

# Observations about Climate, Farming, and Peasant Societies in Carolingian Europe

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The intricate relationship between climate change, agricultural productivity, rural poverty, food insecurity, and rural migration is a matter of contemporary political concern.<sup>1</sup> Against this background, and as natural sciences increasingly provide high-resolution data about past climates, scholarly interest in the impact of climate change on past societies is on the rise.<sup>2</sup> Students of ancient societies have suggested that, in various places and periods, climate change caused famines, socio-economic collapse, and migration.<sup>3</sup> Several recent publications explore aspects of this thematic cluster within the spatial and chronological framework of the Carolingian realm.<sup>4</sup> This paper is a contribution to this wider field of research. It raises several questions specifically regarding the impact of extreme weather events and climate variability on Carolingian farming and peasant societies.<sup>5</sup>

Discussing food shortages in the Carolingian period, Adriaan

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<sup>1</sup> See, for example, FAO, 2017.

<sup>2</sup> Widgren, 2012.

<sup>3</sup> Middleton, 2017, pp. 135-137, 160, 162, 172-174, 237, 292.

<sup>4</sup> Devroey, 2019; Ebert, 2018; Devroey, 2017; Newfield, 2013; McCormick-Dutton-Mayewski, 2007.

<sup>5</sup> In this paper, “peasants” are understood as “households which derive their livelihoods mainly from agriculture, utilise mainly family labour in farm production, and are characterised by partial engagement in input and output markets which are often imperfect and incomplete”, Ellis, 1993, p. 13.

Verhulst observes that “usually [...] famines are interpreted as accidents of growth, as expressions of a disproportion between a rapidly growing population and a rigid economic structure [...]. It is, however, not established that these consecutive famines had cumulative effects as was the case in the fourteenth and fifteenth centuries. There may have been rapid recovery after a famine.”<sup>6</sup> These remarks by one of the most eminent students of medieval economies need to be understood as an attempt to reconcile contradictory observations. Overall, the lands under Frankish rule experienced demographic and economic expansion between the mid-eighth and late ninth centuries.<sup>7</sup> Yet, several famines are recorded for that period.<sup>8</sup> Timothy Newfield recently raised this problem anew, stressing that “shortages [...] occurred too frequently to not have caused population stagnation or contraction at least in some regions and decades.”<sup>9</sup> He further suggests that this observation “could alter current theories that the Carolingian period was largely demographically positive.”<sup>10</sup>

This tension between positive and negative assessments of the economy and demography of Carolingian Europe also polarizes the debate about the impact of climate variations on early medieval societies. John Brooke, for example, argues that because of “climate stress in the post-ancient Dark Ages, between ~AD 400 and AD 900 [...] populations stagnated in Europe and China, which barely managed by AD 1000 to restore their population levels of AD 200.”<sup>11</sup> Conversely, Michael McCormick et al. state that “generally more favourable [climatic] conditions returned to western Eurasia around the later seventh century. In the west, new proto-towns, the trading emporia, emerged near the North Sea; the new kingdoms gained strength in England, France, and Italy; and agrarian expansion was underway.”<sup>12</sup>

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<sup>6</sup> Verhulst, 2002, p. 26.

<sup>7</sup> Verhulst, 2002; Devroey, 2003, Toubert, 2004, and, more recently, Hodges, 2012.

<sup>8</sup> Devroey, 2019; Newfield, 2013.

<sup>9</sup> Newfield, 2013, p. 170.

<sup>10</sup> Newfield, 2013, p. 170.

<sup>11</sup> Brooke, 2014, p. 343.

<sup>12</sup> McCormick et al., 2012, p. 201.

This paper contends that there must be a thoroughgoing discussion of methodologies and theory in order to settle these debates. It introduces the notions of spatial scale and social complexity as two concepts that could be helpful to this end. The expression “spatial scale” is borrowed from ecology. Put simply, it emphasizes that “acts in [...] the ‘ecological theatre’ are played out on various scales of space and time [and that] to understand the drama, we must view it on the appropriate scale.”<sup>13</sup> In this paper, the concept of social complexity is understood loosely, as an invitation to consider that social imbalances in Carolingian societies might have caused different individuals and social groups to be adaptable or vulnerable to environmental crises and food shortages in varying degree. In the following pages, these two concepts and their potential use will be discussed in turn.

### **Carolingian farming and climate: scale matters**

In 2012 an interdisciplinary team of researchers published a paper based on multiple up-to-date, high-resolution proxy data.<sup>14</sup> The authors reconstruct climate dynamics and explore how these might relate to historical developments in the Roman empire and the political entities that emerged from its fragmentation. An important role is assigned to farming: agro-pastoral activities are posited as the “potential link” between climate and social dynamics.<sup>15</sup> Yet, the authors do not focus on farming and its vulnerability to climate per se. Instead, they observe whether “the timing of climate change invite[s] comparison with known historical developments.”<sup>16</sup> Based

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<sup>13</sup> Wiens, 1989, p. 385.

<sup>14</sup> McCormick et al., 2012.

<sup>15</sup> “Notwithstanding the fact that the present state of knowledge does not favor a simplistic unraveling of the complex interactions of environmental, economic, political, and cultural developments, the unquestionable sensitivity of the Roman economy’s agrarian base to climatic factors provides an important potential link between historical and environmental change.” McCormick et al., 2012, p. 173.

<sup>16</sup> McCormick et al., 2012, p. 173.

on this approach, they link the commercial and agrarian expansion of the Carolingian age to climatic improvement.<sup>17</sup>

This type of analysis, while bold and stimulating, has several limitations. First and foremost, the postulate of the “unquestionable sensitivity of the [...] agrarian base to climatic factors” effectively treats farming as an analytical black box. Agriculture is identified as the crucial causal link between climatic and socio-economic dynamics, but the actual impact of environmental dynamics on farming is not the object of detailed investigation. This approach is an invitation to interpret mere coincidences and correlations between climatic and socio-economic dynamics as causal relationships. In fact, the assumption that the connection between these spheres could be linear generates a monocausal and deterministic bias. Political and economic dynamics are implicitly characterized as outcomes of contemporary climatic variations, without considering the impact of other environmental or social factors. A further problem is that this approach fails to account for the sheer geographical, social, and economic diversity of the various social-environmental systems that formed the Carolingian empire.

Émilie Gauthier’s detailed analyses of several pollen cores extracted in various locations of the Jura mountain range suggest that woodland regeneration and decreasing anthropic activity characterized the late Roman and early Merovingian periods (mid-third – late sixth/early seventh century CE).<sup>18</sup> This trend was followed by a phase of woodland clearance and slow agrarian expansion in the late Merovingian and Carolingian era (seventh – tenth century CE).<sup>19</sup> Yet, research on the fluctuations of lake levels and glaciers suggests that between ca. 650 and ca. 850 CE temperatures declined and rainfall increased in the region.<sup>20</sup> These observations have two major im-

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<sup>17</sup> McCormick et al., 2012, p. 201.

<sup>18</sup> Gauthier, 2004, pp. 167-168.

<sup>19</sup> Gauthier, 2004, p. 168.

<sup>20</sup> Gauthier and Richard, 2008, pp. 276-277; Berger and Brochier, 2006, p. 199; Gauthier, 2004, pp. 173-174; Magny, 1993.

plications. Firstly, given the current state of knowledge, the assessment by McCormick et al. that “generally more favorable” climatic conditions emerged in the later seventh century does not apply to the situation in the climate zone to which the Jura massif belongs. Secondly, the intuitive connection between improving climatic conditions and agrarian expansion is not always correct. Assumptions as to what constitutes “favourable” weather conditions (mild temperatures and moderate rainfall in the view of many scholars) might be too simplistic and the relationship between early medieval agrarian systems and climate dynamics might not be as linear as is often assumed.

According to Kerr et al., written, paleoenvironmental, and archaeological evidence suggests that Ireland underwent a phase of “climatic downturn” (more severe winters and increased summer rainfall) in the eighth and ninth centuries CE.<sup>21</sup> The difficulty of overwintering livestock because of this climatic “deterioration” seems to have triggered an increase in cereal production to feed both animals and humans. The authors of the study admit that “it seems counter-intuitive that an increase in cereal production would occur at a time when the weather was comparatively more inimical than it had been in previous centuries.”<sup>22</sup> Yet, they also stress that “the severity of the change was clearly not detrimental to the growing of crops such as barley and oats [...]. The presence of large numbers of so-called ‘corn-drying kilns’ (i.e. ovens for drying the harvested grain) on excavated Early Medieval sites also suggest [sic] that technology was being used to counteract any potentially detrimental climatic downturn.”<sup>23</sup> Up to a certain point, early medieval farmers were able to cope with adverse weather conditions. This does not mean that climate variations had no impact on agrarian practices and forms of land use. Rather, their consequences varied regionally and even locally, depending on the vulnerability or adaptability of social-eco-

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<sup>21</sup> Kerr et al., 2009.

<sup>22</sup> Kerr et al., 2009, p. 2872.

<sup>23</sup> Kerr et al., 2009, p. 2872.

logical systems and farmers. Comparing the results of several interdisciplinary studies carried out in various micro-regions of Italy, Schoolman et al. point out that climate variations barely affected early medieval land use and agrarian practices in some contexts, while they had a significant impact in others.<sup>24</sup> As Mats Widgren has found with regard to early medieval Sweden, the same climate variation can have a negative impact on some regions but support the expansion of others.<sup>25</sup>

These observations invite us to carefully assess how we articulate micro and macro-historical perspectives in models of Carolingian societies and economies. Early medieval farming was profoundly rooted in regional and local contexts.<sup>26</sup> Therefore, the vulnerability/adaptability of farming systems to changing climatic conditions was variable.<sup>27</sup> In other words, we should not expect climate variations to have affected landscapes and farmers uniformly. Which climatic conditions favoured or complicated agrarian production – and for whom – cannot be determined without a good understanding of numerous factors that differed regionally and even locally (e.g. environmental conditions, the nature of crops, farming techniques, coping strategies). As McCormick et al. themselves have pointed out, it is necessary to develop local and regional case studies that combine paleoenvironmental, archaeological, and written evidence in order “to explore the potential effect of both gradual and rapid climate change, and fluctuation, on human societies, and the complex pattern of human responses.”<sup>28</sup> In the meanwhile, macro-historical models that frame early medieval socio-economic expansion as the linear outcome of improving climatic conditions will necessarily be based on significant shortcuts and fail to capture this complexity.

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<sup>24</sup> See the discussion in Schoolman et al., forthcoming.

<sup>25</sup> Widgren, 2012.

<sup>26</sup> The point is remarkably made for Anglo-Saxon England in Banham and Faith, 2014.

<sup>27</sup> See the points made by Devroey, 2019, and Ebert, 2018, p. 214.

<sup>28</sup> McCormick et al., 2012, p. 206.

If we acknowledge the lessons of existing local and regional studies of social-environmental interactions, we can only understand early medieval demographic and agrarian dynamics as the outcome of the interplay of numerous human and environmental factors that operated at various scales. Macro-historical dynamics (e.g. agrarian expansion or the emergence of enduring interregional commercial networks and hubs) result from the agglomeration of various, potentially contradictory, micro-historical processes. The discussion about how to interpret the demographic evidence contained in the Polyptych of St Victor of Marseilles (813-814) illustrates this point.<sup>29</sup>

That document records the age of dependents' children. Analysing this evidence, several scholars have argued that "the numerical differences in the age groups of young children, the youngest being less numerous than the preceding group, suggest the existence of cyclical crises at short intervals in 803-6 and 810-14, possibly corresponding to famines in 803, 805 and 807 and to a cattle-plague sparking over to men in 810."<sup>30</sup> But, as Monique Zerner pointed out, the ages given in the Polyptych appear to be approximations in a number of cases.<sup>31</sup> Connecting them to precisely dated events is therefore risky. Furthermore, the fluctuations in age groups of young children vary from estate to estate, suggesting that crises were local rather than regional.<sup>32</sup> Finally, the estimated overall demographic balance is positive (2.9 to 3.1 children per couple).<sup>33</sup> Taking these points into consideration, the Polyptych allows a nuanced sketch to be drawn of socio-economic dynamics in Carolingian Provence. The dependents of St Victor were certainly vulnerable to crises: "this was not a peasant economy which ensured prosperity, or even, survival to all its members. It was an economy of subsis-

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<sup>29</sup> Renard, 2012; Faith, 2010; Devroey, 2004; Weinburger, 1990; Zerner-Chardavoine, 1981; Guérard, 1857, pp. 633-656.

<sup>30</sup> Verhulst, 2002, p. 25.

<sup>31</sup> Zerner-Chardavoine, 1981, pp. 365-367.

<sup>32</sup> Zerner-Chardavoine, 1981, p. 368.

<sup>33</sup> Zerner-Chardavoine, 1981, p. 371.

tence farming at best and many families must have been vulnerable to natural and demographic crises which could wipe them out completely."<sup>34</sup> Yet, in macro-historical terms, despite this fragility, crises do not appear to have checked demographic growth. Of course, "from its nature as the record of a particular landowner", the Polyp-tych does not permit conclusions to be drawn for Provence as a whole: "it does not record farms which were either allodial properties or belonged to another major landowner."<sup>35</sup> It is therefore particularly interesting to observe that a well-informed overview of archaeological and paleoenvironmental evidence from the region suggests that the eighth and ninth centuries were characterized by "growth in farming, resting on demographic increase combined with intensive land clearance episodes."<sup>36</sup> In conclusion, if we focus on specific households, the image we get from Carolingian Provence is often one of dearth and vulnerability, whereas, if we adopt a larger spatial and chronological scale, the overall impression is one of expansion.

As Timothy Newfield puts it, given the nature of the available evidence and the complexity of the processes discussed, histories of interactions between humans and their environment in the Carolingian era will ineluctably be "messy."<sup>37</sup> Paying close attention to the spatial scale of social-environmental processes may be one of our best options for settling some of the debates mentioned in the introduction. Rethinking how we articulate micro and macro-historical perspectives may offer us opportunities to overcome the contradictions between "prosperity" and "calamities" that seem to characterize the economies of the Carolingian age.

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<sup>34</sup> Faith, 2010, p. 199.

<sup>35</sup> Faith, 2010, p. 180.

<sup>36</sup> Durand-Leveau, 2004, p. 240.

<sup>37</sup> Newfield, 2016.



## Social Perspectives: The vulnerability and adaptability of carolingian farmers

Paying attention to the spatial scale of economic processes and environmental crises also stimulates us to rethink the complexity of Carolingian societies. Adaptability or vulnerability to harvest failures does not depend solely on geographical factors. The ability to cope with adverse climate and with food shortages also varies among social groups. In his seminal discussion of food shortages in seventeenth-century Europe, Pierre Chaunu argues that “ploughers, poor peasants, perhaps even some of the day labourers – the small and busy people of the countryside – did not let themselves starve to death that readily. [...] One does not, or only rarely, die of hunger in mixed landscapes that are less densely populated than open plains; one does not easily starve living close to woodland. Within the economic and social structure of France, at least 50 to 60 percent of the population is protected from inanition.”<sup>38</sup> No early medieval evidence allows us to formulate an equivalent estimation, but this should not prevent us from questioning whether all the groups forming Carolingian societies were equally vulnerable to food shortages. There is plenty of evidence showing that elites were able to concentrate food stocks and engage in hoarding during food shortages.<sup>39</sup>

According to the *Annals of Fulda*, in 850 a very heavy famine (*gravissima fames*) struck the people of *Germania*, especially in the Rhineland.<sup>40</sup> The price of a measure of wheat on the Mainz market rose to ten deniers. The *Annals* report that the famous archbishop Rhabanus Maurus was staying at his estate in Winkel at the time.<sup>41</sup>

<sup>38</sup> Chaunu, 1966, p. 232.

<sup>39</sup> Newfield, 2013, p. 168. Also see below, pp. 199-200.

<sup>40</sup> *Annales Fuldenses*, 1891, pp. 40-41: *Eodem anno gravissima fames Germaniae populos oppressit, maxime circa Rhenum habitantes; nam unus modius de frumento Mogontiaci vendebatur decem siclis argenti. Morabatur autem eo tempore Hrabanus archiepiscopus in quadam villa parrochiae suae, cui vocabulum est Winkela, et pauperes de diversis locis venientes suscipiens, cotidie plus quam trecentos alimento sustentabat, exceptis his, qui in praesentia illius assidue vescebantur.*

<sup>41</sup> Rhabanus Maurus was abbot of Fulda from 823 to 842 and archbishop of Mainz from 847 to 856.

Three hundred poor people from various places gathered there and were fed by the churchman, who was already permanently supporting several poor individuals. Among those who sought to benefit from the archbishop's charity was a mother who died of hunger while passing the estate's threshold. The *Annals* also report that a married couple from Grabfeld (eastwards from Fulda) tried to flee to Thuringia. In a wood, the man suggested they kill and eat their son. His wife reacted with horror, whereupon the man seized their child and ran off. When he attempted to kill his unfortunate son with his knife, the Almighty intervened: He put two wolves that were busy devouring a hind on the man's path. Instead of killing his son, he chased away the beasts and the couple consumed the carrion.

The author of the *Annals* does not specify the causes of the reported food shortage. His main interest in the episode seems to lie in celebrating the generosity of Rhabanus – a former abbot of Fulda – and relating a gloomy story about aborted cannibalism. Vincent Vandenberg suggests that the story about the father who almost killed his son was a regional rumour (influenced by the biblical episode of Abraham and Isaac) that the author of the *Annals* decided to insert in his narration.<sup>42</sup> Two other documents mention a crisis in 850, but it is unclear if they were related: the tenth-century *Gesta Abbatum Sancti Bertini* simply mention a famine in 849/850, without specifying its causes, and the *Annales Xantenses* report a flood on the first of January 850.<sup>43</sup> To date, no paleoclimatic evidence allows us to identify a particularly significant event in 850.<sup>44</sup> This does not, of course, rule out that the story conveyed by the *Annales Fuldenses* may have had a factual core. If we postulate that the narrator reports an actual food shortage – perhaps adding a rumour and a few details of his own making – we are left with several data to characterize this crisis.

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<sup>42</sup> Vandenberg, 2014, pp. 254-256.

<sup>43</sup> Newfield, 2013, p. 137. *Gesta Abbatum Sancti Bertini*, 1881, p. 618, and *Annales Xantenses*, 1909, p. 17.

<sup>44</sup> Newfield, 2013, p. 137.

The food shortage was localized in *Germania*, but the Rhineland was particularly hard hit. While the shortage is described as “very severe” (*gravissima*), the *Annals* suggest that both the archbishop and sellers on the Mainz market had grain reserves. This echoes the poem by Ermold the Black in which the Vosges complain that the river Rhine carries off all the grain of the fertile Rhineland, selling it overseas and starving local farmers.<sup>45</sup> As Olivier Bruand has remarked, this grain was probably exported to Frisia, where the environment was not conducive to arable farming.<sup>46</sup> Perhaps, from this point of view, the Rhineland was exceptional: grain trade seems to have been regional (within a radius of about 100 km) in other regions of the Carolingian empire.<sup>47</sup> Nevertheless, these observations raise the question of whether, in the specific context of the Rhineland, the shortage of 850 occurred because there was not enough food to feed everyone or, rather, because the system of food distribution left some individuals with insufficient command over food.<sup>48</sup> The second scenario does not necessarily contradict Timothy Newfield’s claim that “natural world anomalies were clearly behind most Carolingian shortages.”<sup>49</sup> Yet, expanding on the nuanced approaches of the causality of Carolingian food shortages developed by Ebert and Devroey, among others, it does suggest that the vulnerability to food shortages of a society and its various components is defined by “the diverse relations between external (natural) and internal (social, political) processes.”<sup>50</sup> In other words, whatever the initial causes of a shortage, an unequal system of food circulation can generate situations in which particular social groups are affected and others are not.

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<sup>45</sup> *Si non, Rhene, fores, mansissent denique nostra horrea, quae nobis gignit amoenus ager, per te vecta quidem pretioque redempta marino: Esurit hic noster, heu, gemebundus arans!* Ermold the Black, *Carmen in laudem Pippini regis*, 1884, p. 83.

<sup>46</sup> Bruand, 2002, p. 247.

<sup>47</sup> Bruand, 2002, p. 247.

<sup>48</sup> This important distinction was introduced by the seminal work of Amartya Sen, 1981. For the Carolingian empire, see Devroey, 2016; 2014, p. 33.

<sup>49</sup> Newfield, 2013, p. 167.

<sup>50</sup> Ebert, 2018, p. 214; Devroey, 2019.

A further argument supporting the view that some individuals were not affected by the food shortage of 850 in the Rhineland is provided by a donation charter copied in the *Codex Laureshamensis* (the twelfth-century cartulary of Lorsch). In October 850, one Adalwinus gave some of his properties situated in Bensheim to the monastery of Lorsch.<sup>51</sup> Earlier, in July 848, he had given the monastery an area of wasteland or woodland that was privately appropriated and intended to be cleared (*Bifang*).<sup>52</sup> In 850 he donated ten jurnels of land which had been partly cleared from woodland.<sup>53</sup> Adalwinus's donations of recently cleared land and land to be cleared are not isolated cases: between 765 and 850, more than 30 charters record donations to Lorsch from various individuals in Bensheim.<sup>54</sup> Several of these charters concern portions of land to be cleared (*Bifänge*) and recently cleared land.<sup>55</sup> These documents and numerous similar charters from various localities in the Rhineland are traditionally interpreted as evidence of woodland clearances and agrarian expansion.<sup>56</sup> The fact that Adalwinus was able to make a donation in October 850 – that is, after harvesttime – suggests that clearances were not interrupted in Bensheim and that the food shortage may not have been a concern for relatively wealthy landowners.

While these examples make it clear that the upper strata of Carolingian societies were not always affected by food shortages that struck non-elite groups, it is much more difficult to assess the adaptability or vulnerability of lower social strata. A first, partly speculative distinction can be made between peasants as small producers who were partially and imperfectly engaged in market exchange<sup>57</sup> and some other non-elite groups. Carolingian documentary evi-

<sup>51</sup> Glöckner, 1934, p. 45 (= n. 262, Oct. 15<sup>th</sup>, 850).

<sup>52</sup> Glöckner, 1934, pp. 44-45 (= n. 261, Jul. 28<sup>th</sup>, 848).

<sup>53</sup> *Hoc est rem proprietatis me in Bashinsheim, inter terram factam, et adhuc in silua faciendam, ad X iurnales*, Glöckner, 1934, p. 45.

<sup>54</sup> Gockel, 1970, pp. 260-262.

<sup>55</sup> Gockel, 1970, pp. 260-262; Staab, 1975, p. 313, f. 5.

<sup>56</sup> Staab, 1975, pp. 313-331; Lohrmann, 1990, pp. 109-111. See Larrea Conde (forthcoming) for a more nuanced interpretation.

<sup>57</sup> Sellis, 1993, p. 13.

dence and estate records suggest that the average peasant household consisted of a nuclear family with its offspring and, occasionally, additional relatives, servants, or slaves.<sup>58</sup> In this type of economic unit, household members were producers and consumers. The main economic goal of a peasant household was reproduction (in short, having access to food, clothing, and further necessities to ensure the subsistence of all household members and enough seed to plant for the next harvest).<sup>59</sup> Subordination to the Carolingian state and/or aristocratic estates implied that a surplus was produced in order to be transferred to the aristocracy. Any production surplus beyond that could be marketed, and evidence does exist to support the idea that some Carolingian peasants did exactly that.<sup>60</sup>

According to Chaunu's observations, members of peasant households, because of their specific subsistence economy, were not necessarily at risk during a food shortage. Various strategies potentially enabled them to get by, e.g. reducing the amount of marketed surplus, turning to alternative, locally available types of food, buying grain, asking their neighbours or lord for support, negotiating the postponement or reduction of the rent payment. The 893 Polptych of Prüm, for example, records two instances of rent reduction "because of poverty"<sup>61</sup>. Unfortunately, we do not know what caused this "poverty".

Other social groups – peasants and not – may not have been equally able to cope with the same difficulties. In 794, in the wake of several famines, Charlemagne issued the Capitulary of Frankfurt, which, among other things, imposed new measurement and monetary units, made the payment of tithes mandatory, and established maximum prices for grain and bread.<sup>62</sup> As Adriaan Verhulst notes, the last measure implies that "baked bread could be purchased eas-

<sup>58</sup> Faith, 2010, pp. 191-195; Devroey, 2006, pp. 377-424.

<sup>59</sup> Ellis, 1993, p. 6.

<sup>60</sup> Despy, 1968, pp. 162-163.

<sup>61</sup> Schwab, 1983, ff. 20v-21 and 38.

<sup>62</sup> Boretius, 1883, pp. 73-87; about the context, see Devroey, 2019.

ily by people who did not bake it themselves and were probably mostly living in towns.”<sup>63</sup> These populations (perhaps craftsmen, day workers, beggars, widows) were probably more vulnerable than ordinary peasants to a general reduction of the available supply of grain and to rising grain prices on markets.

The major limitation of this line of thought is that the evidence we have is not specific enough to establish the vulnerability of various types of owner-cultivators and tenant-cultivators. The mention of unoccupied holdings (*mansi absi, sortes absentes*) in estate records has often been interpreted as evidence of their “abandonment” by holders who fled or died because of catastrophic events (e.g. famines, epidemics, Viking or Saracen raids).<sup>64</sup> However, Jean-Pierre Devroey has shown that the term *absus* can merely designate uninhabited holdings or recently created holdings waiting to be assigned to a tenant.<sup>65</sup> Rosamond Faith has pointed out that expressions such as *apsta* “rather than indicating outright abandonment of the land, can simply record difficulty in collecting the tax or rent due from it.”<sup>66</sup> Consequently, many causes other than environmental crises and famines – including agrarian expansion – can explain why holdings were described as “vacant”. Inasmuch as those who drew up estate records virtually never specified why holdings were vacant, occurrences of the term cannot be used to identify rural migration or mortality caused by environmental crises. Annalistic and hagiographic evidence occasionally provides clearer indications, but such documents have their own limitations.

According to the *Annals of St Vaast*, in 892, the lands of the monastery were struck by a famine of so great a magnitude that the monastery’s tenants (*accolae*) left their holdings.<sup>67</sup> Before drawing conclusions from this anecdote, it is worth considering its broader

<sup>63</sup> Verhulst, 2002, p. 124.

<sup>64</sup> See, for example, Renard, 2012, pp. 408-410.

<sup>65</sup> Verhulst, 2002, pp. 57-58; Devroey, 1976.

<sup>66</sup> Faith, 2010, pp. 185-186.

<sup>67</sup> *Annales Vedastini*, 1909, p. 71: *Indeque fames valida et sterilitas terrae nobis invasit, ita ut accolae terrae prae magnitudine famis sua relinquerent loca.*

narrative context. As Paolo Squatriti has remarked, “Carolingian authors’ terrifying accounts of famines fit inside moralizing discourses, and should be treated gingerly as evidence of cereal dearth: chroniclers were just as likely to mention famine as proof of divine displeasure with aristocratic politics as they were to describe actual penury.”<sup>68</sup> The author of the *Annals of St Vaast* mentions the land’s “sterility” as one of numerous events that occurred in 892. The year began with the death of Abbot Rodulfus, in January. Count Baldwin of Flanders (879-918) seized the opportunity to take control of the monastery with support of the monks but against the king’s will. A series of calamities then struck Arras and the monastery. On the Monday before Easter, the castle of Arras took fire and the churches of St Vaast, St Peter, and Our Lady burned down. Chaos ensued and all the relics were stolen. This is when famine struck the monastery’s tenants, causing them to abandon their holdings. On its own, the particular narrative context is sufficient to cast doubt on this being a factual account. Furthermore, no other source mentions a food shortage in 892. The Bavarian continuation of the *Annales Fuldenses* reports a hard winter in 892/893 and Tim Newfield has argued that “it is possible [...] that these two crises were in fact one.”<sup>69</sup> Yet, this connection is chronologically unlikely: the *Annales Vedastini* report a food shortage in the spring of 892, while the *Annales Fuldenses* describe the weather conditions of the following winter and spring. All this makes it seem quite rash to draw conclusions about socio-economic history from this account.

Normative evidence confirms that dependents could migrate in times of food shortage, but interpreting such evidence entails many difficulties as well. In the Capitulary of Nijmegen (806), for example, Charlemagne ordered lords to feed the beggars (*mendici*) among their own dependents (*familia*) and those who belonged to estates they held (*beneficium*).<sup>70</sup> This measure was explicitly presented as a

<sup>68</sup> Ebert, 2018, p. 213; Devroey, 2014, p. 25; Vandenberg, 2014, pp. 234-235, f. 33; Squatriti, 2003; and, in general, the discussions and arguments in Devroey, 2019.

<sup>69</sup> *Annales Fuldenses*, 1891, p. 123; Newfield, 2013, p. 144.

<sup>70</sup> *De mendicis qui per patrias discurrunt volumus, ut unusquisque fidelium nostrorum suum*

solution to prevent beggars from migrating (population movement in times of famine could spread diseases).<sup>71</sup> Yet, it is unclear whether these *pauperes* were average tenants who could not make ends meet or else particularly vulnerable individuals (disabled people, widows). Interestingly, the Capitulary specified that lords only had to feed those who agreed to perform manual labour in exchange.<sup>72</sup> Persons unable to work consequently ended up in highly marginal situations and were in all likelihood particularly vulnerable to food shortages.

To summarize, social complexity is a frustrating but important concept for analysis of the macro-economic consequences of Carolingian food shortages. Seen through this prism, the available evidence suggests that, because of social imbalances and the uneven distribution of food, the adaptability / vulnerability of various social groups to environmental crises or food shortages varied. However, given the nature of the available evidence, precise estimations of the “social depth” of Carolingian food shortages are beyond reach. Quite obviously, aristocrats tended to have privileged access to resources and foodstuffs, including during shortages and famines. It is also clear that marginal individuals (e.g. disabled people, beggars, or widows without support) were among the first victims of food shortages, but in most cases, it is impossible to tell to what extent peasants (owner-cultivators and tenant-cultivators of different statuses) were affected. The matter becomes especially problematic if we are to establish the economic and demographic consequences of food shortages. Peasants arguably formed the very core of Carolingian agrarian economies. Without knowing if and how food shortages affected them, it appears impossible to accurately evaluate the macro-economic consequences of such crises.

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*pauperem de beneficio aut de propria familia nutriat, et non permittat aliubi ire mendicando*, Boretius, 1883, p. 132; Devroey, 2014, pp. 30-33; Scherner, 1994, p. 341.

<sup>71</sup> Scherner, 1994, p. 341.

<sup>72</sup> *Ubi tales inventi fuerint, nisi manibus laborent, nullus eis quicquam tribuere praesumat*, Boretius, 1883, p. 132.



## Conclusions

Scholarly interest in the impact of environmental crises on Carolingian societies, demography, and economies is growing. Some of the models and observations formulated recently about the socio-economic impact of food shortages and climatic fluctuations are contradictory. This paper argues that, in order to settle these debates, it could be helpful to focus on the spatial scale of farming and environmental crises and on the vulnerability or adaptability of various social groups within Carolingian societies. Micro-historical approaches allow us to focus on local or regional contexts, revealing the sheer diversity and complexity of Carolingian social-ecological systems and recognizing the important limitations of the available evidence. Macro-historical models and narratives based on comparing and combining various micro-historical case-studies will necessarily be complex, as are the relationships between agrarian societies and their environment.

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