

The Crisis of the 14th Century

Teleconnections between Environmental
and Societal Change?

Edited by
Martin Bauch and Gerrit Jasper Schenk

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Paolo Nanni

Facing the Crisis in Medieval Florence: Climate Variability, *Carestie*, and Forms of Adaptation in the First Half of the Fourteenth Century

Abstract: In recent years, medieval climate history has become the subject of interdisciplinary research by scholars and scientists throughout Europe. This research is an opportunity for historians of the Middle Ages to contribute insights gleaned from their work with the written historical record and offer the unique perspective of their own discipline. Moreover, the contribution of Italian historiography can both highlight regional differences compared to the rest of Europe and explain some epistemological aspects of the relationships between environment and history, such as different forms of adaptation in the face of rationing crisis.


The case study of Florence in the first half of the fourteenth century focuses on these historical aspects and presents the opportunity for an interesting and relevant case of political-economic argumentation. Although documented natural events between the thirteenth and fourteenth centuries (excessive rain, cold, flood) confirm the strong climate variability of this era, the famines before the Black Death struck were rationing crises triggered mainly by trade mechanisms. Faced with famine and shortages, the city of Florence managed to curb hunger by adopting rationing policies, creating special magistracies, and using communal purchases to control prices. This study outlines the accounts of these events in the chronicles of Domenico Lenzi and Giovanni Villani before discussing the causes and describing the material remedies that were introduced. These remedies were indicative of a growing civic consciousness, new forms of solidarity, and strengthened political communication.

Keywords: Medieval History, Medieval Economic History, Historical Climatology, Medieval Crisis, Famine, Medieval Climatic Anomaly, Historical Argumentation

1 Introduction

The “crisis of the fourteenth century” is not only a historiographic concept, but a discernible event documented by various material and immaterial social factors. In the context of medieval Italy, the word “crisis” is generally linked to the Black

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Death, but there are visible signs of crisis before the fateful year of 1348.¹ The Italian peninsula was characterized in the first half of the fourteenth century by population decline, serious famine, and rationing crises. Although there are no general sources that follow Italy's demographic trend in the decades of the first half of the fourteenth century, there is evidence that the continuous population increase of the three preceding centuries not only stopped, but underwent a reversal, especially between the 1330s and 1340s.² And even if the famine and food shortage did not trigger a general surge of deaths by starvation in Italy, they nevertheless lowered living standards.³

Italian historiography has long addressed the connections between crises, environmental and biological contexts, and climate change,⁴ especially in the context of the history of agriculture.⁵ The main topics have been around relations between

1 Italia 1350–1450: tra crisi, trasformazione, sviluppo, Atti del Centro Italiano di Studi di Storia e d'Arte, Pistoia 1993.

2 Giuliano PINTO, Dalla tarda antichità alla metà del XVI secolo, in: Lorenzo DEL PANTA/ Massimo LIVI BACCI/ Giuliano PINTO/ Eugenio SONNINO, La popolazione italiana dal Medioevo ad oggi, Roma Bari 1996; Maria GINATEMPO/ Lucia SANDRI, L'Italia delle città. Il popolamento urbano tra Medioevo e Rinascimento (secoli XIII–XVI), Firenze 1990.

3 Giuliano PINTO, Congiuntura economica, conflitti sociali, rivolte, in: Monique BOURIN/ Giovanni CHERUBINI/ Giuliano PINTO (eds.), Rivolte urbane e rivolte contadine nell'Europa del Trecento. Un confronto, Firenze 2008, pp. 337–349, here p. 343. See also ID., Città e spazi economici nell'Italia comunale, Bologna 1996; Franco FRANCESCHI, Il sogno di una vita più bella. Aspirazioni e obiettivi dei rivoltosi, in: ID., « ... e saremo tutti ricchi». Lavoro, mobilità sociale e conflitti nelle città dell'Italia medievale, Pisa 2012, pp.157–171; Franco FRANCESCHI/ Ilaria TADDEI, Le città italiane nel Medioevo XII–XIV secolo, Bologna 2012.

4 Emanuela GUIDOBONI/ Antonio NAVARRA/ Enzo BOSCHI, Nella spirale del clima. Culture e società mediterranee di fronte ai mutamenti climatici, Bologna 2010; Mario PINNA, La storia del clima. Variazioni climatiche e rapporto clima–uomo in età postglaciale (Memorie della Società Geografica Italiana 36), Roma 1984; ID., Il clima nell'alto Medioevo. Conoscenze attuali e prospettive di ricerca, in: L'ambiente vegetale nell'alto Medioevo, Atti del Centro Italiano di Studi sull'Alto Medioevo, Spoleto 1990, vol. 1, pp. 431–451; Paola SERENO, Crisi climatiche e crisi di sussistenza: qualche considerazione sulle interazioni tra ambiente geografico e agricoltura nelle economie d'antico regime, in: Luciano SEGRE (ed.), Agricoltura, ambiente e sviluppo economico nella storia europea, Milano 1993, pp. 137–155.

5 When the *Rivista di storia dell'agricoltura*, edited by Giovanni Cherubini, decided to fill a historiographic gap by providing a *Storia dell'agricoltura italiana* (2002), from the early cave dwellers up until today, a geographer was given the task of clarifying these specific aspects, with fixed traits and significant variables: Leonardo ROMBAI, Clima, suolo, ambiente, in: Gaetano FORNI, Arnaldo MARCONE (eds.), *Storia dell'agricoltura italiana*, I, L'età antica, 1, Preistoria, Firenze 2002, pp. XVII–LXIV. And the Italian Centre for Studies of History and Art, in Pistoia, when it organized a conference in 2013 on *I Paesaggi agrari d'Europa (secoli XIII–XV)*, dedicated its first paper to this essential issue: Leonardo ROMBAI, Dall'Atlantico agli Urali: quadro geografico, in: *I paesaggi agrari d'Europa (secoli XIII–XV)*, Atti del Centro Italiano di Studi di Storia e Arte, Pistoia 2015, pp. 33–66.

biomass supplies⁶ (especially food supplies in both rural and urban populations⁷), and economic development.⁸ Nevertheless, the causes of the fourteenth-century crisis and its outcomes were never inferred exclusively from environmental factors, even if they were taken into consideration.⁹ Poor harvests were not enough – at least not in Italy – to set in motion the “infernal cycle” (subsistence crisis) of famine and epidemics described by LE GOFF.¹⁰ The impact of calamities (or climatic changes) was different in Italy than in the rest of continental Europe; Italy responded to natural adversities with varied forms of adaptation (especially in central and northern Italy), such as production diversification, market networks, and rationing policies. Considering all the factors typical of northern and central Italian cities and their consolidated market structures,¹¹ scholars tend to characterize the repeated famines (or shortages) as the “malfunctioning of a system in which the relationship between population and resources had become unbalanced.”¹²

Indeed, this link between markets and crises of supply is even reflected in the language, as a careful semantic examination reveals: the words *caristia* or *carestia* in medieval Latin – or *caro*, *carestia* or *carizia* in the vernacular Italian – conveyed

6 Paolo MALANIMA, *Energia e crescita nell'Europa preindustriale*, Roma 1996; Id., *The Path Towards the Modern Economy. The Role of Energy*, in: Bruno CHIARINI/ Paolo MALANIMA (eds.), *From Malthus' Stagnation to Sustained Growth. Social, Demographic and Economic Factors*, in: *Rivista di Politica Economica* 4/6 (2010–2011), pp. 71–99.

7 See Giovanni CHERUBINI, *Agricoltura e società rurale nel Medioevo*, Firenze 1972; Id., *La crisi del Trecento. Bilancio e prospettive di ricerca*, in: *Studi storici* 15 (1974), pp. 660–670; Franco FRANCESCHI, *Giovanni Cherubini e la crisi tardo-medievale*, in: Duccio BALESTRACCI/ Andrea BARLUCCHI/ Franco FRANCESCHI/ Paolo NANNI/ Gabriella PICCINNI/ Andrea ZORZI (eds.), *Uomini, paesaggi, storie. Studi di storia medievale per Giovanni Cherubini*, Siena 2012, vol. 2, pp. 1131–1149. On diet: Massimo MONTANARI, *Alimentazione e cultura nel Medioevo*, Roma, Bari 1988; Anna Maria NADA PATRONE, *Alimentazione e malattie nel Medioevo*, in: Nicola TRANFAGLIA/ MASSIMO FIRPO (eds.), *La storia, I, Il Medioevo*, 1, I quadri generali, Torino 1988, pp. 29–49.

8 Stephan R. EPSTEIN, *I caratteri originali. L'economia*, in: Francesco SALVESTRINI (ed.), *L'Italia alla fine del Medioevo, I, I caratteri originali nel quadro europeo*, Firenze 2006, pp. 381–431; Paolo MALANIMA, *L'economia italiana. Dalla crescita medievale alla crescita contemporanea*, Bologna 2012.

9 FRANCESCHI/ TADDEI (note 3); Gabriella PICCINNI, *La proprietà della terra, i percettori dei prodotti e della rendita*, in: Giuliano PINTO, Carlo PONI/ Ugo TUCCI (eds.), *Storia dell'agricoltura italiana, II, Medioevo ed età moderna*, Firenze 2002, pp. 145–168; Giuliano PINTO, *Le trasformazioni ambientali nella penisola italiana nel basso Medioevo*, in: SEGRE (note 4), pp. 125–135.

10 Jacques LE GOFF, *La civilisation de l'Occident médiéval*, Paris 1964.

11 Luciano PALERMO, *Scarsità di risorse e storia economica: il dibattito sulla carestia*, in: *Popolazione e storia* 1 (2012), pp. 51–77.

12 In particular, the causes listed are “the relatively small number of producers in relation to the consumers (a direct consequence of the high rate of urbanization), poor land yield, and a potential drop [in yields] because of the overexploitation of soil, growing problems in organization of widespread trade, and a transformation of the land ownership structure and forms of conduct”: FRANCESCHI/ TADDEI (note 3), p. 26.

a number of meanings in thirteenth- and fourteenth-century sources including “shortage” or “lack” of products but also “rising prices.”¹³ Famines or shortages were thus not linked (exclusively) to agricultural production levels, even in the views of contemporary Italians, but they represented a “crossover point where the agricultural crisis met the mechanisms of exchange” and therefore a “form of economic crisis.”¹⁴

2 Interdisciplinary Approaches and the “babel” of Languages

However, even if social and cultural factors were of central importance in the fourteenth-century crisis, the transmission and accumulation of historical knowledge always takes place with reference to an audience (e.g., the academic community or society at large), whose scientific approaches, cultural sensibilities, and common opinion change over time.¹⁵ In this sense, the twenty-first-century interest in environmental issues and their societal impacts represents an opportunity which historians should not ignore. Naturally, they remain bound to employ interpretive models that are acceptable within the tradition of their discipline, but they will serve this discipline best by compiling historical data and evidence to answer the questions of their own age.

Moreover, a historical account of the crisis, especially as related to environmental factors, should avail itself of research in variety of related disciplines, even when such an interdisciplinary approach can prove problematic.¹⁶ Research specialization (e.g., geography, archaeology, natural science, historical climatology, and environmental history, economic history, and history *tout court*) requires a fundamental but sometimes difficult communication between scholars who are accustomed to the different methodologies and jargon of their respective fields.

An international group of scholars has analyzed this issue, making a remarkable contribution toward a truly interdisciplinary collaboration. As they observed, the

¹³ We find the same polysemy in the word *caritas* (*carus*) in classical Latin, as well.

¹⁴ Luciano PALERMO, Di fronte alla crisi: l'economia e il linguaggio della carestia nelle fonti medievali, in: Pere BENITO I MONCLÚS (ed.), *Crisis alimentarias en la Edad Media. Modelos, explicaciones y representaciones*, Lleida 2012, pp. 47–67.

¹⁵ Boris A. USPENSKIJ, *Storia e semiotica*, Milano 1988. See: Paolo NANNI, Per un Quadro ambientale e biologico: il periodo caldo Medievale e la variabilità climatica, in: *La crescita economica dell'occidente medievale. Un tema storico non ancora esaurito*, Atti del Centro Italiano di Studi di Storia e d'Arte, Pistoia 2017, pp. 69–91.

¹⁶ Robert I. ROTBERG/ Theodore K. RABB (eds.), *Climate and History*, Princeton 1981; Tom M.L. WIGLEY/ Martin J. INGRAM/ Graham FARMER (eds.), *Climate and History. Studies in Past Climates and Their Impact on Man*, Cambridge 1981.

problem is not only how to improve the sharing of data or the need for “translation between different scholarly languages,” but “what is further needed, we believe, are research strategies that would be interdisciplinary from the very beginning, where all parties have an equal presence in the staging of the project and determining the research questions.”¹⁷ This kind of critical dialogue is fundamental: without a common epistemological foundation that does not mutually exclude humanist and scientific knowledge, today’s modern methodological specialization can create nearly insurmountable obstacles to dialogue, even when scholars are ostensibly dealing with the same topics or data.

Scholars, in my opinion, frequently take for granted the preliminary explanation of *what* is being specifically investigated (the object) in the course of subsequently arriving at their own specific methods and contributions. Climatologists and historians use different survey methods, but they differ above all in their focus: historical climatology aims to understand the complexity of climate, not history. Similarly, economic historians are primarily interested in verifying model chains of climatic effects on society and economy¹⁸ or testing economic theories – i.e., criticism of the Malthusian Model,¹⁹ or of more recent works on famines and their causes, based on Amartya Sen’s studies.²⁰

17 Adam IZDEBSKI et al., Realizing consilience: How better communication between archaeologists, historians and natural scientists can transform the study of past climate change in the Mediterranean, in: *Quaternary Science Review* (2015), pp. 1–18. See also William J. MEYER/ Carole L. CRUMLEY, *Historical Ecology: Using What Works to Cross the Divide*, in: Tom MOORE/ Xosê–Lois ARMADA (eds.), *Atlantic Europe in the First Millennium BC: Crossing the Divide*, Oxford 2011, pp. 109–134.

18 KATES, for example, suggested this chain: primary climate impacts lead to drops in crop and productive livestock yields and increase mortality of people and breeding livestock; secondary climate impacts include increase in biomass prices (food and fodder); tertiary climate impacts encompass the demographic and political effects of price fluctuations (e.g., higher prices). See Christian PFISTER, *I cambiamenti climatici nella storia dell’Europa. Sviluppi e potenzialità della climatologia storica*, in: Luca BONARDI (ed.), *Che tempo faceva? Variazioni del clima e conseguenze sul popolamento umano. Fonti, metodologie e prospettive*, Milano 2004, pp. 19–59.

19 Bruce M.S. CAMPBELL, *Physical Shocks, Biological Hazards, and Human Impacts: the Crisis of the Fourteenth Century Revisited*, in: Simonetta CAVACIOCCHI (ed.), *Le interazioni fra economia e ambiente biologico nell’Europa preindustriale secc. XIII–XVIII*, Atti dell’Istituto di Storia Economica “F.Datini,” Firenze 2010, pp. 13–32. See also: Id., *Nature as Historical Protagonist: Environment and Society in Pre-Industrial England*, in: *Economic History Review* 63, 2 (2010), pp. 281–314. The author also refers to: Gregory CLARK, *The Long March of History: Farm Wages, Population, and Economic Growth, England 1209–1869*, in: *Economic History Review* 60, 1 (2007), pp. 97–135. More recently: Bruce M.S. CAMPBELL, *The Great Transition. Climate, Disease and Society in the Late-Medieval World*, Cambridge 2016.

20 On the “Entitlement Approach” of Amartya Sen (Nobel Prize in Economic Sciences in 1998), see Luciano PALERMO, *Il principio dell’Entitlement Approach di Sen e l’analisi delle carestie medievali*, in: Manuel VAQUERO PIÑERO/ Maria Luisa FERRARI (eds.), *Moia la carestia. Le conseguenze socio-economiche e demografiche della scarsità in età preindustriale*, Bologna 2015, pp. 21–36. Amartya Sen

So, faced with these historical issues, what is the historian's contribution? What do historical documents have to say in this regard?

3 Historical Realities and Research Questions

Historical knowledge always needs to remain anchored in the reconstruction of events or case studies, with which historians can test more general overviews and come to a better understanding of the historical forces at play. Therefore, to focus on the connections between environmental history and social history as these are reflected in the fourteenth-century climate variations and the ensuing crisis, I will turn my attention to the problem of food supply in Italian cities, especially in Florence and answer the following research questions:

- a) What are the particular characteristics of the study area – in this case, of Tuscany? In other words, an outline of the environmental and historical context is necessary.
- b) Which events are relevant and how were they reported? Documentary data, including the chronicles particularly abundant for Italy, not only relate where and when certain events happened, but also sometimes explain why they were thought to have happened and how the men and women of the time perceived the crisis.²¹ Indeed, it is quite clear that we cannot reconstruct history without taking into account those who lived it, even, and perhaps especially, when their perceptions differ from ours.²²
- c) Faced with the crisis, how did the population adapt? To be precise, it is not just the remedies adopted that matter, but also how these were carried out in the civil and social context of the time. As we shall see, over time the documents increasingly display a particular kind of political-economic argumentation (the building of civic consciousness), thereby contributing to the historical reconstruction of various forms of adaptation to rationing crises.

considers climatic events an *inter alia* factor in the famine phenomenon: Jean DRÈZE/ Amartya SEN, *Hunger and Public Action*, Oxford 1989.

21 Michael MATHEUS, *L'uomo di fronte alle calamità ambientali*, in: Michael MATHEUS/ Gabriella PICCINNI/ Giuliano PINTO/ Gian Maria VARANINI (eds.), *Le calamità ambientali nel tardo Medioevo europeo: realtà, percezioni, reazioni*, Atti del Centro Studi sulla Civiltà del tardo Medioevo, Firenze 2010, pp. 1–20.

22 Gherardo ORTALLI, "Corso di natura" o "giudizio di Dio." Sensibilità collettiva ed eventi naturali, a proposito del diluvio fiorentino del 1333, in: ID., *Lupi genti culture. Uomo e ambiente nel medioevo*, Torino 1997, pp. 155–188; Gerrit Jasper SCHENK, *Dis-astri. Modelli interpretativi delle calamità naturali dal Medioevo al Rinascimento*, in MATHEUS/ PICCINNI/ PINTO/ VARANINI (note 21), pp. 23–75.

4 Italian Anomalies: Environment, Climate, and Climatic Variability

Among the natural factors that influence agricultural production,²³ climatic variables are among the most important: temperatures²⁴ (in particular, minimums and maximums) and rainfall²⁵ (not just total quantity, but also seasonal distribution), as well as general moisture level, wind, and solar radiation.

The climate of the Italian peninsula is characterized by sharp differences due to all of the following: latitudinal range (between the subtropics and middle latitudes); interaction with the warm, shallow Mediterranean Sea, along a coastline that makes up eighty percent of the perimeter (7,500 km out of an overall 9,320 km); the orography of the Alps and Apennines (that separates the two Tyrrhenian and Adriatic sides); and the system of catchment areas (rivers, lakes). In relation to agriculture, the wide-ranging local and regional climates are affected primarily by temperature differences (significant increase toward the southern and central areas) and rainfall (maximum in the Alps and the northern and central Apennines), as well as wind (especially the Apennines and the eastern south and center) and relative moisture (concentrated in the north in summer).²⁶

These marked differences in environment, soil, and climate²⁷ have prevented a general discussion of the history of agricultural structures within Italy and its diverse agrarian economy, land ownership, and farm labor.²⁸ Environmental features are essential to understanding the formation of the typical agricultural structures²⁹ and

23 The process of plant growth depends on heat, photosynthesis, and other physiological processes also influenced by heat (soil fertility, water availability, soil thermal level); geographical factors or agrarian systems (latitude, altitude, declivity, water drainage, land management); or changes caused by intense cold, drought, wind, or plant diseases.

24 Of particular importance in the plant world are *cardinal temperatures* (each plant has a temperature at which growth starts, reaches the *optimum*, and stops) and *critical temperatures* (excessive heat or cold that can cause irreparable damage). Combined with drought and wind, high temperatures increase the potential damage, as do sharp drops in temperature (autumn) or rapid thaws (spring). A cold snap in spring is more dangerous than a cold winter.

25 Water availability is critical for crops in all seasons, but it is particularly harmful during periods of tillage, sowing, and harvesting.

26 For the geographical features of the Italian peninsula, see the *Atlante Geografico dell'Italia* (Istituto Geografico Militare), Firenze 2007; in particular as regards climate factors: Vinicio PELINO (p. 90); Simone ORLANDINI (p. 93) Marina BALDI (p. 92); Marco BINDI (pp. 94–97)

27 ROMBAI (note 5).

28 Alfio CORTONESI/ Massimo MONTANARI (eds.), *Medievistica italiana e storia agraria. Risultati e prospettive di una stagione storiografica*, Bologna 2001; Alfio CORTONESI/ Gabriella PICCINI, *Medioevo nelle campagne*, Roma 2006.

29 On the Italian agricultural structures (*cascine*, *mezzadria*, *masserie*, i.e., sharecropping farms, large scale farms), see: Paolo NANNI, *History of Italian Agriculture and Agricultural Landscapes in the late Middle Ages*, in: *Rivista di storia dell'agricoltura* 2 (2017), pp. 3–24.

of the different types of animal farming and grazing³⁰ (or transhumance³¹) – from the Middle Ages to the modern age – but fundamental historical factors and political territorial boundaries have also played a significant role in these development.³²

Despite this complex environmental and climatic context, some data (proxy data and documentary data) is available for fourteenth-century Italy, which confirms the climatic variability documented for the entire continent during this period (Medieval Climatic Anomaly).³³ These data are particularly important in a comparative European framework as they refer to the southern end of the continent (Italian peninsula). As temperature and rainfall are the most important climatic elements for agriculture, a brief summary will suffice.

The information we have about the advance of the main Alpine glaciers – Aletsch, Gorner, Bunte Moor³⁴ – is confirmed by data collected on Europe's southernmost glacier, the small (and today significantly reduced) Calderone glacier, in Abruzzo's Gran Sasso. Scholars have documented an expansion phase beginning in 1270, which accelerated in the fifteenth century and peaked in the mid-nineteenth century, when a small glacier also appeared near the Majella summit (Abruzzo).³⁵ GIRAUDI calculated that the average winter temperature in this period dropped by about four degrees Celsius with respect to the so-called medieval *optimum* or "Medieval Warm Period" (tenth–thirteenth centuries).

The Venetian lagoon's various freezes have been linked to this change in temperature as well, even if, given the phenomenon's complexity, it is more like a record

30 Luisa CHIAPPA MAURI, Popolazione, popolamento, sistemi colturali, spazi coltivati, aree boschive ed incolte, in: PINTO/ PONI/ TUCCI (note 9), pp. 23–57.

31 Antonello MATTONE, Pinuccia F. SIMBULA (eds.), La pastorizia mediterranea. Storia e diritto (secoli XI–XX), Roma 2011; Raffaele LICINIO, Uomini e terre nella Puglia medievale. Dagli Svevi agli Aragonesi, Bari 2009; Alfio CORTONESI, L'allevamento, in: PINTO/ PONI/ TUCCI (note 9), pp. 83–121; Giovanni CHERUBINI, Le transumanze del mondo mediterraneo, in: I paesaggi agrari d'Europa (note 5), pp. 247–267.

32 Gabriella PICCINNI, Siena, il grano di Maremma e quello dell'ospedale. I provvedimenti economici del 1382, in: *Bullettino senese di storia patria* 120 (2013), pp. 174–189; EAD. (note 9); Roberta MUCCIARELLI/ Gabriella PICCINNI/ Giuliano PINTO (eds.), La costruzione del dominio cittadino sulle campagne. Italia centro-settentrionale, secoli XII–XIV, Siena 2009.

33 Rudolf BRÁZDIL et al., Historical Climatology in Europe. The State of the Art, in: *Climatic Change* 70 (2005), pp. 363–430; Ulf BÜNTGEN et al., 2500 years of European climate variability and human susceptibility, in: *Science* 331 (2011), pp. 578–582; Valérie MASSON-DELMORTE et al., Information from Paleoclimate Archives, in: Thomas F. STOCKER et al. (eds.), *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge New York 2013, pp. 383–464.

34 Emmanuel LE ROY LADURIE, *Histoire humaine et comparée du climat, I, Canicules et glaciers XIII^e–XVIII^e siècles*, Paris 2004; ID., *Histoire du climat depuis l'an mil*, Paris 1967.

35 Carlo GIRAUDI, La variazioni climatiche in Italia Centrale negli ultimi 10.000 anni, in: *Variabilità naturale del clima nell'Olocene ed in tempi storici: un approccio geologico*, in: *Quaderni della Società Geologica Italiana* 1 (2007), pp. 18–24.

of extreme events. Using documentary data, CAMUFFO³⁶ reconstructed episodes of repeated freezes in the second decade of the twelfth century (1118, 1122), in the first half of the thirteenth (1234), and again from the fifteenth century (1432, 1443, 1475–76, 1487, 1491, 1514, etc.): these data confirm the recurrence of harsh winters documented also by the freezing of the Po River between the twelfth and fourteenth centuries (1116, 1133, 1216, 1234, 1311, 1355).

Some interesting data about rainfall can be gleaned from the non-perennial lake levels in the central Apennines (Abruzzo and Lazio) – e.g., Lake Mezzano, Lake Fucino (reclaimed in the Roman period and then in the late nineteenth century), and Lake Vico. Fed by significant rainfall and snow melt, the water level of these “ephemeral lakes” rose, especially starting from the fourteenth century, with very extensive lake sediments.³⁷ Further evidence of this periodization comes also from the geo-archaeological stratigraphy of the Mediterranean coasts, which show desertification (twelfth–fourteenth centuries) and increased alluvial sedimentation (fourteenth–eighteenth centuries).³⁸

Beyond this environmental and climatic context,³⁹ one further factor warrants mention in any account of conditions in medieval Italy: the impact of climate events (especially temperature and rainfall variations) on agriculture and food supply not only changes dramatically from one climatic region or microclimate to another,⁴⁰ but also depended upon the various social economic and cultural contexts.⁴¹

5 Italian Anomalies: Population, Food Supply and Famines

In the context of the present study, urbanization plays an important role, especially in northern and central Italy. At the height of medieval growth, before the crisis, Italy reached not only a high population density with 12.5 million people (about eighteen

36 Dario CAMUFFO, *Clima e uomo. Meteorologia e cultura: dai “fulmini” di Giove alle previsioni via satellite*, Milano 1990.

37 GIRAUDI (note 35).

38 Franco ORTOLANI/ Silvana PAGLIUCA, *Evidenze geologiche di variazioni climatico-ambientali storiche nell’Area Mediterranea*, in: *Variabilità naturale del clima* (note 35), pp. 13–17.

39 More detailed data may be found in: Jürg LUTERBACHER et al., *A review of 2000 Years of Paleoclimatic Evidence in the Mediterranean*, in: Piero LIONELLO (ed.), *The climate of the Mediterranean region*, Amsterdam 2012, pp. 87–185; ID. et al., *European summer temperatures since Roman times*, in: *Environmental Research Letters* 11 (2016), pp. 1–13.

40 Above all, latitude, exposure, soil characteristics, vegetation density, and distance from large bodies of water and ocean currents have an impact on defining agricultural climate zones.

41 Giuliano PINTO, *Le città italiane di fronte alle grandi carestie trecentesche: percezione della crisi e politiche annonarie*, in: ID., *Il lavoro, la povertà, l’assistenza*, Roma 2008, pp. 147–161.

percent of the European population excluding Russia within about six percent of the respective area) but also – and more significantly – high rates of urbanization, particularly in the Po Valley between Milan, Venice, and Bologna, and in the Arno Valley around Florence.⁴² In the early fourteenth century, it is estimated that twenty to twenty-five percent of the Italian population lived in urban centers, with peaks of thirty percent in Tuscany. The existence of large cities (150,000 inhabitants in Milan; over 100,000 in Venice and Florence) and urban centers in this period led not only to a progressive expansion of cultivated areas (often to the detriment of forests) to increase the food supply⁴³ but also to an extensive commercial network that encompassed the entire peninsula.⁴⁴

As for grain (especially wheat), one of the most important elements of the food supply, a brief geographic overview of production and consumption can be outlined as follows⁴⁵:

- areas that exported cereals: southern Italy and the islands, the Papal States, and some cities in the Marches and the Po Valley;
- self-sufficient cities able to export in more abundant years: Arezzo, Siena, Romagna, and the main centers in the Po Valley;
- cities that relied on imports in varying degrees: Florence, Lucca, Pisa, Perugia, Bologna, Bergamo, etc.;
- and seaside towns, with limited hinterlands, supplied mainly by the marketplace: Genoa and Venice.

While the cities in the Po Valley – apart from Venice itself (before the conquest of the mainland) and a few other cities like Bergamo, Parma, Modena, and Bologna – generally enjoyed a good balance between cereal production in the countryside and their urban needs, there were major imbalances in central Italy (Tuscany, Umbria, and the Marches), due to the limited existence of plains and low hilly areas. The most problematic cases were Florence, Lucca, Pisa, Perugia, Orvieto, and Ascoli.⁴⁶

Moreover, even if these cities gained control over expanding (small or large) territories or rural areas, their influence as trading centers for goods including foodstuffs went far beyond their boundaries. In the case of Florence, Domenico Lenzi reports

⁴² PINTO (note 2); GINATEMPO/ SANDRI (note 2); FRANCESCHI/ TADDEI (note 3).

⁴³ Giovanni CHERUBINI, *Risorse, paesaggio ed utilizzazione agricola del territorio della Toscana sud-occidentale nei secoli XIV–XV*, in: *Civiltà ed economia agricola in Toscana nei secc. XIII–XV: problemi della vita delle campagne nel Tardo Medioevo*, Atti del Centro Italiano di Studi di Storia e Arte, Pistoia 1981, pp. 91–115; ID., *L'approvvigionamento alimentare delle città toscane tra XII e XV secolo*, in: ID., *Firenze e la Toscana. Scritti vari*, Pisa 2013, pp. 39–55.

⁴⁴ Bruno DINI, *La circolazione dei prodotti (secc. VI–XVIII)*, in: PINTO/ PONI/ TUCCI (note 9), pp. 383–448.

⁴⁵ Giuliano PINTO, *L'annona: aspetti e problemi dell'approvvigionamento urbano fra XIII e XV secolo*, in: ID., *Città e spazi economici nell'Italia comunale*, Bologna 1996, pp. 77–96.

⁴⁶ PINTO (note 41).

that the production of the countryside was sufficient to meet its own needs for a year but could provide the city with grain for only five months.⁴⁷ As a result, medieval Florence, a city with about 100,000 inhabitants, relied on the market for seven months of the year, unlike other Tuscan cities that were generally self-sufficient (e.g., Siena or Arezzo). Calculated directly from the market or the gabelles, Lenzi's and Villani's data indicates that about 220–225,000 quintals of wheat were sold annually in the city of Florence.

Narrative sources such as chronicles are abundant for medieval Italy, and these include important news about famines, especially from the thirteenth and fourteenth centuries. Giuliana ALBINI⁴⁸ systematically examined these sources (documentary data) from the region of Emilia, assessing the reliability of the data and the particular historical context of the cities on which the different authors (e.g., Salimbene de Adam) and different works (e.g., the *Chronicon Parmense*) report. Periods of “general crisis” (climate, famine, epidemics) are recorded in the following years in 1083–1085; 1178–1182; 1227–1228; 1243; 1271–1272; 1275–1278; 1309–1311 (1312 in Lombardy and Italy⁴⁹); 1329–1330; and 1339–1340. The fact that the reports increase beginning in the mid-thirteenth century onwards, does not, as ALBINI explains, necessarily mean that there had previously been fewer climate events and crises: “The greater frequency of reports relating to bad harvest years and non-catastrophic natural events (such as a rainy season or an unusually dry summer) increased starting from the mid-thirteenth century because of a greater availability of sources and a new focus on these events.”⁵⁰ In addition, the particular literary genre of these chronicles, a true construction of a city's identity, pays special attention in this period to the relationship between natural events and social and economic life: the “dynamics of price increases”; the “cause-effect relationships between natural phenomena, famines, and epidemics”⁵¹; the food rationing measures of city governments.

⁴⁷ Giuliano PINTO, *Il Libro del Biadaio*. Carestie e annona a Firenze dalla metà del '200 al 1348, Firenze 1974, p. 346.

⁴⁸ Giuliana ALBINI, Un problema dimenticato: carestie ed epidemie nei secoli XI–XIII. Il caso emiliano, in: Rinaldo COMBA/ Irma NASO (eds.), *Demografia e società nell'Italia medievale*. Secoli IX–XIV, Cuneo 1994, pp. 47–67.

⁴⁹ “the shortage of all cereals, vegetables, wine, meat and all other victuals was serious throughout Italy, especially in Lombardy” / “grave fu per tuta Italia, masime in Lombardia, carestia d'ogni biave, ligumi, vini, carne e d'ogni altra vitualia”: *Chronicon Parmense ad anno MXXXVII usque ad annum MCCCXXXVIII, Rerum Italicarum Scriptores*, 2nd ed. IX, X, Città di Castello 1902–1904. All the medieval texts quoted in this article are translated into English by the author.

⁵⁰ ALBINI (note 48), p. 53.

⁵¹ *Ibid.*

6 Famines in Fourteenth-Century Florence

When, as LE ROY LADURIE wrote, the West found itself ankle-deep in water in the second decade of the fourteenth century at the time of the *Great Famine* (1315–1316), Italy too experienced famine, shortages, and increased mortality. However, the term *Dantean Anomaly*,⁵² used to indicate the decade coinciding with the poet's final years, does not correspond exactly to the times of distress in Dante's native land (or the rest of Italy), as we shall see.

The first relevant famines mentioned by the Florentine (and Sieneese) chronicles occurred in 1285–1286, when, according to the accounts of Marchionne di Coppo Stefani⁵³ and Giovanni Villani,⁵⁴ there was a drought at the time of sowing; in 1302–1303, excessive rain⁵⁵ (also described in the anonymous Sieneese chronicle⁵⁶) caused harvests to fail. Other information on later famines appears in various sources for some years in the second decade of the fourteenth century: 1310–1311 in Florence, and 1317 in Romagna, Casentino, and Mugello (Tuscany). Moreover, in the minds of men and women of that time, the *Great Famine* of 1316 in northern Europe must also

52 Neville BROWN, *History and Climate Change: a Eurocentric Prospective*, London, New York 2001.

53 “Due to the great drought of the past year [1285], the cereal harvest was so bad this year [1286] in Florence and throughout Italy [...] that, until this time in Florence, there had never been a comparable famine” / “Per lo molto secco ch'era stato dell'anno passato [1285] fue sì cattivo raccolto di biade quest'anno [1286] in Firenze ed in tutta Italia (...) che infino a quel dì in Firenze non era mai stata una tale carestia”: Marchionne di Coppo STEFANI, *Cronaca fiorentina*, edited by Niccolò RODOLICO, Firenze 1903, 2008, p. 62 (rub. 168).

54 “As in Italy, there was great shortage of victuals. In the year 1286, especially in the months of April and May, there was a big rise in [the prices of] victuals throughout Italy; in Florence, a ‘level’ bushel of wheat was worth 18 soldi, in the value of 35 soldi per one gold florin” / “Come in Italia ebbe grande carestia di vittuaglia. Nell'anno MCCLXXXVI, specialmente del mese d'aprile e di maggio, fu grande caro di vittuaglia in tutta Italia, e valse in Firenze lo stajo del grano alla misura rasa, soldi XVIII di soldi XXXV il fiorino dell'oro”: Giovanni VILLANI, *Nuova cronica*, edited by Giuseppe PORTA, Varese 2007, vol. I, p. 576 (Lib. VIII, c. 111). It is well known that the value of “soldo” changed during the thirteenth and fourteenth centuries: Richard A. GOLDTHWAITE, *The economy of Renaissance Florence*, Baltimore 2009. In the quoted excerpt Villani accounts for its value at the given date (1 florin = 35 soldi).

55 “This year [1303] there were very long and heavy rains, so that the grain went completely bad throughout Italy, due to war and the rain this year, a bushel of wheat reached the highest price in Florence that it had even been, or rather a bushel was worth three–fourths of a florin and more” / “In quest'anno [1303] furono grandissime et lunghe piogge per modo che le biade andarò a male per tutto, per modo che per tutta Italia per la guerra e per la pioggia questo anno valse a Firenze lo stajo del grano maggior pregio che mai vi fosse valuto, ciò valse tre quarti di fiorino lo stajo et più”: STEFANI (note 53), p. 89 (rub. 237).

56 1303: “It was the highest rise that had ever taken place in three hundred years or more, and the famine was so great that many people died of hunger” / “fue 'l maggiore charo che fusse mai già trecen-to anni o più, ed era sì grande la carestia che molta gente si morì di fame”: *Cronaca senese dei fatti riguardanti la città e il suo territorio di autore anonimo del secolo XIV*, *Rerum Italicarum Scriptores*, 2nd ed., XV, VI, Bologna 1932, c. 83.

have had great resonance, as recounted in great detail in Villani's chronicle, which also described how grain traders travelled from Sicily and Puglia, lured by the possibility of profiting from the shortage of victuals. However, beginning in the 1320s, a series of more serious problems swept over Italy.

The winter of 1322–1323 was remembered as the coldest in living memory, while the long drought that struck Puglia had consequences on the city markets that were supplied with wheat from those lands. Hunger and famine hit Pisa, Lucca, and Pistoia in particular, and, “due to the famine, the poor fled from the countryside into Florence,” where the commune welcomed them, warding off starvation thanks to the many donations (reported by Villani⁵⁷ and Stefani⁵⁸). During the following August and September (1323), Florence and the rest of Italy⁵⁹ were struck by a general “infirmity of cold,” while other famines are documented in Parma, Modena, and Bologna.

The decade ended with a second famine, the severity of which has been compared to the Great Famine.⁶⁰ Although specific weather events are not mentioned, the 1328 harvests were so small that the price of wheat rose, increasing still further in the following two years (1329–1330) to the price of one gold florin per bushel.⁶¹ The

57 “Of a great cold and famine that were in Italy. In the said year, 1322, in the months of November, December, and January, Italy experienced its most severe winter and more snow than there had ever been for a long time; and in Puglia, the drought was so great that it did not rain for more than eight months, so in the country there was very great hunger and a dearth of all goods; and so, in almost all of Italy, especially in Pisa, Lucca, and Pistoia, great famine and scarcity followed, so that all the poor fled from the countryside to Florence because of the famine; and in Florence itself, prices rose up to two and a half bushels of wheat per gold florin” / “D’uno grande freddo che fue in Italia e carestia. Nel detto anno MCCCXXII, del mese di novembre e dicembre e gennaio, fue in Italia la maggiore vernata, e di più nevi che fosse grande tempo passato; e in Puglia fu sì grande secco, che più di mesi VIII stette che non vi piovette, per la qual cosa grandissimo struggimento e carestia di tutti i beni fue nel paese; e così seguì quasi in tutta Italia, specialmente in Pisa e in Lucca e Pistoia, grandissima fame e carestia, onde tutti i poveri di loro contado fuggirono per la fame a Firenze, e in Firenze medesimo fu caro; le II e mezzo staiora di grano uno fiorino d’oro”: VILLANI (note 54), vol. II, pp. 376–377 (Lib. X, c. 186).

58 “How there was a great famine throughout almost of Italy and in Florence. There was a scarcity of all victuals throughout Italy in that year [1322] [...] And all the poor driven from Tuscany were welcomed by the city, and no one died of hunger, such was the great charity of the Florentines” / “Come fu grande carestia quasi in tutta Italia ed in Firenze. Fu nell’anno predetto [1322] carestia d’ogni vetovaglia in tutta Italia (...) E tutti i poveri scacciati di Toscana il Comune di Firenze li raccettava, e niuno di fame non morì, tante furono le limosine de’ Fiorentini”: STEFANI (note 53), p. 130 (rub. 352).

59 “How many suffered from the cold in Florence. In August and September of said year [1323], there was an almost general infirmity of cold, and many developed a fever and lost their appetite, and many died, old men and women; and that disease was almost throughout Italy, and ceased upon reaching mid–October” / “Come fu grande quantità in Firenze di infreddati. Nel detto anno [1323] e del mese d’agosto e di settembre fu una infermità quasi generale di freddo, ed alquanti pigliava loro la febbre, e perdeano l’appetito, ed alquanti ne morieno, cioè vecchi e vecchie, e fu la detta malattia quasi in tutta Italia, e come venne mezzo ottobre restò”: STEFANI (note 53), p. 133 (rub. 364).

60 PINTO (note 2)

61 The Florentine *staiò* (bushel) was 24,36 liters (= 18,3 kg of wheat).

famine was so “harsh” that poor beggars were driven out of Perugia, Siena, Lucca, Pistoia, and other towns in Tuscany. Florence, “with sage advice and good action,” welcomed this new flow of people.

The 1330s were marked, first of all, by great downpours in Florence, “almost a revolution of the world in our city” as reported by Villani.⁶² His chronicle’s twelfth book provides a comprehensive account of the 1333⁶³ flood, when it seemed that the “floodgates of heaven”⁶⁴ had opened, and the Arno inundated the entire city. The following year, the same thing happened again. The third decade ended with the “great mortality” that struck Florence in 1340 from late March until the onset of winter. According to Villani, fifteen thousand people, or one-sixth of its inhabitants, were struck, with deaths in every family. Among those who fell ill, “almost no one escaped” and, after the epidemic, “starvation and rise in prices” followed on top of that from the previous year.⁶⁵ The commune intervened with rationing measures once again.

Nevertheless, although the city of Florence was able to cope with repeated and successive famines for about sixty years before the plague, it could do little in the face of the famine that struck in 1346 and 1347. The continuous rain during the autumn sowing (October–November 1345) ruined the crops, and rain and storms the following spring (April–June 1346) damaged the spring sowing, as well. Villani wrote that no one could remember such bad harvests of wheat, other grains, wine, oil, and other foods for more than a hundred years. However, Villani continued, unlike the episodes in 1329 and 1340 when, despite the large price increases, wheat and other grains could be found, the shortages in 1346 were dramatic, with the surrounding countryside producing only a quarter or a sixth of the norm. Moreover, “as always seems to happen” after periods of famine and starvation, “disease and death began in Florence and the countryside, especially among women, children, and poor people.” Overall, “it was estimated that more than 4,000 people died in this period.”⁶⁶ The spring of 1347 was no better: rain and hail ruined the “fruits and grains in many parts of the countryside.”⁶⁷

62 VILLANI (note 54), vol. II, p. 798 (Lib. XI, c. 227).

63 The account and the argumentation of the causes of the flood of 1333 in Florence, written by Giovanni Villani, have been studied by many scholars. See: ORTALLI (note 22); Laurence MOULINIER/Odile REDON, “Pareano aperte le cataratte del cielo”: le ipotesi di Giovanni Villani sull’inondazione del 1333 a Firenze, in: Sofia BOESCH GAJANO/ Marilena MODICA (eds.), *Miracoli. Dai segni alla storia*, Roma 1999, pp. 137–154; Gerrit Jasper SCHENK, “... prima ci fu la cagione de la mala provedenza de’ fiorentini ...” Disaster and ‘Life World’: Reactions in the Commune of Florence to the Flood of November 1333, in: *The Medieval History Journal* 10 (2007), pp. 355–386; Id., *L’alluvione del 1333. Discorsi sopra un disastro naturale nella Firenze medievale*, in: *Medioevo e Rinascimento* NS, 18 (2007), pp. 27–54; Francesco SALVESTRINI, *Libera città su fiume regale. Firenze e l’Arno dall’Antichità al Quattrocento*, Firenze 2005.

64 VILLANI (note 54), vol. III, p. 3 (Lib. XII, c. 1).

65 *Ibid.*, vol. III, pp. 225–228 (Lib. XII, c. 114).

66 *Ibid.*, vol. III, p. 485 (Lib. XIII, c. 84).

67 *Ibid.*, vol. III, p. 498 (Lib. XIII, c. 91).

Between November and December of that same year, prices began to rise again, and people were frightened, fearing the return of “past famine.”⁶⁸ The bad years were aggravated furthermore by the vicissitudes of the market: the simultaneous famine in Venice, that had been caused by the disruption of shipping routes, forced Venetians to turn to Romagna for wheat, thus compromising Florence’s provisioning.⁶⁹

7 Reporting the Famine: Events and Provisions of the City

Faced by famine and shortages in the first half of the fourteenth century, the city of Florence managed to curb hunger by adopting rationing policies, special magistracies, and purchases by the commune to control prices.⁷⁰ The chronicles report on various aspects of these events; they include a discussion of the causes, and their description of the material remedies shows how civic consciousness and forms of solidarity and political communication developed during this period. Noteworthy examples of the above as pertaining to the 1328–1330 famine are the writings of Domenico Lenzi and Giovanni Villani.

Domenico Lenzi set his hand to his *Specchio Umano* (lit., “Human Mirror,” but known as the *Libro del Biadaio*) under the effect of the 1328–1330 famine. His detailed description of the people in Florence’s Orsanmichele market also conveys everyday scenes, in which farmers and townspeople looking for supplies curse the grain merchants: “These merchants are the ones who are causing the price to increase and you would like to kill all of them and steal from them;”⁷¹ “These thieves want us to starve to death.”⁷² The government and the rich who stockpile wheat in their homes are also subjected to the wrath of the people: “Behold this ill-guided city that does not let us have wheat! You would like to go into the homes of these robbers that have wheat, set them on fire and burn them inside, since they are keeping us hun-

⁶⁸ Ibid., vol. III, p. 558 (Lib. XIII, c. 118).

⁶⁹ “Venice had a great shortage of grain; and because of the great mortality and epidemics of the coastal lands [...] and the struggles of the king of Hungary in Puglia, the Venetians could not have shiploads of wheat from Sicily and Puglia” / “Vinegia avea gran caro di grano; e per la generale mortalità e infermità delle terre marine (...) e per la venuta del re d’Ungheria in Puglia, i Viniziani non potieno avere tratta di grano né di Cicilia né di Puglia”: Ibid., p. 558 (Lib. XIII, c. 118). See: Giuliano PINTO, *Firenze e la carestia del 1346–1347*, in: Id., *La Toscana nel tardo Medioevo. Ambiente, economia rurale, società*, Firenze 1982, pp. 333–398.

⁷⁰ PINTO (note 41, 45).

⁷¹ “Questi merchatanti sono coloro che amettono il charo e si vorrebbero tutti uccidere e rubagli”: PINTO (note 47), p. 293.

⁷² “Questi ladri ci volliono fare morire di fame”: Ibid., p. 296.

gry.”⁷³ Lenzi almost makes those cries his own, organizing his book as a daily report (1320–1335) of grain prices.

The *Libro del Biadaiole* is thus an extraordinary record of daily prices (Figure 1), probably taken from the notes in his registers or other evidence, for the fifteen years covered by his book. Lenzi’s chronicle, however, conveys not only the simple price trend but also data related to the various kinds of wheat and other grains [*biade*] with information from other parts of the peninsula.⁷⁴ Furthermore, Lenzi reports on the commune’s response to the famine, with the “the Grain Six” [*Sei del Biado*] magistracy and the rationing policies, grain warehouses, various notices, purchases, and sales carried out by the commune. At the same time, Lenzi praises the Florentines who made such generous donations that Florence was able to face the rationing crisis and take in the starving poor that were coming not only from the surrounding countryside but also from such other cities like Siena, Lucca, Pistoia, and Perugia.

With so great and so cruel a hunger and increase in prices persisting in Florence, certainly, you gentlemen that read, should know that, in other parts of the world, they were not left unaffected by it, but everywhere, according to what some trustworthy souls reported in our city, it [the famine] was perceived as so cruel and severe that the poor resorted to [eating] the roots of different herbs and fruit trees as well as that meat rejected in the past, not only by the mouth but also by the nose. However, Italy, and especially Tuscany, was filled with such troubles and more affected than other parts. But truly I can say that my birthplace, Florence – which has a surrounding countryside able to supply it with its grain for no more than five months [a year], and where the victuals always cost more than in other parts of Italy – succeeded in the said time of hunger in supporting – on its own – half of Tuscany’s poor, with Providence and the help of its rich and good citizens and their money. So, it could be said, and truly it was and is so, that from the lands rich in wheat and properties around Tuscany the poor were expelled for fear of running out of supplies and they all flocked with their poverty only to Florence, as a haven of trusted consolation.⁷⁵

73 “Ecco città mal guidata, ké non possiamo avere del grano! E si vorrebbe andare alle chase di questi ladroni che n’anno, e mettervi fuocho e ardeglivi entro perché e’ ci tenghono in questa fame”: Ibid., p. 302.

74 The famine of 1328–1330 also struck Lombardy, the Marche, Bologna, Rome, Naples, and Puglia.

75 “Durando qui in Firenze tanta e sì chrudele fame e charo, certo, signori che leggete, dovete sapere che l’altri parti del mondo non furono senza essa, ma in tutte parti, secondo che alchuni di fede degni rapportorono alla nostra cittade, ella si senti tanto chruda e grava che i poveri ricorrevano a diverse radici d’erbe ‘e frutti d’arbori e carni da quinci adietro schifate, non che dalla bocca, ma etiandio dal naso. Tuttavia Ytalia e massimamente Toschana di tale pistilenza si senti del tutto piena ed intorneata più che altra parte. Ma tanto bene posso io dire che la detta mia patria, Firenze, a la quale nonn è contado che tanto la sostenesse di suo grano quanto è uno spazio di V mesi e ove sempre più vale la vittuallia ch’a nulla parte di Ytalia, nel detto tempo della fame poté essere che bastò a sostenere per sé sola la metà de’ poveri Toschi colla provedenza e aiuto de’ ricchi buoni cittadini e di loro danari; sì che dire si potea, e vero fu et è, che delle ricche terre di possessioni e di grano intorno a llei, per paura che a lloro non menomasse, cacciati i poveri e tolti loro i conceduti rimedii, solo a Firenze, come a porto di fidata consolatione, colla loro povertà tutti ricorrevano”: PINTO (note 47), p. 317.

76 VILLANI (note 54), vol. II, pp. 670–671 (Lib. XI, c. 119).

Table 1: Grain prices reported during the famine of 1328–1330 in Domenico Lenzi’s *Libro del Biadaio*. Data from PINTO (note 47). (1 soldo = 12 denari; for these years 1 florin = 66 soldi).

1327: annual average	13 soldi
1328: annual average	17 soldi
1329: monthly average (jan)	22 soldi and 8 denari
1329: monthly average (feb)	24 soldi and 6 denari
1329: monthly average (mar)	27 soldi and 3 denari
1329: monthly average (apr)	36 soldi and 6 denari
1329: monthly average (may)	33 soldi and 11 denari
1329: monthly average (jun)	45 soldi and 6 denari
The first days of June, grain price reached the highest peak of 1 florin (= 66 soldi), as reported also by Villani ⁷⁶	
1329: monthly average (jul)	22 soldi and 9 denari
1329: monthly average (aug)	24 soldi and 2 denari
1329: monthly average (sep)	29 soldi and 10 denari
1329: monthly average (oct)	31 soldi and 1 denaro
1329: monthly average (nov)	32 soldi
1329: monthly average (dec)	32 soldi
1330: annual average	26 soldi
1331: annual average	13 soldi and 7 denari

Why this emphasis on recording the daily prices of the grain market? Because the availability of supplies on the market was in fact a “human mirror.” The abundance was proof of private and public virtues and of the welfare [*bene fare*] of ancient times, while the scarcity was evidence of vices and of the “perverse behavior” of his own period. Moreover, this “human mirror” reflected the lack of pity that Lenzi – with a completely Florentine emphasis – attributed to an haughty [*insuperbita*] Siena, which had expelled its own beggars, in contrast to the “noble city of Florence’s true benevolence toward the poor.” As a “work of true and fruitful intention” and “effective charity”⁷⁷ he mentioned the two grain warehouses [*canove*], which the commune opened in each of the city’s districts [*sestieri*] to provide for the poor by distributing eight ounces (about 225 grams) of bread at controlled prices at the commune’s expense.

Giovanni Villani’s examination of the causes and remedies of the 1328–1330 famine is somewhat more complex. In the absence of specific weather events, the dizzying rise in prices, organized along the same lines as Lenzi, is attributed to market exchange mechanisms, “wheat no longer had a price” and with “rich people” being able to bear

⁷⁷ PINTO (note 47), p. 323.

the price increases, the consequences fell on poor people.⁷⁸ Moreover, as Pinto noted,⁷⁹ the loss of access to the port of Pisa as a result of the wars with Castruccio Castracani and Louis the Bavarian forced Florence to fall back on the port of Talamone after an agreement with Siena, making transport complicated. Despite these difficulties, the Republic of Florence faced the crisis by intervening directly with the purchase of wheat. Called personally to be one of the grain [*Biado*] officers, Villani informs us of the sixty thousand gold florins spent to purchase grain for the public warehouses.

8 “Remedy” and “Argument”: The Medieval Political-Economic Argumentation

Villani’s account of the 1329–1330 famine is remarkable not only in its accuracy and narrative, but as a surprising expression of the historical genre of *scire per causas* (understanding something through its causes) and for its sophisticated political-economic argumentation. Villani gives credit to the historical method inherited from the classical and Christian traditions, delivering a reliable reconstruction of the facts and placing these “in a coherent chronological system and in a causal development, such as to give significance to the fact itself.”⁸⁰

Villani structured his text around specific explanations for the famine; he attributed the sudden rise in prices to speculation by the grain merchants, who took advantage of the financial resources of the rich. As a consequence, the poor had even less purchasing power, “and wheat was priceless, as the rich people who needed it were able to pay: as a result, poor people suffered great hardship and affliction.”⁸¹ Continuing along this line of causation, Villani dwells on the empirical observations and astrological knowledge of the times to give a full picture of the reported events, pointing out, as he also does in other parts of the *Cronica*,⁸² the distinction between necessity and freedom, nature and God’s freedom:

78 VILLANI (note 54), vol. II, pp. 670–671 (Lib. XI, c. 119).

79 PINTO (note 47), p. 91.

80 Marta SORDI, *Dalla storiografia classica alla storiografia cristiana*, in: *Civiltà Classica e Cristiana* 3 (1982), pp. 7–29.

81 “e nonn-avea pregio il grano, possendosene avere per danari la gente ricca che n’avea bisogno, onde fu grande stento e dolore a la povera gente”: VILLANI (note 54), vol. II, pp. 670–671 (Lib. XI, c. 119).

82 This distinction between nature and God recurs in other excerpts of the *Cronica*. It’s the case, for example, in his account of the flood of 1333 and the debate about the “course of nature” and “God’s judgement”: ORTALLI (note 22); MOULINIER/ REDON (note 63); SCHENK (note 63); SALVESTRINI (note 63). In our current vocabulary, the medieval distinction among nature and God’s freedom has disappeared, and the term “act of God” normally accounts for natural disasters: Rudi PALMIERI, “Act de Dieu” ou “Erreur humaine”? – Analyse argumentative du débat relative à la crise de l’automobile de Détroit (2008), in: *ILCEA* (online) 15 (2012).

And note [reader] that when the planet Saturn is in the sign of Cancer and Leo, famine will be in our country of Italy, and especially in our city of Florence, since it seems attributed to that sign. We do not say this will necessarily happen, because God can make worthless what is dear, and dear what is worthless, according to his will, or by the grace of merits or by washing away your sins, but speaking according to nature, Saturn ...⁸³

Anyway, what matters in this reconstruction of the causes is that God's freedom calls into play men's freedom, i.e., the peaceful state of the city. Villani thus gives a detailed account of the solutions adopted to face the rationing crisis, an expression of the city's adaptability, through forms of private solidarity (alms) and the commune's initiatives: price ceilings, grain purchases from other markets, and agreements for the transit of goods, even devising a solution for how to ensure that the poorest had daily access to food:

In those two years, the commune of Florence spent more than sixty thousand gold florins to give sustenance to the people, and all this was not enough; then, finally, the commune's officials decreed that grain not be sold in the market, but bread be made for the commune in all the bakeries, and then every morning, in three or four grain warehouses for every *sestiere* [district of the city], mixed breads [of wheat and other grains] weighing six ounces [about two hundred grams] be sold for the price of four *danari* [12 *danari* = 1 *soldo*]⁸⁴

But this measure was not only a “remedy” to solve the problem of the limited food availability or to counter the reduced spending power due to the increased price of wheat, but also an “argument” to maintain peaceful harmony in the city, responding to the needs of the poorest, those who lived hand-to-mouth on low wages:

This argument supported and satisfied the fury of the people and of the poor: because at least everyone could have bread for subsistence, even those who had 8 or 12 *denari* a day for their livelihood [wages], and did not have the *denari* [money] to buy a bushel.⁸⁵

The use of this pair of nouns – remedy and argument – is highly interesting, but the semantic richness of this hendiadys may be unclear, due to the usage of these two

83 “E nota che sempre che la pianeta di Saturno saràe ne la fine del segno del Cancro e infino al ventre del Leone, carestia fia in questo nostro paese d’Italia, e massimamente nella nostra città di Firenze, però che pare attribuita a parte di quello segno. Questo non diciamo sia però necessitate, che Idio può fare del caro vile e del vile caro secondo sua volontà, o per grazia de’ meriti di sante persone o per pulizione de’ peccati; ma naturalmente parlando, Saturno ...”: VILLANI (note 54), vol. II, p. 672 (Lib. XI, c. 119).

84 “E perdévi il Comune di Firenze in quegli due anni più di LXm fiorini d’oro per sostenere il popolo; e tutto questo era niente; se non che infine si provide per gli uficiali del Comune di non vendere grano in piazza, ma di fare pane per lo Comune a tutti i forni, e poi ogni mattina si vendea in tre o quattro canove per sesto di peso d’onçe VI il pane mischiato per danari IIII l’uno”: Ibid., p. 671.

85 “Questo argomento sostenne e contentò la furia del popolo e della povera gente: ch’almeno ciascuno potea avere pane per vivere, e tale avea danari VIII o XII per sua vita il dì, che non potea raunare i danari di comperare lo stao”: Ibid.

terms in our ordinary language.⁸⁶ In this excerpt Villani remarkably introduces a relevant example of political reasonableness,⁸⁷ highlighting how the effectiveness of the remedy (ensuring daily access to food for the poorest) must involve also the efficiency of a reasonable persuasion (i.e., the argument).⁸⁸

The narrative thus becomes the example for building civic consciousness and its state of peace, even in the face of famine.

We talked this matter over for so long to give an example to our future citizens, so that they will have argument and remedy if our city should find itself in such a dangerous famine/shortage, so that the people might be saved by the pleasure and reverence of God, and the city not suffer any danger of fury or theft.⁸⁹

It is precisely this political-economic argumentation⁹⁰ that completes and gives the clearest measure of the ability to adapt in the face of a rationing crisis, be this the result of an actual shortage of production or a crisis in the trade mechanisms.

This care for reasonable persuasion emphasizes the role of argumentation⁹¹ in the political context as an indispensable building block in the construction of the “common good” (*Bene Commune*), even when facing a rationing crisis. Moreover, it is also a relevant case study for the present discussion in the field of the social sciences.⁹²

86 The Italian language, for example, has lost the original meaning of “argumentum,” and the noun “argomento” is commonly used in the sense of “topic” (or confused with “standpoint”). On the contrary, Villani’s “argument” expresses the Latin definition of Cicero (Topica 2, 7): “argumentum est ratio quae rei dubiae facit fidem” (argument is the justification that proves the reliability of an otherwise dubious standpoint).

87 See: Eddo RIGOTTI/ Andrea ROCCI/ Sara GRECO, The semantic of reasonableness, in: Peter HOUTLOSSER/ Agnes VAN REES (eds.), *Considering Pragma-Dialectics*, London 2006, pp. 257–274.

88 The literal translation of the quoted excerpt is clear: a reasonable conclusion (the fury of the people was satisfied) was inferred from a reasonable argument “because at least everyone could have bread” (“ch’almeno ... ,” i.e., “perché almeno ... ,” in the original text).

89 “Avemo fatto sì lungo parlare sopra questa materia per dare esempio a’ nostri cittadini che verranno d’aver argomento e riparo, quando in così pericolosa carestia incorresse la nostra città, acciò che si salvi il popolo al piacere e reverenza di Dio, e la città non incorra in pericolo di furore o rubellazione”: VILLANI (note 54), vol. II, p. 672.

90 It is the very same political-economic argumentation that Ambrogio Lorenzetti immortalized during this same era on the walls of the *Sala dei Nove* (Hall of the Nine) in Siena’s town hall. See: Gabriella PICCINNI, Siena 1309–1310: il contesto, in: Nora GIORDANO/ Gabriella PICCINNI (eds.), *Siena nello specchio del suo Costituto in volgare del 1309–1310*, Pisa 2014, pp. 15–36.

91 After the “new rhetoric” (or *linguistic turn*) of the late Fifties (Chaim PERELMAN/ Lucie OLBRECHTS-TYTECA, *La nouvelle rhétorique. Traité de l’argumentation*, Bruxelles 1958; Stephen E. TOULMIN, *The Uses of Argument*, Cambridge 1958), the theory of argumentation has more recently gained new fundamental contributions: Frans H. VAN EEMEREN/ Rob GROOTENDORST, *A Systematic Theory of Argumentation: The Pragmadiialectical Approach*, Cambridge 2004; Frans H. VAN EEMEREN, *Strategic Maneuvering in Argumentative Discourse. Extending the Pragma-Dialectical Theory of Argumentation*, Amsterdam/Philadelphia 2010; Eddo RIGOTTI/ Sara GRECO, *Inference in Argumentation. A Topics-Based Approach to Argument Schemes*, Cham 2019.

92 Several scholars emphasize also the role of communication and reasonable persuasion in the context of the social sciences (economics, finance, politics): Donald McCLOSKEY/ Arjo KLAMER, *One Quar-*

9 Conclusions

As we said at the beginning, the environmental dimension has taken on new urgency today⁹³ as scholars seek to advance the environment as a new interpretative and methodological paradigm for reconstructing historical trajectories and thereby discredit other forms of data or argumentative disciplines including history itself.⁹⁴ I do not share in this approach, which undermines the most basic historical records. The various elements that I have drawn upon, through major studies of a broad historiography and historical sources, show the signs and causes of a crisis set within a complex web of demographic phenomena (i.e., the ratio of population to food supply) as well as to economics, political, and social contexts. Although natural events are also documented for Italy between the thirteenth and fourteenth centuries, confirming the strong climate variability of those times, the famines before the Black Death were rationing crises triggered primarily by trade mechanisms.

Historians – in dialogue with other disciplines for a complete reconstruction of environmental history – should not only collect and interpret data from their own typical sources (documentary data), but also relate aspects of history (through case studies) that, in a certain sense, transcend the limits of time, making them comprehensible to researchers in other fields and to the general public. The uniqueness of the discipline of history is its ability to locate and reconstruct specific general historical contexts (politics, economics, society, and culture), acts of genius, choices, and plans by individuals and communities, which are never necessarily derived from determinate factors: like Villani’s “remedy and argument,” a case of a political-economic argumentation can be of great interest and relevance.

I believe that thus the voice of history can make its own original contribution.

ter of GDP is Persuasion, in: *The American Economic Review* 85, 2 (1995), pp. 191–195; Sandy E. GREEN, *A Rhetorical Theory of Diffusion*, in: *Academy of Management Review* 29, 4 (2004), pp. 653–669; Rudi PALMIERI, *Corporate argumentation in takeover bids*, Amsterdam/Philadelphia 2014.

⁹³ Paul ACOT, *Histoire du climat. Du Big Bang aux catastrophe climatiques*, Paris 2009; Wolfgang BEHRINGER, *Kulturgeschichte des Klimas. Von der Eiszeit zur globalen Erwärmung*, München 2010.

⁹⁴ In this context, the success of Jared Diamond’s book attributing differences between peoples from various continents to “environmental differences” is emblematic (Jared DIAMOND, *Guns, Germs, and Steel. The Fates of Human Societies*, New York 1997): with confidence in history waning, environmental history or geo-history is offered as the new paradigm of history. On closer inspection, it is a particular form of manipulation that takes advantage of the confidence placed in so-called “scientific” knowledge by involving “experts” from the field of “science” in areas that are foreign to them: see Sara GRECO MORASSO/ Carlo MORASSO, *Argumentation from expert opinion in science journalism: the case of Eureka’s Fight Club*, in: Steve OSWALD/ Thierry HERRMAN (eds.), *Rhétorique et Cognition*, Bern 2014, pp. 185–212.