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HUMAN SETTLEMENT AND ENVIRONMENT IN THE MEDIEVAL BASSA ROMAGNA (RAVENNA, ITALY) *C.* 800–1200

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The Bassa Romandiola project was started in 2009 by the University of Bologna, directed by Professor Andrea Augenti and coordinated in the field by Professor Marco Cavalazzi. Its aim was to study a sub-region located west of the city of Ravenna called Bassa Romagna in north-east Italy (Fig. 1). Four survey campaigns have been completed, with a total of 62km^2 investigated. Among the discovery of about 51 new sites, the project brought to light archaeological evidence of a rural settlement, totally unknown before, dated to the early and high Middle Ages. The archaeological assemblage collected during the fieldwork mainly consists of courseware pottery and soapstone, suggesting that the site was probably comprised of rural houses and/or huts, made of perishable materials. During August 2017, the project team furthermore started the excavation of the so-called castle of Zagonara (Lugo, Ravenna), one of the sites first recognised in 2009.

Medieval geomorphology of the territory

In order to better understand the local settlement dynamics and the consequent reshaping of the natural and anthropogenic landscape of the investigated area during the ninth to thirteenth centuries, it is necessary to analyse the geomorphological framework of the region. In recent decades, numerous theories about the hydrography of the area have been advanced, often conflicting with each other. However, in recent years progress has been made in the definition of the Romagna palaeohydrography and geomorphology, shedding some light on many previously unaddressed questions (Franceschelli and Marabini 2007).

Situated between the current course of the rivers Sillaro and Lamone, the Bassa Romagna is a plain of alluvial origin characterised by a high rate of tectonic subsidence, the vertical lowering of the soil caused by the internal mechanisms of the earth crust. This phenomenon, together with a natural tendency of the rivers to overflow and create marshlands, and the nature of the soils (waterlogged or poorly permeable clays) on which the waters become stagnant, led to a continuous growth of the alluvial deposits, causing the burial of prehistoric and historic archaeological layers under several meters of alluvium (from 2 to 5 m) (Cavalazzi 2015, 132).

The rivers used to meander across this flat floodplain, creating raised riverbeds as a result of in-channel sedimentation. A consequence of this, already in antiquity, were frequent overbanking episodes and floodplain saturation. In particular, in the Romagna plain, the overflowing of the rivers has encouraged the formation of wetlands and marshes such as the *Valle Libba* to the north-east of the town of Fusignano (Veggiani 1982, 9–13; Fabbri 1993, 44) and the *Valle Fenarie* to the north of the town of Bagnacavallo and to the east of Alfonsine (Cremonini 1994, 19; Vasina 1994, 152).[2]

The main hydrogeological event to have occurred in the Po delta area is the appearance, between the fifth and the eighth centuries AD, of a new river branch, the Po of Primaro. The Po of Spina gradually went out of use and the written sources of subsequent centuries refer to it as *Padus Vetus*, 'the old/former Po'. This 'geomorphological revolution' changed the depth of the tributaries, raising their riverbeds and filling them with sediment, again causing flooding and diversions (Franceschelli and Marabini 2007, 134–135).

Any reconstruction of the evolution of the Bassa Romagna landscape and its historical phases requires, first of all, an understanding of the history of land reclamation that has characterised this territory since the Roman period. Such activity is represented by the presence of centuriated field systems and improved drainage channels dug in the Middle Ages, which have survived into the modern era, each episode designed to redeem 'unhealthy' marsh areas, making them fit for settlement and agriculture. It now proves possible to postulate that during the Roman period, the area was extensively inhabited and cultivated. As a consequence of environmental instability, part of the region became uninhabitable during the Late Roman Imperial period. Then, during the early Middle Ages, or maybe already during the Late Antique period, a long process of reclamation began, probably promoted by the main property owner of the time, the Church of Ravenna (Cavalazzi *et al*. 2015).

During the Middle Ages, the territory can be roughly divided into two main historical landscapes: the southern area of the region was characterised by the presence of three different centuriated field systems (Chouquer 2015, 248–250; Bottazzi 1994, 83–87), whilst the northern part of the plain, due to the presence of the Po of Primaro and the hydrographical instability of its tributaries, remained mainly covered by marshes and wet woodland areas (Franceschelli and Marabini 2007, 134–135; Cavalazzi 2017).

Another important aspect of this territory was the typical structure of land organisation and settlement that characterised the Bassa Romagna plain during Late Antiquity and the Middle Ages: the *massa*. This was an

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[2] Names in italics are place-names that no longer exist.

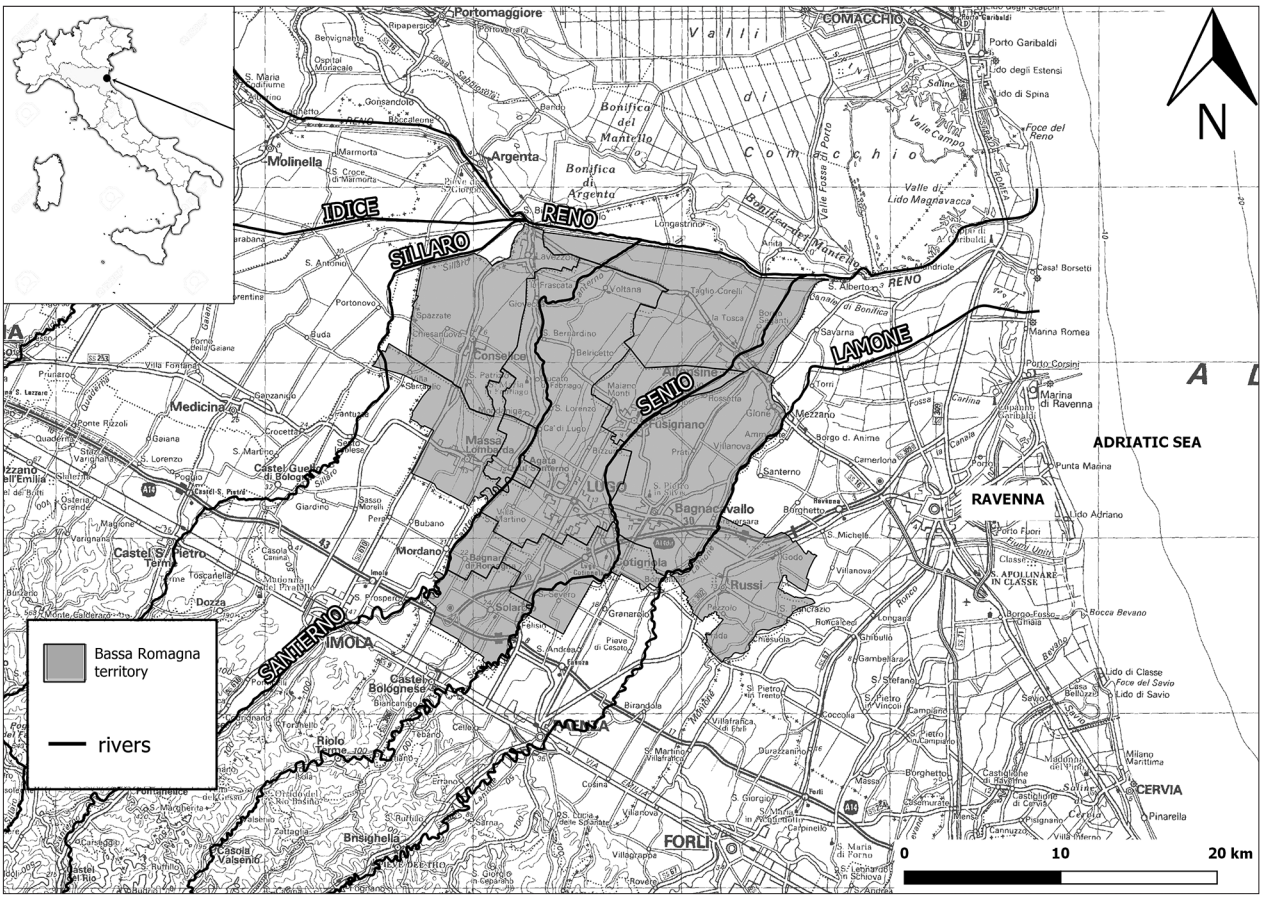

Figure 1 The Bassa Romagna territory and the main rivers of the area under investigation (Image elaborated from GIS of the Bassa Romandiola Project, CTR 1:250.000). Figure by author.

agglomeration of *fundi* (*i.e.* cadastral units), cultivated thanks to agreements between farmers and owners, and *casali* (apparently portions of a *fundus*, but their nature has not been clarified yet (Castagnetti 1982, 239–247)), usually situated in 'wild' areas, characterised by marshes and woodland, which seem to represent new farmland (Pasquali 1997, 18–19; Mancassola 2008; Andreolli and Montanari 1985).

From the ninth and tenth centuries onwards, the properties were located in the territorial district of a *plebs*, centred on rural churches with baptismal and burial functions. While the documentary record provides much information about *fundi* and *plebes* (their names, characteristics, position, and owner), material evidence for the houses of agricultural workers has proved elusive to date. In order to define and understand the medieval settlement pattern in this region better, it is therefore absolutely essential to combine information obtained from written sources with new archaeological data.

Here, information about the ninth to twelfth-century environment drawn from manuscript sources is presented, alongside other data regarding the presence of rivers, woodland areas, marshes, types of cultivation and more, in order to reconstruct and understand the relationship between human settlement and the medieval Bassa Romagna landscape.

Data

The primary sources included in this paper are homogeneous in their characteristics and typologies. All are private documents, including 35 *libelli*, 28 *enfiteusi*, 5 *pacta* (different types of contracts, explained below), 8 donations, 1 trade, 1 concession, 1 *permuta* (exchange) and 5 non-specified documents, giving a total of 84 documents (Benericetti 1999; 2002a; 2002b; 2003; 2005; 2006; 2007; 2010a; 2010b; 2010c; 2010d; 2011; Gaddoni and Zaccherini 1912).

Most of the documents belong to the type of the *libellum*, a contract that generally had a duration of 29 years with the possibility of renewal, and which generally related to small parcels of land. The payment of the fee corresponded usually to a *terraticum* (paid in both money and products) and other charges, such as *exenia* (donations in money or products), labour services on the lord's demesne and obligations (Pasquali 1993, 94–99).

Enfiteusi were long-term contracts (generally extended to three generations) intended for the management of larger properties and often drawn up between individuals belonging to the eminent classes. In exchange for the use of the land, the party receiving the *fundus* was required to carry out maintenance works and to pay to the owner an annual fee (in money) called a *pensio*, usually calculated on the extension of the property or on the economic value of the land (Andreolli

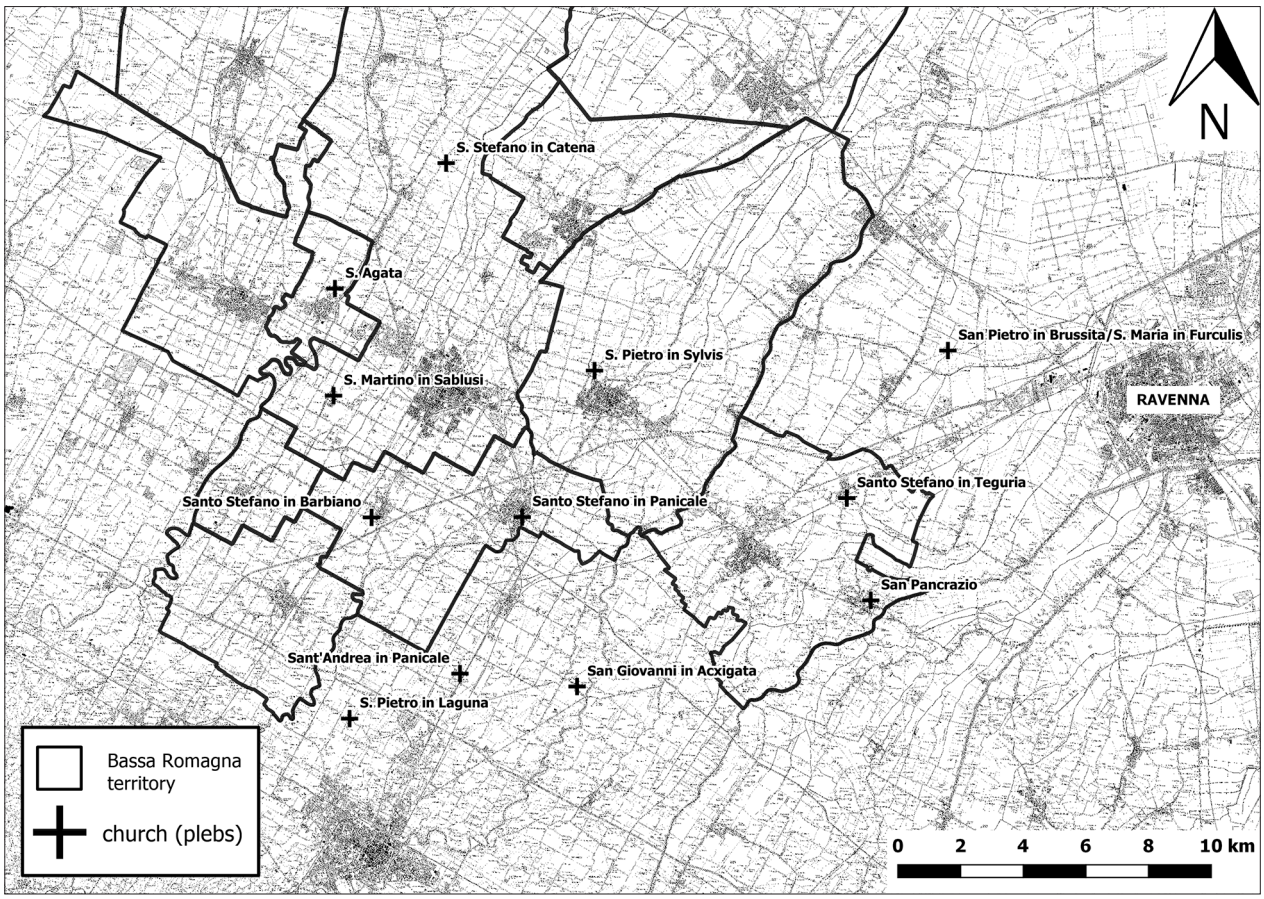

Figure 2 Map showing the location of the plebes (Image elaborated from GIS of the Bassa Romandiola Project, CTR 1:25.000 scale). Figure by author.

1999, 145–168). *Pacta* usually lasted sixty years, with a rather moderate fee, both in money and/or in goods (Pasquali 1993, 94). The remaining document types do not have a codified structure, with different contract durations and fees occurring within the same category.

Most of the documents belong to the tenth and eleventh centuries, a period during which the main protagonists in the management of the Bassa Romagna territory were monasteries. Fewer documents survive from the ninth and twelfth centuries, and only one from the eighth century. From the tenth century onwards, private owners – such as counts – disappeared, their power probably weakened by the decision of the imperial authority to apply the Lombard hereditary system to the lands of the Exarchate, which resulted in a proliferation of small rural countships (Vasina 1970, 154; Rabotti 1993, 129) (Table 1). While recognising that the evidential base is varied and unevenly distributed through time, and that the territory changed its appearance several times during this period, for the purposes of this paper these documents have been merged to form a single chronology and cartography.

The documents examined relate to the territorial districts of thirteen *plebes*, situated in the Bassa Romagna territory: S. Pietro *in Sylvis*, S. Martino *in Sablusi*, S. Stefano in Catena, S. Giovanni in Libba, S. Agata, S. Stefano in Barbiano, S. Stefano in Panicale, S. Stefano in Teguria, S. Pancrazio, S. Pietro *in Brussita* (then S. Maria *in Furculis*), S. Pietro in Laguna, S. Andrea in Panicale e S. Giovanni *in Acxigata* (today Pieve Cesato) (Fig. 2).

Methodology

An Access database was created to archive and analyse all the information contained in the primary sources. All data concerning the charters and their contents were inserted into the database. Fields included:

- type of contract;
- the available editions;
- the chronological date and the topical date (the location where the document was created or compiled);
- the territory of reference;
- the individuals involved and their social status;
- land boundaries;
- natural and anthropic elements within the *fundus*;
- fees and obligations.

Each record was assigned an additional ID corresponding to the GIS database.

All the information was systematically categorised, in particular information concerning 'natural and environmental elements'. All references concerning direct human interventions (such as buildings, canalisations, and roads) were included in the 'anthropogenic elements' category, but of course everything that can be considered

Table 1 Numbers of documents per century.

Type of documents per century									
Century	***libelli***	***enfiteusi***	**donations**	***pacta***	**trade**	**concession**	***permuta***	**non specified**	**total**
VIII			1						**1**
IX	2		1						**3**
X	5	4	4	2	1		1		**17**
1° half of XI	11	9		1				5	**26**
2° half of XI	10	14	1	2		1			**28**
XII	7	1	1						**9**
Total	**35**	**28**	**8**	**5**	**1**	**1**	**1**	**5**	**84**

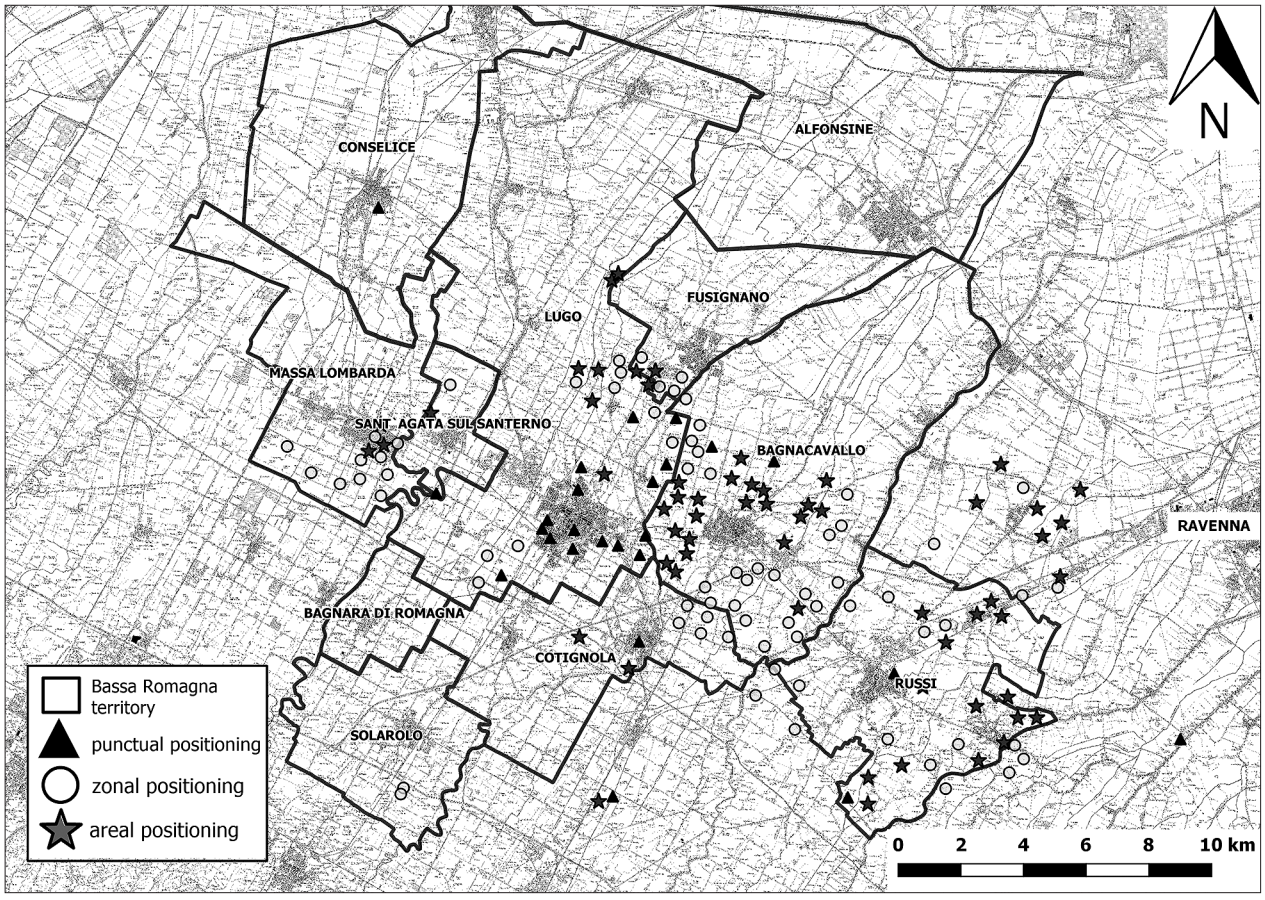

Figure 3 Map showing the location of the fundi (Image elaborated from GIS of the Bassa Romandiola Project, CTR 1:25.000 scale). Figure by author.

'natural' (*e.g.* fields and forests) has also been subjected to human intervention. For this reason, the landscape has been classified into three major typologies: agricultural landscapes (*e.g.* fields); semi-natural landscapes (*e.g.* forests, grazings, and lawns); and sub-natural landscape (*e.g.* rivers, marshes, and uncultivated lands) (Tosco 2009, 127–134).

Although almost no direct reference about intensive (*e.g.* grapevines) or extensive (*e.g.* cereals and beans) crops is ever made, it was decided to hypothesise their presence within the *fundus* on the basis of the goods requested in the fees (the *terraticum,* generally one third of the crops paid in proportion to the crop harvested, and the *exenia,* an additional tax, or rather a gift, consisting in part of the crops and processed products, such as breads and cakes). Since the farmers were asked for certain products, they probably should have been easily available in that area, on-site, or in a nearby land. In any case, this information can still provide a significant indicator of the type of cultivation spread across the Bassa Romagna region during the ninth to thirteenth centuries.

In addition to the Access database, the *fundi* were mapped in a GIS platform with the aim of producing thematic maps, querying the spatial data on the basis of qualitative information. The cartographic base that was used is the Regional Technical Cartography (CTR) at a scale of 1:25.000. The *plebs* and the *territorium* in which the land was located were used as general reference points, while, in order to refine the mapping, information about land boundaries such as rivers, canals or other adjacent *fundi* for which precise location information exists was also included.

Lands were plotted according to a 'scale of reliability': triangles indicate the *fundi* of certain position (point or punctual positioning); circles indicate the *fundi* whose positions are only known to within an area of *c*. 4–5 kilometres, but of which there is no absolute certainty (zonal positioning); and stars indicate those *fundi* that can be located within the territory of the parish to which they refer, but whose exact location remains hypothetical (areal positioning) (Fig. 3).

A toponymic study was also undertaken. However this was not decisive for research purposes. Place-names mentioned in the primary sources typical of Ravenna present many problems: first, it is not possible to state with certainty when and under what circumstances (*e.g.* social, environmental, political, linguistic) any toponym was coined; secondly, it frequently happens that a place-name is mentioned only once in all the available documentation, limiting its interpretation and contextualisation.

Despite these limitations, the study was able to provide a small but significant insight into the landscape situation of the medieval Bassa Romagna and three main classes of place-names have been identified:

1. those referring to water and wetlands and marshy areas (*e.g.* the hamlet's name Sabbioni derives probably from the pre-latin **saba*/*sapa*/*sabia* which means 'ditch', 'sand', or 'mud');
2. those relating to woodland and trees, which recall not only the presence of spread-out wooded areas (*silva*), but also of specific tree species like, for example, Ulmito, which comes from *ulmus, -i* ('elm tree') or Frassineto, from *farnus,-i* ('ash tree');
3. those that make reference to human activity of reclamation and control of 'wild' areas, for example all the places that have the Latin word *runcus,-i* ('deforested land') in their name (Fig. 4, Table 2).

The analytical interpretation of the data has been presented in several bar charts in which the number of references made in the sources for every element of the categories previously mentioned – like rivers, forests, and marshes (Fig. 5) – and also their agricultural products (Figs 6–7), are considered. This methodology was first applied to every single parish and then to the entire area under examination.

In order to create a graphical display of the evidence recorded in the database and to form hypotheses about the medieval structure of the environment, heat

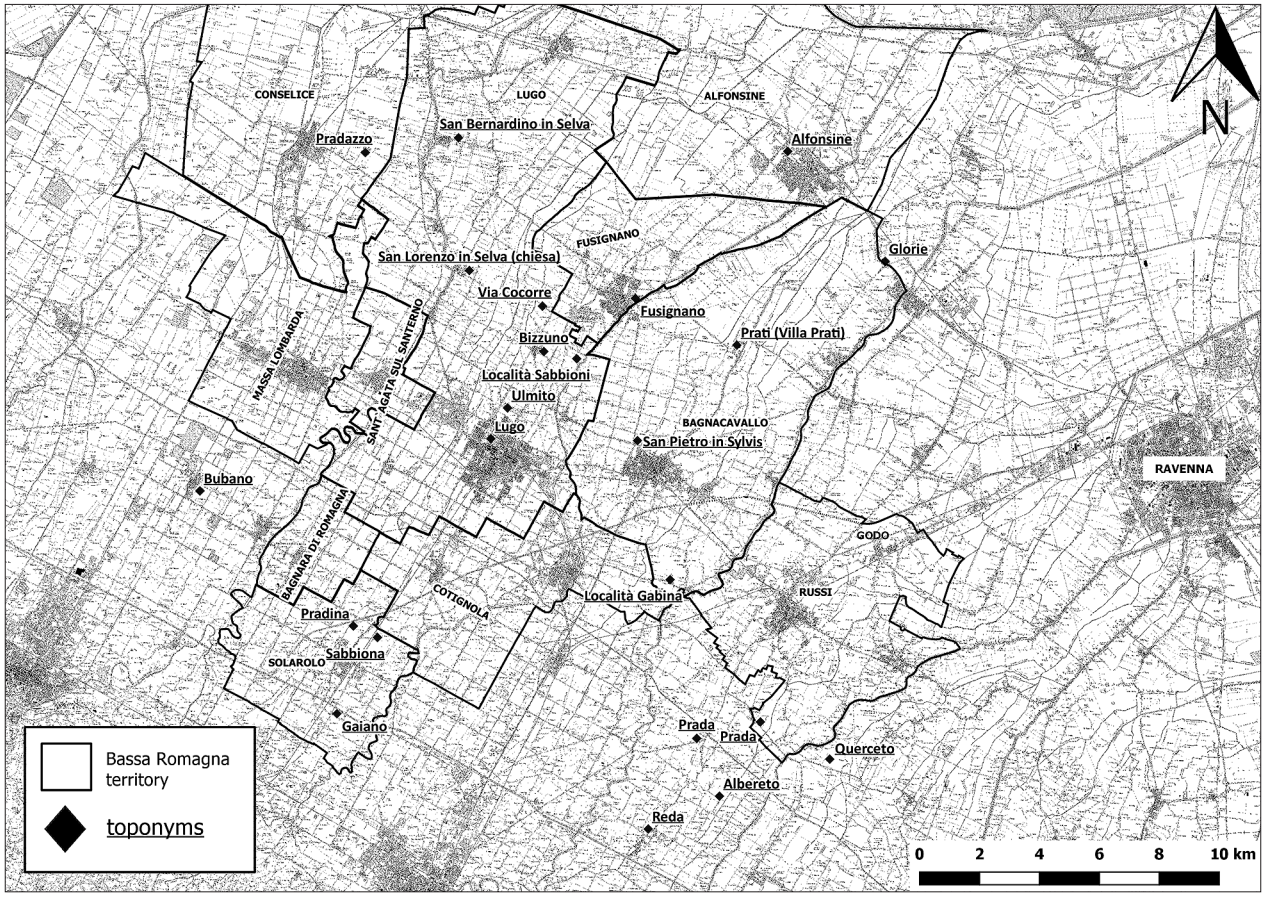

Figure 4 Map showing the toponyms identified in the documentation (Image elaborated from GIS of the Bassa Romandiola Project CTR 1:25.000 scale). Figure by author.

Table 2 Etymology of some of the toponyms identified in the territory.

Name	Etymology	Meaning
Albereto	Lat. a*rboretum*	cultivated wood, orchard
Alfonsine, Fusignano	Lat. *fossa, -ae*, old local dialect *alfunseni*	"to the ditches"
Bizzuno	pre-Lat. **beta/bettiu,-a*	birch
Bubano	pre-Lat. **bowa/*buba* (bova, canale melmoso, melma)	muddy canal, mud
Carpinello	Lat. *carpinus/carpen, -inis*	hornbeam
Glorie	old local dialect *góri/gúri*	shears, scissors
Località Gabina, Gaiano	pre-Lat. **gaba/gava/cava*	ditch, stream, river
Località Sabbioni, Sabbiona	pre-Lat. **saba/*sapa/*sabia* (corso d'acqua, fango, fosso)	stream, mud, ditch
Lugo	Lat. *lucus, -i*	sacred wood
Prada, Pradazzo, Pradina, Prati (Villa Prati)	Lat. *pratum, -i*	lawn, non-arable land
Querceto	Lat. *quercetum*	land planted with oaks
Reda	Lat. *retum, -i*	path that runs along a river, country canal
Ronco	Lat. *runco, runconis*	tool used to cut the weeds
San Bernardino in Selva, San Lorenzo in Selva (church), San Pietro in Sylvis	Lat. *silva, -ae*	forest, non-sacred wood, uninhabited
Ulmito	Lat. *ulmus, -i / ulmetum*	elm, land planted with elms
Via Cocorre	Lat. *caput* (head) + *corii* (marsh)	land at the edge of the marsh

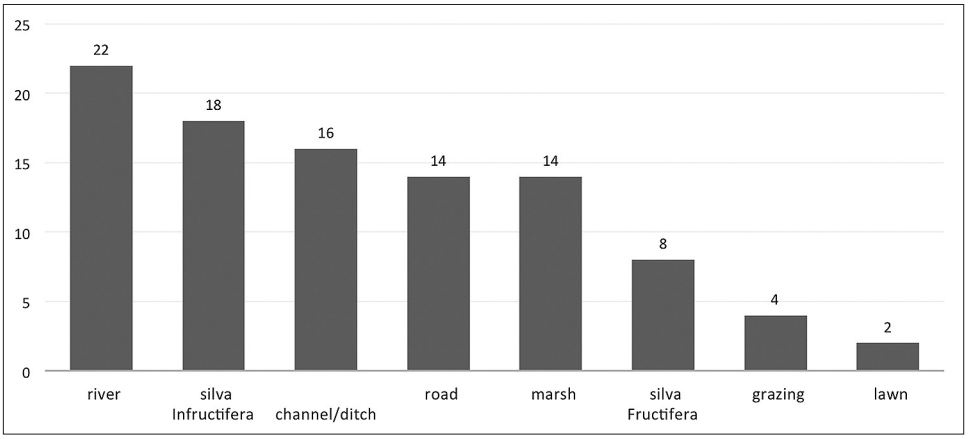

Figure 5 Bar chart of the total amount of mentions of every environmental element.

maps were generated in GIS. These represent the distribution of the 'environmental' elements, *i.e.* the presence of agricultural products, forests, and marshes, in relation to the canalisations and the environmental and archaeological information available in the Bassa Romandiola project database.

QGis software was used to create vector-based 'heat maps', modifying the value of the radius to the purpose of research and keeping the other variables to their default settings. It was decided to use a radius of 1500m, based on the average size of a *centuria* parcel (the smallest unit of the centuriation field system, a square area of 710 × 710m, called *fundus* during the Middle Ages). This was duplicated to also include the 'natural' and anthropogenic evidence located at the borders of the land, probably belonging to the surrounding properties. This measure has been chosen in order not to lose the informative power of the data extrapolated from the documentation, which otherwise would have been lost using a greater radius. At the same time, it allows a sufficient interpolation of the points, being able, in this way, to recognise the presence of landscape units as matrices and patches (Forman and Godron 1986, 83–187).

Results

The analysis of the documents and the processing of the data in heat maps has returned the image of a territory widely cultivated both in areas characterised

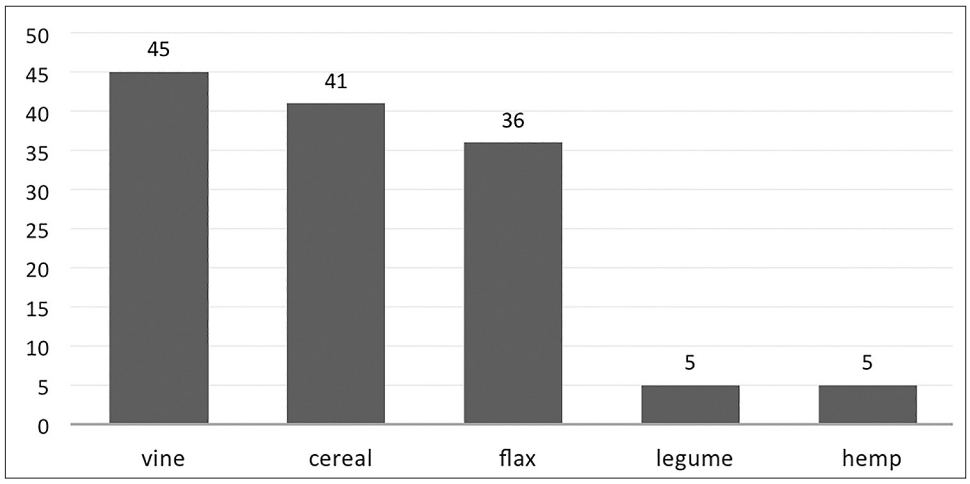

Figure 6 Bar chart of the total amount of mentions of the agricultural products.

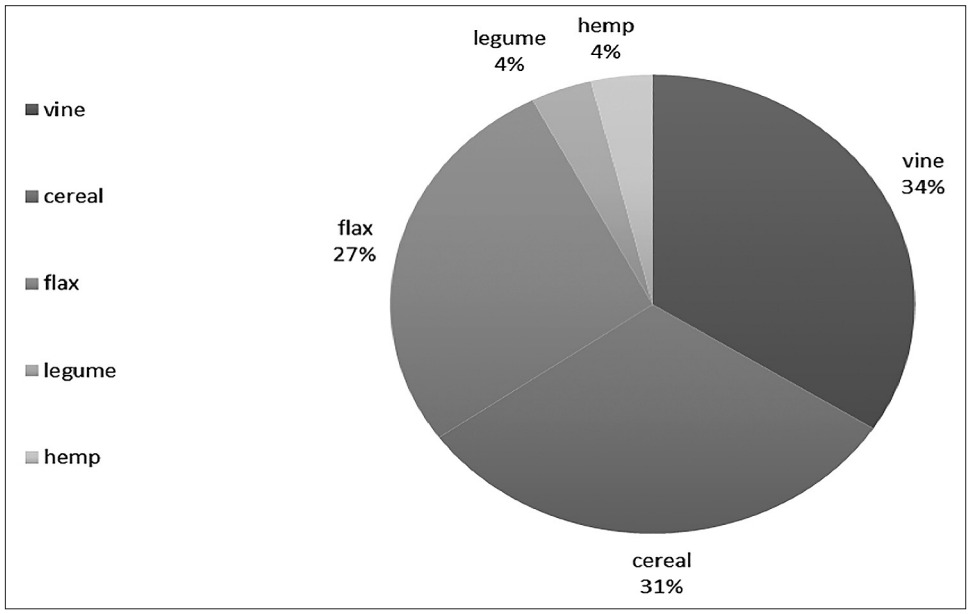

Figure 7 Pie chart showing the percentage of every agricultural product.

by the presence of centuriated field systems and in areas characterised by a strong hydrographic instability, mainly concentrated in the south-west of the plain. However, the northern section of this territory did not return any mentions of the presence of cultivated areas. This part of the region is characterised, from the Roman period until the late Middle Ages, by the presence of large valleys and marshes (*i.e.* the Fenarie and Libba valleys), in which the main activities were fishing (*piscacionibus*) and hunting (*formis anatariis,* bodies of water in which the settler could hunt and capture waterfowl). The thick network of canals was mainly used as way of communication, on which small fluvial ports were set up (as Conselice, *Petredolo, Runci, Libba*) for the movement of agricultural commodities (Gambi 1949; Mascanzoni 2005).

Subsequently, the concepts of 'matrices' and 'patches' from the discipline of Landscape Ecology were applied to the heat maps previously obtained. According to this discipline, a 'matrix' is an extensive and connected landscape element type that plays a dominant role in the functioning of the overall landscape (*e.g.* a large cultivated area with small disturbance patches of trees). By contrast, a 'patch', or landscape unit, is usually defined as an area with relatively homogeneous environmental conditions (*e.g.* the portion of a forest characterised by a specific tree species) (Forman and Godron 1986, 83–187).

In the area under investigation, five different matrices were identified (Fig. 8). Two were agricultural matrices ('Agricultural A', mainly cultivated with few wooded and marshy areas, and 'Agricultural B', characterised by the presence of hemp and legumes), located in the western part of the plain where the presence of the centuriated field system allowed a better control and exploitation of the land. Two other matrices ('Marshy A', more extended and with only three evidences of small vineyards, and 'Marshy B', smaller and almost completely uncultivated) were located in the south-eastern portion of the plain, characterised by the presence of several marshes, due to the hydrographic instability of the area between Russi and Bagnacavallo. A fifth and final 'Composite' matrix, in the area of Russi and Godo, was situated on the right bank of the Lamone river. This was mainly wooded but characterised by the presence of marshy and agricultural patches.

The western part of the plain emerges as predominantly agricultural, with few patches of forests and marshes. In contrast, the south-east portion seems to have been inserted in a largely uncultivated environmental

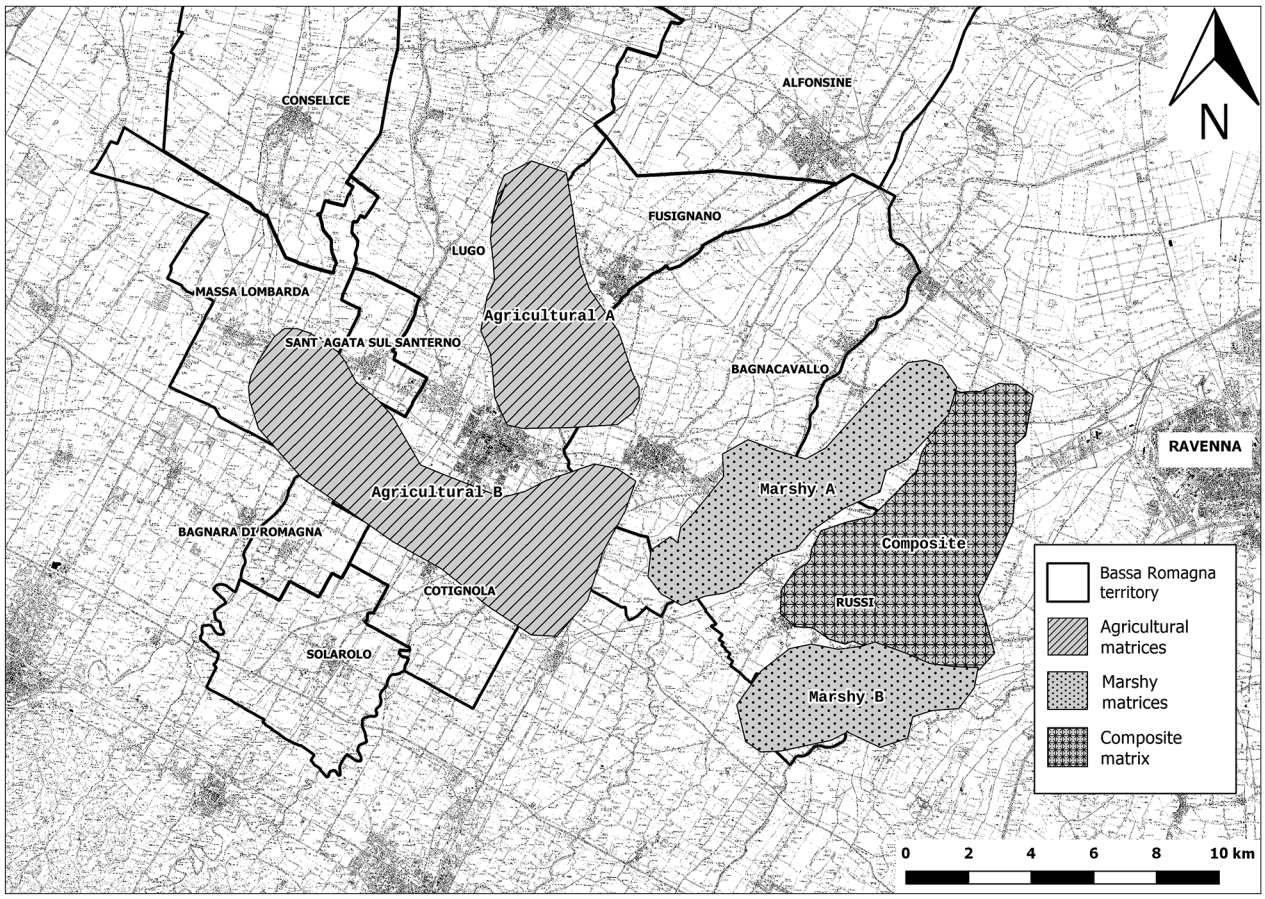

Figure 8 Map of the matrices (Image elaborated from GIS of the Bassa Romandiola Project, CTR 1:25.000 scale). Figure by author.

context. The request of *terraticum* from the *fundi* in this area, however, suggests the presence of more or less extensively cultivated areas (mainly with vines, but also cereal and flax), reclaimed from forests and wetlands. The agricultural matrices, if non-homogeneous, are mostly distinguished by the vine (34% of the products required in the *terraticum* of all the documents), whose products were requested in greater quantities than any other kind of goods (Fig. 9).

Cereal products appear in 31% of the analysed documents. They are divided between cereals *maiores*, represented by wheat, barley, rye, and spelt, and *minores*, including millet, switchgrass and sorghum. Unfortunately, the fact that they are listed cumulatively in the documents does not allow us to calculate to what extent they were cultivated and harvested. This may prove possible through palaeobotanical and carpological analysis, and through consideration of the spatial diffusion of the various cereal types. The third most widespread production in the Bassa Romagna countryside was flax (27%), widely attested in almost all the contracts, used for textile fibre, together with hemp (4%), which was widely cultivated and used in this area across the entire medieval period. Finally, there are only five mentions, all from the tenth century, of legumes (4%), in particular broad beans.

This predominantly agricultural matrix appeared interspersed with a series of woodland patches, consisting of both *silva fructifera* (6%), usually used for the production of timber, and *silva infructifera* (12%), earmarked for wood pasture, represented by the mention of the *glandatico*, a fee the farmer had to pay to the owner of the land for pig breeding, which, during the Middle Ages, were left to 'graze' freely in the wooded areas, eating acorns and fruits from the undergrowth (Montanari 1991, 95).

Discussion

The analysis of the territorial units within the Bassa Romagna provides an image of a heterogeneous agricultural economy, with crops intermixed with forests and wetlands. The exploitation and management of the region seem to be well established from the Roman period into the modern era through a continuous process of farming, whereby uncultivated lands were being brought under cultivation, and those already cultivated were widely maintained.

As previously highlighted, wine products, representing 34% of the entire product demand, are most frequently requested by the landowners, usually comprising one third of the fee, and the vine appears to be heterogeneously cultivated in almost all the *plebes* analysed in the present research, even in those characterised by marshes and wetlands like S. Pietro in Brussita and S. Pancrazio (see Fig. 2). The presence of vineyards is attested both in the

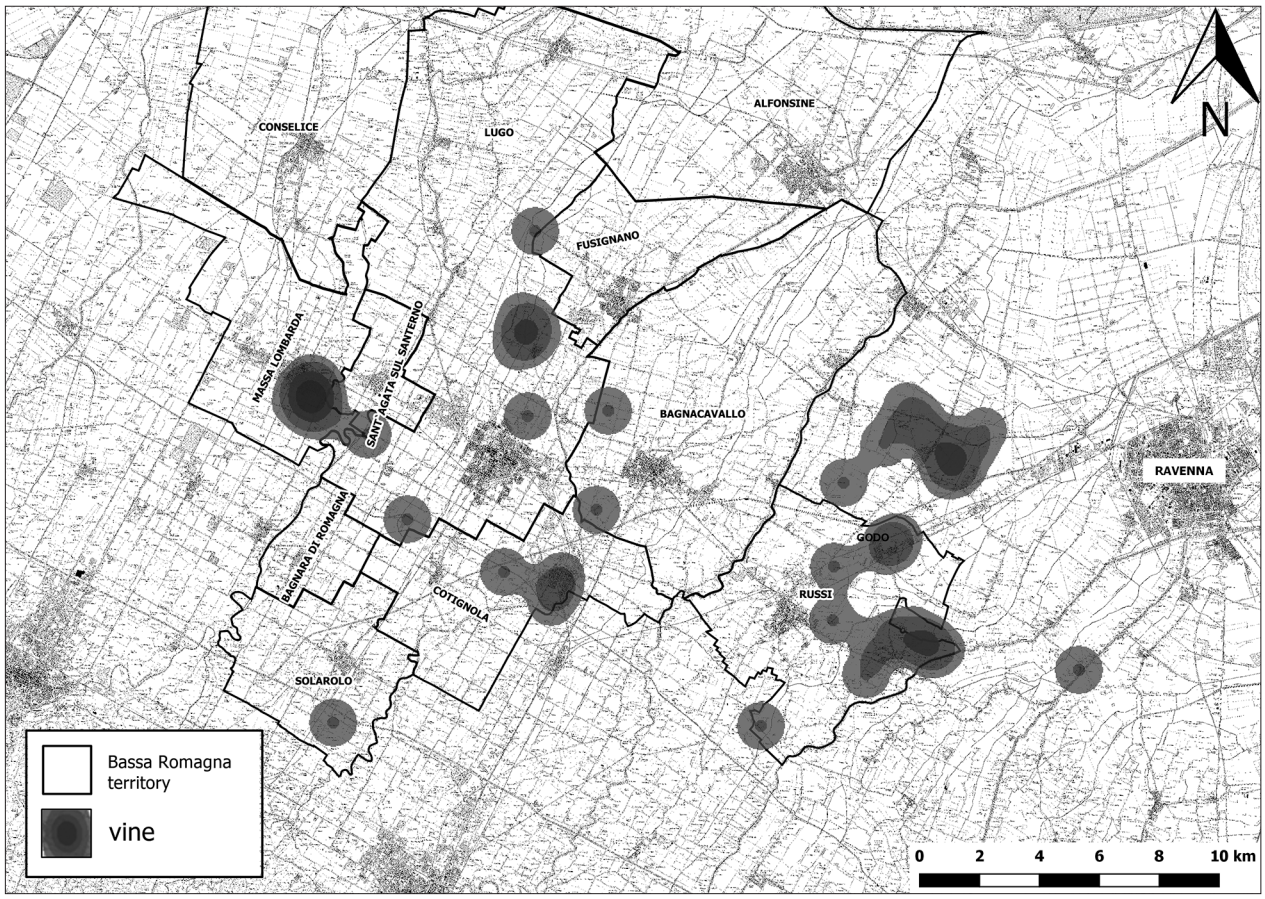

Figure 9 Heat-map with the distribution of vine cultivation (image elaborated from GIS of the Bassa Romandiola Project, CTR 1:25.000 scale). Figure by author.

form of small parcels, as *peciae vinearum* and *clausurae vineatae*, and more extensive and more profitable vines like *vineae* of several hectares (*i.e.* the 23 *turnaturiae de vinea* requested in the *fundus Prada*, equivalent to more or less 5ha).

In some cases, there were also attestations regarding some vinification rules, represented by the recurring formula '*arbore pecto ponente piciolo semel incisso, postea [relicum] sit nobis petitoris cessum*', that could be roughly translated as 'using the *follatoio* [an instrument used to cut the pomace], after that the pomace [the refuse of grapes or other fruit that have been pressed for winemaking] has been cut one time; may the remainder be left to us farmers' (Pasquali 1984, 225–229).

Other valuable insights can be gleaned from the production of hemp and legumes. Even if they are represented far less frequently than other products, their presence provides us with some information about the economic and social structure of this region.

Hemp is attested in only five documents from 1162 and 1164, all belonging to the *plebs* of S. Agata (Massa Lombarda), *c.* 30km west of Ravenna. It is an area characterised by the presence of the Santerno river, which, near the *plebs*, had (and nowadays still has) a sinuous course, which undoubtedly caused flooding during the Middle Ages. This hydrographical situation created the perfect conditions for the cultivation of hemp, even though it remained a marginal production compared to flax. Furthermore, the properties in which hemp is attested all belong to the monastery of S. Maria *in Cosmedin*, in the city of Ravenna, suggesting the idea of specific market demand. The analysis of later documentation is required to shed more light on this phenomenon.

The legumes are only mentioned five times in the tenth century, and their disappearance from later documents could be interpreted as a sign of a progressive cereal-based '*monophagism*' – a process of impoverishment in the variety of crops which is attested from the late tenth century onwards and deeply affected the peasants' diet (Montanari 1984, 152). Despite the scarce information about legumes, they were not necessarily of marginal importance, given the fact that for long periods in European history they represented the main substitute to meat.

The present paper has also highlighted a concentration of forests and wooded areas in the territories of Russi and Godo (south-west of Ravenna), with few occurrences in the rest of the plain (Fig. 10). It is important to highlight that the highest number of references to swamps and marshes ('Marshy A' and 'Marshy B' matrices) has been noted around these two cities (Fig. 11), suggesting a different economic emphasis in this part of the plain, mainly based on the exploitation of timber and pig breeding. It is in this portion of the plain that medieval communities put the biggest effort in controlling the

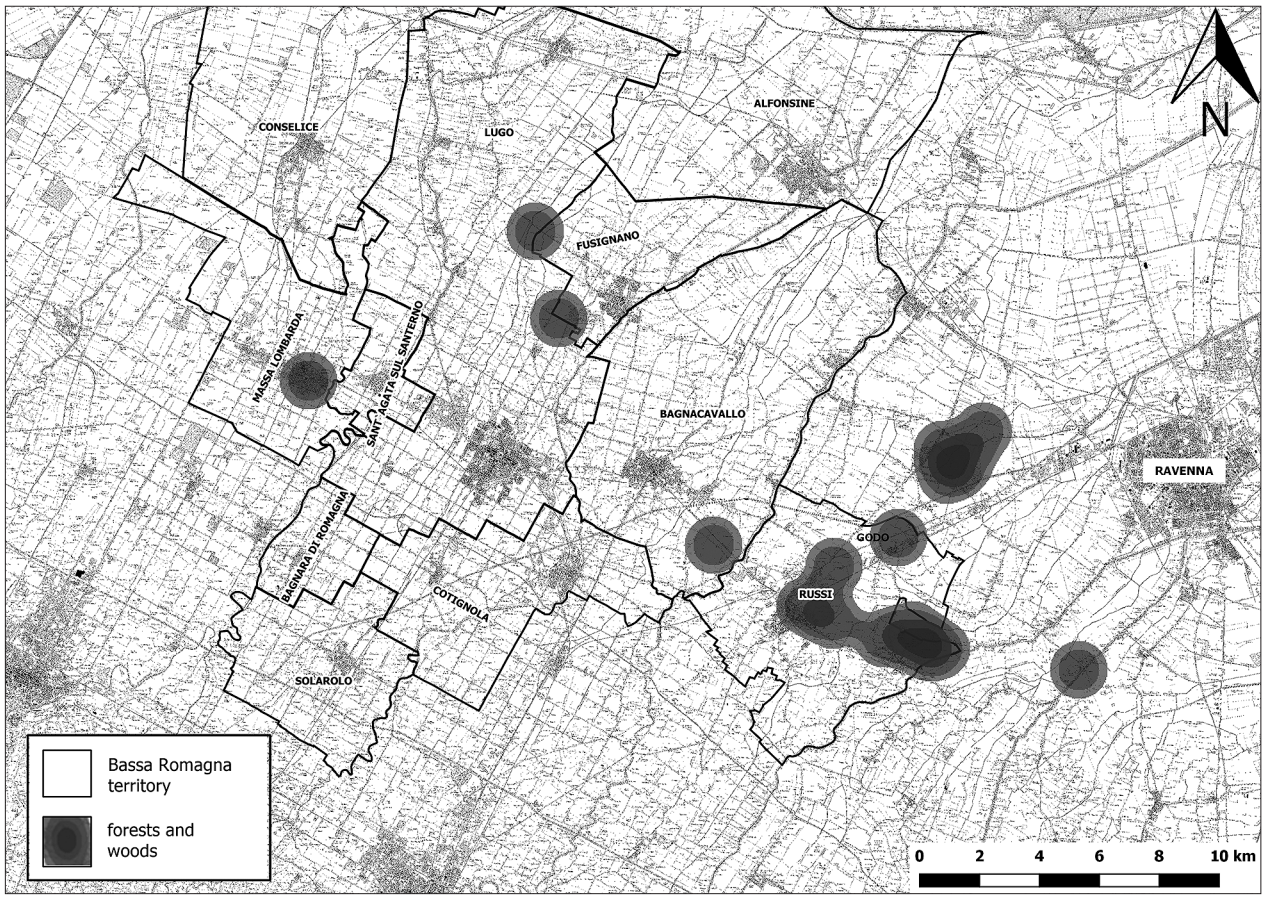

Figure 10 Heat-map of the distribution of the silva (image elaborated from GIS of the Bassa Romandiola Project, CTR 1:25.000 scale). Figure by author.

waterways, building a network of canals able to prevent or, at least, to contain, the damages caused by floods.

Monasteries were the most important protagonists for the development of the region, for its exploitation, and for the dynamics of colonisation. In particular, the monastic houses were major promoters of the redevelopment of areas that required the most extensive reclamation, which was achieved through the unification of their properties in *massae*, like the *massa Decimello, Madrara, Samternese* and *Prada* (see Fig. 11), all in the territory of Russi and Bagnacavallo. This encouraged the cultivation of wild lands (in particular through the implantation of new vineyards with a rent lower than usual, the so-called practice of the *pastinatio*). They adapted economic and market dynamics to specific environmental characteristics, encouraging settlement in order to control population growth and colonisation.

The results obtained from this documentary analysis offer an excellent starting point for further landscape-archaeological research in this region. The historical data require not only corroboration or questioning in the light of palaeobotanical and archaeobotanical analysis, but must also be compared against archaeological information, which is currently only available for the territory of Ravenna (Augenti *et al*. 2005; Augenti *et al*. 2010; Augenti *et al*. 2012; Cavalazzi *et al*. 2015). Crossing the disciplinary boundaries in environmental studies and research is undoubtedly difficult but, at the same time, it can be a powerful tool to better understand the complex dynamics underneath the making and the functioning of a landscape.

The success of interdisciplinary approaches is widely shown by several landscape projects that placed interdisciplinarity at the centre of their research methodology, as the Raunds Area Project or the Shapwick Project in England (Parry 2006; Audouy and Chapman 2009); the Pontine Region Project in Central Italy (Attema 1993); and the geoarchaeological work in the Vallée de Baux, in Southern France (Leveau 1999). These are, of course, only a few examples of how the integration of archaeological, historical and palaeonvironmental data could help in writing a landscape history and reconstruct its evolution trough time.

Finally, it would also be interesting to study more archival materials in order to extend the chronological scope of this study into later centuries, for which the cartographic and cadastral sources are certainly richer and more eloquent. Such an approach will bring important insights into the relationship between people and landscape as it developed in the territory of Ravenna.

Conclusion

The present study has used information obtained from documentary sources in combination with archaeological

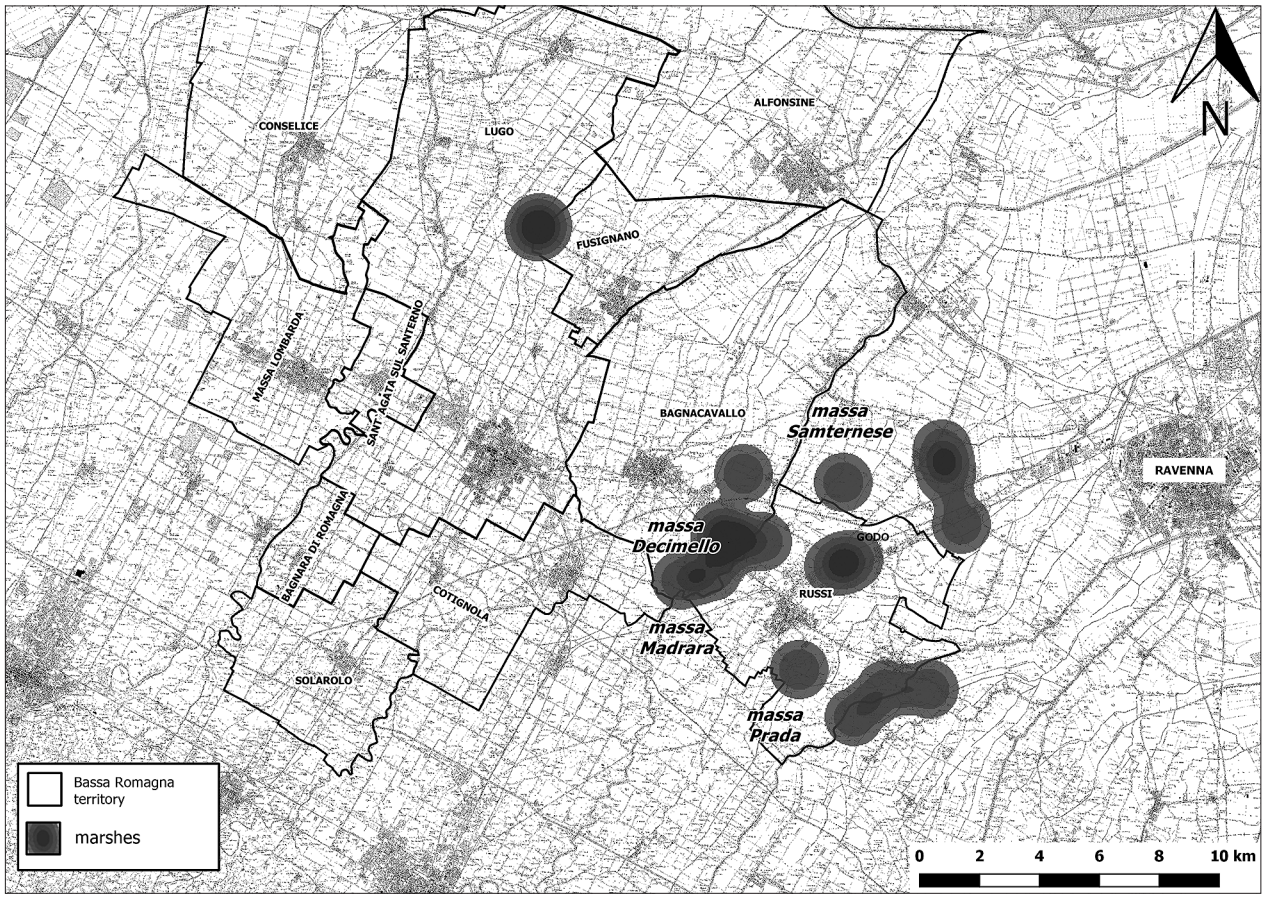

Figure 11 Heat-map of the distribution of the marshes and indication of the massae (image elaborated from GIS of the Bassa Romandiola Project, CTR 1:25.000 scale). Figure by author.

data in order to identify the different matrices and patches that characterised the environmental framework of the medieval Bassa Romagna plain (*c*. 800–1200). It reveals a territory widely cultivated in the western part of the plain, with few disturbance patches (small woods and marshes), and mainly covered by forests and marshes in the south-eastern portion.

The reconstruction proposed here brings to attention the relationship that developed between Bassa Romagna communities and their territories in the medieval period. This was not always easy, and, above all, was characterised by a continuous alternation between phases of tillage and of partial abandonment (albeit never long-lasting). A major factor in these shifts was the hydrographical instability of the region's rivers, sometimes deliberately controlled and channelled, and sometimes causing significant changes to and remodelling of settlement patterns when the forces of nature proved too difficult to counter. The monasteries were undoubtedly the protagonists in the evolution and exploitation of this landscape, promoting the redevelopment of uncultivated lands and encouraging the colonisation of newly reclaimed marsh areas.

It is hoped that this study will provide a starting point for future investigations into the landscape history of the region, integrating palaeobotanical studies and further archaeological evidence.

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