinhas, but also in hortas. [2] Managed particularly by women, by men or both (WM). [3] Single species can have more than one use, however in Table 1 is only reported the main use; fodder; food (human diet), medicinal and socio cultural. Botanical classification is according to the APG III (2009) system.

Table 2 - Total number of species inventoried in Montesinho homegardens, and from these, number of specifically existing in cortinhas and hortas

Main use	Total inventoried	*Cortinhas*	*Hortas*
Human and animal health care [1]	97	80	97
Food/human diet	93	30	90
Ornamental [2]	74	12	74
Socio cultural [3]	66	32	62
Fodder	60	56	60

[1] In addition to cultivated plants, weeds and wild species are also used to prepare home remedies.
[2] Used to create an attractive domestic environment.
[3] Grown or gathered in the gardens to be used specifically in festivals, and Christian and pagan ceremonies; to be used with magic spells as additional aids to medical care; also, either as protection for superstitious beliefs and evil eye, or as source of status and authority, and component of cultural identity.

Gendered gardening knowledge and practice in Montesinho

A key feature of Montesinho homegardens was the gender related differences in priorities, practices and plant knowledge, but particularly the gender-based division of labour. Transmission between generations, religious and social norms, value and belief systems, as well as access to different environments and social spheres also contribute to gendered knowledge and practices (Howard 2003), and thus all these topics influenced Montesinho homegardening and featured gender relations.

This study-case documented that in this period (2002-2005) men were responsible for crops or species that required more technical or demanding inputs, particularly those normally cultivated in arable fields and also some cultivated in *cortinhas*. Besides cultivation of staple crops, men were mainly concerned with cattle or flocks, fodder production and forestry activities. They also cleaned and maintained barns and sheds, prepared animal and green manure, and managed firewood. Women's daily tasks were centred on the house and the family, but they also commonly tended the *horta*, fed and took care for pigs, poultry and sometimes calves (in which case, they would harvest fodder from the *cortinha* each day), weaved baskets, helped female neighbours with social and religious events, such as preparing collective meals, holding weddings, baptisms, funerals, cemetery rituals or village festivals, and daily maintenance of the church.

Until the 1990s women did not have any social rights, such as access to the village council, or other public duties with the exception of those related to religious practices. Although males generally had a superior status and theoretically had authority over females, women were commonly treated with respect and consideration. In the privacy of the home this male authority was generally more muted, as familial and domestic issues remained in female hands. Sometimes women were even feared due to strong female social networks in the communities. Female social networks were built upon a mutual understanding of the demands of women tasks and sharing of experiences while working together and expressed as a great solidarity amongst the women.

These complex gender relationships influenced the methodology adopted to collect information. Since male were considered heads of household, in order to respect hierarchies, they should be the first contact in the communities, even though they were not primarily responsible for the general running of the gardens. However, some of them quickly introduced their wives and commented '*Ah! Isso das hortas é com a minha senhora*' (Oh, gardens are my wife's subject!).

Whereas *hortas* were confined to the household and seemed to be mostly a female concern, *cortinhas* pertain to both the household and the community domains, hence were predominantly a male responsibility. The collective management regime of *cortinhas* implied that control of practices and upkeep occurred in a wider social sphere where men judged the performance of other men based on accepted norms of masculinity. Semi-structured interviews and garden surveys revealed that these social pressures influenced men's gardening knowledge and practices. Male knowledge and activities were normally accorded a higher status due to the fact that they provided major sources of income (e.g. cattle, forestry, and firewood). It would be seen as not appropriately masculine for a man to acquire 'female' knowledge. Thus the men had a much more specific knowledge domain than women. Women were interested and knew about men' realm, whereas men, in most of the circumstances, were not aware of knowing about plant requirements for social uses, homemade remedies, herbs and food.

Furthermore, it was important for their status that men were seen to control and make decisions about *cortinhas* even though the actual decision-making was more shared than it initially appears. During a group discussion in Rio de Onor, the female informants told as though they exerted influence in the *cortinhas* as well as the *hortas* and the husbands generally did not contradict them. The women explained that they often evaluated the needs or constraints of the household or farm, and then proceeded accordingly. Before carrying out tasks related to the *cortinhas*, men always consulted with their wives on why, what, where and, especially, when to promote and plant new annual species or to improve the existing ones.

Women's knowledge of species, varieties and gardening practices and of men's ability to raise cattle and manage the forest is generally recognised. Cultivation techniques were shared by women and men in a few villages where women previously ploughed and drove tractors (Dias 1984). Women usually tilled the soil, irrigated, and controlled pests and diseases by removing whole or part of diseased plants, or by using home made products, such as cinders from the fireplace or extracts and exudates from particular plant species. Women were primarily concerned with vegetables, spices, medicinal herbs, ornamental plants and with all the items related to their cultivation, harvest and storage, while men mostly knew about timber, livestock, fodder, fruit trees, vineyards, arable crops and all the activities that were previously carried out on a larger scale and were considered important sources of household income. In the studied period (2002-2005), women provided 60 % of the food, medicinal and social uses inventoried and men provided 65 % of the information on the local uses and preferred species of fodder, veterinary, wood or timber plants.

Sometimes, the decision-making process was not easy and conflicts between men and women occurred. Frequently, men were asked to help with ground and bed preparation in *hortas*. On some occasions, they did not consider those tasks to be a priority because they did not agree with the women's choices and regarded them as useless, time-consuming and requiring a lot of work. For instance, some women still used to fatten pigs; a difficult task that their husbands did not feel necessary because it was possible to buy already fattened pigs in the nearest Spanish villages. Men argued that buying pigs was cheaper and avoided the risk of piglet mortality and the tedium of fodder cultivation. Women argued that higher quality meat was obtained; they were able to productively dispose of kitchen leftovers and crop residues; and they would be seen to have a useful, rather than abandoned, garden. Women concluded by declaring that 'nothing can be done without some work!' (*nada se faz sem trabalho!*).

Men did not value some use categories of plants, such as the ornamental or symbolic ones used for religious rituals, gift giving, household security, and for beautifying the domestic environment. Thus, men, through inattention or ignorance, sometimes ploughed or dug up the plots where women were cultivating these kinds of species.

Homegardens as places for female practices, values and ideals

In the Montesinho case-study, tending gardens was the most time-consuming of women's daily activities. As the *horta* was a female domain, it could be assumed that gardens were shaped by their current priorities and desires, and evolved organically out of their preferences. Instead, homegardens were shaped by a broad range of factors and considerations. This study made clear that most of the gardeners chose and managed species according to principles they had learned from their mothers and grandmothers, as well as to meet the economic needs of the family, community values, other factors connected with external influences and changes occurring in rural society, and their own ideals.

Heckler (2004) considered homegardens to be dwelling spaces and multivalent contributions to quality of life. She described how homegardens serve as a backdrop for the social activities of the family. Montesinho homegardens were also places of sociality and conviviality evolving from female perceptions of the natural, social and economic environment and from community and family expectations.

Furthermore, homegardens were ideal places to practice and improve traditional knowledge as it was transmitted between generations. Some women stated that generational transmission was the primary factor affecting local gardening knowledge, structure and composition, followed by external influence of migrants, friends and mass media (Frazão-Moreira et al 2007 and 2009).

They believed that much of local gardening depended on local knowledge and expertise, elements of which they learned from their grandmothers and mothers. Without these elements (local knowledge and expertise), some species, techniques and skills would be gradually lost, as well as the social and individual value of the *horta*. Women in Montesinho study-case had a sense that local species and modes of cultivation were higher quality, less expensive and better adjusted to household purposes. Accordingly, being in charge of a *horta* and cultivating local produce implied to know how to keep good seeds, year after year, what species/varieties to use, their exigencies in terms of soil, temperature, lifecycle, harvest and preservation. These characteristics and demands only known locally are completely different from those of the commercial seeds and species.

Several participants emphasised the importance of tradition by giving two examples of acquired knowledge and expertise: the appropriate management of local landraces and the traditional bread baking. It was reported that the choice of which spring species can be cultivated must take into account the severity of the preceding winter. After a snowy and cold winter the soil is moist, propitious for sowing or planting the most demanding species; a good harvest is almost guaranteed as is suggested by a regional proverb: '*ano de nevão, ano de pão*' (snowy years are years of abundance). Mild winters are not favourable for some local varieties because they require cold induction for germination. In that case, other varieties that are more tolerant to higher temperatures substitute the more demanding ones. Local garden biodiversity allowed gardeners to face several productive constraints but required local knowledge and practices.

Although the typical homemade rye bread was still fully appreciated, only a few women were able to reproduce all the steps necessary to bake durable and good tasting bread. According to them, being in possession of a wood oven or having the right seeds to grow and grind is not enough. There is an expertise associated with producing good bread, including skills required for the appropriate type of cultivation, harvesting, milling and type of firewood for the wood oven, which younger women, in most situations, do not have because they have never learned from their forbears.

These examples are of great significance because they explain how a final product such as grain, tomatoes or bread can incorporate several specific and local technologies besides multiple choices and decisions that can change according to different reasons and purposes. Gardeners must have great capacity to evaluate each stage of the productive process and to deal with constraints and diversity.

Every homegarden visited had a broad array of species aimed at satisfying distinct needs of the gardener. As mentioned before, primary concerns of women in the area were focused on family welfare and the community, which in turn informed all gardening decisions. For instance, if a woman decided to continue to fatten pigs or grow potatoes she was partly motivated by the pleasure home-grown sausages or home-grown potatoes would give to her children or relatives living elsewhere; if she was responsible for three months of church care she would endeavour to grow the most beautiful and appropriate plants to decorate it. Under normal circumstances, such as when they were in good health, women enjoyed being useful to and involved with community life. In addition, women gained status and satisfaction from fulfilling these community roles with skill and flair. Homegardening enabled women to more skilfully fulfil many of their expected roles (Figure 7).

Figure 7 - Hortas were woman's domain and pride. Vilarinho de Lomba (A), Quintanilha (B), Natural Park of Montesinho.

In general, homegardening in Montesinho was successful when different strategies and practices were implemented in order to achieve different purposes. Women not only worked individually but also collectively, and were therefore able to fulfil needs and expectations whenever it was necessary. The following examples demonstrate how tasks using individual and shared knowledge, experience, and cooperative labour between female neighbours maximised time and resources.

Selling seedlings, vegetables, spices and medicinal herbs was an economic opportunity that women had taken advantage of. In local markets where couples used to sell their surplus, women set prices and hawked their wares. If somebody asked the man about prices he would answer: 'How much does it cost? I don't know! This is my wife's business; she's the one who knows!' (*Quanto custa?! Não sei isso é com a mulher, ela é que sabe!*).

Plants most often considered as weeds such as nettles, mallow or sorrels were usually removed by women to avoid competition with the main crops. However, both weeds and wild plants could sometimes be used as food, spices, medicine, or fodder. Women used to process these species as food, for medical or veterinary purposes or to give them to hens, rabbits or pigs, thereby avoiding 'wasting them'. These tasks were generally done in groups of women who worked together to weed several parcels of land and gather useful plants from the village's natural surroundings. Sometimes, the harvest was also collectively prepared, as well as other duties, including stripping stems, peeling fruits or drying leaves and flowers, before being shared between members of the group or distributed among friends and relatives.

Harvesting, sowing, selecting seeds, bulbs or cuttings, taking care of seedbed or plant nurseries and germinating seedlings were common female activities carried out in the *hortas.* Most of the plants grown in *cortinhas* originated in *horta* nurseries. Typically, each woman prepared seedlings of certain species, which were then exchanged for seedlings of different species grown by friends or neighbours. Women obtained seeds, cuttings or seedlings for their desired ornamental or symbolic species by gathering from the wild, exchanging with friends and neighbours or buying at the local markets. It was reported that when one woman grew a new ornamental plant, it would soon be growing in almost every garden of the village because cuttings were freely shared. Where propagation was not easy, the idea was adopted by other women who would buy the plant to keep at home.

Female strategies and practices for homegarden composition and diversity also took into account social events during specific periods of the year, such as Christmas, Carnival, and summer holidays, in which all neighbours participated and to which relatives living far away were invited. The tasks related to preparation for village festivals and farming peak periods were shared out. Women helped each other with harvesting and preserving the products of *horta*s, such as pickles, marmalades, jellies and other preserves. At these times, women were proud of the quality of their unique goods grown in natural conditions. They also expressed concern for the nutrition and health of their children, grand-children, and other family members who were normally subjected to a less healthy urban lifestyle. Thus, they gained pleasure from providing high quality nutrition and from preparing a wide range of home-grown foods that the relatives would consume during their stay in the village or would take back home.

The changing role of Montesinho homegardens

During the studied period (2002-2005) Montesinho territory was really a mosaic of slightly different and complementary garden sites, which have been changing in response to demographic and socioeconomics contexts. Nowadays, as in former times, the term homegarden, such as discussed by several authors, may not be a meaningful category in Montesinho. Research and development policies besides professionals have ignored the important role of homegardens in conserving tradition and cultural heritage as well as plant biodiversity, perhaps because women were largely responsible for these gardens.

Both a decline of agriculture and demographic trends have generated new approaches to gardens, which women have been able to incorporate (Carvalho and Frazão-Moreira, 2011; Frazão-Moreira et al. 2007; Frazão-Moreira et al. 2009). According to interviewees, in former times (at least in the 1950s and the 1906s), *cortinhas* and *hortas* were less diverse because other agricultural activities such as forestry, grain production and animal husbandry were considered much more important for the household economy. Clearings and the land immediately surrounding the villages were exhaustively exploited for non-cultivated comestibles, medicinal herbs and raw materials. Food production in the *cortinhas* and *hortas* was very limited and those gardens were mainly used to grow fodder and flax to make linen. All of these activities consumed a large proportion of the available workforce. Because of changing economic conditions leading to migratory flows and the aging of those still living in rural areas, an ever decreasing number of people are committed to fulltime agriculture and most of these farming systems were abandoned .

It became clear from the interviews that in the past thirty years, *hortas* have become areas of *in situ* and *ex situ* conservation for both nostalgic and pragmatic reasons. Some crops and landraces are no longer cultivated in arable fields and wild species are threatened by new access roads, wild fires, reforestation activities and abandonment (Carvalho and Frazão-Moreira 2011). These species as well as popular heritage species and varieties were brought into the gardens and were maintained primarily by women. Cultivating and consuming these plants ensures a high food quality, provides the raw materials necessary to maintain traditional recipes and reproduces traditional sociocultural uses, such as exchange and hospitality norms, culinary traditions and rites, traditional festivals and feasts. This last category now attracts outsiders and tourists, so provides an alternative income for rural areas. Some examples documented include couscous and bread made from flour of a local wheat landrace (*barbela*), several types of common beans that are consumed inside their dried pods (*cascas*, *casulas*), and old varieties of quinces, cherries, and plums that are used for marmalades, spirits or home remedies.

Indirectly, these activities have improved conservation of plant species and varieties and related cultural heritage, traditional knowledge and associated agricultural techniques. Unfortunately, some old women think that most of these species will disappear with the passing of their generation, but the interest that several younger women (45-50 year olds) are showing in traditional recipes, herbs and spices suggests that this view may be overly pessimistic. They are starting up small businesses in which local products such as sausages, marmalades, cookies, cakes, and herbal teas are marketed. As one seventy year-old woman from Moimenta commented 'You do not forget what you keep doing!' (*Só não se esquece, aquilo que ainda se pratica!*).

Hortas, however, were not only places of tradition, but also innovation. Many of the women demonstrated a curiosity about new experiences and a fondness for sharing ideas in their gardening experiences (Carvalho and Frazão-Moreira 2011). Floral composition of *hortas* has increased with the introduction of a wide range of greens and ornamental species in the last three decades, a phenomenon also observed in other European regions (Vogl-Lukasser and Vogl 2001; Vogl and Vogl-Lukasser 2003 and 2004; San Miguel 2004) and all over the world (e.g. Zaldivar et al. 2002; Shrestha et al. 2004; Trinh 2004; Heckler 2004). These plants or propagation materials have been brought from remote areas, exchanged between relatives and neighbours or bought from retailers at the local markets.

Approximately seventy species of the 206 species recorded in the garden survey have been intentionally introduced as a result of external influences such as changes in rural lifestyle and diet, the media, relatives and emigrants. These plants are used for human consumption, medicine, or socio-cultural functions. The most important introductions are vegetables (e.g. Brussels sprouts, broccoli, aubergine, and spinach), spices (e.g. coriander, basil, and common thyme) or modern varieties of fruit trees (e.g. plums, apples and exotic species such as berries, passion fruit, gogi, and kiwi), new varieties of lettuces, potatoes, onions and garlic and ornamentals. Forty-six new ornamental species grown for decorative, religious, and symbolic or ritual purposes have taken the place of wild species previously harvested from the forest by women and children (e.g. ferns, common hawthorn, wild peonies, primroses, lilies and roses).

Although gardening is a powerful means of connecting with past heritage, it is also affected by innovation which is an expression of adaptive management to external influence and on-going changes. Homegardens often do not fit very well into official conceptions of how the region should develop and they are not considered sufficiently by development professionals and policy-makers, so their role in today's society in Montesinho is still uncertain. Nevertheless, the gardeners themselves are finding many ways to adapt and develop new meanings for their homegardens.

Conclusion

In the studied period (2002-2005), the homegarden system in the Natural Park of Montesinho territory, North-eastern Portugal, comprised two different sorts of gardens: *cortinhas* and *hortas*. The particular features of location, size and management of *cortinhas* differentiate them from typical homegardens as described in the literature. However both *cortinhas* and *hortas* had similar roles for their gardeners and the community that contributed to the maintenance of biological diversity, cultural heritage and rural community welfare. Moreover, their layout and composition used to reflect the gardeners' purposes, age, gender, values and heritage.

Local gardens were especially important and diverse if gardeners were small-scale breeders or keep animals. They were usually sites of high agrobiodiversity, of *in situ* and *ex situ* conservation and places that enabled traditions and local culture, as well as places in which to experiment with new species and technologies, some of them related to organic and sustainable farming techniques.

Socio-cultural functions of Montesinho homedgardens intertwined with and were as fundamental as the economical and ecological ones. Several factors including division of labour, social norms, religion, and social sphere enhanced gendered gardening knowledge and practice. Men were involved in *cortinhas* because it was generally considered that *cortinhas* required more technical inputs and it was important for a man's status to show that he controlled and made decisions about those lands. *Hortas*, on the other hand, were confined to the household and were primarily a concern of women. Women had a sense that what they raised themselves was higher quality than what was bought. They were aware about the idea of 'health food', which they saw as being closely related to local or organic produce and a rural lifestyle. Through their *hortas* and *horta* produce, women gained status. Moreover *hortas* contributed to the mental and physical health of elders, were places of sociality, conviviality, and very important in terms of social acceptance.

To be the owner of a well organised and productive homegarden, to have a good selection of different horticultural species, to introduce and experiment with new plants, or to grow the most beautiful ornamentals were matters of pride and the ideal of almost every elder woman. Moreover, the production of appropriate species and produce from homegardens was a means of becoming involved in religious ceremonies and other local celebrations, and of being recognised as an efficient and productive community member. Therefore, homegardens were particularly valuable for female self-esteem, social recognition, and community belonging and were an expression of social significance for every woman.

This paper has provided evidence of homegarden practices that maintained endangered traditional knowledge, techniques, plant varieties and local culture.

The complex structure and intertwined roles of Montesinho homegardens have been neglected by research and development professionals, perhaps because women, who were the primary experts and knowledge holders, were often marginalised in development programmes. Changes in rural societies and the modernisation of lifestyles have affected homegardens' relevance, roles and management. Such changes have also influenced gardeners' behaviour and the persistence and transmission of traditional knowledge. Frequently, agriculture in general and homegardening in particular are not attractive activities for the younger generations. However, some participants believed that with new economic opportunities such as agritourism and organic produce, and given the limited economic alternatives in rural areas, this situation could reverse in the medium term. In this instance, transmission of homegardening knowledge and practice would be vital.

There is limited evidence that despite the general trend towards knowledge loss, some younger people are committed to gardening and cultural heritage. However, further research is required for a better understanding of local homegardens, gender relations, knowledge transmission and social organisation, and to explore the effects of these changes on younger generations.

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