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ESCOLA DE ADMINISTRAÇÃO DE EMPRESAS DE SÃO PAULO

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**LANDOWNERSHIP IN THE COUNTRYSIDE OF PORTUGAL AND WILDFIRES: A  
QUALITATIVE APPROACH**

SÃO PAULO

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Thesis presented to Escola de  
Administração de Empresas de São Paulo of  
Fundação Getulio Vargas, as a requirement  
to obtain the title of Master in International  
Management (MPGI).

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## **ABSTRACT**

Every year in the summer, the news about wildfires happening somewhere in Portugal reaches the world through the media (RTP, 2017; Publico, 2019), and when the winter arrives, everything is fine again, but the cycle repeats itself. One of the issues is the excess of fuel in the lands to feed the fire due to the lack of management of lands in the countryside of continental Portugal; more precisely in the Center and North of the country, where the lands are so small, they lost their value for production. More than 80% of the lands in Portugal are privately owned, and different from other countries, there is no concentration in the ownership (Tirapicos, 2019). This exploratory qualitative research is an attempt to understand the reasons behind the lack of use of land, one of the factors that influence those repetitive cycles. Data gathering was made through field trips for observation, data given by the stakeholders, interviews with specialist and, mainly, interviews with landowners. Interviews with the landowners made for this research shed light that the lands on insights of why keeping a land that is unproductive or not profitable. There is more than just emotional attachment, they are part of the identity of those people (Moore, 2014).

**KEY WORDS:** Wildfires, Portugal, Landownership, Consumer behavior, identity, Maslow hierarchy of needs, qualitative research.

## **RESUMO**

Todos os anos no verão, as notícias sobre incêndios florestais que acontecem em algum lugar de Portugal chegam ao mundo através da mídia (RTP, 2017; Publico, 2019) e, quando chega o inverno, está tudo bem novamente, mas o ciclo se repete. Uma das questões é o excesso de combustível nas terras para alimentar o fogo devido à falta de gestão das terras no interior de Portugal continental; mais precisamente no centro e norte do país, onde as terras são tão pequenas, elas perderam seu valor para a produção. Mais de 80% das terras em Portugal são de propriedade privada e, diferente de outros países, não há concentração na propriedade (Tirapicos, 2019). Esta pesquisa qualitativa exploratória é uma tentativa de entender as razões por trás da falta de uso da terra, um dos fatores que influenciam esses ciclos repetitivos. Os dados foram coletados como visitas de campo para observação, dados fornecidos pelas partes interessadas, entrevistas com especialistas e, principalmente, entrevistas com proprietários de terras. Entrevistas com os proprietários de terras feitas para esta pesquisa lançam luz que as terras revelam por que manter uma terra improdutiva ou não lucrativa. Há mais do que apego emocional, eles fazem parte da identidade dessas pessoas (Moore, 2014).

**PALAVRAS CHAVE:** Incêndios florestais, Portugal, Proprietários de terras, Comportamento do consumidor, identidade, Maslow, pesquisa qualitativa.

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## ABBREVIATIONS

APFLOR	Association of the Forest Producers of Pedrógão Grande, in Portuguese
BUPI	Centralized Building Registry, in Portuguese
CEF	Center of Forest Studies, in Portuguese
ISA	Superior Institute of Agronomy, in Portuguese
CELPA	Paper Industry Association
ZIF	Forestry Intervention Zone, in Portuguese

## 1 INTRODUCTION

Every summer in the countryside of Portugal, there are dozens of wildfire episodes. They are always on the news and, even with the best efforts of the stakeholders, including the National and Local Governments, nothing seems to make a solution come through. The problem is more complex than just criminal ignitions, as biggest part of the average Portuguese media disseminates (Agencia Lusa, 2017; RTP, 2017; Publico, 2019). The summer weather, climate changes, re-kindles and the lack of the proper management with the lands in forest, and all the stakeholders involved in it are part of the problem and the solution.

A common sentence heard in Portugal regarding lands in the countryside is “people are too emotionally attached to their lands to sell or rent to another” (Benali, 2019), is this sentence even true? If the landowners too emotionally attached to sell their lands, why do they not manage their lands? Those are some of the questions that started to arise within the landownership in rural areas in the North and Center of Portugal and the question seemed more complex and the research proceeded.

This qualitative research will approach the topic of the wildfires in Portugal, landownership structures in the rural North and Center of the country, through the analysis of documents, legislation, information gathered through meetings and interviews with landowners and specialists that act on the forest economy system. The goal is to explore if there is indeed a link between the current landownership structure and the wildfires and, if there is, if the landowners feel responsible and tackle it in some manner. The South is not inside the scope of this research since the landownership structure is quite different from the rest and the wildfires cases are not so devastating and frequent when compared to North and Center of the country.

This research is structured in, first, a literature review on the second chapter, to understand better the depopulation phenomenon in rural areas, continuing to the role of lands and possessions in identity building and new perceptions about the links between objects and goods and identity. The third part is the presentation of the qualitative methodology that was followed to collect data regarding the research, personal notes of the researcher and the limitations of the methodology. The fourth part is a presentation of the findings, starting with the presentation of the fire structure, continuing with the migration and shifts in the use of soil in the Center and North of Portugal, then, the analysis of legal documents of property and landownership, finalizing with interviews with landowners. The fifth chapter consists in an analysis of the main findings in the research through the lenses of the theoretical basis presented in the second chapter. Finally, the conclusion and indication for future researches on the topic.

The research found out that identity plays a crucial part in the willingness of landowners to sell or rent their lands. This connection goes through the past need of securing the future by owning land and passing to their successors (Maslow). It was also possible to find that the precarious documentation makes it hard for some landowners to know where their lands are, their shape, area and borders are. This can be a barrier for the management of land. At the same time, the lack of economic incentives and the reduced size of land, lack of knowledge or willingness to cooperate can also be barriers for an increasing land usage in forest areas and, therefore, also a barrier to prevent wildfires. However, not only landowners are responsible, other stakeholders like the national and local governments, corporations, firefighters, forest associations, play a role in the wildfire issue.

The qualitative methodology proved to be interesting in the exploratory part of the issue, there are a lot of studies about the wildfires, none of them focusing, specifically, on the system stakeholders and their motivations. However, the methodology is limited in the sense of establishing precise proportions of the landowners' classification and validate the findings with numbers and quantitative data. A suggested next step would be to dive deeper into other stakeholders and proceed with quantitative data to back it up.



## 2 LITERATURE REVIEW

Before presenting the collected data and analyzing the landownership structure in Portugal and the data collected, the main concepts around identity, the connection between identity, lands and landscapes, attachment to possessions, and fluidity must be analyzed. Afterwards, the theories behind rural-urban migration phenomenon have been explored bearing in mind the European reality.

This theoretical part starts with a review on the literature of rural urban migration. Then, it proceeds to a review on the literature regarding consumers identity formation, proceeding to its connection with land and landscapes, moving to consumer possessions as a part of identification. Finally, ending the second part on the concept of fluid identity and unattachment of consumers to possessions.

For this research, the concepts of identity presented by Ceko and Baumann, as well as the concept of Maslow hierarchy of needs were chosen to conduct the analysis of the presented data. Those theories support on the understanding the contrast of building the individual's concept of self based on possessions, the need of having a land against the lack of management of those properties and, even, lack of knowledge of the location of those properties.

### 2.1 *Rural-urban migration*

The rural scenario and dynamics have been characterized by three trends that are interrelated: economic diversification, deagrarianisation and depopulation. The first two trends tend to be common to all rural areas, while the third one affects, particularly, the most disadvantaged areas (Delgado Viñas, 2019). Nevertheless, it remains true that deagrarianisation (Camarero Rioja, 2009, Collantes, 2007a, 2007b) and the shift towards the service economy, as said by Delgado Viñas (2019, p.341) that happens simultaneously in “present-day rural economies and societies has not led to the disappearance of the rural space but instead has given rise to new and multiple forms of rurality” (Sorokin & Zimmerman, 1929; Hoggart, 1995, 2001a, 2001b; Ratier, 2002; Ballas, *et al.*, 2004; Woods, 2005; Cloke, 1977, 2006; Waldorf, 2006; Jornad, 2009; Rieutort, 2012; Berdegúé & Proctor, 2014; Rauch, 2014; Goerlich, 2016).

#### 2.1.1 *Difference between rural areas*

There is a distinction between rural areas to be made that is important, according to Delgado Viñas (2019), it differentiates: (a) rural areas that are part of urban and metropolitan areas, (b) rural areas that are still well connected to medium-sized urban centers and/or intermediate city networks, and (c) remote rural areas that remain poorly connected with any

type of urban space. Even though the criteria used to define and to limit rural areas in the European Union might diverge according to the goals pursued on work, as a whole they all reflect a statistical and administrative approach, usually based on the size of the local population, both in absolute number, as the number of inhabitants in the area, and in relative terms through population density (EUROSTAT, 2010).

Consistent with the adoption of basic principle of development guidelines, OECD has established a typology on rural areas that is undeniably complementary to the ones used previously (OECD, 1994, 2006, 2010): (a) dynamic remote rural regions; (b) lagging remote rural regions; (c) dynamic intermediate regions; and (d) lagging intermediate regions.

Likewise, a Delgado Viñas (2019) highlights a distinction that is also often made between the rural areas that are: (a) specifically facing the process of depopulation, with considerably weak economic activity and which is highly dependent on the agricultural production; (b) the intermediate ones in which agricultural activity still plays an important role in conjunction with different emerging economic activities; and (c) rural areas presenting an astonishing transformation of their economy making agricultural activity relatively unimportant as the urban activities and functions acquire greater roles in the region. In fact, these last areas have a tendency to comprise zones that falls between the countryside and the city where intensive urbanization or peri-urbanization processes are taking place on those rural places (Bibby, 2004; Alario *et al.* 2018).

### *2.1.1 Depopulation in rural areas*

When considering depopulated or sparsely populated areas, there still is no agreement on the most correct term to designate them. Depending on each researcher's approach, or what is their research object and the issue they want to stress, these areas can be called sub-populated regions, fragile or less favored areas, thinly populated, remote rural areas, etc. Regardless, they are characterized by their low population density and their fragility of economic activities, both of which can be related to substantial geographical isolation and some difficulties regarding territorial integration with other regions. The most commonly accepted concept of depopulation as referred by Delgado Viñas (2019, p.346) is “the process of chronic loss of population in a territory without any expectation of recovering or returning to the previous maximum population” (García Valdivia, 2018; Johnson & Lichter, 2019).

This chronic population decrease, or depopulation, became a rather common pattern of population change in several low-fertility countries, when considering the developed world. (Münz 2006; Nikitina 2000). The rural areas have “emptied out” as urbanization has continued

rapidly throughout most parts of Europe (MacDonald, 2000; Carrasco, 2012), United States of America (Wuthnow, 2018; Johnson & Lichter, 2019) and, also, in several East Asian countries (Matanle, 2011; Xingan, 2015).

There are a lot of researches and literature surrounding the phenomenon of rural-urban migration, also in rural depopulation in Europe. All of those comprise different theories about those phenomena, but all of them sustain a common factor: the main causes of depopulation are not due to natural causes but political and economic ones (Viñas, 2019). The normally accepted causal aspects that explain the process of depopulation include demographic regression, intense de-ruralization, de-agrarization, poor transportation and connection links, etc.

Another point is that most of the researches coincides in pointing that the process of decrease in population in European rural areas is not the result of one specific crisis, but it is “due to a two-century-long structural situation that has been aggravated by certain episodes” (Viñas, 2019, p.342). According to this perspective, depopulation can be seen as a specific case of a bigger phenomenon, which was the rural exodus caused by modern economic growth (Wuthnow, 2018; Viñas, 2019).

When considering the theories that describe changes in the economic system, some authors defend the theory of the collapse of the “traditional mountain economies”, economies which were based on strong agricultural activities. This was generated by the dissemination of the market economy with its logic of accumulation and reproduction (Commins, 1978; Dunaway, 1996; Collantes, 2001b, 2004b).

All of those changes stimulated and aggravated the polarization of territorial dynamics, which triggered intense effects in the areas that have less capacity to compete. The so called “mountain areas” have an economic base less diversified, more difficult regarding accessibility, more geographic and climatic disadvantages for agricultural production, etc. (Rieutort, 1997; Collantes, 2004a). Other factors may include the deficiencies in equipment and services. According to Delgado Viñas (2019, p.342) it is not so much of a “problem of the internal decadence of traditional models; it is more a question of maladjustment to new global contexts and a lack of economic, social and territorial cohesion”.

For a significant amount of time, there was great concern over the economic and environmental issues that resulted from this process (Coleman, 2011; Smailes, 2002). Several studies suggest that the low population levels, and the remote locations, points that the economies of those sparsely populated and/or underpopulated regions tend to grow at far lower rates than the EU average or, even, to reach a stagnation point altogether (Gáková, 2010). Meaning that: the low population density, aging population, low birth rates and constant

population loss due to emigration from those areas, are the main challenges faced currently by rural areas (FEMP, 2017a, 2017b). The article 174 of the Treaty on the Functioning of the European Union recommends that particular attention should be paid to “regions which suffer from severe and permanent natural or demographic handicaps” (Delgado Viñas, 2019 p.344), exemplified by the northernmost regions, that tends to have a very low population density, islands, and mountainous regions.

## *2.2 The concept of identity formation and basic human needs*

One’s identity is a rather complex topic that has been discussed in a variety of fields, i.e. psychology, consumer behavior, philosophy. As Ceko (2018) stated, identity and identity formation are primally built based upon personal experience of a certain individual, and determined by sociological framework, being individual or collective, which would require a sum of individual identities. This means that the one has been involved in social frameworks like family, school, work, environment, etc. since primary socialization and interaction with these institutions affects directly the behavior and channeling of individual activities (Ceko, 2018). "An individual socializes and builds his/her identity in stages, for a long period ranging from birth to maturity. Constantly, the picture you build about yourself, your beliefs, and your own roles is an extremely important psychological structure that allows you to choose your activities and your social relationships” (Katrin and Ruano-Borbalan, 2009, as cited by Ceko, 2018).

Ceko (2018) discuss that the image of oneself play a central role in the construction of an individual identity, or of ones’ "ego". Then again, it is important to stress that any form of identification of oneself becomes meaningful only if and when it is noticed by "others", or the external world. The concept is complex, so it is important to recognize that an individual identity is essentially based on diversity, whereas the collective identity, within a social group, is usually based on similarities. In this sense, it is important to recognize the developmental dimension of identity that usually encompasses all forms of identity (Katrin and Ruano-Borbalan, 2009; Ceko, 2018).

For Ceko (2018), the concept of identity can be used in different circumstances and tasks, being it an analysis of an individual's personality, or the formation of his attitudes and values, or even as the identification with a particular group, being it smaller or larger, when analyzing the formation of collective identities. The process of forming an identity takes place through “three stages in every person's life”. Therefore, it is important to differentiate the primary individuality, which more commonly happens during the first three years of childhood,

a categorical individuality, very characteristic of the adolescence period, and the personalizing individuality of adolescence (Castells, 2002). Building a collective identity tends to be largely based on some basic materials from the past, like a common or similar history, collective memory, territorial affiliation, and social legacy. Building a collective identity

... determines the symbolic content of this identity and its meaning for those who identify with it or set apart from it. Since social identity building always takes place in a context marked by power relations, it is suggested to distinguish between three forms and sources of identity building: legitimate identity, identity of resistance, and project identity. (Touraine, 1992).

Castells (2002) defines legitimate identity as a characteristic for civil society, and through institutions, organizations, and organized social actors, it reproduces a form of identity that "rationalizes the sources of structural domination". Regarding identity for resistance, Castells (2002) and Ceko (2018) states that it enables the formation of communes, groups or communities. This kind of identity is structured in the form of collective resistance, it is a reaction to the "oppression by dominant institutions, ideologies, dominant values, etc" (Hamouda and Gharbi, 2013). Finally, project identity from individuals creates subjects. "By subject I mean the desire to be an individual, to create a personal history, to give meaning to the full wealth of individual life experience (...) the process of transforming individuals into subjects is a necessary combination of two ratifications: an individual in relation to communities and individuals in relation to market" (Touraine, 1992. According to Castells, 2002).

In the discussion of identity, Ceko (2018) and Hamouda and Gharbi (2013) defines it not only as a process, but also as a state through an individual determining their lifestyle and makes the choice of social groups that one identifies with, which is also conditioned by the social structures the individual and the group belongs to. The identity of individuals or a personal identity is shaped in relation to other individuals; this emergence is usually conditioned by factors that are inherited and other that are chosen (Castells, 2002).

Currently, with the development of fluid identity through online/offline channels, the identity started to not be necessarily bounded by a specific territory, their emergence and development, seeks the world at great speed because of the networked and connected society (Ceko, 2018; Hamouda and Gharbi, 2013). This concept of fluid identity and its forms makes a significant contrast when related to "solid" identities, which are inherited or linked to a particular territory or space. It is stated that the process of cultural identification allows individuals to view their cultural identity as a "symbolic and big body" that helps them to shape

and adapt their ego (Katrin and Ruano-Borbalan, 2009). According to Katrin and Ruano-Borbalan (2009), some cultural features of traditional societies, like any kind of ritual, symbol, mythical story, or even religious and political affiliations, can be considered as elements that “enable an individual to integrate into a particular cultural community by linking their personal psychological functions with the values and morality of a given society” (p.113). For Hamouda and Gharbi (2013), in the modern fluid societies, this process of linkage and integration was transformed and does not require a religious, political or similar affiliation anymore, but can be connected by the possessions and consumption of material goods and services in common. This means that “with each new purchase we become part of a global consumerism cultural community” (Ceko, 2018, p. 123).

According to Maslow (1943, 1954), our actions as human beings are prompted in order to attain sure needs. Maslow first delivered his concept of a hierarchy of wishes and motivation in his 1943 paper “A Theory of Human Motivation” and his subsequent book in 1954, “Motivation and Personality.”

Maslow brought a new place of attention in the field of psychology. While psychological theories and colleges of concept have been dominated by means of psychoanalysis and behaviourism, psychology centered closely on frustrating behaviours. Maslow on the different hand was extra fascinated in studying and grasp what motivates people. He was additionally an awful lot involved in comprehending what human beings do, in order to gain what makes them happy. As a humanist psychologist, Maslow believed that human beings have an innate wish to be self-actualised: that is, the wish to be all they can wholly be. Yet for Maslow, in order to reap these final desires of what people sincerely choose to be, a wide variety of more fundamental needs ought to be met, such as the want for food, safety, love, and self-esteem, among others.

While this idea is normally recognized as the hierarchy of needs, he never displayed his concept as a pyramid (Eaton 2012). Depicted in terms of a pyramid, however, the lowest ranges are made up of the most ‘basic needs’, whilst the more ‘complex needs’ are located at the top of the pyramid. The desires at the bottom of the pyramid are fundamental bodily necessities along with the need for food, water, shelter, and warmth. But for humans to cross on to the next stage of needs, which are in the main for safety and security, the lower-level wishes have to be met first. This is one motive why, Maslow explains, as people ‘progress’, their wants become increasingly more psychological and social to the extent that the want for love, friendship, and intimacy grow to be greater vital than any different needs. Yet as we go even further from this

degree of the pyramid, the want for non-public esteem and feelings of accomplishment become greater necessary than these at the lower-levels.

Maslow (1943) distinguishes 5 one-of-a-kind tiers of needs, to which he assigns distinct levels of relevance: “if I may also assign arbitrary figures for the sake of illustration, it is as if the common citizen is blissful perhaps 85% in his physiological needs, 70% in his safety needs, 50% in his love needs, 40% in his vanity wants and 10% in his self-actualization needs” (Maslow 1943: 388-389). If we have been to draw a plan (a pyramid for that matter) to represent the hierarchy of desires as explained by using Maslow, the physiological wishes would want to characterize a an awful lot larger piece of the pyramid. The five one of a kind tiers in Maslow’s (1943) hierarchy are as follow:

#### *Physiological Needs*

Psysiological wishes include the most basic wants that are quintessential to survival, such as the need for water, air, food, and shelter. As Maslow believed, these desires are the most primary and instinctive wishes in the hierarchy due to the fact all desires grow to be secondary until these physiological needs are met. Maslow introduced that most of these lower degree wishes are in all likelihood fairly apparent. This is due to the fact everyone, as long as s/he is human, needs food and water to survive. We also need to breathe and keep a steady body temperature. Besides eating, drinking, and having enough refuge and clothing, Maslow also cautioned that the other important physiological fundamental want used to be sexual: reproduction.

#### *Security Needs*

Security wants include the needs for security and security. Security wants are necessary for survival, however they are now not as demanding as the physiological needs. Examples of security wants consist of a want for consistent employment, fitness care, protected neighbourhoods, and shelter from the environment. These desires become a bit extra complicated at this factor in the hierarchy as theyare regarded 'higher' than physiological needs. And when the greater simple survival desires have been fulfilled, people start to sense that they want more manipulate and order to their lives. People start to problem themselves with protection in terms of where they live, monetary security, physical safety, and staying healthy.

#### *Social Needs*

Social wants include needs for belonging, love, and affection. Maslow described these wishes as much less fundamental than physiological and protection needs. Relationships such as friendships,romantic attachments, and families help fulfil this want for companionship and acceptance, also involvement in social, community, or religious groups.

### *Esteem Needs*

When the first three wants have been satisfied, esteem needs become increasingly important. Esteem wants consist of the need for matters that replicate on self-esteem, non-public worth, social recognition, and accomplishment. At this point, it will become essential to reap the appreciate and appreciation of others. People have a need to accomplish matters and then have their efforts recognized. People often have interaction in activities such as going to school, playing a sport, taking part in a hobby, or collaborating in expert things to do in order to fulfil this need. Satisfying this want and gaining acceptance and esteem helps humans end up more confident. Failing to obtain focus for accomplishments, however, can lead to feelings of failure or inferiority.

### *Self-actualising Needs*

Self-actualising needs assume the very best degree of Maslow's hierarchy of needs. Self-actualising human beings are self-aware, involved with non-public growth, less concerned with the opinions of others, and involved in fulfilling their potential.

#### *2.2.1 Land, landscape and identity*

The relationship between people and land is quite complex. In his works, Miller (1995) argues that there is a complex "inter-relationship between group culture, land, and state territorial rights. Moore (2014) argues that the relationship between group culture and land is established through a symbiotic relation between them, where one transforms the other and vice-versa. On that account, landscape is constantly changing due to human intervention (Council Of Europe, 2000) and it will impact directly on the relationship with the people living in that landscape, and consequently in their landscape identity (Dossche, Rogge, & Van Eetvelde, 2016).

These relations have been discussed by different authors on the past decades. Landscape can be perceived by the "uniqueness of a place and regarded as it's social and personal construction in which biophysics of the area are components" (Stobbelaar and Pedroli, 2011). This approach was taken even further when Loupa Ramos, Bernardo, Ribeiro and Van Eetvelde (2016) argued the landscape identity should be seen as the dynamic, continuous relationship between people and their landscape. Loupa Ramos, Bianchi, Bernardo and Van Eetvelde (2019) also reinforces that this relationship is greatly influenced by action in and the perception of that landscape in particular and can be analyzed through a theoretical framework called "Transactional Model of Landscape Identity".



Despite being embedded in social memories and representations, it is important to highlight that lands and landscape identity is not only collective, but it is also an individual construction made through individual experiences and memories (Bernardo, Almeida, & Martins, 2016; Loupa Ramos, Bianchi, Bernardo and Van Eestvelde, 2019). That is the reason why people may make explicit references to some specific features and qualities of their landscape, those have acquired meaning through the “simultaneous relations between individual and collective practices and values” (Loupa Ramos et al, 2019).

On their most recent study performed in Palmela, Portugal, Loupa Ramos et al (2019), concluded that regional scale (Carvalho-Ribeiro et al., 2013) and an expert-based approach, more focused on one particular region, (Loupa-Ramos et al, 2016) managed to collect generic attributes (e.g. memories, smells, traditions) from the lands and the landscape as a part of the landscape identity. People would be very clear in their expressions and answers when referring to concrete aspects of their lives that were relevant to their identity, and the difference in scales considering, municipality, parishes, villages was a factor for people when attributing their identity to different scales in the landscape (Stobbelaar & Pedroli, 2011; Loupa-Ramos et al., 2016).

However, it is also known that the past and links to that past also plays an important role when shaping the present identity of the individuals. The heritage and the connection of people with the land was a significant aspect in the set of contents related to identity of the residents and non-residents of the studied municipality (Loupa Ramos et al., 2019).

### *2.2.2 Consumer attachment to possessions*

It is not new that research explore theories in the area of objects attachment as a form of developing identity (Belk, 1988). The research on material possessions as an “expression and extension of selfhood” is more than 25 years old (Arnould and Thompson 2005; Belk 1988). In this regard it is argued that material possessions can be crucial when maintaining, displaying, and transforming a person’s self, due to the symbolic connections between possessions and someone’s “personal history, values, relationships, and ethnic or national culture” (Belk1988; Richins 1994; Schouten 1991; Wallendorf and Arnould1988).

In this regard, it is possible to state that possessions extend the self-identity into the external world, a way to provide concrete links between the one’s self, the material world, and the cultural context (Grayson and Shulman 2000; Miller 1987; Tian and Belk 2005). Findings made by Csikszentmihalyi and Rocherberg-Halton (1981) and McCracken (1986) shows that possessions are seen as an anchor and a way to stabilize identity in space, since they transform

the world and the space into a place of belonging. It is not uncommon that migrant consumers use possessions to maintain a connection to a certain place and to sustain their self-identity (Belk 1992; Joy and Dholakia 1991; Mehta and Belk 1991). It is also shown in researches that consumers tend to use possessions to manage temporality, meaning, to carry the past into the present, maintain their present selves, and, also, trying to anticipate future selves (Marcoux 2001a; Price, Arnould, and Curasi 2000).

Consumers tend to form enduring, salient, and strong attachment to possessions, as shown by consumer researchers, because these possessions play a role in their singular identity projects. Bardhi, Eckhardt, and Arnould (2012) stated that, overall, the perception is that object and possessions attachment “fixes one to place, time, and culture, and it may protect or buffer the self from change”.

### *2.2.3 Liquidity and unattachment*

Attachment changed over time and due to the globalization processes, Bardhi, Eckhardt, and Arnould (2012) affirms that being attached to things can become problematic, since identities are constantly changing in our present “liquid world”. Zygmund Bauman (2000; 2007) proposed the concept of “liquid modernity” aiming to characterize the current social condition where the social structures “limit individual choices, institutions that guard repetitions of routines, patterns of acceptable behavior” are no longer stable, also they face a shortened life expectancy; meaning that “they cannot serve as frames of reference for human actions and long-term life strategies” (Bauman, 2007, 1).

Bauman defined the term “liquidity” from the problems raised by terms such as “postmodernity” or “late modernity”; the philosopher characterized the present postmodern condition as being “liquid” or “fluid”, a contrast with the precedent concept of solid modernity. This solid modernity could be characterized as an era of heavy infrastructural and industrial investment, also labor-intensive production, where “capital was as much fixed to the ground as were the laborers it engaged” (Bauman, 2000); another characteristic was the relatively fixed time-space locational orientations, such as nation states, a term that was conceived in Westphalia and became much more transitional.

Contrary to the solid modernity concept, where size means power and weight means success, Bauman argued that solidity, fixity and sheer extension of locational control is not automatically an asset anymore in the liquid modernity (Tomlinson, 2007). Ritzer (2010) stated that during the last century and at an increasing rate, things that appeared to be solid tended to melt, becoming increasingly liquid, this included places, objects, people, institutions, and

information. According to Slater (1997) the core aspect of the route that started with post-Fordism and continued to advanced consumer cultures “is the dematerialization of objects and commodities, indeed of the economy and ultimately of society as a whole”.

### 3 METHODOLOGY

The purpose of this chapter is to explain the methodological approach adopted when conducting the research. It also contains the motivations behind the chosen approach.

According to Leedy & Omrod (2016), research is the process of collecting, analyzing, and interpreting data, aiming to have a better understanding of specific phenomenon. The most common approaches to conduct a research are quantitative, qualitative, and mixed-methods. The first method targets specific groups or in-depth interviews (Kothari, 2004) to validate the information on the subject and collect data about it through a certain number of participants, collecting insights about the topic. The second method, the quantitative, aims to find patterns, therefore, it needs a large number of participants to reply questionnaires, or surveys, where the answers can be translated into statistical measures. The third approach, mix both methodologies in order to have the qualitative insights and perceptions, aligned and supported with the statistical patterns and analysis. Since the main focus of this research is to understand the connection of landownership in Portugal, value of land in the countryside, and its connection with the wildfires, mainly in the Center and North of the country, the qualitative method for a first research was chosen for the capability of generating the first insights on the subject, thanks to its exploratory nature.

Therefore, through qualitative methodology, the goal of this dissertation was to explore the value of lands, the urbanization phenomenon, and the point-of-view of local and national authorities in what concerns the subject. Bearing this in mind, it is important to highlight that the wildfires are a complex phenomenon and in this research, the focus was to gather insights about ownership of lands in the countryside of Portugal, with a special emphasis in the Central and North areas of the country where there is the highest concentration of wildfires on summers as it is possible to see in the website *fogos.pt*.

The purpose of the first session is to discuss the theory behind qualitative methodology, while in the second there will be the discussion of additional methods and resources used to support the dissertation, including analysis of printed documents, personal direct observations, meetings, and other.

#### 3.1 *Qualitative research methodology*

The main advantage of qualitative research is the flexibility in its design which allows it to change along stages of the process when the research target changes and evolve. Hence, in this case, as Maxwell (2008) pointed, the research design tends to be broader and less restrictive than other research methods that are held as being more traditional. It is believed that all

components of a qualitative research should be interactive (Maxwell, 2008), since they usually affect and are affected by each other. On this regard, Maxwell points the components that are deemed essential when understanding this type of study: goals, conceptual framework, research questions, methods, and validity.

Therefore, benefiting from the flexibility of this methodology (Creswell, 2008) when combining different sources and to gather a more broad and holistic view about the relation of wildfires and landownership in Portugal, different sources of information.

According to Baxter & Jack (2008), the qualitative case study methodology allows “researchers opportunities to explore or describe a phenomenon in context using a variety of data sources”. That is why the sources diversity in qualitative case study allows for a more complete and holistic view of the object of study. This will lead to a higher quality of inferences and, also in the conclusion, at the end of the research. It was two constructivist researchers, Robert Stake and Robert Yin, that developed the basis of this methodology using their own constructivist perspective to build the base of the method used in this research. For constructivists, the human perspective is subjective and what can be considered as truth depends on one’s perspective about it. Meaning that reality changes depending on each one’s background and it is possible to say that reality is a social construct (Baxter & Jack, 2008). Consequently, each participant and source will introduce a new perspective according to their own realities or their author’s in this kind of research.

According to Robert Yin (2009), it is possible to adopt a case study approach when “a) the focus of the study is to answer “how” and “why” questions; (b) you cannot manipulate the behavior of those involved in the study; (c) you want to cover contextual conditions because you believe they are relevant to the phenomenon under study; or (d) the boundaries are not clear between the phenomenon and context”. Going deeper into the subject, the author breaks the case study into three different types: exploratory, explanatory, and descriptive (Tellis, 1997). Considering the definitions given by Yin and Baxter, this research on the landownership in North and Center of Portugal, the value of land and wildfires. In this case, the instrumental type of case is defined as:

Is used to accomplish something other than understanding a particular situation. It provides insight into an issue or helps to refine a theory. The case is of secondary interest; it plays a supportive role, facilitating our understanding of something else. The case is often looked at in depth, its contexts scrutinized, its ordinary activities detailed, and because it helps the researcher pursue the external interest. (Baxter & Jack, 2008).

### 3.2 Research process

#### 3.2.1 Data gathering

Considering that this dissertation is based in case study method the sources of data can be diversified and integrated. “Potential data sources may include, but are not limited to: documentation, archival records, interviews, physical artifacts, direct observations, and participant-observation” (Baxter & Jack, 2008). For the purpose of understanding better the phenomenon covered in this dissertation, multiple forms of qualitative data collection were used. Those were field visits and observations, interviews with landowners, documents like minutes of meetings and official documents, also visual materials like photographs.

Documentation was retrieved from a wide range of sources, including meeting reports, presentations, researches made by other institutions, and official documents provided by the government and its institutions. The documentation was used to understand better the perspective of other stakeholders that are also affected or have the power to tackle the wildfires. These institutions are companies that hold assets in forest areas, like Altri and The Navigator Company, government institutions like the official registry organism *Instituto Nacional de Registos* (in Portuguese).

There were also interviews with landowners, most were conducted through phone due to the distance. They were semi-structured interviews, made with open end questions to try to capture information as the landowner would give, and to explore as many topics as possible inside the subject. The pre-requisites to be interviewed were owning lands in the North and Center of Portugal, willingness to share information about their own lands. The complete transcript of the interviews can be seen in the appendix, as well as any other document explored in this research.

The interviews were crucial to get a deeper understanding of the motivations, or lack of motivations, of landowners when deciding to take care of their lands, give a productive use for them. Or the opposite, not giving a use and also opting not to sell or rent their plots.

#### 3.2.2 Personal notes and experience

This research is focused on the topic of wildfires, which was the topic of a Case Challenge to tackle the wildfires in Portugal with a business model promoted in one of the courses of the researcher from February 2019 until June 2019. During this time, the researcher was able to get familiar with the topic and dive even deeper when the researcher and a colleague decided to transform the business model, into a Startup in June of 2019. This proved to be an

advantage, since landowners and other stakeholders were easier to access and to schedule conversations and meetings. As it will be presented, the best way of developing a business model focused on reducing the risk of wildfires in Portugal, is to conquer the current challenge of increasing the area of managed forest and incentivize landowners to give a use for their forest lands.

The researcher used a lot of the experience, notes, observations and meetings as material for finding the research question and to develop the research itself. The time was also useful to get familiar with theoretical framework and terminologies from agronomy and forest engineering.

Another important note is that the researcher family owns lands in the countryside of Portugal. Therefore, a topic directly tied with the researcher's personal experience, hence, before starting to work on the area the researcher was not aware of her own condition as a potential landowner.

## 4 FINDINGS

This chapter describes and presents the findings of this research about of the wildfires' occurrences in Portugal, the main stakeholders in the forest area, the occupation and use of soil, the landownership structure and documentation in the researched regions, and the main insights gathered from the interviews.

Information about the wildfire circle will be presented in order to establish better it's connection to the present landownership structure in the country. To better set the A part of the history of landownership in Portugal will be covered, in order to provide a better understanding of the current situation. The main goal of this chapter is to establish a scenario of the situation and the views of different stakeholders in to the issue for a posterior analysis on how the lack of value of lands is affecting all the stakeholders that relies on the forest areas for its social and economic activities.

### *4.1 The wildfires cycle*

Wildfires have been an increasing and more aggravating problem in Portugal, until it culminated in 2017, when, for the first time, there were deaths caused by the wildfire that spreads through Pedrógão Grande and Góis.

The average burned area increases yearly as showed in the figure below. But 2017 was the first year where there were most damage to people, cities, and villages. According to Beighley & Hyde (2018) from the 1980s until 1999, a 20 years cycle, only in 6 years the burned area exceeded 100,000 ha, while from the 2000s onwards, on 11 out of 18 years the burned area exceeded this 100,000 ha, as showed in the graph below. It means that, beyond the risks increasing, the chances of a wildfire that spreads and burns more than 100,000 ha has increased by 61%.

Beighley & Hyde (2018) stated that this “pattern of alternating years of pattern of alternating years of higher highs (e.g. 2003 for area and 2005 for occurrence) and lower lows (e.g. 2007 for occurrence and 2008 for area) can place extreme stress on environmental systems”



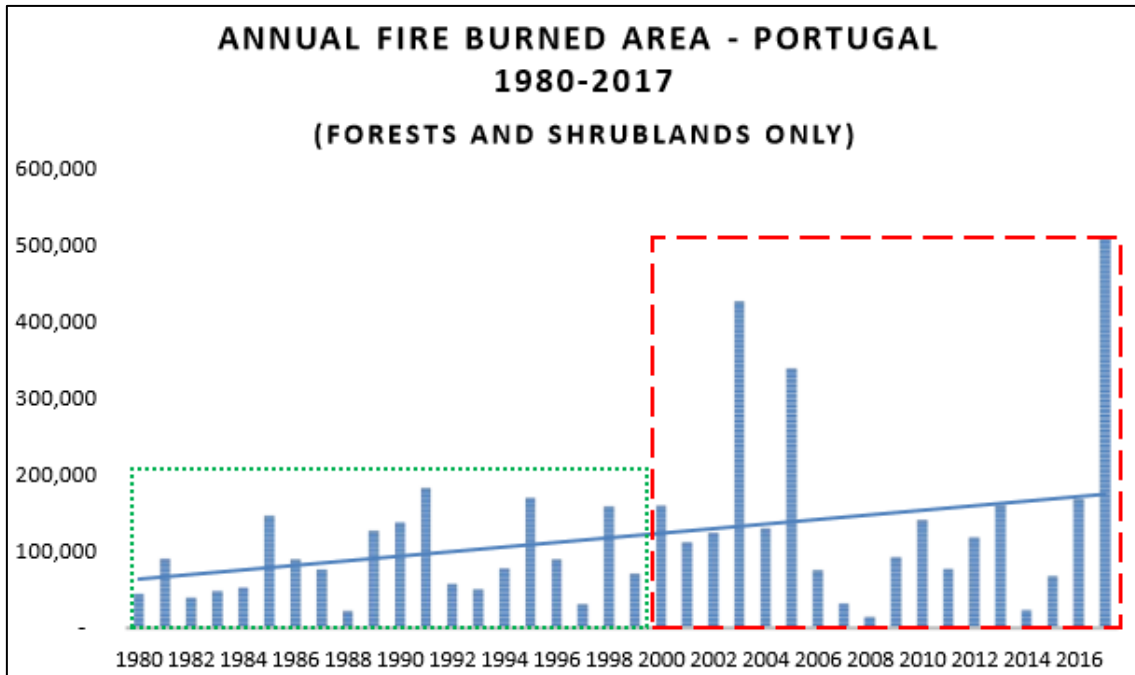


Figure 1. Annual fire burned area in Portugal 2001-2017, with linear trend line  
Source: ICNF, 2017

A report published on the case of wildfires in Alvares (2019) defines that there is a clear cycle and three main factors that creates the conditions for fire to start and spread. It is called the fire triangle: for a fire to start and spread there is need of some sort of ignition, fuel and also favorable climate conditions.

#### 4.1.1 Ignitions

The summers in Portugal tend to be very dry and the absence of rain makes the weather conditions for a fire to start easier. Ignitions can be caused by natural causes, can be intentional, out of negligence or a rekindle of a fire focus.

Even with the possibility of fire being caused by natural ignitions, for instance, dry storms, the figure below shows that the percentage is very low. However, it is possible to observe that negligence represents more than 40% of the reasons for fires in Portugal. Researchers have already noted that there is a correlation between fire occurrence and population centers (Catry *et al*, 2007). However, as it was stated:

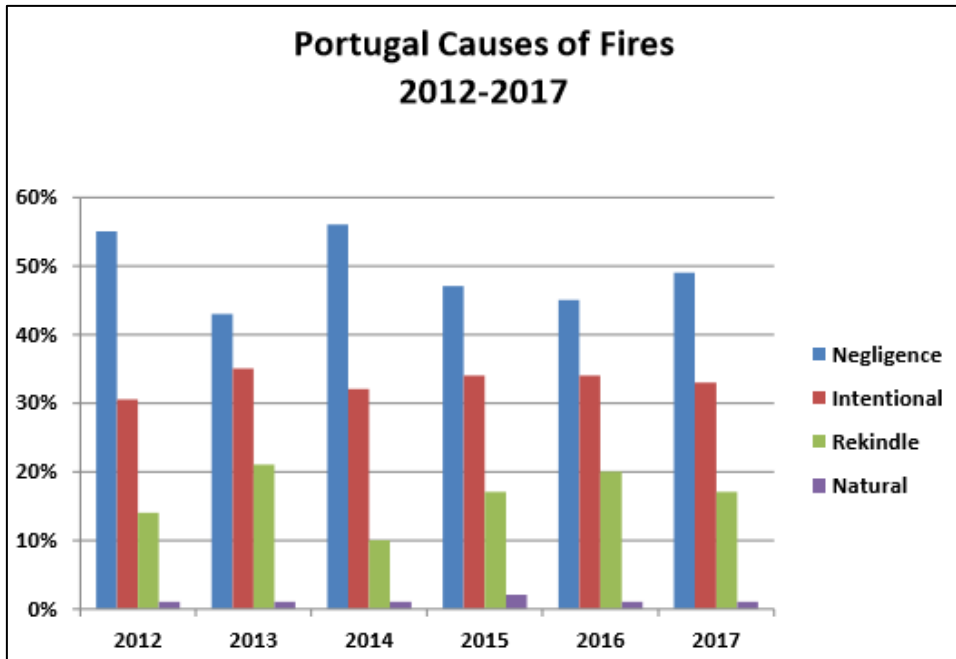


Figure 2. Source of Portugal's fires where a cause is known 2012-2017

Source: EFFIS data 2012-2016 and ICNF for 2017

Most of these urban area ignitions result in little damage but do place a demand on the fire response system. Someone has to respond to every reported fire. On days when dozens to hundreds of fires are starting, every fire represents a potential danger and becomes important. In contrast, more remote forested and uncultivated shrub and grassland areas that represent about 46% of the country, host less than 15% of fire ignitions. However, it's often in these more remote locations that ignitions result in large fires. This happens because detection becomes a challenge and first response times are, generally, longer. The terrains tend to be more rugged and less accessible to the firefighting forces and its' equipment and the dry weather in the Summer tends to be an aggravating factor (Beighley & Hyde, 2018).

#### 4.1.2 Climate conditions

The climate conditions can also be seen as a threat and, in a sense, a contribute to the increase of available fuel on the countryside. Viegas (2008) commented that in some years burning conditions were so severe that the firefighters and all fire protection system were overwhelmed. In 2003 it was high Spring rainfalls followed by heat waves and in 2005 it was a complete drought. According to ITC Report (2017) the year of 2017 was the worst due to a combination of drought, heat, wind from thunderstorms and offshore Hurricane Ophelia, as well.

The mild summers are also a factor to increase the area burned in hot and dryer summers. First, milder summers grow vegetation at an accelerated rate providing more fuel for future

fires. Second, in those summers what did not burned due to more moisture will provide more fuel to be burned (Beighley & Hyde, 2018).

#### *4.1.3 Fuel*

No fire spreads without something to fuel it and Beighley & Hyde (2018) also highlights the importance of the excess of fuel in the countryside of Portugal. Aside from the difficulty on early detection of fire focus, the excess of fuel makes it even easier to spread faster. Catry et al. (2007) noted that one of the factors that is contributing most to this increase in the burned area in the country “are those related to increasing fuel load and continuity across large landscapes”.

According to two researches “...in the Portuguese landscapes, lack of active management and suppression driven wildfire policies promote fuel accumulation (Collins et al., 2013) and bigger and recurrent fires set an important disturbance, jeopardizing forest and conservation goals” (Oliveira et al., 2017). The lack of management is so aggravating that is estimated that 80% of forest areas in Portugal are abandoned and unmanaged (Beighley & Hyde, 2018).

Recently burned areas in the landscape can provide a measure of containment of wildfires, since the scarce vegetation left will not feed the fire and helps its spreads. Yet, this benefit is temporary, since if the area continues to not being managed in the long term the growing vegetation will serve again as potential fuel to be burned. The lack of management also open space for other species more flammable to grow like shrubs, acacias, eucalyptus, and others (Beighley & Hyde, 2018).

The figure below shows maps measuring the wildfire susceptibility. There are numerous factors that makes the fire spreads faster, including the location and positioning of the fuel in the landscape from a topographic point-of-view. Fires tends to spread faster up steep slopes. The tends to be channeled and amplified when encountering some topographic features (ISA, 2019). The Figure 4A is the result of a methodology developed by Verde and Zêzere (2010), combining the effect of vegetation and topography to measure the fire potential. Figure 4B is the same map but with an overlay of the areas burned in 2017 made by Beighley and Hyde (2018). The green areas are classified as low risk while the red areas are classified as high risk. The areas in black on Figure 4B are the burned areas. It is not a coincidence that most of the burned areas in the center of the country are very steep from a topographic point-of-view.

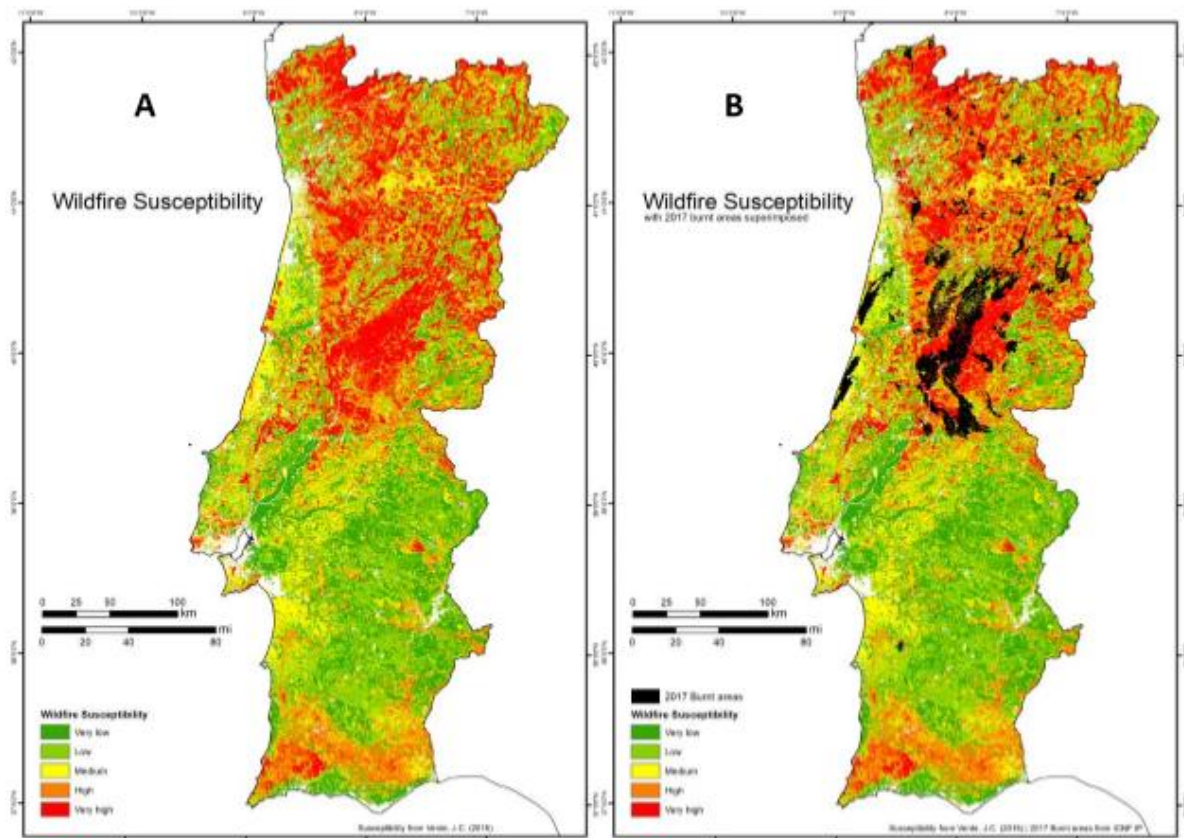


Figure 3: Wildfire susceptibility in continental Portugal

#### 4.2 Occupation and use of soil in the rural Portugal

In this section the findings regarding occupation and use of soil in rural Portugal will be discussed. Starting with a subsection explaining the change in the configuration of use of soil over the years and explaining the landownership structure in place in the countryside, following by the subsection that will briefly explore the question of migration and populational density. Then, the following subsection will present the current structure in official documents, registry, and landmarks. The final subsection will present the findings in the interviews with the urban landowners that, as it will be presented, are the majority of landowners in the Center and North of Portugal.

Portugal changed a lot over time. Not only the rural exodus to the big cities, but migratory movements also had a big impact in the Cities became bigger and migratory moves in the occupation and use of soil in the country, more significantly in its rural areas.

According to Tapiricos (2019)<sup>1</sup>, in the European Union an average of 40% of the forests are managed by public organizations and institutions, contrary to that number, in Portugal, those

<sup>1</sup> See full document on appendix

public institutions controls only 2% of the areas, 14% are managed by local communities, which leaves 84% in the private owners' care.

#### 4.2.1 Use of soil in rural Portugal

Portugal was a known rural country and owning a land in a time of poverty and crisis could mean the difference between having means to live or not, but over time, as shown on figure 5 the area of agriculture started to decrease as people moved to the urban areas. From the 1980s to 2010s the area of agriculture production decreased from 40 to 35%, while the forest area has increased from 31.5% to 34.6%.

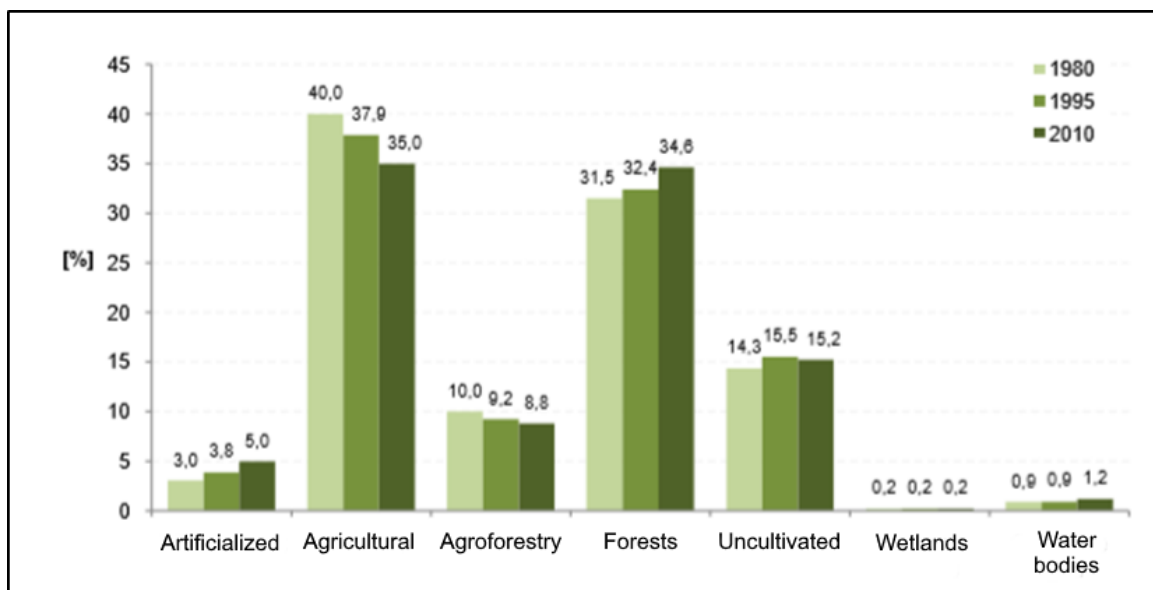


Figure 4 - Occupancy of areas of Continental Portugal by category.

Source: ICNF

The figure below illustrates the occupation of the area of Góis, a municipality in the Centre of Portugal over a century. Despite being focused on a specific area Akli Benali from the Superior Institute of Agronomy (ISA, in Portuguese) confirmed that the figure is a precise portrait of what has been happening in the countryside of Portugal in the last century. The areas in red are areas of agriculture, the grey is of pasture, while the green is the area of forest. As it is possible to see, the area of forest grew from 7% of the total area to 90% of the total area in the region, leaving almost no space for animal pasture and agriculture. According to Benali, this is due to the abandonment of lands due to rural-urban migratory movements.

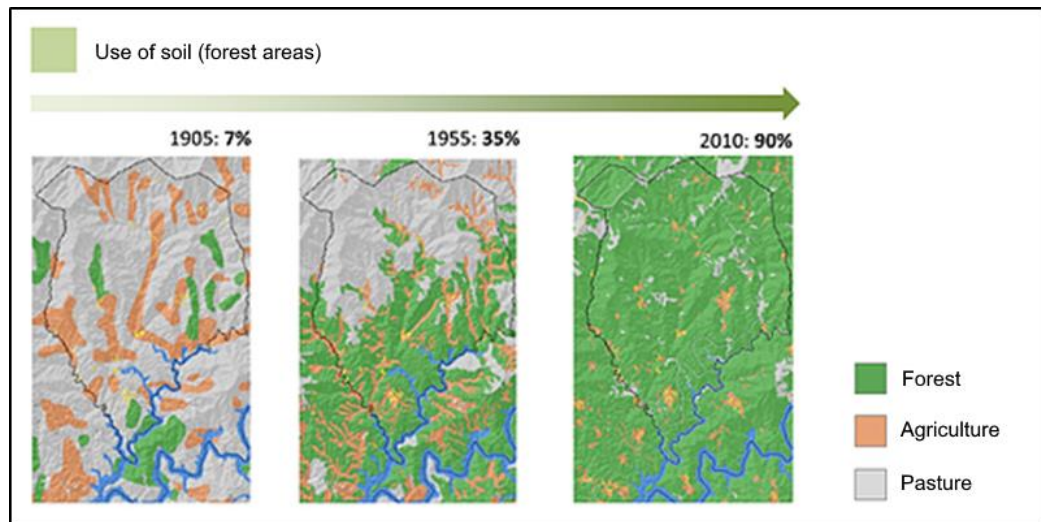


Figure 5. Use of soil and forest area in Góis from 1905 to 2010

Source: Alvares-fogo.pt

However, several factors influence the absence of management of forest areas beyond urbanization and the best opportunities being in the city, including:

Inadequate culture practices predominantly in eucalyptus and pine that result in large areas of overstocked, monoculture, single age class stands. Aggressive natural revegetation of abandoned agricultural plots and recently disturbed sites such as burned areas and forest clearings for powerlines and roadways. Finally, a lack of economic stimulus for promoting opportunities for larger scale biomass removal of understory, noncommercial vegetation and harvest residue for biofuel or electricity generation. (Beighley & Hyde, 2018).

Benali, a researcher from CEF, ISA (41, male) stated that:

The cutting age for eucalyptus is 12 years. With this age, and good land management, the trees reach their optimum point considering wood quality for paper production and density of the wood per cubic millimeters<sup>2</sup>. It's also when the producers can achieve the higher price for the wood, even higher if it is certified wood\*<sup>3</sup>. But due to the high risk of wildfires, the eucalyptus producers are cutting the trees with the minimum age possible of 8 to 10 years depending on the quality of land management.

In one of the interviews with a landowner that is also using forest to produce wood, the affirmation of Benali was confirmed when most of them stated the difficulty to actually wait for 12 years, since the lack of land management of their neighbors put their assets in risk. Another factor that complicates the issue is that those landowners that are actively managing

<sup>2</sup> For paper production and biofuel the price of the wood is calculated per density, so cubic meters of wood. In November of 2019 the price per cubic meter was 45 euros (CELPA, 2019)

<sup>3</sup> Wood certification is a process established to guarantee that the best practices of cultivation and land management were employed. There are institutions specialized in verify those practices (CELPA, 2019).



their properties and producing wood do not have big contiguous areas, as can be seen in the figure 6.

Figure 6 illustrates the areas in Pedrógão Grande, some of the areas belong to the same landowner, however, due to private reasons it is not possible to show in detail who owns which area. But the landowners and producers highlighted in the meeting their goal of buying adjacent areas as difficult as it might be. The mapped areas are all highlighted in yellow, the spaces in between are non-mapped land plots.

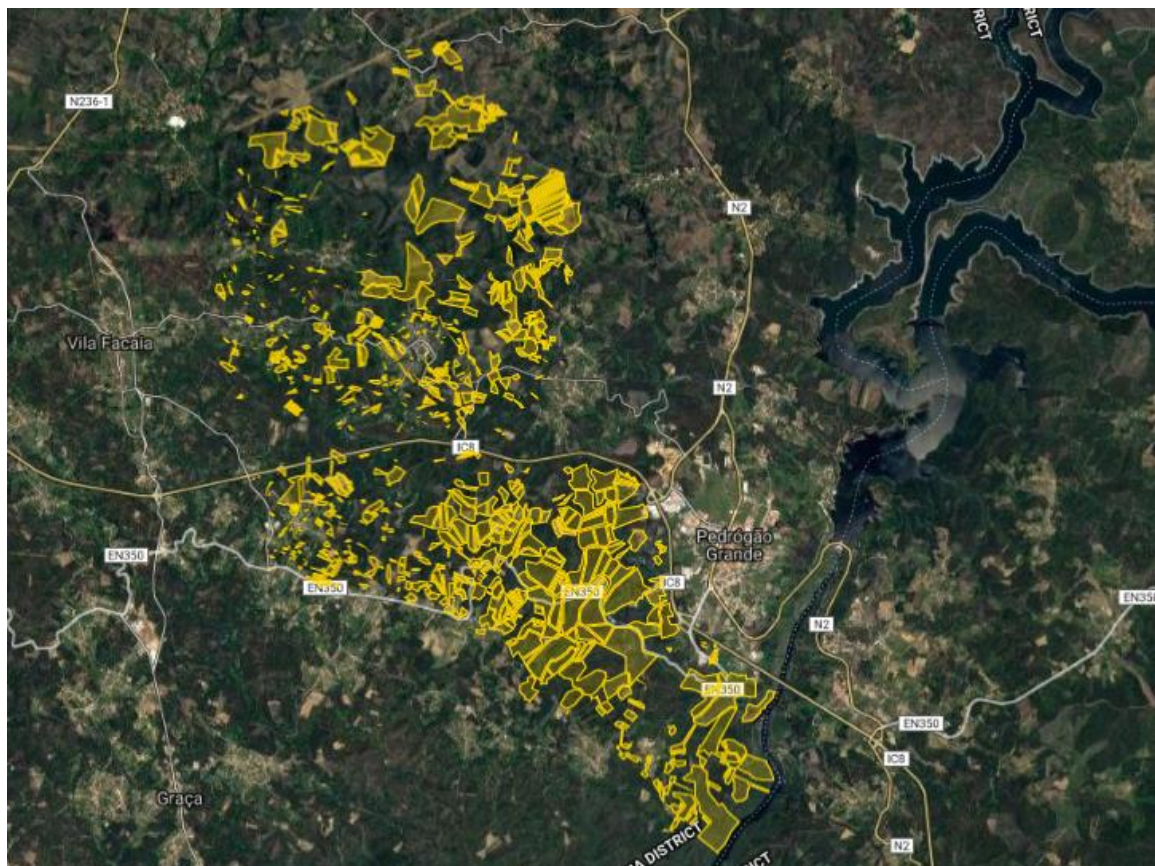


Figure 6: Georeferenced land plots in Pedrógão Grande

Source: APFLOR, 2019

The information provided by APFLOR in the region shows that the average size of the plots in the region are 0.15 ha, the situation is quite common, and the largest plot is 23 ha. However, in an area of estimated more than 18,000 landowners, only 1,103 have their areas mapped and are part of the forest association, more or less 6% of the total amount of lands in the region.

Having a small land plot in the middle of a forest is a factor that increases abandonment of lands. Along with information provided by CEF part of ISA the production of silviculture like pines, eucalyptus, and others, is only economic viable starting from an area of 5 ha. Considering that the total amount of area of the municipality, as provided by PORDATA (2019)

is 12,875 ha, and the estimated number of landowners, each landowner, on average, would have an area of 0.71 ha, already making any kind of wood production economic unviable in the area.

According to Benali (2019), the reason for those small areas is that until 2017 there was no minimum limit for the area division. So, the divisions could go on endlessly to any size, “I have seen and mapped a plot from a guy that inherited it from his grandparents that, literally, measured 10 square meters and had a single olive tree in the middle” (Akli Benali, 41, male, ISA researcher). Only in 2017 the new law imposed a minimum area up until the land plots could be divided.

#### *4.2.2 Portugal's population density and migration*

Portugal is known by its historic explorations of the sea, that led to a development of the coastal cities and regions; the two biggest cities of the country Porto and Lisbon, are located near the coast. Figure 7 shows the population density in Portugal. Focusing on the continental portion of the country, it is possible to see that the densest areas are near the coast. Mainly around the metropolitan areas of Porto and Braga, in the north, Lisbon, in the center-south and the city of Faro, in the south. Areas in the center-west like Pedrógão Grande lost considerably their population due to migrations abroad and to the coastal areas of the country.



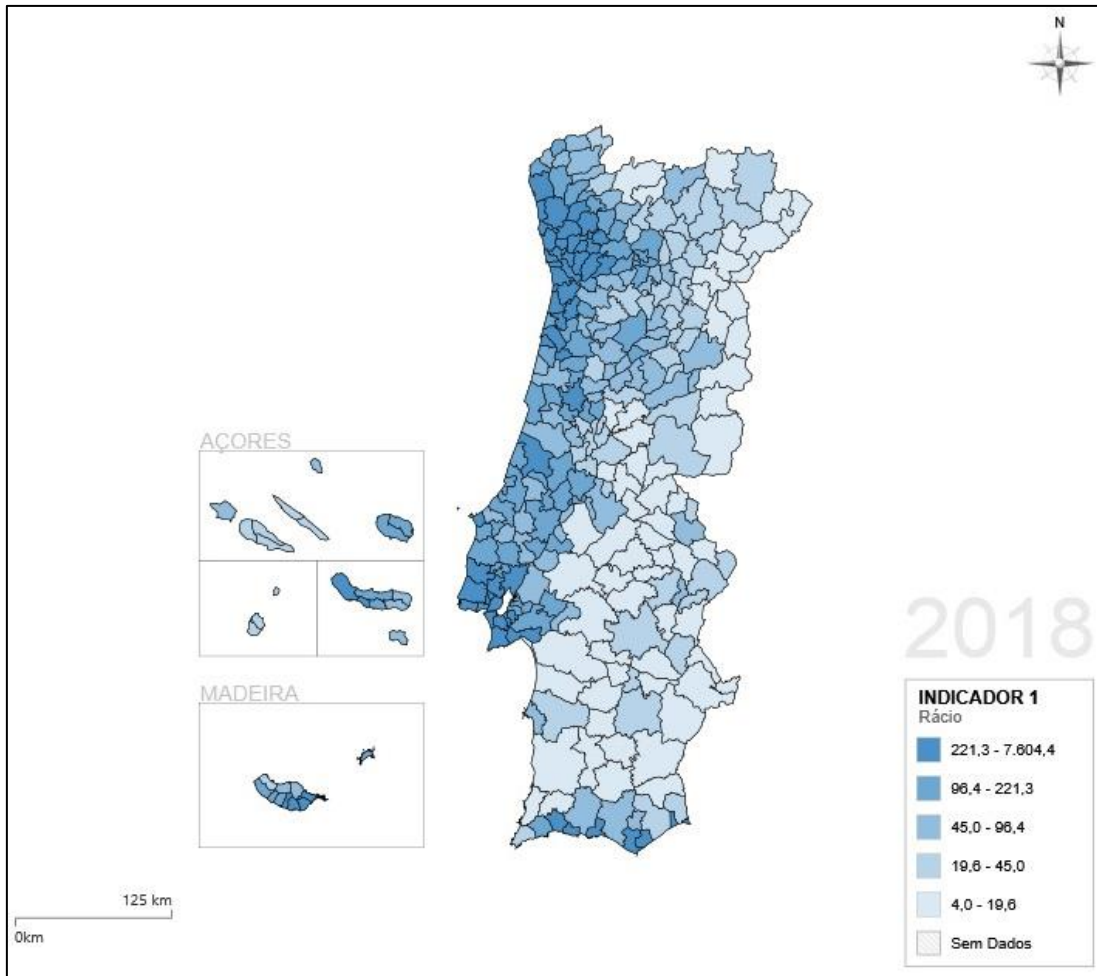


Figure 7: Population density in Portugal in 2018

Source: PORDATA, 2019

It is hard for a municipality like Pedrógão Grande with estimated 18,000 landowners keep track of the registry when they cannot access any document of landownership due to data protection laws. The municipality only knows those who still live in the city and villages around, which are 3,915 inhabitants according to the last census made in 2011, not all of those are landowners yet, a big part of them are elders being 65 years old or more as shown in the table below, while the younger generation is the smallest part of the local population. Not everyone living in the area of the municipality is a landowner and most of them, according to APFLOR, are older than 65. According to João Paulo Catarino, State Secretary for Countryside Valorization, this situation is similar in Góis and other municipalities in the countryside, excluding the south of the country, where the land plots have a large area and the local municipalities executed a quite early work of mapping, first in cartography references, than GPS, those areas and identifying the owners. Where are all landowners than? In the cities

Number of inhabitants per age group												
	1900	1911	1920	1930	1940	1950	1960	1970	1981	1991	2001	2011
<b>Total</b>	13,488	13,477	7,975	9,062	9,176	8,595	8,239	4,985	5,842	4,643	4,398	3,915
<b>0-14 y.o.</b>	4,846	4,763	2,741	2,793	2,801	2,173	1,863	840	943	654	508	434
<b>15-24 y.o.</b>	2,240	2,174	1,265	1,716	1,590	1,573	1,212	505	719	465	458	355
<b>25-64 y.o.</b>	5,577	5,572	3,446	3,913	3,982	4,076	4,103	2,555	2,841	2,224	2,016	1,815
<b>= or &gt; 65 y.o.</b>	812	949	523	625	782	850	1,061	1,085	1,339	1,300	1,416	1,311
<b>&gt;unknown</b>	13	19	0	15	21							

Table 1: Number of inhabitants of Pedrógão Grande from 1900 until 2011

Source: PORDATA, 2019

#### 4.2.3 Registry, documentation, identification, and value of land plots

Some of the landowners that were in meetings regarding landownership in Portugal declared that the popular saying is that the worst enemy of anyone is their neighbors; and it only gets worse when people do not know who their neighbors are. That is a relevant issue, since the official documents of properties in rural areas the delimitations are often given by the name of the owners of the properties bordering and other elements, such as stones, paths, trees, rivers, etc. Most of those have not been updated since 1980s.

On the appendix shows a part of the official document *Caderneta Predial Rústica*. Despite saying building, the document is the same even for land plots where there is no type of construction. The first part shows the information of where the land plot is located, the municipality, district, and neighborhood. The second part is the registry in the neighborhood, while the third one is what region of the neighborhood it is located. It is important to highlight since it is a rural property, most of those places do not have a proper address or road to identify it, and those regions are not properly registered, being the popular name that only locals know

as shown in Alvares and other parts of center and north of the country (ISA, 2019). The fourth part of the document notes the borders of the plot, in the case below the borders are with:

- North: Mr. Jose Mendes Reis' land plot.
- South: he heirs of Armando Freire land plot.
- East: Dr. Alfredo Coelho da Silva's land plot.
- West: a rural road.

The subsequent part of the document shows in which year the building was registered, how much it was the value of the property in euros, an update of the value from 1989. The total area in ha and what it contained in the last update, in this case, olive and oak trees, and shrubs. Finally, the final sessions of the documents are information about the last registered landowner and tax information, in this case, due to the low value of the plot, the owner does not need to pay the taxes for it.

This document in the appendix is an example of most of documents of rural properties in the Center and North of Portugal. The issue with this kind of indication, the region inside the neighborhood or *Freguesia*, is that those areas are not mapped and do not have a proper GPS location, the locals that live on the city or in the small villages are usually the ones who know best where are those areas. However, being most of them older than 70 years old is just a matter of time until this knowledge gets lost (Benali, 41, male, researcher on ISA).

Another challenge that can be perceived in the document is despite describing the total area and the borders of the land plot, there is not a precise description of the format of the plot. Meaning it can be in any format, a square, triangle, an irregular figure, as long as it respects the size and borders.

Without the practice of making fences, one of the only ways to determine in a way the format of the land is to find the landmarks, stones set with the purpose of marking the limits of. The stone is not very tall, in land plots that are managed, it often contains the initials of the original owner, as shown in the figure 9A. Those landmarks are not fixed and tend to be quite fragile. When the researcher was there, the vibration of a small truck passing nearby was enough to make it drop on the floor as shown in figure 9B.



**Figure 1** Photos of landmark of a land plot in the municipality of Entroncamento.

**Source:** Field visit to The Navigator operation in July 3<sup>rd</sup>, 2019.

#### *4.3 Interview with the landowners*

In this section, the researcher will present the main insights from the 10 interviews conducted. The interviews were ordered chronologically and will be available in the appendix. It is important to highlight that the interviews were conducted in Portuguese and, then, freely translated for English by the researcher.

The interviewees had different ages, profiles, and goals. But, overall, they all had a high education degree, at least a bachelor's degree. Another common trace is that all of them live in the largest cities of Portugal, or in their metropolitan areas, having inherited their lands in the countryside from parents or relatives.

Not all of them let the researcher identify them, asking the interviewer to keep their privacy, be it because of not feeling willing to share, or because of working in a company or position that they feel it could be compromised. Even though, the researcher tried to identify as many interviewees as possible.

##### *4.3.1 Interview 1*

Luciana Pires, Brazilian, female, 26 years old, inherited her lands six years ago, when her father passed away. She is a master's student in management in Nova School of Business and Economics and her family is from Belo Horizonte, Minas Gerais, she was born and raised

there, and so was her father. It was her grandfather that emigrated from Portugal to Brazil, along with the interviewee, seeking better economic prospects than what he had in his village.

The lands belonged to my grandfather, he also inherited it from his father. I am not quite sure, but I think it was my grandfather who lived there when he was young, before coming to Brazil. I never met him, so I don't know for sure. (Luciana Pires, 26, female)

According to the interviewee, her family has lands somewhere in the North of Portugal, but she does not know precisely in what municipality, but she guess it is not near the coast, because her father used to say there was only forest there "I was never there [in the lands], my father and my uncle were in the city near our lands just once, to split the land plots when my grandfather died" (Luciana Pires, 26, female). But she affirms it was quite small. When asked how the division was made, if she was there and if she remembers it. She said she does, and that the division was made in an informal way:

It was weird. Apparently, my grandfather had inherited four land plots in different areas of the municipality. Basically, my father and my uncle were called to the Municipal Chamber, then, the guy from one of the departments told them the areas and said that, to avoid advantages for any side regarding productivity of the land plots, all four were divided in two. He showed four mugs with two folded papers each and asked for them to select one paper each from each mug. They did and that was how the land plots were divided. I inherited the four plots of my dad since I am his only daughter. (Luciana Pires, 26, female).

The interviewee affirms that not even the people from the municipality knew where the land plots were located. What the officials did was to indicate the name of the villages that were near the land plots, so her family could go there and ask one of the elderly that lived in the place where the land plots of her great-grandfather, were, and one of them would know for sure.

The interviewee confirms she never went to the village or the region and does not know the extension of the area that she inherited, she would like to know, but she thinks the plots are small, probably less than 1 ha if summed.

When asked what she would like to do with the land plots, she said that she would like to sell them:

But my uncle advised me to wait for me to inherit his lands, because that will be easier to sell and do all the paperwork. Right now, apparently, I need to do the documentation for my land plots, which are quite expensive, and my uncle's for his, it's awful to say this, but when he passes away his land plots will also be mine, so it'll be easier to make the documents of the single plots again. (Luciana Pires, 26, female)

Even not knowing for sure, the interviewee is aware of the 250 euros fee per plot to update the documentation, plus, if she wants to sell, she would need to map all areas digitally and with GPS, since it's mandatory by the new legislation of 2017.

#### *4.3.2 Interview 2*

The employee 1, Portuguese, 31, male, works in The Navigator Company he inherited lands from his grandparents in the North of Portugal. The interviewee was born in Braga, in the North of Portugal. Currently, he works as Communication and Brand Manager in The Navigator Company and lives in the metropolitan area of Lisbon. The lands might be around Viana do Castelo have been in his family for the generations and is where his mother's family comes from originally. His mother also inherited lands and supposes to be around the area.

When asked how many plots he has and an estimate of the size in ha, he could not say. When asked if he knows in which municipality in the North his lands are, he answered that "Maybe around Viana do Castelo, but I know it's not there. Not even my mother knows, maybe my grandparents knew" (employee, 31, male). The researcher asked that, if he does not know where the lands are, how does he know he has lands in the North of Portugal and the interviewee answered that every year he and his mother receive the taxes to be paid to the Ministry of Finance.

Despite working in a company that has lands and plantations of eucalyptus, the employee did not seem aware that his lands can impact on the wildfire risk in their region until the interview happened:

I always saw land ownership and the landowners as part of the problem. Inside the company is a thing that we are often saying and repeating when there's a wildfire near one of our plantations. We say that people do not care with their lands and, despite of the knowledge about the risk, they do not care with the wildfires. But I never saw myself or my mom as part of the problem, now that you're asking those questions, I can see that is exactly people like me that are the issue. That I am the issue because I have lands that I don't even know where they are. (Employee, 31, male)

When asked what he would do with the lands, the interviewee said he would not rather keep the problem growing, so selling would be the best option. Yet it is a hard task, since neither he or his mother knows the exact location of the lands and, according to the new law, the lands need to be mapped before the owner develops any kind of activity on it, be it a planting project, a construction project, renting, selling, or any other (XXXXX, 2017).

### 4.3.3 Interview 3

Calisto Santos, male, Portuguese, 64 years old, was interviewed because he inherited lands from his parents, grandparents, and bought himself lands in the Center of Portugal. The interviewee was a Civil Engineer and is currently retired, his main business is buying houses and apartments in the city, refurbishing them and putting to rent. He was born in Lisbon and lived all his life in the city, however, he would go often with his family to Castelo Branco, where he owns lands.

Counting with the lands the interviewee bought, now he has 35 ha divided into two productions of 12 and 23 ha. He has eucalyptus for production and pine trees, that are protected by law and cannot be cut, and, in one of his properties, a couple of fruit trees that his father planted. He stated that “it is more of a hobby than an actual economic activity. The eucalyptus market is too informal and if I actually calculate it, I will probably reach the conclusion that it’s not worth it” (Calisto Santos, 64, male). As an economic activity, the interviewee buys, refurbish, and rent houses and apartments in Lisbon, the rent allows him to compliment his retirement and invest on his lands in the countryside.

When asked about what is considered informal, the interviewee answered:

I do not have the tools for cutting the trees when it’s time, just to take out shrubs, and etc. So, we call the *madeirero*<sup>4</sup> and he looks at your plantation and gives a value based loosely on the number of trees standing there and their size. You can try to negotiate to reach a price that would be fairer, but them, they come with the equipment, cut the trees and take to the paper manufacturer, where it will be sold by cubic milliliters of wood... And they have way more knowledge than any of us [landowners/ producers]. It is very informal, so I know sometimes I win and sometimes I lose and, probably, I lose more often than I win. (Calisto Santos, 64, male)

When asked why he keeps planting eucalyptus and even bought more lands if he does not see it as a profitable business, the interviewee said it is because these are the lands where his “family comes from, we’re from Castelo Branco and my grandfather and father lived there, lived from the land. There was a moment where having a land was a guarantee of providing for your family” (Calisto Santos, 63, male).

Regarding land management, in the interviewee’s opinion, land management is different from actions regarding fire prevention. He declares that, depending on the kind of land one’s have, it is easy to manage, cut the shrubs “with the truck and the proper tools do not take long, but, if it is too steep, than its way harder for the truck to access it and it needs to be done by a

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<sup>4</sup> Madeireros – in Portuguese, wood workers, are people that offers the services of cleaning and cutting the trees in landowners’ properties and, then, sell the wood to paper producers or biofuel producers (see interview with Akli Benali in the Appendix)



man with a cutting machine...”. Fire prevention would be something that “only the government can enforce. You need to do the corridors without anything to stop the fire and no one is willing to do that because they will not make any money from the land they own”.

The interviewee is trying to cut his eucalyptus each 10 years, at least, when possible he cuts them with 8 years. He does not seem the value of waiting until the trees complete 12 years of being planted to cut them, since the risk of a fire increases too much and, then, he would have “spent and worked for nothing, since burned wood worth’s almost nothing, not even half the price”. The interviewee also does not think that land management is the same as avoiding fires:

...to do things to avoid fires and manage the land well is a personal decision. If one of my neighbors don’t clean the place, the fires will take his lands, but the risk of taking mine are lower, since I take actually manage it, but it doesn’t mean that the fire will not spread to my lands if more people around me don’t take care of their lands as they should. (Calisto Santos, 64, male).

The interviewee does not plan to sell his lands now, he would leave for his daughter to do whatever she seems fit. However, his opinion about those who do not take care of their lands is “easier for them to just sell. I often try to buy lands near mine and people will not sell because it was from their parents, or grandparents. There’s too much attachment for a land they don’t even take care of” (Calisto Santos, 64, male). Other issue that the interviewee faces when trying to buy lands is that “no one knows who own it anymore, not even the municipality, they [the lands] are from people that moved to another place long ago and their parents died and no one knows where they live anymore, they can be anywhere”.

Finally, according to the interviewee, the worst issue he faces when trying to expand his eucalyptus production is that some land plots are divided between three or more heirs, the individual plots are very small and they do not actually know which plot belongs to whom so

... When you try to buy, if everyone agrees is perfect, but usually you have one [of the heirs] that is too attached to a piece of land to let it go, and because of this one you can’t buy, no one knows which plot belongs to whom... They kind of receive numbers when the division happens, but no one actually knows. And if you plant on the wrong plot, it will be a legal headache in the future. The person can file a process in the court against you because you invaded his land plot. (Calisto Santos, 64, male).

Calisto Santos was the only interviewee who owned a significant amount of lands and uses it for an economic activity, even in a quite informal way.



#### 4.3.4 Interview 4

José Maria Mendes Lameira, Portuguese, 73, male, was born in the region of Setúbal, south of Lisbon, the lands he manages are from his wife who is from Pedrógão Grande. She inherited the lands from her parents and she grew up in the region, until moving to Lisbon to work, however, she still has family in Pedrógão, so she and the interviewee tend to go quite often to the region.

According to the interviewee, they have “less than 2 ha, for sure”, but he was not quite certain of the amount of land. He is familiar with a part of it, since it is very close to the village where they keep a house. These plots have some olive and apple trees, they are contiguous, but it is still smaller than 1 ha and not enough for any kind of economic activity to be developed. Regarding the other plots, the interviewee affirms that “they are deep in the forest and the access is very difficult, there are those shrubs that have torn and block the passage in some points”.

Since his wife is from the region, the interviewee still has family members living around the region. For him, selling would be the best option for those who do not take care of their lands properly, at the same time, when asked what he would do with the lands that are forest area, he states that “is complicated, because we don’t know where they are exactly, I could be selling a neighbor plot or even be in another area thinking that it is mine”.

At the same time there is a component of emotional attachment, at least, that is what the interviewee claims when talking about the possibility of selling his wife’s lands

My wife’s cousin died trying to escape the wildfire in a wall near our property [in 2017]. She lived all her life in Pedrógão, and in this year we actually talked about selling the property and the lands that we have knowledge about; however, they belong to the family for generations, we can’t just sell them like these. Our children will inherit them someday and keep the legacy, and pass it to our grandchildren. They’re very important to my wife, it’s where she comes from. But we wouldn’t mind to sell the lands that are in the forest, the problem is that we don’t know where they are. (José Lameira, 73, male).

José Lameira feels responsible for cleaning the lands and keep it in order. According to the new legislation from 2017 the landowners need to keep areas near cities, villages, houses, roads, and energy line clean, and the interviewee makes the effort to keep his lands in the village clean, hiring every year someone to cut the shrubs. However, the land plots that are in the forest, the interviewee is not able to clean them.

#### 4.3.5 Interview 5

Rui Siqueira, Portuguese, 56, male, was born in the metropolitan area of Porto, the lands he used to manage were inherited from his grandfather by his father, both were born in a small

village around Guimarães region, in the North. The interviewee studied math in bachelor and, nowadays, is the co-Founder and CTO of an IT company that also operates in Brazil mapping cities and checking if the real area of buildings is similar to the declared construction area. He is quite sure is less than 1 ha, but does not know for sure. His father knew more or less where some of the plots could be, but did not know all of them, since he left the city when he was young to work.

In 2017, after the wildfire in Pedrógão and Góis, the interviewee said he was able to convince his father to sell the lands to a cousin that wanted to buy it for a long time. According to him, the disaster in Pedrógão, and the people that died trying to escape the fire were a huge impact nationally

Even with my father who was super attached to the lands who belonged to my grandfather, and my great -grandfather. He [the father] would never go there, since all the family is here [in Porto], his cousin wanted to buy, and he would not sell just because he grew up there and belonged to his father before. After the fires of 2017, me and my sister talked to him that this could happen also in his lands, and he finally agreed to sell. If he hadn't sold them, then it would be a headache to sell them after, since I don't know where they are. (Rui Siqueira, 56, male)

Not going often meant the interviewee's father was not completely aware of the states of the land plots he inherited, according to the interviewee this was not the main problem, the attachment was the biggest issue.

When asked how the bureaucratic process was of updating the registries and mapping were done, the interviewee stated that it was an informal process

In the countryside to honor the word and promises is very important, we sold the lands before the law was approved, so, in the agreement, my father's cousin would be in charge of updating the registry of ownership and mapping the areas. He had contact with the local [forest] association so it would be easier. (Rui Siqueira, 56, male).

The interviewee states that the informality in the country side is common even now, after the new law from 2017, because "people in the countryside have an advanced age, they don't feel the need to do it as it's mandatory now, they think the government just want to charge more taxes" (Rui Siqueira, 56, male). This lack of confidence in the government and in the new processes is the norm in the villages and small cities through the biggest part of the landowners, stated the interviewee.

#### 4.3.6 Interview 6

Employee 2, Portuguese, 52, male, was born in Porto, North of Portugal. He graduated in Civil Engineering and Postgraduate studies in management, he works as a General Director in a big Portuguese group. The interviewee said he has lands in Viana do Castelo, his family comes from this region, originally, and the lands were inherited from his father family.

I think about selling it, I go there two times a year, maximum. There is a small farm house in the 0.1 ha plot and it is very enjoyable. But I don't know what to do with the area that is in the forest. It is 0.2 ha, but it is inside a dense forest area and it's not possible to plant anything there. At least, in the area near the village, I go with my wife to enjoy the countryside, because you can't do anything productive with such a small area. (Employee 2, 52, male).

The interviewee states that his children are probably taking over the house, if they, employee 2 and his wife, do not decide to sell it before. Nevertheless, regarding the area that is in the middle of the forest it is hard to do something with it, since the area location is not certain.

The issue is going in the middle of the forest, in an area that I don't know and has a lot of shrubs with thorns growing around, to look for the original landmarks. This is the only way to find the land and the shape, but I'm not even sure where to start looking. I have a broad idea of where it might be, but I've never been there... Or I was there one, when I was a child and never again. (Employee 2, 52, male).

Even when talking about selling in a very straightforward and pragmatic manner, Employee 2, states that it is easier to talk about it than actually doing it, so there is a component of a certain attachment.

#### 4.3.7 Interview 7

Luis Cimeira, Portuguese, 55, male, was born in Aranhas, Center East of Portugal. He graduated in Engineering and currently works in Volkswagen in Alentejo, South of Portugal. The interviewee inherited 10 ha of lands from his grandparents in Aranhas, Castelo Branco; the lands are divided in two different plots and areas, but they are quite large for the average of the region (Luis Cameira, 55, male).

The interviewee knows all his lands, there are olives that his grandparents used to harvest and sell or make oil, also to commercialize, it was the main economic resource of their family in the past. He left the lands to study in Lisbon, and since then has been living in Lisbon, and now, due to work, in Alentejo. Currently, there still are the olive trees and the interviewee hired an employee to work on maintenance of the lands and harvest the olives, also keeping the land clean of shrubs.

But in the past, it was easy, there were a lot of people around, living in the city and the villages surrounding it. Now, it's more complicated. People left the villages and the city because Lisbon, Porto, and Coimbra offer better work opportunities, some even went abroad. No one wants to work on the fields anymore, not even I do, maybe when I retire for pleasure, because the amount I make with the olive trees is not enough to keep my family. You need 1,000 kilos of olives to make 100 liters of olive oil, I make less than that and I sell what is produced to my family and friends, but it's not an industrial production. (Luis Cameira, 55, male).

The interviewee claims that if the countryside was more attractive to live in, having more economic opportunities, the lands would be better taken care of, in the present “a lot of lands surrounding mines are not used, there is not enough people living in the area and they don't have enough money to keep it clean” (Luis Cameira, 55, male).

There is also an emotional attachment to the lands the interviewee inherited, and he makes the effort to go four to five times a year:

If I had enough money, I would live there with them. Since I don't have, I can't be there all the time. I'm not making any money with the land, in fact, I'm spending more, but it's an important place for me and I hope one day my kids will take care of it also. It's where I'm from and our family build a life. (Luis Cameira, 55, male)

The interviewee believes that it will be hard to solve the wildfire issue in Portugal; according to him, extinguishing wildfires became a big business in the country, since it is more expensive than the preventive actions, that tend to be more efficient.

#### *4.3.8 Interview 8*

Miguel Fernandes Pinho, Portuguese, 58, male, was born in Porto. After graduating in Economics, he went to live and work in Germany, where he currently lives and works. He has lands in Castelo de Paiva that he inherited from his father. He knows where the land plots are, because he used to go with his father when he was a kid, though, they are in the forest and they basically have pine trees and eucalyptus.

When asked how often he goes there, the interviewee said he barely remembers, when he comes to Portugal is around Christmas or other special dates, and he usually stays in Porto with the family. However, it is important to highlight that “selling is not an option, because it belongs to the family and other members of my family have lands around there too”.

Despite not being quite sure about the size of the area, the interviewee affirms that his land plots are smaller than 1 ha even if summed, so he does not believe that they would have any economic potential. Still, he cleans his lands “because I feel that I have this responsibility, since some of them borders with my family's lands” (Miguel Pinto, 58, male).

The interviewee stated that hiring services tend to be an informal and unregulated process:

We [he and his siblings] just contact a man who lives nearby, apparently, he also has lands in the region. It's a mouth to mouth business and in these small cities and villages, everyone knows everyone. He knew our father, so he knows exactly where the land plots are, it's basically, call him and he'll clean it and say how much it was afterwards. We [the interviewee and his siblings] split the bill and I send the money to my brothers. There's no invoice, nothing. (Miguel Pinho, 58, male).

The trust and informality impact a lot how easy is to manage lands in the countryside when not living in the area anymore, like the interviewee and his brothers:

If you don't know anyone, and no one knows you, it's quite hard to get things through. The people in the countryside are really suspicious of strangers and people they've never met before. Unfortunately, in the area of my father's lands that happens a lot, most people are gone for quite long and a service provider will not go to the people's lands alone if they don't know him. (Miguel Pinho, 58, male).

#### *4.3.9 Interview 9*

Employee 3, Portuguese, 53, male, was born in Porto, and is one of the siblings of the interviewee Miguel Pinho. He holds a Master's degree from Porto University, and, currently, was hired for a senior management position in a medium-sized business. He still holds the land plots that he inherited from his father in Castelo de Paiva, where his family is originally from. He is also aware of the location of his land plots, similar to his brother, he used to visit the plots with his father, and declares all his plots are inside the forest and only have eucalyptus growing that "I didn't even plant it. They just spread and grow." (Employee 3, 53, male).

The interviewee tries to go to his lands as much as possible, however, it is quite hard in his position, so he goes two to three times a year. When asked about the possibility of selling his lands, the interviewee immediately answered that "it is out of question", since it is originally where his family comes from and his siblings also have lands in the area. At the same time, he also cleans his lands and is the responsible for arranging the collective yearly cleaning with his siblings.

I feel responsible to take care of those plots that were my father's, and so do my siblings. It's also because of the neighbors, there are people that makes their lands a living, it would be irresponsible with my neighbors if I didn't clean, but there's a lot of other people that don't do that. The main issue with the cleaning is that the price changes every time, even when cleaning all the lands nearby that, are almost all from family, but sometimes, he cleans for free in exchange for the wood there. (Employee 3, 53, male).

When asked if he kept invoices of this services, he declared that the services providers never issue invoices “and I’ve talked to a handful of them, in the beginning, but no *madeirero*<sup>5</sup> issues invoices, usually they also have their lands in the area and just do it as a side business”.

When asked if he plans to use his land plots to develop some economic activities, the interviewee answered that his lands are too small to develop any economic activity “less than 0,5 ha, each plot”, so it becomes hard being them in the middle of a forest area.

#### 4.3.10 Interview 10

Employee 4, Portuguese, 59, female, was born in the metropolitan area of Lisbon. She studied mathematics in Coimbra, on Bachelor and Control Engineering in the Imperial College of London, on her master’s and PhD. She inherited lands from her parents and grandparents around Sertã, Center of Portugal, in the region of Coimbra. Her areas are around 1 ha and are separated in two different plots not too far from each other, and she tends to visit the areas every three months, since she owns a house in the village nearby.

The interviewee informed that the fires that happened around Sertã in 2019 did not reached her plots, even if her plots are in an area of forest. According to her, a friend of her father does the management of her plots, since “they had a long-lasting friendship and he is good and professional” (Employee 4, 59, female) which makes it easier for her. When asked if she visits the land plots, she declared that she is “too busy to check it out, but my father’s friend takes good care of that”

He does not charge anything; our agreement is that he can get all the profit from cleaning. It’s a win-win deal, since he gets the wood without much effort, keep it clean for me, and I don’t need to worry about fires or the negligence fines on my land plots. (Employee 4, 59, female).

According to the interviewee the land plots are too small to develop any economic activity that is not the forest itself, “it’s what it grows there, it doesn’t requires any effort, the trees simply grows in the region”, however, she thinks that neighbors should “get together and turn all the small plots they own into a large property, managing it together and make them more profitable”. When inquired if she knew about the ZIFs, the interviewee answered that they do not work because “people in the countryside are always suspicious about their neighbors, if they are going to steal lands or trees”. On top of that, the interviewee also highlighted that the ZIFs were enforced by the local authorities, and that also makes the locals even more

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<sup>5</sup> Madeireros – see appendix.

suspicious, thinking that the government will take their lands, or some neighbors will have more profit than the other.

Nevertheless, the interviewee was not able to say if there was any operating forest association in the area, and

... if one exists, it is bad. Don't get me wrong, I think associations would be really beneficial for the area, ..., but if I am not aware of their existence, then it means that it should be made a better effort in communicating their existence, they could facilitate the management of the small properties. (Employee 4, 59, female).

## 5. DISCUSSION

This chapter will provide an analysis of the interview insights regarding the incentives or lack of incentives that led to the depopulation and lack of management of land plots in the Center and North of Portugal. Finally, regarding, mainly, the unproductive lands the researcher will analyze if there is an attachment and if these lands represent an element of the identity of the landowners, if not, it will be important to understand why detachment regarding it is there.

### 5.1 *Depopulation in the rural Center and North of Portugal*

Portugal has developed its economy and main urban centers in the coast, as demonstrated in Figure 7, this dates from the last century, but, as Viñas (2019) discussed, along with many other authors, is that Europe overall faced a strong process of depopulation in rural areas over the last two centuries, but regarding the findings, by interviews, use of soil and the populational table of Pedrógão Grande, the last century has been crucial to aggravate this movement. A clear evidence is that most of the interviewees lives on the metropolitan areas of the biggest urban centers of Portugal, even one living in Alentejo, he is there due to work and far from his own lands. Beyond that, the Portuguese migration went beyond the biggest urban areas of the country, the first interviewee, now living in the metropolitan area of Lisbon, used to live in the city of Belo Horizonte, Brazil, thousands of kilometers from the lands she inherited somewhere in the North of Portugal.

According to the findings in the interview with Benali, the number of lands in the countryside is significantly bigger than the number of resident landowners and their total amount of land. The interviewees also mentioned that no one knows the neighbors anymore in the small villages and they do not live in the area anymore. Another fact is that municipalities are struggling to apply the new law on forest, approved in 2017, because they do not have access to the information of landownership in the area and cannot issue the fines for the landowners that are not living in the region anymore.

Another factor to take into consideration is that of all landowners interviewed that are managing their lands, no one actually thinks about moving back to the countryside. All of them exercise an economic activity in the urban regions and coast area of the country where, as argued by Viñas (2019) the development of European cities has been focused in the last two centuries, in continental Portugal was no different and this development was focused on the coast of the country.

The lack of economic activity in these areas beyond agriculture and the silviculture itself makes it even more unattractive for the landowners. A final point is that, as presented by Benali,



the necessary area of land to actually develop a profitable silviculture activity with eucalyptus or pine trees is 5 ha; most of landowners, including the interviewed ones, would not be able to develop any activity due to the size of their lands. The only ones that are able to develop economic activities report that is not a profitable business, be it because of the lack of value of the product itself, in the case of olive oil, due to the lack of scale in the production or the complete lack of transparency on the eucalyptus wood market. Looking specifically for the eucalyptus market, the *madeireiros* play a major role, since they are the intermediaries that buys the production and sells it for the paper producers for the whole price, without the risk of losing the production of eucalyptus for plagues or fires.

Other appointment is the lack of effective public policies for the development of rural areas in Portugal and the encouragement for rural activity. Both of the landowners that have productive lands appointed that there is not enough incentives or policies to incentivize the development of their agroforestry activities or their immediate neighbors. According to both, there is the need of being big producers in order to access those resources. It is important to highlight that, as stated by Benali, the ZIFs would be a mechanism of generating scale in the production, at least forestry cultures production, however, the lack of trust and the excess of animosity between the neighboring landowners makes the mechanism not work; in fact, there is not a single ZIF that is known to be working in the country as declared by him.

The ZIFs could be an interesting mechanism to reach a land size large enough for the landowners to actually have an almost industrial production, sharing costs and risks, and, on the side of local governments, plan better actions and policies to prevent wildfires, as the gap lines, 100 meters large lines that focus on slicing the municipality and helps to prevent the fire to spread to another areas in the municipality. The down size is that “many landowners feel personally and economically managed knowing that their lands will not be able to participate in the production”, besides that, the landowners that would participate with productive lands “feel that the profit is theirs and they cannot share it with someone that is not producing” (Benali, 41, male). This lack of collaboration put the ZIFs in complete stagnation.

## 5.2 *Interview results and main insights*

From the ten interviews, it is clear that the landownership situation is quite diverse, and it is hard to point a specific type for the urban landowners. However, a common trace on the interviewees is that most of them had, at least, a bachelor's degree. Since the biggest part of the population that owns land in the countryside and do not manage, it lives in urban areas, why

not just selling those lands. According to 8 interviewees it is hard to sell as a result of an emotional attachment with these lands, mainly, due to the fact that these lands seem to connect those landowners with their past and roots: “where my family comes from” and similar sentences were a constant in the interviews.

It was important to highlight that the younger landowners were the ones less attached to the lands and more willing to just sell them if they knew where the lands were. The exception was Rui Siqueira, but during the interview it seemed that he did not have a lot of contact with the lands from his father, so the connection with the roots was not tied to the lands.

Diving deeper into the question of knowledge about the lands, two of the interviewees did not know where any of their parcels are located or even the size of their parcels in total, while one of them only knew where his wife’s parcels are near the village and, apparently, not even his wife knows where the forest plots are located. One of the interviewees, Employee 1, could not relate his situation as a part of the issue of unmanaged lands, even if he worked for a paper producer that also plants eucalyptus, beyond buying from other producers.

All of the interviewees live in the metropolitan areas of Lisbon and Porto, most of them were born and raised on these areas, just Luciana Pires is the exception, since she was born and lived all her life, until the master’s in Belo Horizonte, Brazil.

One of the main intakes is how complex is the system around forest. The interviewees that give use for their lands, highlighted how it is not profitable, even with a significant amount of land that is bigger than 5 ha, as it was stated as the minimum size of land for professional silviculture practices. Those landowners, also the smaller ones that take care of their lands also pointed the fact that the market is rather informal “The main issue with the cleaning is that the price changes every time, even when cleaning all the lands nearby that, are almost all from family” (Interviewee 9, AGE).

Other issue illustrated clearly by the interviewees that owns bigger amounts of lands is the lack of profitability, even with areas that can be already considered profitable. Interviewee 7 (2019) stated that “If I had enough money, I would live there with them. Since I don’t have, I can’t be there all the time. I’m not making any money with the land, in fact, I’m spending more...”, even though, he does not sell his lands. Interviewee 3 can be considered an even more curious case, since he not only does not sell his lands despite the lack of profitability in his cultures, but he bought more lands and increased the areas he inherited. The largest part of the interviewees stated clearly that they would not sell their land plots, even if they are too small for forest production, or, in case of being productive, the production lacks economic return to the point of being considered as an expensive hobby.

### 5.3 *Land as part of identity*

As shown in the interviews, there is a strong connection between possessions and identity formation. At the same time Moore (2014) stated that lands, landscapes and its elements, can be part of the identity of an individual, a small group, or even a community. In general, the elements that are connected and forms the self tend to be unique and comes from the individual experience of each one (Ceko, 2018).

On that regard, when we analyze the role of the unproductive lands, and even the productive ones, most of the interviewees do not even consider to sell or to rent their lands. In all the interviews the sentence “my family is from there” or similar sentences that were as strong and meaningful for the interviewees; there was also often stated the willingness to leave the land plots for their descendants. Not because of the value of the land, itself, but it is more about the role this possession plays in their identity and how it provides some kind of connection with their past, their roots.

This was such a strong element that even those interviewees that do not visit their lands and could not be sure if they are taken care of, have conviction that someone is taking care for them, and that there is no need to sell it or rent. In this case, the identity formation factor has an even more prominent role, because it can be considered that the idea of owning land in a certain place is the fundamental identity factor, not even the land itself. This can also include those who do not know for sure where their lands are, since they are in the middle of the forest or cannot be accessed anymore, because of the growth of shrubs over old paths.

As it was mentioned by Benali, lands were also a crucial element for survival and living in the countryside of Portugal in the past. As Maslow (1947) stated, lands could be seen as a source of Security Needs, deep rooted in the mindset of an older generation that needed to work on the lands and also wanted to secure, not only their own living, but also their families and future generations. Splitting lands until they become so small that lose the value for production in forests, was not an issue in the past, since many of those lands were used as pasture for animals or agriculture (Figure 5), meaning that the land did not need to be large to be productive or securing the families lives. Despite being conscious of the lack of value or even profitability of the lands they own, most of the interviewees are still motivated to keep their lands as a part of their identity, and deep rooted needs connected to their past generations of the importance that those same lands represented to their parents and grandparents in their way of living.

Taking into consideration the two interviewees that would be willing to sell their lands, it is noticeable that the lands they own do not play a major or any role on their identity or in

their need for security, leading to the lack of motivation for keeping a land in the countryside. Their needs and motivations are already rooted somewhere else. It is not considered a way to bring the past. Analyzing both interviews, this might happen because two of them are younger than the other interviewees, belonging to a different generation that, according to Bauman (2000, 2007) grew up in a time of more uncertainty and even liquid relations. This would mean that possession as durable as lands would play a minor role in the development of identity of younger generations.

Other factor that might play an important role in this unattachment regarding landownership is the distance in their two forms: (i) physical distance, as in the case of Luciana Pires; and (ii) temporal distance, as in the case of both Rui Siqueira and Employee 1.

On the temporal distance, it can be highlighted that most of the interviewees inherited the lands from their parents or grandparents, at a maximum, meaning that their parents and their grandparents were the last ones to live around the areas where the land plots are located, when analyzing Rui Siqueira and Employee 1's situation, it is quite different from the others. Both, Employee 1 and Rui Siqueira inherited, or would inherit, lands that the last ones that lived there were his great-grandparents, not even his grandparents had proper contact and living experience in the region where they own or would own lands.

Regarding physical distance, despite the last one that lived in the area where the lands are was Luciana Pires' grandmother, the interviewee do not feel that the lands connect her with memories of her grandmother or even her father, those memories and links with the past, that could be fundamental to her identity, are connected with the city that she used to live in Brazil.

So, temporal and physical distance play an important role to the detachment of landownership in the countryside of Portugal and the identity of the heirs of the lands. Another point is the generational gap. In general, the interviewees from their 50s years old or above tended to be more connected to the lands and feel it as a big part of their own selves, a link, a materialization of theirs and their family's past.

When comparing with Maslow Hierarchy of needs, owning a land fits into the Security extract, still near the base of deeper needs, right after the physiological needs for survival. It was possible to observe in interviews that, even when the interviewees' lands are not profitable or do not even have the size for being profitable, the owners are not willing to sell it.

## 6. CONCLUSION AND FUTURE WORKS

The wildfires situation is complex, but there still is an important role played by the lack of management, mainly in the Center and North of Portugal, meaning the landowners, particularly the smaller ones, still owns a bigger percentage of the lands in the country. Fines are a way of incentivizing management, however, if there is no knowledge about the ownership of a significant number of plots, it does not impact on the final results.

Initiatives like BUPi needs to be encouraged, but the lack of success of the project might be due to suspicion of the landowners regarding the projects intention, but it also could be for the unaware landowners, those like two of the interviewees that did not have any kind of knowledge about the precise location of their land plots. To find the ownership of these lands is a matter of racing against time, since most of the people that owns the lands around their villages are already elderly, 70 years old or more, and this knowledge could be lost.

Beyond awareness, it is important to understand that the land plots are not only a piece of land for the owners, they are a part of their identity, a materialization of a link to their rural past and roots. It is also associated by their the deep need that owning a land represented in the country in the past. It is not so prominent in younger urban generations, but still very present in those that are 40 years old or older.

However, this means that while an effort to develop business models that aggregate lands in order to form areas of viable forest production is not made, and the incentives for forest production in existing areas continue to be low, the wildfire risk provided by the fuel of those lands will only get higher. As far as owning a land but not having any incentive to take care of it, lack of management and the deep need for keeping a land based on roots and identity will keep conflicting and generating more risk for Portugal's population in the Center and North of the country.

More research needs to be done in order to validate the findings of this research, for instance, a future possible step would be a quantitative research to find out the precise proportion of landowners that manage their lands, those who delegates the management to someone else, those who struggles with financial resources and time to manage, those who are unaware of where and/or how much land they own, and, the hardest ones, those who do not think land management is important. Most of the interviewees, being specialists or landowners pointed that the biggest issue are the landowners that do not manage their lands for lack of time, resource, or even awareness of the issue, a group that was pointed out in the meeting with the than State Secretary for Countryside Valorization, João Catarino, and it did not and would

hardly show in the interviews are the landowners that are not even aware that they own a land in Portugal. The last group, only data provided by the Finance department would be able to confirm.

Further studies could also explore more deeply the role of the remaining stakeholders in the issue of wildfires and their solution. Despite the lack of land management still playing an important role in the wildfires problem, other structural questions, like the lack of incentives for dynamization of rural and forest economy, the intermediaries, like *madeireiros*, and even the industries that rely on forest resources play a role in the issue and in the solution.

### *6.1 Limitations of research process*

Despite the different sources of information, including the interviews with different stakeholders, to understand better the landownership structure in Portugal, the value of land, the bias of the researcher, who is working and trying to develop a business model in forest areas, cannot be eliminated from this dissertation. Still, it is possible to limit the researcher bias if the researcher is aware of its existence. In this case, the researcher's experience with forest management and previous research on the topic proved to be an advantage when analyzing meetings reports of Forest Associations, and other institutions that deals, specifically, with the area and have already a language tied to it. It is also important to highlight that using critical thinking and self-awareness, the researcher tried to limit the bias as much as possible.

Another limitation is that, despite the valuable information provided by all the interviewees, but specially by the landowners, in order to validate the insights and divide them in possible categories, taking into consideration their age, economic and social situation, behaviors and patterns, a quantitative method would be necessary. Since the focus of this research was to be exploratory, a future quantitative approach could deepen the knowledge and test the insights taken.

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## APPENDIX

### INTERVIEWS

#### 1. Pre-requisite questions

Name:

Age:

Contact details:

Do you own a land in Portugal?

Where?

Would you agree to be interviewed for a master's research?

Do you have any restriction on participating? Which?

Do you allow me to publish the interview?

What is your availability?

Could the interview be done in English?

#### 2. Interviews

**Luciana Pires – 10 November 2019. 2:30 PM**

##### **General Information**

- Female
- 26 years old
- Brazilian
- Master's student of Management at Nova SBE
- Lives in Lisbon
- Born in Belo Horizonte, Minas Gerais, Brazil

***Interviewer:* How you acquired the lands?**



*Luciana Pires:* I inherited the lands... My father passed away 5 years ago and I inherited from him. It was basically going through the generations. The lands belonged to my grandfather, he also inherited it from his father. I am not quite sure, but I think it was my grandfather who lived there when he was young, before coming to Brazil. I never met him, so I don't know for sure.

***Interviewer:* Where is your land?**

*LP:* Somewhere in the North of Portugal I was never there [in the lands], my father and my uncle were in the city near the lands just once, to split the land plots when my grandfather died. I can't tell in which city it is, but it's not near the coast, since I remember my father saying there was only forest around when he went there to sort it out. But the plots were quite small, at least, that's what my uncle and my father told me.

***Interviewer:* Can you explain me what is "sort it out"?**

*LP:* I can tell you what my father and my uncle told me... According to them, it was weird. Apparently, my grandfather had inherited four land plots in different areas of the municipality. Basically, my father and my uncle were called to the Municipal Chamber, then, the guy from one of the departments told them the areas and said that, to avoid advantages for any side regarding productivity of the land plots, all four were divided in two. He showed four mugs with two folded papers each and asked for them to select one paper each from each mug. They did and that was how the land plots were divided. I inherited the four plots of my dad, since I am his only daughter and I'll probably inherit the ones from my uncle.

***Interviewer:* Do you have any documents about the lands?**

*LP:* No, my uncle has, but he said it's super old, like from my grandfather's time. I guess I'll need to sort this eventually.

***Interviewer:* Tell me more about what you know about your lands**

*LP:* Apparently, not even the people of the government knew where the lands were. They [government officials] said it was probably easy just to find someone who knew. But they gave more or less indications of name of the villages that should be nearby the area of the plots... Than, they [father and uncle] could go there, asked some of the elderly that lived around if they knew my great-grandfather and where his lands were... One of them would know for sure, according to the guys of the [municipal] chamber.

I might do this, or try one day... The thing is that I've never been there, I would need to ask my uncle for a scan of the documents... He lives in the USA for some years, so I don't know how easy is for him to find it... The thing is that I don't even know how much land it's... You said that 1 ha is one football field, no?

***I: Yes, more or less.***

***LP:*** Okay... But from what my uncle said the plots were already quite small before being divided by them [her uncle and her father], so I would guess all of it together have less than 1 ha, pretty sure.

***Interviewer: What would you like to do with them?***

***LP:*** I would just sell it already... It would be easier and it would help me to pay my tuition and etc. But my uncle advised me to wait for me to inherit his lands, because that will be easier to sell and do all the paper work. Right now, apparently, I need to do the documentation for my land plots, which are quite expensive, and my uncle's for his, it's awful to say this, but when he passes away his land plots will also be mine, so it'll be easier to make the documents of the single plots again.

**Employee 1 – September 03, 2019. 5:30 PM, by phone**

**General Information**

- Male
- 31 years old
- Portuguese
- Communication Manager at Navigator Company
- University degree
- Lives and works in in Lisbon
- Born in Braga, North of Portugal

***Interviewer: How you acquired the lands?***

***Employee 1:*** I'm sorry, but I don't have too much time. Well, the lands belonged to my grandparents and me and my mom inherited them. So, it was not an acquisition, it was more of an inheritance, quite normal here in Portugal, since not so many people buy lands on the countryside.

***Interviewer: Where is your land?***

***Employee 1:*** Maybe around Viana do Castelo, but I know it's not there. Not even my mother knows, maybe my grandparents knew. I suppose it's on that region because that's where my mom's family comes from.

***Interviewer: Did your grandparents live in the region of the land?***

*Employee 1:* No, they also lived in Braga... I don't know when they moved out, or if it were my great-grandparents that moved, but my mother was already born and raised in the city and never went there.

***Interviewer:* How do you know you own lands?**

*Employee 1:* Well, every year I receive the letter from *Finanças* with the taxes value to be paid. But there's no other information, like where those lands are, how large the plot are... It's kind of tricky, because the department that charges the taxes is not the same where you have the register of the land.

***Interviewer:* Tell me your experience and perception of the wildfires here in Portugal**

*Employee 1:* I see it on the news and it really affects my company's business. Because of wildfires is not uncommon that we need to import wood from South America, it's really bad for the business. In a sense is the lack of care for the land by the owners, if they actually took better care of their lands they would also be benefited, not only my company or our competitors. But he could do something with his land... How the situation is now it's not possible, but what can we do? People just don't care about their own lands. Our company and our competitor designed some initiatives inside CELPA to try to generate incentives for people to just manage their lands... Clean it... And even receive something with it... But they do not reach many users. Usually, is always the same landowners present in the meetings and applying for the programs, and those are already producers of eucalyptus and pine, they already have big lands... More than 20 ha... And they still are the minority of the landowners.

If people [landowners] were more collaborative between them, the results would be better, those programs even give incentives for landowners that are applying as a group, and expanding the area of action with their contiguous lands. If the ZIFs worked, would be fine, because you can gather very small plots into a big one and share the costs and profits... One plus one equals three ( $1+1=3$ ) in those areas. But many complain about arguments with their neighbors, or about not even knowing who are the neighbors...

But now that I'm talking this... I might be the problem also. I never realized that... I'm the problem.

***Interviewer:* What do you mean?**

*Employee 1:* I mean... Like I was talking to you just now... I always saw land ownership and the landowners as part of the problem. Inside the company is a thing that we are often saying and repeating when there's a wildfire near one of our plantations. We say that

people do not care with their lands and, despite of the knowledge about the risk, they do not care with the wildfires. But I never saw myself or my mom as part of the problem, now that you're asking those questions, I can see that is exactly people like me that are the issue. That I am the issue because I have lands that I don't even know where they are... And I don't actually even know how to find them.

For me, those lands are not important at all... I could sell or rent them, but currently I can't. How can I be sure that I will find the right borders in the middle of the forest? You need to take a look in the documents, if possible, they are very outdated and not helpful.

But I don't know if my mom would sell or rent... It belonged to my grandparents, but since she's never been there and, like me, she only is reminded of them when she receives annually the taxes... She might not mind, but I can't talk for her.

**Calisto Joaquim Santos – November 04, 2019. 3:30 PM**

**General Information**

- Male
- 64 years old
- Portuguese
- Retired, but former Civil Engineer
- Currently business is to buy houses and apartments in Lisbon, refurbish them and rent them.
- Lives and works in in Lisbon.
- Born and raised “all his life” in Lisbon, Portugal

***Interviewer:* How you acquired the lands?**

*Calisto Santos:* I inherited them form my parents and grandparents. But I also bought more after receiving the inheritance, now they are more or less 35 ha divided in 2 production sets of 12 and 23 ha each.

***Interviewer:* Where is your land?**

CS: They are near Castelo Branco.

***Interviewer:* How often do you go there?**

CS: Every 2 weeks.

***Interviewer:* Did your parents and grandparents live in the region of the land?**

CS: Not my parents, they were already living in Lisbon, but my grandparents are from there. I used to go every summer vacations to Castelo Branco to stay with my grandparents, at least a week... And for Christmas and other special days too. I really love that region.

***Interviewer: How do you use your lands?***

CS: I plant eucalyptus, really for production, and I have some pine trees as well in one of the plots I inherited, unfortunately, I can't cut them because they are protected by law, but they are not productive at all. I also have a few fruit trees in one of my plots, near the house. It was my father that planted them and they are still good. Of course you need to cut them for them to get strong sometimes, but they're quite old already. But the eucalyptus, well, it is more of a hobby than an actual economic activity. The eucalyptus market is too informal and if I actually calculate it, I will probably reach the conclusion that it's not worth it.

***Interviewer: How is it "too informal"? Could you explain what you mean?***

CS: I do not have the tools for cutting the trees when it's time, just to take out shrubs, and etc. So, we call the *madeireiro* and he looks at your plantation and gives a value based loosely on the number of trees standing there and their size. You can try to negotiate to reach a price that would be fairer, but them, they come with the equipment, cut the trees and take to the paper manufacturer, where it will be sold by cubic milliliters of wood... And they have way more knowledge than any of us [landowners/ producers]. It is very informal, so I know sometimes I win and sometimes I lose and, probably, I lose more often than I win.

***Interviewer: If it is not a profitable business, why did you buy more lands and just keeps planting?***

CS: Because that's where my family comes from, we're from Castelo Branco and my grandfather and father lived there, lived from the land. There was a moment where having a land was a guarantee of providing for your family, a guarantee that you would survive and, one they, your children would also have it. Portugal is a small country and you're not from here, but there was also a sense of community in those places, everyone knew everyone and would help everyone, even with some family feuds at times. People remember these and wants to keep their lands.

***Interviewer: So... Was it easy for you to buy the other lands you did?***

CS: No. People are too attached and then you start to enter in internal family disputes because of this attachment. When you try to buy, if it's one heir, it's easier, he might be attached, but it's easier to negotiate, but some have three or more people inheriting it, if everyone agrees is perfect, but usually you have one [of the heirs] that is too attached to a that piece of land to let it go, and because of this one you can't buy, no one knows which plot

belongs to whom... They kind of receive numbers when the division happens, but no one actually knows. And if you plant on the wrong plot, it will be a legal headache in the future. The person can file a process in the court against you because you invaded his land plot. If people are not going to take care of it, it would be easier for them to just sell. I often try to buy lands near mine and people will not sell because it was from their parents, or grandparents. There's too much attachment for a land they don't even take care of. People will not pay for the shrubs and trees be cut when needed, but they'll not sell also.

***Interviewer: So, the issue with the fire is that people don't properly take care of their lands, they don't manage it?***

CS: Those are different things. Suppose the girl Flavia has a land, if you care for it you will hire a service to properly take care of it. If your land is flat with the truck and the proper tools do not take long, but, if it is too steep, than its way harder for the truck to access it and it needs to be done by a man with a cutting machine, it'll get more expensive and take more time, but it's still easy to do. That's what I call land management, it's an easy and simple thing. Hire someone, or do it yourself, but cut the shrubs, keep the land clean. Fire prevention is bigger, the girl Flavia do not have control over it. It's a planning done by the local government, only the government can enforce. You need to do the corridors without anything to stop the fire and no one is willing to do that because they will not make any money from the land they own. In the end, to do things to avoid fires and manage the land well is a personal decision. If one of my neighbors don't clean the place, the fires will take his lands, but the risk of taking mine are lower, since I take actually manage it, but it doesn't mean that the fire will not spread to my lands if more people around me don't take care of their lands as they should. The risk gets higher and, now, there's a lot of people around me that don't take care of their lands. And no one knows who own it anymore, not even the municipality, they [the lands] are from people that moved to another place long ago and their parents died and no one knows where they live anymore, they can be anywhere. Some people we still know, but not all of them. The [national] government knows all of them, but they can't give their data so the person can be contacted to take care of his land because of the data protection law.

***Interviewer: How do you manage your plantation?***

CS: I do everything by the book. I plant, clean the lands with the right amount of time, every three years or so is enough if the land is used like mine, I have my own truck to do it and sometimes I lend it to my neighbors when they need it. The hardest part is the first clean after planting the eucalyptus, because they are still too small and if you don't take care, you can end up cutting then [the eucalyptus] by accident. I also do the 2 fertilizations required. So,

when the eucalyptus is 8 or 10, they're ready for the cutting. I prefer 8 years, but sometimes you need to wait until 10.

**Interviewer: Why not waiting until they [the eucalyptus] are 12?**

CS: I already heard from the forest engineer of the forest association that I should wait until 12, but Flavia knows that the fires happen every year, right? The more I wait, the more the chances of a fire increase, and if the fire happens, I've spent and worked for nothing, since burned wood worth's almost nothing, not even half the price of normal wood. So, no, it's not worth it. There are those who say that when the eucalyptus price drops too much, the one who puts fire are the *madeireiros*. I don't think so, but it's possible.

**Interviewer: What are you going to do with your land afterwards?**

CS: Well... I hope that my daughter will take care of it. It's my legacy to her and I hope she'll enjoy it as much as I do. She knows that's where we come from since she was little. I've tried to take her there as much as possible with school, my work, and all those things. So I hope she takes care of it and take my future grandchildren there also.

**José Maria Mendes Lameira – September 04, 2019. 5:30 PM, by phone**

#### **General Information**

- Male
- 73 years old
- Portuguese
- Retired
- Didn't talk about currently activities or educational background.
- Lives in the metropolitan area of Lisbon.
- Born in Setúbal, South of Lisbon.

**Interviewer: How you acquired the lands?**

*José Lameira:* They're not mine, actually, they belong to my wife, but I manage and do everything about it.

**Interviewer: So, how has your wife acquired the lands?**

*José Lameira:* She inherited from her parents, she's from Pedrógão Grande, you know? Where the fires happened... Well, she grew up in a village there and moved to Lisbon later, to work.

**Interviewer: So, her lands are in Pedrógão?**

*JL:* Yes, her whole family have plots in the villages in the area. In the old days you would marry someone from other village in the same area.

***Interviewer:* How often you go there?**

*JL:* Almost her whole family still lives in the region, so we go once a month, usually. When things are busy we go every 2 months, but never less than that.

***Interviewer:* How big is your area?**

*JL:* Well, we have less than 2 ha, for sure, but I am not quite sure because I don't know all the plots, only a few.

***Interviewer:* So, tell me about these plots different plots you own**

*JL:* They're bordering the village. We have a house there [village]. The three plots we have are all together, one bordering the other. The other plots I don't know, they are deep in the forest and the access is very difficult, there are those shrubs that have torn and block the passage in some points.

***Interviewer:* How do you use the lands you own?**

*JL:* The lands near the village we have some olive trees and some apple trees, but they are still small, less than 1 ha, so, too small to plant anything and sell it. The ones in the forest I don't even know and only forest grow there, I don't think they would be good to plant something. But we try to keep them clean, we feel that the minimum we can do it to keep our lands clean. We always did it, but mainly after 2017. It was really awful. But the lands in the forest, we don't know where it is and in that area not even the boars go anymore because of the shrubs that I've told you, with thorns, unfortunately we can't clean it and take care of it properly.

***Interviewer:* Would you be willing to sell or rent your lands?**

My wife's cousin died trying to escape the wildfire in a wall near our property [in 2017]. She lived all her life in Pedrógão, and in this year we actually thought about selling the property and the lands that we have knowledge about; however, they belong to the family for generations, we can't just sell them like these. Our children will inherit them someday and keep the legacy, and pass it to our grandchildren. They're very important to my wife, it's where she comes from. But we wouldn't mind to sell the lands that are in the forest, the problem is that we don't know where they are. The situation is complicated, because we don't know where they are exactly, I could be selling a neighbor plot or even be in another area thinking that it is mine and that would generate a lot of problems.



### **General Information**

- Male
- 56 years old
- Portuguese
- Co-founder and CTO of an IT company – the company maps cities and

checking if the real area of buildings is similar to the declared construction area. They're also developing business in Brazil.

- Didn't talk about currently activities or educational background.
- Lives in the metropolitan area of Porto.
- Born in the metropolitan area of Porto.

### ***Interviewer: How you acquired the lands?***

*Rui Siqueira:* My father inherited the lands from my grandfather more than 20 years ago, I just helped him take care of it when it was necessary. We were able to finally sell them in 2017.

### ***Interviewer: Where are the lands?***

*RS:* Around the region of Guimarães, probably near a village. I never went there, my father knew more or less where they were, some were in the middle of the forest, but it was not sure their location, and I'm not sure he knew all of them, because he came to Porto to work when he was still young. My grandfather would have known where they are if he was alive.

### ***Interviewer: How big were the plots?***

*RS:* I think less than 1 ha. They were quite small according to my father.

### ***Interviewer: Tell me about you experience in selling the area***

*RS:* Me and my sister, we've been insisting to my father sell the areas, he never went there to see them, but he wouldn't sell because they were the lands of his father and he was attached to them. He said it was where our family was born and raised, so he would not sell. I think he was disappointed with me and my sister for doing it, because he wanted us to have them, lands are important for him, even if they worth almost nothing, and even more the ones that he inherited.

It changed after Pedrógão and Góis, you may have seen news from it back then. It was quite a shock for the country, because every year we have wildfires around the country, but until 2017 no one would actually get hurt... And more than 60 people died, some trapped

in their cars trying to escape through the road. Even with my father, who was super attached to the lands who belonged to my grandfather, and my great -grandfather. He [the father] would never go there, since all the family is here [in Porto], his cousin wanted to buy, and he would not sell just because he grew up there and belonged to his father before. After the fires of 2017, me and my sister talked to him that this could happen also in his lands, and he finally agreed to sell. If he hadn't sold them, then it would be a headache to sell them after, since I don't know where they are, and now you need to go over a really big bureaucratic process to sell, the register would need to be updated...The lands can't be sold if they're not digitally mapped, also, and I couldn't even do it, because, my father doesn't know for sure all the plots and I don't even know where the village is.

***Interviewer: At that point you didn't need to do this?***

*RS:* You're used with the city, where you have contracts, registry, documentation, everything is already done how it's supposed to be, because it would be too chaotic, and people don't know each other. In the countryside, they're a community. It's different because people in the countryside have an advanced age, they don't feel the need to do it as it's mandatory now, they think the government just want to charge more taxes. In the countryside to honor the word and promises is very important, we sold the lands before the law was approved, so, in the agreement, my father's cousin would be in charge of updating the registry of ownership and mapping the areas. He had contact with the local [forest] association so it would be easier.

But try to go to any of these villages or very small cities in the countryside of Portugal. If you don't know anyone, or is not a relative of anyone from there or that lived there, people will not trust you. They also don't trust the government and a lot of them don't map because they think they'll be charged more taxes, and not because it would be important to have a more permanent registry of the ownership, for them, knowing where their lands are in their minds is enough, they don't see that someday someone like me can inherit the land and not having it mapped by GPS will actually generate more problems.

**Employee 2 – 30 November 2019. 7:00 PM, by phone**

**General Information**

- Male
- 52 years old
- Portuguese

- Graduated in Civil Engineering and Postgraduate in management.
- Work as a General Director in a big Portuguese company.
- Lives in the metropolitan area of Porto.
- Born in the metropolitan area of Porto.

***Interviewer: How you acquired the lands?***

*Employee 2:* I inherited the lands from my father, his family comes from the region, really in the North of Portugal, it's called Viana do Castelo, I'm not sure if you're familiar with it.

***Interviewer: How big are the land plots?***

*Employee 2:* One is 0.1 ha, and the other is 0.2 ha.

***Interviewer: How do you use the plots?***

*Employee 2:* I think about selling it, I go there two times a year, maximum. There is a small farm house in the 0.1 ha plot and it is very enjoyable. But I don't know what to do with the area that is in the forest. It is 0.2 ha, but it is inside a dense forest area and it's not possible to plant anything there. At least, in the area near the village, I go with my wife to enjoy the countryside, because you can't do anything productive with such a small area.

***Interviewer: So, tell me more about the idea of selling the land plots.***

*Employee 2:* The one near the village would be easy, we have a house there, and it's a nice plot. My children would probably take care of it if I don't sell it. The issue is going in the middle of the forest, in an area that I don't know and has a lot of shrubs with thorns growing around, to look for the original landmarks. This is the only way to find the land and the shape, but I'm not even sure where to start looking. I have a broad idea of where it might be, but I've never been there... Or I was there one, when I was a child and never again.

The main issue is that I need to have time to go with someone of the village and the guys that do the GPS mapping to search for the lands, because he [the person from the village] might know because they knew my grandfather and, maybe, even my father.

***Interviewer: How do you feel about selling.***

*Employee 2:* It would be the right thing to do with the fires and all, and I really wouldn't mind in selling the ones in the forest... But it's hard to think about selling the one in the village... It's the house my father was born, we made adjustments and it's more modern, but it's still the house where he lived and he left it for me... So, I don't know if I could actually do it if the time comes.

***Interviewer: How is hiring services for your land plots?***

*Employee 2:* It's easy, because it's someone who knew my father, and I know him, so he comes here and takes the shrubs away once a year, it's not expensive because the area is small and very easy to be done, but that's it. The one that's in the middle of the forest I don't even know. I can't hire someone to clean if I don't even know where it is, but someone already told me that, if I ever find the plot in the forest and need it clean, I can go to the local association or even the local bar, that everyone knows everyone and it'll be easy to find a *madeireiro*.

**Luis Cameira – 03 December 2019. 8:00 PM, by phone**

### **General Information**

- Male
- 55 years old
- Portuguese
- Graduated in Engineering.
- Work in Volkswagen.
- Lives in Alentejo, South of Portugal, near his workplace.
- Born in Aranhas, Castelo Branco, Center East of Portugal.

### ***Interviewer:* How you acquired the lands?**

*Luis Cameira:* I inherited them from my grandparents quite a few years ago.

### ***Interviewer:* How big are the areas you inherited?**

*LC:* They are 10 ha in total, divided in two big plots that are in different areas of the region. They're quite big for the average land plot in the area, most of people have less than 1 ha.

### ***Interviewer:* Have you ever been to all land plots you own?**

*LC:* Yes, I basically grew up going there on weekends or after classes, when I had time.

### ***Interviewer:* Could you tell me about the current use of your lands?**

*LC:* We still have the olive trees and I keep an employee to work on their maintenance and the land's... So he cut the shrubs, cut the branches when needed... Harvest the olives when it's time. It's just 2 plots, so he's enough, because it's hard to hire people now. But in the past it was easy, there were a lot of people around, living in the city and the villages surrounding it. Now, it's more complicated. People left the villages and the city because Lisbon, Porto, and

Coimbra offer better work opportunities, some even went abroad and send money to the family. No one wants to work on the fields anymore, not even I do, maybe when I retire for pleasure, because the amount I make with the olive trees is not enough to keep my family. You need 1,000 kilos of olives to make 100 liters of olive oil, I make less than that and sell what is produced to my family and friends, but it's not an industrial production.

***Interviewer:* When you said that in the past was easier... Could you tell me more about that?**

*LC:* There was more opportunities in the countryside. Having lands like mine were enough to produce olive oil and sell it, this would give enough money for the people to live. It was a very modest life, but they would take things from the lands they owned. So, people would always take care of their lands. Now, a lot of lands surrounding mines are not used, there is not enough people living in the area and they don't have enough money or strength to keep it clean. Most of the people that still lives in the countryside are older than 70, 75... And their children are probably far in the city. It's not cheap to keep a land plot.

***Interviewer:* When you said that in the past was easier... Could you tell me more about that?**

*LC:* There was more opportunities in the countryside. Having lands like mine were enough to produce olive oil and sell it, this would give enough money for the people to live. It was a very modest life, but they would take things from the lands they owned. So, people would always take care of their lands. Now, "a lot of lands surrounding mines are not used, there is not enough people living in the area and they don't have enough money or strength to keep it clean. Most of the people that still lives in the countryside are older than 70, 75.

***Interviewer:* How often you visit your lands?**

*LC:* I try to go as much as possible, and I try to take my kids with me also. If I had enough money. I would live there with them. Since I don't have, I can't be there all the time. I'm not making any money with the land, in fact, I'm spending more, but it's an important place for me and I hope one day my kids will take care of it also. It's where I'm from and our family build a life.

***Interviewer:* What can you tell me about the wildfires?**

*LC:* There's always the risk, and people don't clean their lands... So, it's worse, but it's a hard issue to solve. As I said before, the landowners are too old and don't have money or strength to do it anymore, or they are in the cities and far away like me... But wildfires are also like a big business in this country, you need to understand that extinguishing the fires is way

more expensive than actions to prevent them, even if the prevention being more efficient, so a lot of people are benefiting from them.

**Miguel fernandes Pinho – 05 December 2019. 6:30 PM, by phone**

**General Information**

- Male
- 58 years old
- Portuguese
- Graduated in Economics.
- Work and lives in Germany.
- Born in Porto.

***Interviewer:* How you acquired the lands?**

*Miguel pinho:* I inherited the lands from my father, he's from Castelo de Paiva, it's not that far from Porto.

***Interviewer:* How big are the areas you inherited?**

*MP:* Not even 1 ah if I put them together, it's only 2 plots, but they don't reach 1 ha

***Interviewer:* Do you know where the plots are?**

*MP:* Yes, my father used to take us [he and his sibilings] there to visit every now and then when we were kids. But they are all in the middle of the forest.

***Interviewer:* Could you tell me about the current use of your lands?**

*MP:* Well, nothing grows there except forest... basically pines and eucalyptus. But it's hard to do anything with them because of their size and location. In forest areas the only thing you can do is eucalyptus, but we would need bigger lands for it

***Interviewer:* How do you manage your lands?**

*MP:* We [he and his sibilings] just contact a man who lives nearby, apparently, he also has lands in the region. It's a mouth to mouth business and in these small cities and villages, everyone knows everyone. He knew our father, so he knows exactly where the land plots are, it's basically, call him and he'll clean it and say how much it was afterwards. We [the interviewee and his sibilings] split the bill and I send the money to my brothers. There's no invoice, nothing. I clean it because I feel that I have this responsibility, since some of them borders with my family's lands.

If you don't know anyone, and no one knows you, it's quite hard to get things through. The people in the countryside are really suspicious of strangers and people they've never met before. Unfortunately, in the area of my father's lands that happens a lot, most people are gone for quite long and a service provider will not go to the people's lands alone if they don't know him.

***Interviewer: How often do you visit your lands?***

*MP:* I barely remember the last time I was there. When I go to Portugal is for Christmas, birthdays, and other celebrations from our family, but since everyone, including my mother, lives in Porto, I don't need to go to Castelo de Paiva.

***Interviewer: Would you sell the lands?***

*MP:* I know it might not make sense for you, but no. They were from my father and my grandparents, and we are from Castelo de Paiva, it was important for him... It's important for my family and it's important for me.

### **Employee 3 – 05 December 2019. 07:30 PM, by phone**

#### **General Information**

- Male
- 53 years old
- Portuguese
- Hold a master's degree from Porto University.
- Works in a senior management position in a medium-sized business.
- Lives in Porto.
- Born in Porto and brother of Miguel Pinho.

***Interviewer: How you acquired the lands?***

*Employee 3:* Through my father, he inherited the lands of my grandfather in Castelo de Paiva, my brother probably told you that our family is from the area.

***Interviewer: How big are the areas you inherited?***

*E 3:* Really small... I don't know for sure now, the guy who cut the shrubs knows better... But they're really small.

***Interviewer: Do you know where the plots are?***

*E 3:* I do, they're in the middle of the forest, I know how to reach them because my father used to take us when we were children, at the time it was fun.

***Interviewer: Could you tell me about the current use of your lands?***

*E3:* Forest, basically, the areas is too small for anything and being in the middle of the forest, it's just eucalyptus growing in the area I didn't even plant it. They just spread and grow. But is as they say, that eucalyptus kill the other species... The only worse one would be acacia, as I was told by a man that lives in the region

***Interviewer: How often do you go to the lands?***

*E3:* I go as much as possible, but it's not easy to make time in my current job position, but I try to go two or three times every year, I need to check if the cleaning was made.

***Interviewer: Would you sell or rent your lands?***

*E3:* It's out of question, those were my father's lands, it's where my family comes from and my brother and sister also have lands in the area, so it's not even a possibility to sell or rent for someone else.

I feel responsible to take care of those plots that were my father's, and so do my brother and my sister. It's also because of the neighbors, there are people that makes their lands a living, it would be irresponsible with my neighbors if I didn't clean, but there's a lot of other people that don't do that. The main issue with the cleaning is that the price changes every time, even when cleaning all the lands nearby that, are almost all from family, but sometimes, he cleans for free in exchange for the wood there.

The madeireiros don't issue invoices, or anything, is very informal and I've talked to a handful of them, in the beginning, but no *madeirero* issues invoices, usually they also have their lands in the area and just do it as a side business

***Interviewer: Since selling is not an option, would you consider to do something else with them?***

*E3:* Like a production of some kind? The main issue is the size of the plots, they have less than 0.5 ha each, in the middle of the forest is nothing. Even if I joined my brother and sister... To produce eucalyptus, that basically goes there without any effort, I would need 20 ha or even more and we don't have this, not even considering the lands that still belongs to my mom.

**Employee 4 – 07 December 2019. 2:30 PM, by phone**

**General Information**

- Female
- 59 years old
- Portuguese



- Graduated in Math in Coimbra University, coursed a master Control Engineering in the Imperial College of London and has PhD also.

- Lives in Porto
- Born in the metropolitan area of Lisbon

***Interviewer: How you acquired the lands?***

*Employee 4:* My lands were from my grandparents and my parents, my mother, and I inherited them.

***Interviewer: Where is your land?***

*E4:* They're in Sertão, it's a region more or less near Coimbra. I was lucky because the fires in the area this year didn't reach my plots, but it's the first time they get so close.

***Interviewer: Do you know the size of your plots?***

*E4:* They're around 1 ha, the equivalent of one football field, and they are divided in 2 plots not far from each other in the middle of the forest, but they are not neighbouring also.

***Interviewer: How often do you go to Sertão?***

*E4:* We have a house in one of the villages near my land plots, so I would say every three months, or so.

***Interviewer: How do you manage your lands and hire services for it?***

*E4:* It's actually a friend of my father that does it, they had a long-lasting friendship and he is good and professional. He does not charge anything; our agreement is that he can get all the profit from cleaning. It's a win-win deal, since he gets the wood without much effort, keep it clean for me, and I don't need to worry about fires or the negligence fines on my land plots.

***Interviewer: Have you ever taught about developing an economic activity or selling them?***

*E4:* The problem is that they are too small and are in the middle of the forest, so nothing besides forest is good there, it's what it grows there, it doesn't requires any effort, the trees simply grows in the region, but I would never sell it. It belonged to my father and grandparents, it's a nice memory of them and part of me. But the best solution would be joining my land plots with my neighbors, so we could get together and turn all the small plots they own into a large property, managing it together and make them more profitable.

***Interviewer: Have you hear anything about the ZIFs?***

*E4:* Yes, apparently they are not working in the region of my lands, and do not work anywhere else, but it's a very limited view to not try to work with this arrangement, it's basically the institutionalized form of what I've just described to you. However, people in the countryside

are always suspicious about their neighbors, if they are going to steal lands or trees. The ZIFs were imposed by the local authorities, this makes the locals even more suspicious of the intentions with it. They think the government might steal their lands, or some of the neighbors will make more profit while the others lose it... It's quite complicated.

***Interviewer: Are you aware of any forest association in your area?***

*E4:* I never heard of one, and if one exists, it is bad. Don't get me wrong, I think associations would be really beneficial for the area, they need more associative initiatives in order to reduce the number of abandoned land plots, but if I am not aware of their existence, then it means that it should be made a better effort in communicating their existence, they could facilitate the management of the small properties. I go ever three or four months to the area for years and never heard of one...

## Interview with Akli Benali, 25 July 2019 – by phone

### Property Owners

- What kind of property owners did you interact with?
  - Our goal was to characterize the landowners and back up our insights with data, so we've talked with as many as possible.
- Are their different types of landowners and how would you classify them?
  - The ones we interact most with is a minority that is interested to do something with the forest. They're motivated to do something with the forest, they plant and also try to buy as many lands as possible. Then you have the ones that do something, but not a lot, sometimes they just plant the eucalyptus and they wait for it to grow, if it doesn't burn in the process, they will try to cut it and sell to the madeireiros (contractors). Some of them don't have the conscious that if they don't take care of the land, it can be dangerous. Some just don't have money enough to take care of the land properly, you both need to understand that the reality of the urban centers is quite different from the countryside, the gap used to be bigger, but it's still quite different. And you also have those who are unaware of their land and/or its potential, usually these are the ones who lives far away. Those I'd say they are more unattached and would be happy to just get rid of the land".
  - There are discussions on creating an entity that would manage properties, basically a ZIF, however they don't proceed because of the landowners, or it's hard to contact them, or the ones who are producing don't want to stop doing it, because they don't believe that the profits would actually get shared if they do the association. There's a lot of animosity between neighbors fearing their lands will be stolen by the other. They just don't trust that the rules in the institution will protect them, so they don't trust in the ZIFs.
  - The whole issue is like the picture in the work of Alvares, you had people that lived in the countryside and used it for taking the resin from pine trees, used the shrubs as food for the animals or for heating, and they planted their own food... The land was used, the fires happened, because it's part of the cycle, and if you check, here in Portugal you have some plants that reproduce themselves through the fire... But they were way smaller and easy to control, because there was little fuel in the land. However, when people emigrated to the cities, the land was not used anymore. Bear in mind that the ones who went to the cities were the younger ones, the older remained... So now you have a lot of landowners that are 75+ in the countryside, and their lands will be future unmanaged lands, because their children live in the cities, abroad, and they don't want to sell, because it belonged to their family, but they don't know the importance of taking care of that. And I'm not only talking about Góis or Alvares, I'm talking about the whole Center and North of Portugal. That figure illustrates one area, but it's a precise portrait of the country.

- If you take any forest area you'll see that you usually have, at least, and it's at least, because there are cases like Pedrógão where this is way more critical, 3 times more the number of landowners that don't even live near compared to the ones who are still in the cities and villages of the municipality. And it's complicated, because if the municipality wants to enforce the law of 2017, they can't, because they don't have any database with these landowners that they can access, and with the data protection laws in Europe, even the fiscal authority is resistant to give the information to them.
- Why not the South?
  - The reasons are simple: the lands are bigger, they were not divided indefinitely as generations passed and inherited, people didn't have too much interest in the south in the past, the population was smaller. And the municipalities in the South made a mapping of all lands and landowners years ago, set a database, to try to create incentives for companies moving there, like the cork industry, or oranges... And they digitalized as soon as it was possible... So they did everything right.
  - In the North, since there was always this concern of leaving a piece of land for all the children, because it was a matter of survival, the land plots that were big started being divided by all the children, and in the past, people didn't have one son or daughter, they had 4, 5 or even more... And this constantly division created small plots (*minifundios*) that we have today.

## Service Providers

- Which kind of service providers exist in Portugal?
  - There are different types of service providers, you have those who work in the cleaning, you have the ones that fertilize, and you have the ones that works in plantation.
  - Between those you have the *madeireiros*. They usually cut and sell the wood, but it's a highly untransparent business, because from the landowners that produce eucalyptus, they buy the wood, the price varies according with how easy is to access the terrain, the size and number of trees, but they always buy the tress standing. They cut them, and goes to the paper producers, and they [paper producers] will buy the wood by cubic meters. From the small landowners, they charge on both sides... They charge to sell the wood, but they also charge for clean the lands of the small landowners.
  - They are more interested in larger areas, because usually it's easier for them, since the landowners tend to take care of it.
- What do you know about those?
  - Decision for a service provider is mostly done when having a coffee
  - Contact is created through WOM or forest associations
- Are the landowners that live far away aware of the service providers

- It is not very easy, but probably they have people in the village they would call... But depends on the distance. Usually, you meet those guys in the bar or in the restaurant of the villages, they're part of the community and know everyone. If you grew up in the city and you never went there, then you need to go and try to find one personally, if they don't know who you are, they'll not do business if they don't know the person. They're very suspicious. But if they knew someone in your family, then he probably knows where your land is, and he'll clean it and charge for it, but it's very informal and non-transparent.

### **Large companies**

- What are their major goals?
  - Altri has some kind of plans in Alvares but I am not sure what they want to do
  - Alvares is a good region for the plantations and they have expanded their areas
- Navigator and Altri
  - If they want to protect their plantations, they need to have more areas around that are managed to reduce their risk
  - They need raw materials to be used in their factories. Thus, they have a high motivation to incentivize landowners to produce their own woods, but they're reaching a cap, so they need more people to harvest the wood they already have, but never paid any attention to.
  - To promote these they try to go through the association to reach a higher number of people
  - Well, the certification is important for two reasons
    - Improving their image
    - Promotes good practices
  - They also try to promote the initiatives from CELPA, but it's not very helpful.
  - They're seen as the villains, because of the eucalyptus, by the public opinion, so they'll try to improve their image. The eucalyptus is not that bad and not the cause of the problems, but it's how the media communicates it. They need to protect their plantations also and promoting those initiatives is a way of doing it.

### **New law**

- Is it just about the distance to the house or also about cleaning the forest that is not close to a village?
  - Just referring to the vegetation close to buildings
  - There is no legislation obliging people to manage their forest
  - If you want people to clean the forest, command and control tools won't do the job. You cannot oblige them to clean their land every year
  - We have to incentivize people to do that

## Underlying problem

- In your eyes, what is the underlying problem of the wildfires in Portugal?
    - First of all is the scale, the properties are just too small. Then, we have the issue with profitability, because the properties are too small; you need at least 5 ha of land, and that depends on how steep and rocky is the land, to start having some kind of profit in the production of eucalyptus or pine trees... Remembering that pine the person needs to be willing to wait for 20 years... The big eucalyptus companies try to promote certification, but even that you need a larger area than most owners have.
    - There's also the lack of options and incentives. People will not manage their lands if they don't see incentives, and there's not much incentives for forest production in Portugal, most of them are for agriculture and you have a lot of areas that it's not a good soil for agriculture... And tied to it there's the lack of information, landowners do a lot of things badly, or don't do, because they don't know, or because they can't be reached, or because they are from a time where that practice was normal and don't want to change their ways.
    - The cutting age for eucalyptus is 12 years. With this age, and good land management, the trees reach their optimum point considering wood quality for paper production and density of the wood per cubic millimeters<sup>6</sup>. It's also when the producers can achieve the higher price for the wood, even higher if it is certified wood. But due to the high risk of wildfires, the eucalyptus producers are cutting the trees with the minimum age possible of 8 to 10 years depending on the quality of land management.
    - Overall, there's a lack of incentive for people to manage their lands properly. If they did, it would help a lot to reduce the risk.
  - How can you convince people to manage their land?
    - There's the way of power, like the local governments try to do, that is issuing fines and charging people the price of cleaning. And there should be ways to touch the heart of the owners. Most don't sell their lands because they are attached to it... It was from their parents or their grandparents... At the same time, people don't seem to be attached enough to do something about it.
  - What about the mapping, how is it done when people don't know the properties?
    - Normal and active landowners go to the forest association, or hire the service themselves and go with the technician and map their lands... Because they already know them.
    - The others is more complicated, because if you have an opportunity to look at the document, you'll understand... They don't tell anything about where your plot is located, the shape, where it ends and where it begins... Well it tells, but in a way that is not helpful. You have a name of a region that is not on Google Maps... You need to go to a village and find an elder that knew your
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grandfather or great-grandfather... We're talking about people that are 70 years old or more... If they have lands near yours, they will know exactly where it's and can show you, most of them do... Because in the past, they knew how many pine trees they had, how many their neighbors... They knew it by heart... And they know where were the paths that the forest took over. But it's a matter of time until this knowledge gets lost... And a lot of people already can't find their lands, because the people that lived and worked there passed away.

## Summary of National Forestry Legislation

### Resumo da Legislação Florestal Nacional

Nuno Tirapicos Reis, Assessor Parlamentar

O ordenamento do território é, como o próprio nome indica, a gestão da interação Homem-Espaço Natural, nomeadamente através do planeamento cuidadoso das ocupações e aproveitamento das infraestruturas existentes com vista à preservação dos recursos naturais.

Deste modo, o ordenamento territorial tem um importante papel na prossecução das políticas ambientais: ao determinar o uso dos solos e o equilíbrio entre a agricultura, a indústria, as zonas urbanas e as florestas, poderá assim potenciar ou menoscar a execução e eficácia das políticas ambientais. Assim sendo, daqui se deduz que uma boa gestão do território poderá ter efeitos muito positivos na manutenção e preservação dos ecossistemas e das suas espécies, ao mesmo tempo que uma fraca gestão territorial poderá ter efeitos nefastos no meio ambiente.

Em Portugal, a entidade pública à qual competem as funções da prossecução das políticas públicas de ordenamento do território e urbanismo é a Direção-Geral do Território, criada pelo Decreto-Lei n.º 7/2012, de 17 de janeiro<sup>7</sup>.

Dividimos este capítulo em duas vertentes - a gestão florestal e a reorganização agrícola - áreas que consideramos fulcrais para uma gestão eficiente dos recursos naturais em território natural e que não raras vezes acabam por ser esquecidas.

#### 1.1. Território Florestal

##### 1.1.1. Descrição e Caracterização

###### Contextualização nacional e internacional:

Em Portugal, e de acordo com o perfil florestal do Instituto da Conservação da Natureza e das Florestas datado de março de 2017, 35,4% do território nacional é classificado como floresta, ocupando 3.261.501 dos 9.221.392 hectares<sup>8</sup> que compreendem os limites do nosso território, sendo esse o uso do solo mais frequente e com maior peso no nosso país.

Apesar desta dimensão considerável do território florestal, que se encontra um pouco abaixo da média de 38% registada pela União Europeia<sup>9</sup>, quase três quartos de toda esta extensão é ocupada por apenas três espécies - o eucalipto, com 26% do total de espécies em Portugal, e o sobreiro e o pinheiro-

<sup>7</sup> Decreto-Lei n.º 7/2012 de 17 de janeiro, Diário da República n.º 12/2012, Série I (pág.214-229)

<sup>8</sup> <http://www2.icnf.pt/portal/icnf/noticias/resource/press/2017-03-21-anx%20floresta.pdf>

<sup>9</sup> The World Bank, Forest area (% of land area), 2016. Retirado de: <https://data.worldbank.org/indicator/ag.lnd.frst.zs>



bravo, ambos com 23% do total. Seguem-se depois outras espécies, embora com menor expressão, como a azinheira (11%), o pinheiro-manso (6%), os castanheiros (1%), entre outras<sup>2</sup>.

De igual forma, e contrariamente à média da União Europeia onde quase 40% das florestas são geridas por entidades públicas, em Portugal as entidades públicas apenas controlam 2% de toda a extensão florestal, sendo 14% detida por comunidades locais (também conhecidos como baldios) e 84% gerida por proprietários privados<sup>10</sup>. Contudo, quando analisamos os registos prediais destes terrenos, verificamos que nem toda a extensão do território florestal se encontra registada, estimando-se que cerca de 20% deste território não possua dono ou que este seja desconhecido<sup>2</sup>. Assim, a fragmentação e divisão excessiva do território florestal traduz-se numa fragilidade da floresta portuguesa, sujeita a uma gestão incipiente e, em alguns casos, inexistente.

As Organizações de Produtores Florestais (OPF) são um importante elemento na política florestal, permitindo a gestão da floresta de forma sustentada, com especial relevância nas zonas de minifúndio. Estas providenciam aconselhamento e apoio direto aos proprietários e produtores florestais e de gestão florestal, no qual se salienta a constituição e gestão de Zonas de Intervenção Florestal (ZIF), a submissão de candidaturas de financiamento, e também a implementação de medidas de defesa da floresta contra incêndios (ao gerirem as equipas de Sapadores Florestais). Atualmente existem 143 OPF em Portugal, divididas da seguinte forma<sup>11</sup>:

DCNF (1)	NACIONAL	REGIONAL	MUNICIPAL	COMPLEMENTAR	TOTAL
Norte	1	2	33	8	44
Centro	3	2	58	13	76
LVT	0	1	9	0	10
Alentejo	0	0	8	0	8
Algarve	0	0	4	1	5
<b>TOTAL</b>	<b>4</b>	<b>5</b>	<b>112</b>	<b>22</b>	<b>143</b>

A extensão considerável do nosso território florestal traduz-se num forte valor económico. A riqueza das florestas de Portugal Continental é, por hectare, uma das maiores dos países mediterrânicos, com um valor de 344€<sup>12</sup>. Em termos de valor acrescentado, estima-se que o valor acrescentado bruto das fileiras florestais se situe por volta dos 2-3% do PIB, sendo unicamente ultrapassado pela Suécia e Finlândia neste indicador<sup>13 14</sup>.

Este setor é fortemente caracterizado pelas exportações, onde tem uma forte presença, com uma balança comercial bastante vantajosa, nas quais as exportações ultrapassam as importações em 2,3

<sup>10</sup> Conselho Económico e Social. 2017. “Economia da Floresta e Ordenamento do Território”

<sup>11</sup> Visto pela última vez em: <http://www2.icnf.pt/portal/florestas/gf/opf/assoc-florestal>

<sup>12</sup> Direcção-Geral dos Recursos Florestais. 2007. “Estratégia Nacional para as Florestas”. Imprensa Nacional-Casa da Moeda.

<sup>13</sup> Observatório para as Fileiras Florestais com base em dados do Eurostat

<sup>14</sup> Disponível em: <http://www2.icnf.pt/portal/florestas/fileiras/econ>

mil milhões de euros em 2017<sup>15</sup>, o equivalente a cerca de 9% do total de exportações e 4% das importações do país. Neste âmbito, as três fileiras mais importantes no comércio internacional florestal são as da pasta de papel, papel e cartão, representando 50% do valor das exportações e 45% das importações de produtos de base florestal, com um excedente comercial de 1,3 mil milhões de euros; a fileira da madeira, carvão vegetal, mobiliário e obras afins, representando 27% das exportações e 37% das importações, com um excedente comercial de 0,4 mil milhões de euros, e, por último, o setor da cortiça e produtos derivados, correspondendo a 20% das exportações e 7% das importações, totalizando um excedente comercial de 0,8 mil milhões de euros.

Também ao nível da empregabilidade este setor representa um forte motor de desenvolvimento nas regiões nas quais opera. É estimado, segundo o Instituto de Conservação da Natureza e das Florestas, que este setor seja responsável pela criação de cerca de 94,3 mil postos de trabalho, dos quais quase 68,7 mil correspondem a empregos diretos no setor primário e indústrias transformadoras de base florestal<sup>7</sup>.

Não admira, portanto, que Portugal seja o maior produtor europeu de papel fino não revestido de impressão e escrita, e o 3º maior produtor europeu de pastas químicas<sup>16</sup>, provando que o país soube aproveitar a clara vantagem competitiva de que dispõe neste âmbito.

### **1.1.2. Desafios da floresta portuguesa**

#### Contextualização nacional e internacional:

As alterações climáticas, com tudo o que daí advém, constituem o principal desafio à floresta portuguesa. Só entre 1996 e 2005, a temperatura do ar a nível global registou um aumento médio de 0,74°C, com alterações na precipitação total e na frequência e intensidade de fenómenos extremos, nomeadamente com o aumento do número de dias e noites quentes e da frequência das ondas de calor, assim como o aumento da precipitação extrema<sup>17</sup>.

A nível europeu, a região mediterrânea e o sul da Europa são as regiões mais vulneráveis, e onde se esperam impactos mais significativos deste tipo de alterações<sup>18</sup>.

Portugal não foi exceção, e também no nosso país se registaram diversas tendências, evidenciadas no projeto SIAM II<sup>19</sup>:

- Desde 1970 a temperatura média subiu em todas as regiões de Portugal a uma taxa média de 0,5°C por década, com aumento mais significativo a norte do Douro;

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<sup>15</sup> Instituto da Conservação da Natureza e das Florestas. 2019. “*Mercados e Produção Florestais - 2017*”

<sup>16</sup> Projeto Melhor Eucalipto. 2016. “*(Re)arborização de Povoamento de Eucalipto*”.

<sup>17</sup> Painel Intergovernamental para as Alterações Climáticas. 2007.

<sup>18</sup> Comissão das Comunidades Europeias. 2009. “*Livro Branco - Adaptação às alterações climáticas: para um quadro de ação europeu*”.

<sup>19</sup> F. D. Santos e P. Miranda (editores). 2006. “*Alterações Climáticas em Portugal. Cenários, Impactos e Medidas de Adaptação - Projecto SIAM II*”. Gradiva, Lisboa.

- Subida mais intensa das temperaturas mínimas, traduzida na diminuição da amplitude térmica;
- Aumento da frequência e duração das ondas de calor e dos dias muito quentes;
- Diminuição dos dias com geada e dos dias frios;
- Diminuição da precipitação total, em cerca de 80% das estações, acompanhada pela diminuição do número de dias muito chuvosos;
- Variabilidade sazonal da precipitação: na primavera houve uma diminuição da precipitação total, e no outono registou-se uma tendência positiva na mesma;
- Aumento da frequência e intensidade de situações de seca, com especial destaque para a região do Alentejo.

Os relatórios dos projetos SIAM I e II deram origem às seguintes projeções para o futuro:

- Aumento significativo da temperatura média em todas as regiões de Portugal até ao final do século XXI, agravando-se do litoral para o interior e de sul para norte:
  - Variação da temperatura média anual na ordem dos +0,5°C a 1,5°C no período 2011-2040;
  - Variação da temperatura média anual na ordem dos 1,5°C a 3°C no período 2041-2070;
  - Variação da temperatura média anual na ordem dos 5°C no período 2070-2100;
- Incremento do número anual de noites tropicais (noites com temperatura mínima de 20°C);
- Redução da precipitação média anual: Anomalias até 2040 de -10% a -25% quando comparado com a média 1961-90, agravando-se de norte para sul;
- Desaparecimento dos dias de geada, principalmente no litoral e no sul;
- No continente, aumentos da temperatura máxima no verão entre 3°C no litoral e 7°C no interior;
- Grande incremento da frequência e intensidade das ondas de calor, sobretudo nas regiões do interior.

Todas estas alterações ao nível do clima têm um efeito ao nível das espécies arbóreas presentes em Portugal, ao modificar as condições ótimas para o seu crescimento e desenvolvimento, podendo colocar em causa, em certas situações, a sobrevivência de algumas destas espécies em território nacional.

Por exemplo, se no verão a diminuição da precipitação e o aumento da temperatura diminuem a produtividade das espécies, o aumento desta no inverno é favorável ao aumento da produtividade, assim como a maior concentração de CO<sub>2</sub> na atmosfera, que provoca um incremento na fotossíntese e reduz a transpiração. Não obstante, e segundo a literatura, são os fenómenos extremos, como a seca e as ondas de calor, e não as alterações graduais do clima, que provocam efeitos mais imediatos e drásticos na produtividade e sobrevivência das espécies vegetais<sup>20</sup>. Além disso, o aumento da

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<sup>20</sup> Ciais, P. et al. 2005. “Europe-wide reduction in primary productivity caused by the heat and drought in 2003”. Nature, Vol. 437, N° 7058, pág. 529–533.

temperatura no inverno e na primavera é favorável à capacidade reprodutiva das espécies de insetos, potenciando os seus níveis populacionais e aumentando o risco de surtos de pragas<sup>21</sup>.

Dadas estas alterações, são esperados os seguintes impactos ao nível das principais espécies florestais:

- **Pinheiro-bravo:** Diminuição da área com aptidão para esta espécie, particularmente a sul do Rio Tejo e na Beira Interior Sul, e redução do acréscimo médio anual em todas as regiões (excepto no norte litoral, no qual se regista um aumento de 10%), com especial relevância no centro litoral e sul, com quebras na ordem dos 27% e 50%, respetivamente. A média de diminuição de produtividade situa-se entre os 15% e os 20%;
- **Eucalipto:** Diminuição substancial da área de distribuição potencial a sul do Tejo e na Beira Interior Sul. Sobre a produtividade primária líquida, esta pode aumentar em 10% no norte litoral, podendo também registar aumentos no norte interior. Já na região centro pode haver uma diminuição generalizada (-30% no centro interior e -15% no centro litoral), agravando-se à medida que seguimos para sul, sendo que nesta região a produtividade espera reduções entre os 25% e os 50%. Em média, o decréscimo situar-se-á entre os 10% e os 15%;
- **Sobreiro:** Redução da área de distribuição potencial no sul e centro interior, com aumento no norte interior. A regressão da espécie nas regiões mais áridas poderá ser acompanhada pela sua substituição pela azinheira, uma espécie capaz de resistir a condições extremas. Ao nível da produtividade primária líquida, espera-se um aumento nas regiões norte (20% a 25% nas estações piores) e centro litoral (10%), diminuindo na região sul litoral (-25%) e sul interior (-60%), onde se encontram solos com menor capacidade de retenção para a água;
- **Azinheira:** Apesar de ser resistente a condições de stress hídrico, tem a sua frutificação afetada pelo aumento da temperatura e diminuição da precipitação, diminuindo o tamanho das bolotas e produção total<sup>22</sup>;
- **Pinheiro-manso:** Produção de pinha afetada pela diminuição da precipitação primaveril.

Contudo, e apesar deste cenário, é esperado que as espécies sofram mecanismos evolutivos de adaptação autónoma, criando novas formas de resistir às novas condições climáticas. São esperadas as seguintes capacidades de adaptação para as principais espécies:

- **Pinheiro-bravo:** Apresenta uma grande variação de características morfológicas e adaptativas que permite a esta espécie resistir em condições adversas (resistência à seca, geadas e ataques de agentes bióticos);
- **Sobreiro:** É natural que ocorra adaptação autónoma através dos mecanismos de seleção natural, não ocorrendo contudo em toda a área de distribuição<sup>23</sup>. A tolerância à seca é uma

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<sup>21</sup> Instituto da Conservação da Natureza e das Florestas. 2013. “*Adaptação das Florestas às Alterações Climáticas*”

<sup>22</sup> Humanes, B. et al. 2009. “*Acorn production and growth in Mediterranean oaks: Trade-offs and the role of climate, modular organization and phenology*”. Bellaterra, Universitat Autònoma de Barcelona

<sup>23</sup> Pereira, J. S. et al. 2009. “*Cork Oak Woodlands on the Edge: Conservation, Adaptive Management and Restoration*”. New York: Island Press.

das características desta espécie, sendo portanto provável que povoamentos situados em regiões pouco afetadas pela seca sejam mais vulneráveis que os das regiões mais secas<sup>24</sup>;

- **Pinheiro-manso:** Tem uma baixa variabilidade genética, o que constitui um ponto fraco face às alterações climáticas, sendo contudo compensada por uma elevada plasticidade fenotípica.

Tendo isto em conta, a Estratégia Nacional para as Florestas (ENF) identificou as regiões norte, centro litoral e região sul litoral como as zonas mais propícias à produção lenhosa, sendo que nas restantes zonas de menor produtividade potencial propõe uma lógica de funcionalidade na qual se destacam as fileiras de produtos não lenhosos, a conservação da biodiversidade e a proteção do solo. Para além disso, a ENF também defende uma gestão ativa do território florestal, dinamizando a investigação e o desenvolvimento na área do melhoramento genético das espécies<sup>5</sup>.

Uma das consequências mais visíveis das alterações climáticas é o aumento do risco de incêndio florestal, com maior expressão na região mediterrânea, sendo o maior risco percebido no setor florestal. Entre 1980 e 2017, a área média ardida anualmente foi de aproximadamente 123.000ha, com um aumento sensível dos valores médios na primeira década do século XXI, destacando-se os anos de 2003, 2005 e 2017 pela expressão inédita das áreas florestais ardidas, com 472 mil, 347 mil e 540 mil hectares consumidos pelas chamas, respetivamente<sup>25</sup>. Há assim um claro aumento do risco meteorológico de incêndio médio derivado do agravamento das condições meteorológicas (mais dias de calor e seca e menor precipitação).

Assim, e especialmente após o ano de 2017, o Sistema Nacional de Defesa da Floresta Contra Incêndios foi revisto

Depois dos anos de 2003, 2005 e 2017, os três piores anos em termos de área ardida desde o início do século, o Sistema Nacional de Defesa da Floresta Contra Incêndios foi revisto e passou a contemplar três níveis de planeamento florestal: nacional, distrital e municipal. Como aspeto positivo da implementação do Plano Nacional de Defesa da Floresta Contra Incêndios (PNDFCI) destaca-se a melhoria do desempenho ao nível da coordenação dos intervenientes na vigilância, deteção e combate, provocando uma racionalização dos esforços para uma atuação mais eficiente, havendo uma redução do tempo de ataque inicial.

O trabalho desenvolvido no âmbito da prevenção estrutural está a cargo do ICNF, que, malgrado a intervenção na gestão de matos, pontos de água e caminhos florestais, tem ainda um grave desequilíbrio na relação entre a despesa afeta ao combate e na prevenção, com um saldo favoravelmente favorável à primeira. A capacidade de executar ações de prevenção estruturais revela-se insuficiente face à extensão do território, sendo essencial dispor da capacidade para utilizar maquinaria.

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<sup>24</sup> Ramírez Valiente, J.A. 2010. “*Plasticidad fenotípica y diferenciación genética inter- e intrapoblacional en Quercus Suber L.: evaluación mediante caracteres fisiológicos y marcadores moleculares*”. E.T.S.I. Montes - Universidad Politécnica de Madrid.

<sup>25</sup> Pordata. 2018. “*Incêndios rurais e área ardida - Continente*”

Considerando o potencial agravamento dos incêndios florestais decorrente das alterações climáticas e os impactos sobre as funções dos espaços florestais, justifica-se o reforço da capacidade de resposta atual, sobretudo da capacidade de implementar medidas de prevenção adequadas. A gestão eficiente dos combustíveis e a diminuição do número de ocorrências são essenciais para aumentar a capacidade de resposta dos meios de primeira intervenção e combate.

As alterações climáticas aumentam assim as condições de *stress* e diminuem a capacidade de resistência aos agentes bióticos, agravadas com os incêndios florestais, com particular expressão nas espécies mais sensíveis a condições de stress hídrico, resultando em importantes perdas para o setor florestal.

## Image of a Landownership document

 <b>AT</b> autoridade tributária e aduaneira	<b>CADERNETA PREDIAL RÚSTICA</b> <b>Modelo A</b> <small>SERVIÇO DE FINANÇAS: 1325 - ANSIÃO</small>
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**IDENTIFICAÇÃO DO PRÉDIO**

DISTRITO: 10 - LEIRIA **CONCELHO:** 03 - ANSIÃO **FREGUESIA:** 09 - ANSIÃO  
**SECÇÃO:** ARTIGO MATRICIAL Nº: 11697 **ARV:**

**TEVE ORIGEM NOS ARTIGOS**

**Freguesia:** 100302 **Tipo:** R **Secção:** **Artigo:** 6501 **Arv/Col:**

**NOME/LOCALIZAÇÃO PRÉDIO**

SERRADO DO LAGAR

**CONFRONTAÇÕES DO PRÉDIO**

**Norte:** JOSE MENDES REIS **Sul:** ARMANDO FREIRE, HºS.  
**Nascente:** ALFREDO COELHO DA SILVA, DR. **Poente:** ESTRADA

**ELEMENTOS DO PRÉDIO**

**Ano de inscrição na matriz:** 1972 **Valor Patrimonial Inicial:** €12,27  
**Valor Patrimonial Actual:** €16,96 **Determinado no ano:** 1989  
**Área Total (ha):** 0,570000  
**Descrição:** CULTURA COM 18 OLIVEIRAS, MATA DE CARVALHOS E MATO.

**TITULARES**

Identificação fiscal: 100309 Nome: ARMENIO DUARTE DA PAZ  
Motivo: ART.45 EBF - PREDIOS DE REDUZIDO VALOR PATRIMONIAL  
Tipo de titular: Propriedade plena Parte: 1/3 Documento: 2708240

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**Identificação fiscal:** 100309 **Nome:** ARMENIO DUARTE DA PAZ  
Motivo: ART.45 EBF - PREDIOS DE REDUZIDO VALOR PATRIMONIAL  
**Tipo de titular:** Propriedade plena **Parte:** 1/3 Documento: 2708240

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Identificação fiscal: 100309 Nome: ARMENIO DUARTE DA PAZ  
Motivo: ART.45 EBF - PREDIOS DE REDUZIDO VALOR PATRIMONIAL  
Tipo de titular: Propriedade plena Parte: 1/3 Documento: 2708240

**ISENÇÕES**

**Identificação fiscal:** 100309

**Motivo:** ART.45 EBF - PREDIOS DE REDUZIDO VALOR PATRIMONIAL **Início:** 2013 **Valor isento:** €5,65  
**Processo:** 2708240



Photos of the field trip to Pedrógão Grande, Goiás and Entroncamento, between July 23rd – 25<sup>th</sup>, 2019



*Burned trees from the previous wildfire are still standing in the same place while new trees grow, making evident what lands are nor managed and cleaned.*



*Burned trees from the previous wildfire are still standing in the same place while new trees grow, making evident what lands are nor managed and cleaned.*





*Burned trees from the previous wildfire are still standing in the same place while new trees grow, making evident what lands are nor managed and cleaned.*





The contrast between managed and unmanaged land plots. The managed has only new trees growing, while in the unmanaged there are still remainings of the burned trees from the wildfire.



Eucalyptus grow 6 to 9 branches, in order to reduce fuel, secure better production, it is necessary to keep it at 3, cutting the others.

























Shrubs that fuels the fire growing in unmanaged lands.





Shrubs that fuels the fire growing in unmanaged lands.



Shrubs that fuels the fire growing in unmanaged lands.





Shrubs that fuels the fire growing in unmanaged lands.



The shrubs also grow near villages





Smoke from wildfire growing on in the area.



Trucks taking the eucalyptus wood to paper production. Many of those trucks are owned by *Madeireiros*.