

The Crisis of the Fourteenth Century Reassessed: Between Ecology and Institutions – Evidence from England (1310-1350)

**Philip Slavin, Department of Economics, McGill University
philip.slavin@mail.mcgill.ca**

That the first half of the fourteenth century was a period of ecological and economic shocks is truism requires no argumentation. In England, as elsewhere in Northern Europe, the local population was hit by a series of harsh crises, the three most devastating of which were the Great Famine of 1314/5-22, the Great Cattle Plague of c.1315-21 and the Black Death of 1348-51. While the latter has been a subject of much scholarly investigation and debate, the first two crises, their implications and impact are yet to be studied in a detail.

It has long been established that the Great Famine of 1314/5-22 was an agrarian crisis, brought about by a series of failed grain harvests, mostly of winter crops. The harvest failures, in turn, were created by the almost Biblical flooding, which befell on most parts of Northern Europe between late 1314 and late 1316, and then again throughout much winter and spring of 1321 (Jordan 1996). The wheat and rye harvests of 1315 were approximately 40 per cent below their normal level; in 1316 they stood at 60 per cent below their average level; in 1321 they were as bad as in 1315 (Campbell 2007, 2008 and 2009). The obvious result of this environmental shock was widespread famine, which seems to have killed about 10-15 per cent of North-European population. While there is no doubt that the torrential floods of 1314-6 were the primary bringers of the famine, it is, perhaps, worth asking to what extent they were the only factors standing behind the hardships of 1314-22. Here, I suggest that the famine of the early fourteenth century was, in fact, somewhat more complex phenomenon, with far-reaching implications and repercussions beyond its traditional chronological limit of 1315-22. As I shall argue in the discussion, perhaps the better term for this disaster is the ‘food crisis of the first half of the fourteenth century’. This crisis seems to have been created by an adverse combination of ecological and institutional factors. My research is based on the original archival material, consisting of over 1,000 manorial accounts, about 100 diet accounts, and further 100 sheriffs’ accounts with the conjunction of grain purveyance during the Scottish War of Independence (1296-1328). Taken together, these sources portray a more complex and gloomier picture than is commonly seen.

Let us now turn to the institutional factors. In recent years, more and more economic historians encourage their peers to regard institutions, no matter how weak or underdeveloped they may be, as important and decisive factors in economic development (Greif (2000, 2002, 2006); Acemoglu (2002, 2005, 2006, 2008); Ogilvie (1995, 2007)

and Gelderblom (2009)). In the case of early-fourteenth century England, the following institutions are to be considered: (1) manorialism; (2) warfare.

As far as manorialism is concerned, its relevance to the current topic is manifested in the lordship's ability to use its socio-economic status and recruit sufficient quantities of grain supply, whether through direct demesne exploitation (grain extraction), or financial resources (grain purchases). The situation is illustrated well on Figure 1 showing the differences in food supply patterns between different communities before and during the famine years. The sample includes three wealthy monastic communities, Durham Cathedral Priory, Canterbury Cathedral Priory and Norwich Cathedral Priory, and one community of impoverished status, Bolton Priory (Yorkshire).¹ As the figure suggests, the crisis was hardly felt in the Durham, Canterbury and Norwich communities. At Durham and Norwich, the brethren increased the share of grain purchases, to make the ends meet. At Canterbury, the community, enjoying its 'holy' status, received generous grain gifts from local benefactors. Even though both Durham and Norwich communities increased their grain purchases, the main bulk of corn still came from the demesne. Thus, on Canterbury Cathedral demesnes, about 86 per cent of harvested wheat was dispatched to the priory in 1316/7, in contrast with about 69 per cent between 1310 and 1314. Similarly, the authorities of Westminster Abbey and Durham Cathedral Priory augmented the levels of demesne grain extraction. In addition, about 13 per cent of the total grain supply of Durham Priory was carried over for the next year in 1316. Before the agrarian crisis, on the other hand, few or no grain was hoarded there. Thus, the better-off households managed to secure a steady grain supply notwithstanding the harsh agrarian crisis. Figure 2, providing an overview of the total grain supply levels of the four houses, indicates that while Norwich, Canterbury and Durham Cathedral Priors managed to secure a steady supply of crops both before, during and after the agrarian crisis of 1315-7, altogether different was the situation at Bolton Priory. The adverse combination of Anglo-Scottish warfare, which forced the local authorities to pay tribute to Scottish warlords, and limited demesne resources, did not allow the brethren to secure sufficient levels of grain supply, through either channel. Moreover, unlike Durham, Norwich and Canterbury communities, the Bolton canons did not have sufficient resources to purchase surplus grain, to hoard and carry over for the next year. As a result, the total grain supply at Bolton stood at about 66 per cent its pre-famine level, between 1315 and 1321, that is both during and after the harvest failures of 1315-7. This brings us to the second institutional aspect, relevant for our discussion: warfare.

¹ Sadly, no granator's accounts from Westminster Abbey survive for the famine years.

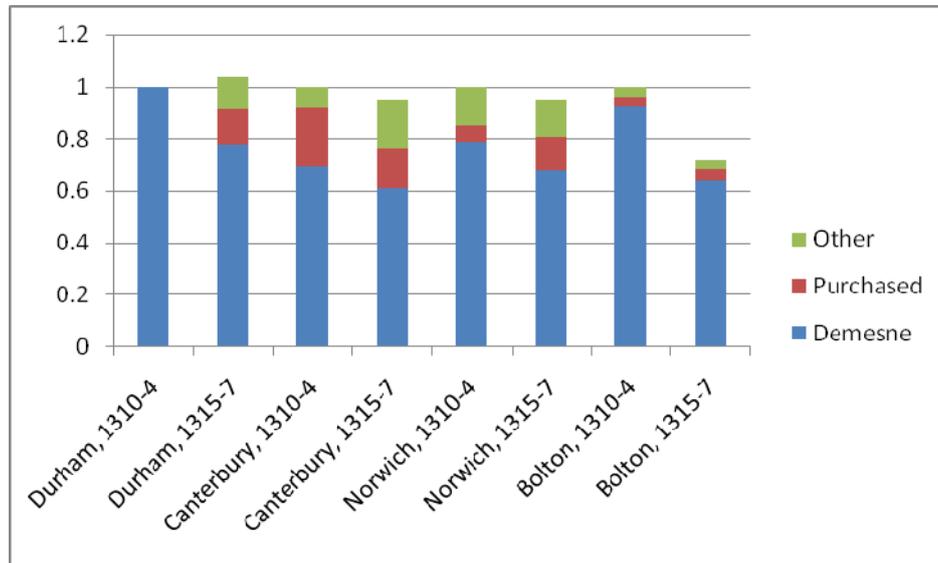


Figure 1. Grain Supply at Four English Monastic Communities, 1310-7 (1310-4 = 1)

Source: Household Accounts Database; Manorial Accounts Database

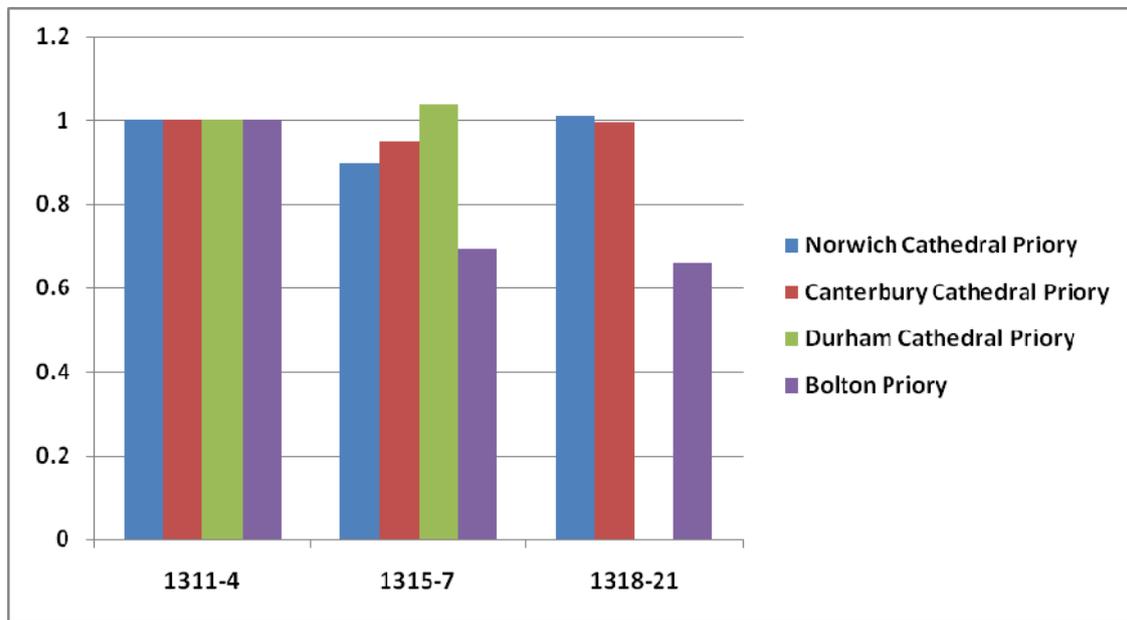


Figure 2. Total Grain Supply of Four Monastic Houses, 1311-21 (indexed on 1311-4)

Source: Norfolk Record Office, DCN 1/1/22-28; Canterbury Cathedral Archives, Granger 4-16, Bartoner 4-11; Durham Cathedral Archives, Granator 1308-9, 1312-3 and 1316-7; Bolton Compotus, eds. Ian Kershaw and David Smith (2000)

Note: No grain accounts survive for Durham Priory for the period of 1318-21.

Unluckily for the English populace, the Great Famine coincided with the Scottish War for Independence, which made its hardships all the more unbearable. To begin with, it is vital to divide England into two socio-economic zones: the South of the Humber, which may be classified as a ‘war-free’ zone and the North of that river, which can be regarded as a ‘war-zone’. The ‘war-zones’ were directly affected by a number of war-related (=institutional) aspects, including *purveyance* and *flood plundering deriving from military incursions*. First, let us deal with the institution of purveyance. In essence, purveyance was a royal prerogative to recruit forced contributions or sales of grain, to provision armed forces during a conflict. Unfortunately, no complete purveyance accounts from the famine years survive, and, hence, we draw our information from select sheriffs’ accounts compiled during these years. For instance, the 1315/6 account of the sheriff of Norfolk and Suffolk, dealing with the provisioning of Berwick-upon-Tweed, indicates that although the peasants were forced to sell their wheat supplies for, more or less, the market price, the purveyance prices of barley and oat were far below their average market level (7s 6d and 3s 8d a quarter, compared with 12s 3d. and 5s. a quarter).² The institution of purveyance hit the peasantry from two sides. First, it forced them basically to surrender their potentially life-saving grain supplies. Second, the financial compensation for these losses was less than unrewarding. But even if the peasants were to receive adequate, ‘market’ prices for oats and barley, they may well have experienced troubles finding freely available grain for purchase on the market. After all, the general turnover within the grain sector undoubtedly contracted during the famine years. Once the agrarian crisis was, more or less over, the gap between the purveyance and market prices became less apparent, with the ratio of 0.85:1.00 for wheat and 0.75:1.00 for spring crops.

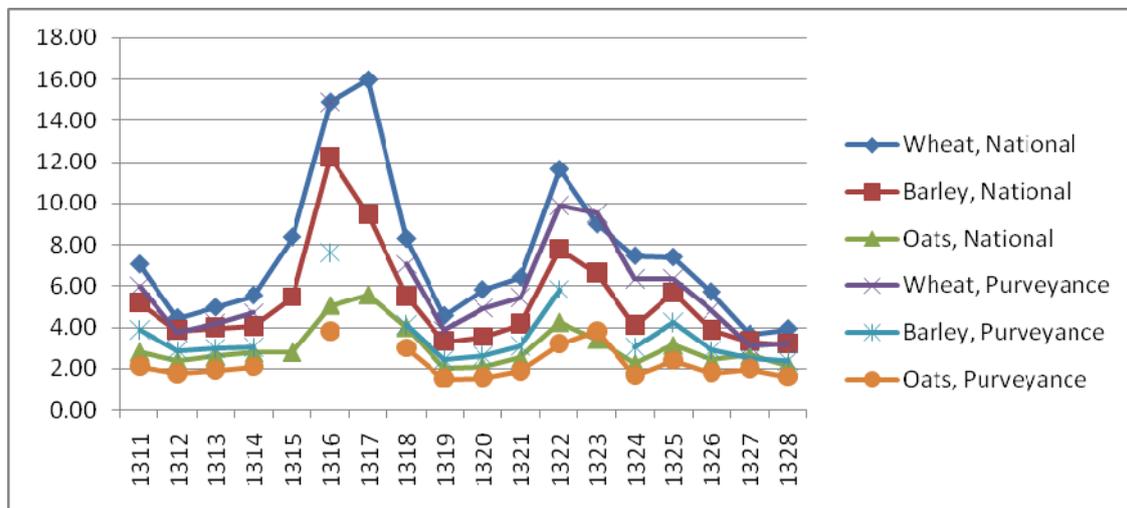


Figure 3. Market and Purveyance Grain Prices, 1311-1325 (in Shilling per Quarter)

² The National Archives, E101 574/22

Source: Purveyance Accounts Database; John Munro's revised Phelps Brown and Hopkins 'basket of consumables' commodity price series and craftsmen's wage series: <http://www.economics.utoronto.ca/munro5/EngBasketPrices.xls> (last accessed 1 December 2009)

Some historians, Marxists and otherwise, have claimed that the institution of purveyance caused much burdens and hardships for the English peasantry (Maddicott 1975 and Krug 2006). Unfortunately, such claims were largely theory-based, without much reliance on the actual sources. In order to appreciate the full extent of this phenomenon, one has to examine it within broader economic and agrarian contexts of the same years. Table 1 shows how the purveyance worked in 1316 in Yorkshire, a county ravaged by both the disastrous harvests and warfare. Let us assume that the crop failures in that year reduced the total agricultural output by some 50 per cent, decreasing the overall agrarian potential of this county from about 690,000 to some 345,000 quarters a year. The 2,940 quarters of grain collected from the peasants by the royal officials meant less than one per cent of the total produce. This fact undoubtedly weakens the argument that the institution of purveyance was especially burdensome for the peasantry. One may argue, at most, that it disrupted steady market trade of grain, by diverting its supplies from market stalls into soldiers' bags and by distorting the price schedule, but it was hardly responsible for augmenting the famine.

Table 1. Purveyance in Yorkshire, 1316.

	<i>Grain Collected (in Quarters)</i>	<i>Quarters per every vill</i>	<i>Quarters per levied vill</i>
<i>East Riding</i>	1010	2.74	2.94
<i>North Riding</i>	860	1.71	2.63
<i>West Riding</i>	1070	1.84	3.33
TOTAL	2940	2.02	2.96
<i>As % of the total arable potential of Yorkshire</i>	0.85%		

Source: *Calendar of Patent Rolls, EDII 2 (1313-7), 543-4*

Food plundering is yet another aspect tightly connected to the ongoing crisis of the early fourteenth century. In the course of the Anglo-Scottish warfare, both sides conducted extensive raids at the enemy's rear, chiefly the countryside. While the marauding activities are vividly described in both English and Scottish chronicles, the extent of their economic damage is to be found in some manorial accounts from the Northern counties. Unfortunately, and mostly for institutional reasons, the North of England has much thinner coverage of the accounts. Nevertheless, the few available

accounts can provide a partial grasp of the situation. Between 1312 and 1324 the five North counties (Cumbria, Lancashire, Northumberland, Westmorland and Yorkshire) saw some most devastating attacks by the Scots. In the course of the attacks, the marauders ravaged fields, burnt granaries and carried away livestock, mainly cattle. The impact of the raids is clearly seen on Figures 6, 7 and 8, indicating that the overall agricultural and pastoral production suffered a visible contraction in the course of the war, within both the demesne and peasant sectors in the North.

The socio-economic and agricultural difference between the two zones has never been as apparent as during the troublesome years of the second and third decades of the fourteenth century. As Figure 4 suggests, the Northern yields remained low well after the end of the torrential floods in 1316 and it was not until 1324 that they returned to their pre-1315 levels. This was undoubtedly due to the frequent Scottish attacks, which are attested not only in narrative sources, but also in the manorial account. A typical entry would state “[in this year]...grain X rendered yield Y and no more, because of the Scottish incursions”. In the South, on the other hand, the yields returned to their pre-Famine levels in 1317 and remained relatively high after that, with the exception of the disastrous harvest of 1321, owing to heavy rains. Manorial accounts, however, are dealing with the lords and their produce, not the peasants. Our data regarding the situation within the tenancy comes from tithe accounts, some of which were enrolled into the manorial accounts proper, and some of which were compiled as individual documents. Unfortunately, unlike the manorial accounts, demesne receipts survive in very small numbers and hence, their geographic coverage is not nearly as broad as that of the former.

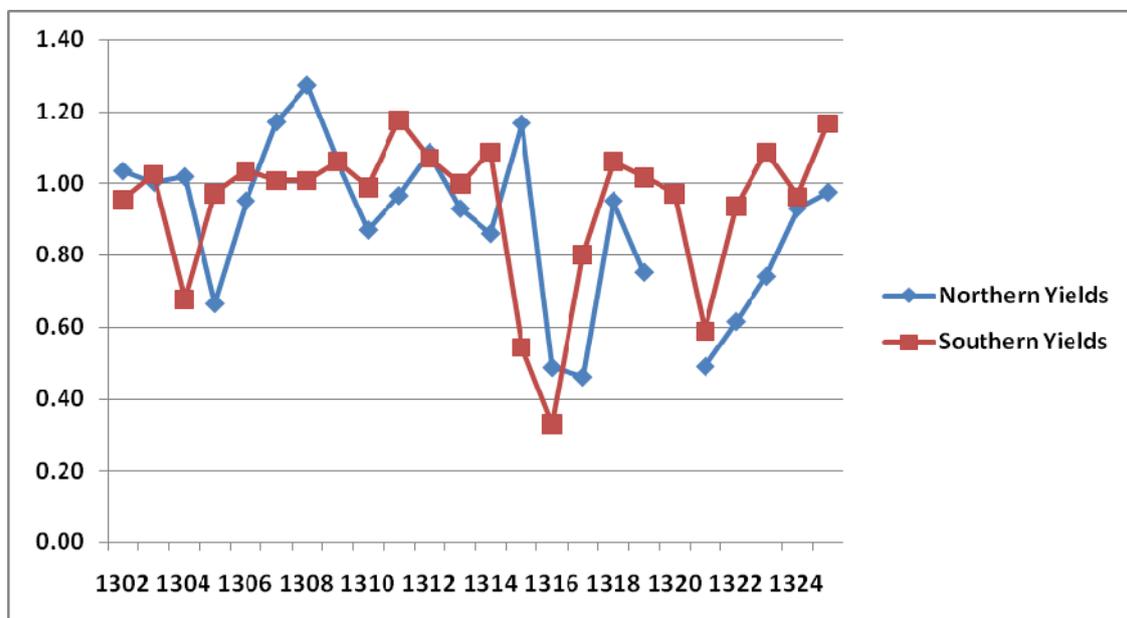


Figure 4. Composite Crop Yields (Grains+Legumes) on Northern and Southern Demesnes, 1302-25 (indexed on 1304-13)

Source: Bruce M. S. Campbell (2007), *Three centuries of English crops yields, 1211-1491* [WWW document]. URL <http://www.cropyields.ac.uk>; Slavin's Manorial Accounts Database (2008-)

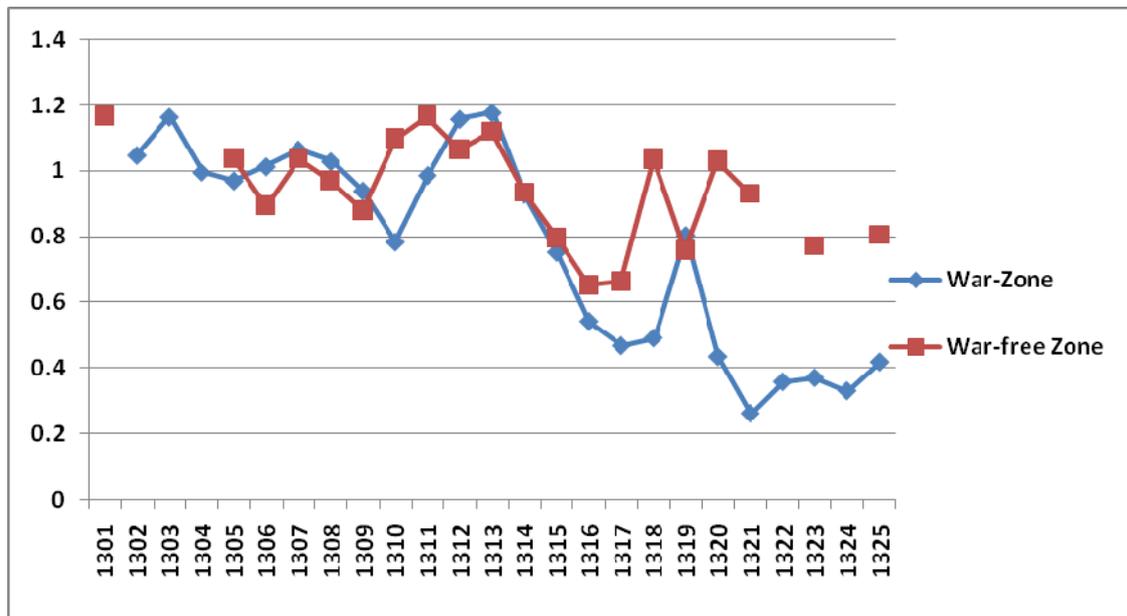


Figure 5. Tithe-Receipts on Four Northern and Three Southern Manors (Indexed on 1301-10)

Source: Durham Cathedral Archives, Tithe accounts and Hampshire Record Office, 97M97; Norfolk Record Office, DCN 60/15/7a-15 and DCN 60/11-22; Bolton Compotus, eds. Ian Kershaw and David Smith (2000)

As Figure 5 clearly indicates, there was a visible gap in the levels of the peasant productivity between the Northern farms (=war zones) and the Southern tenancies (=war-free zones), during the late 1310s and the early 1320s. This, in turn, reveals that the Northern peasants were badly ravaged by the ongoing warfare and that they were doomed to starve well after the agrarian crisis of 1315-7 was over. The famine in the North, it appears, was brought about not only by the environmental factors, but mostly by the institutional ones.

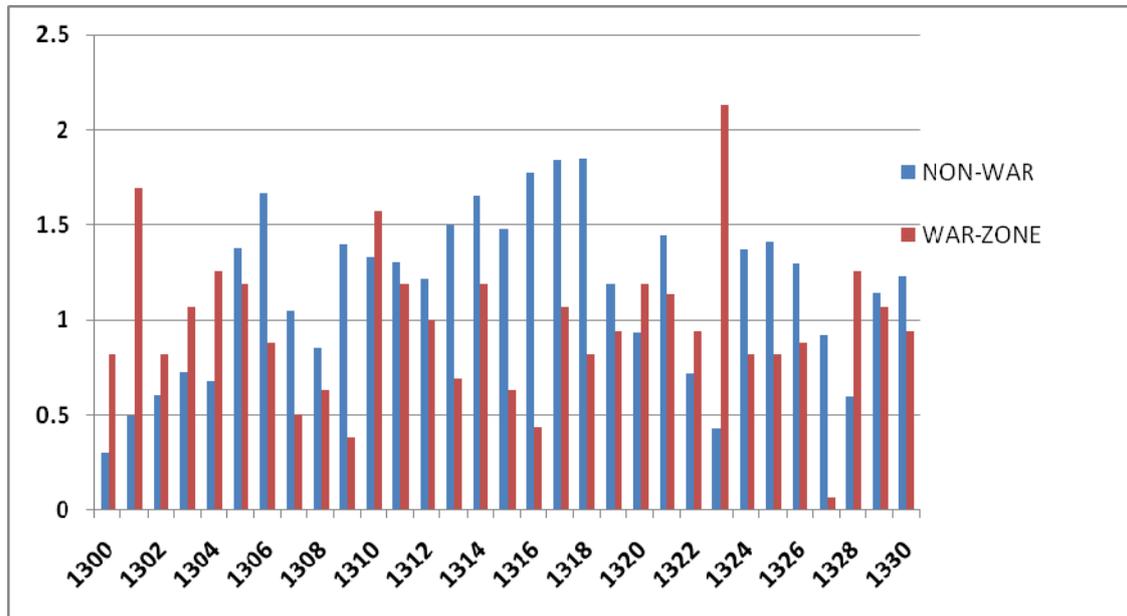


Figure 6. Economic Devastation of the North: Evidence from Land Transactions (Freehold Land), 1300-1330 (indexed on 1300-12) [5 Northern and 22 Southern counties]

Source: Slavin, Feet of Fines Database, 1195-1547 (2010-)

One direct indication as to the extent of the economic devastation of the North during the famine and war years is to be found in the volume of freehold land transactions, conducted in these years (Figure 6). Between 1314 and 1318 there was a clear divergence in the total volume of land transactions between the Northern and Southern counties. While the number of transactions rose some 180 per cent in the South, in the war-devastated North it fell to unprecedentedly low levels. How is this paradox to be explained? Some scholars tend to view the increased land market activities as a clear indication to the economic crisis, whereby some impoverished social elements attempted to recruit cash by selling their properties, to purchase grain, in order to make the ends meet (Davies and Kissonck 2004 and Campbell 2008 and 2009). While their argument seems to be valid, these scholars tended to rely on data from the Southern (=war-free) counties, while the situation in the North has largely been neglected. Using the same model, one may argue that the virtually paralyzed land-market activities actually indicate the fact that the Northern communities were devastated so badly that the sellers could not find any potential buyers to offer cash for their land plots. This hypothesis, however, needs a further testing, requiring an additional research.

The combination of inequality among different communities within the manorial structure of late-medieval England, on the one hand, and the ongoing warfare, on the other, created conditions similar to what Amartya Sen coined as the ‘entitlement crisis’ (Sen 1981). In essence, the entitlement crisis means a disruption in equal access to food

supply, created by socio-economic advantages (ab)used by stronger social strata to secure food supplies, at the expense of poorer elements, during famine years. Clearly, in the case of the early fourteenth century crisis, the poorer echelons were deprived of a steady and ready access to their food supply not only by disastrous yields, low availability and high prices of grain, but also by the ability of stronger elements to recruit the *remainder of the potentially available* grain supply, whether through the market, or purveyances.

Having dealt with the institutional factors, it is now appropriate to revert to the environmental side of the crisis. Again, much advance has been made here in most recent years by Bruce Campbell, in his seminal studies (Campbell 2007, 2008 and 2009). However, one aspect yet to be studied in this conjunction is the connection between the Great Cattle Plague and human famine, on the one hand, and the impact of the former on the latter, on the other. The pestilence has arrived in England around the spring of 1319, killing about 65 per cent of local bovids within just over a year (Newfield 2009 and Slavin 2010). This colossal figure meant that the English lords and peasants were deprived of the single most important ploughing force, as well as fertilizing agents and some vital sources of protein. Since grain was the single most important food component in the pre-Industrial era, it is no wonder that the lords and their bailiffs did their best to replenish their ox stocks as swiftly as possible. By 1332, the ox stocks stood at some 80 per cent of their pre-1319 levels. This, however, came at the price of a slow replenishment of cattle. This selective restocking policy had, naturally, a profound effect on the dairy produce sector. Unfortunately, very few manorial accounts gave particulars about lactage yields and dairy production. Our main source of information here comes mainly from seven Berkshire-Buckinghamshire demesnes of Winchester Bishopric, as well as several Kentish demesnes of Canterbury Cathedral Priory and a number of Wiltshire-Somerset demesnes of Glastonbury Abbey. For the purpose of the present paper, I have confined my observations to the dairy sector of Winchester Bishopric (Figure 7). During the years of pestilence, that is 1319/20, the overall levels of milk production per demesne fell to abysmally low levels. With most cows perished, the surviving animals were too debilitated to render high milk yields (the average lactage yields fell from 142 to 45 gallons *per cow*). Once the panzootic was over, an average productivity per cow returned to its normal. At the same time however, the overall dairy produce levels could not catch with the pre-pestilence ones. The demographic recovery of cows was slow; it did not begin until the late 1320s and it was not until *c.* 1337 that the Winchester cattle stood at its pre-1319 level. Elsewhere in England, however, the restocking was slower and it was not until the Black Death that the replenishment was, more or less, complete (Slavin 2010). Furthermore, between 1325 and 1327, some manors experienced yet another outbreak of bovine disease, apparently different in its nature from the panzootic of 1319/20. It was characterized by physical debilitation, abortion, failed calving, termination of milk production, but eventual recovery and return to fields and dairy-houses, rather than death. At the same time, however, milk produce *per cow* fell further.

The overall decline in the dairy produce sector meant that less protein sources were available for the human consumption. As Table 7 suggests, there is no sign that the

manorial authorities and their reeves attempted to take up the slack by augmenting the share of legume acreage, as an alternative source of protein. The post-1319 human malnourishment, deriving from a decreased intake of dairy products and, thus, protein nutrients, may have weakened the human population and made it more susceptible to various pathogens and diseases. It is now established that shortage of protein, or protein-energy malnutrition (PEM), can have severe implications on human populations, and especially on a child's development. The period of 'dairy famine', lasting for *at least* 20 years, was much longer period than several years of inclement weather, bad harvests and grain malnutrition and, hence, it is highly likely that its implications were most severe. It is plausible, then, that the period of 'famine', or, perhaps better yet 'food crisis', lasted much longer than just for three of seven years, as 'codified' in scholarly literature.³ In effect, the crisis seems to have lasted for well over 20 years.

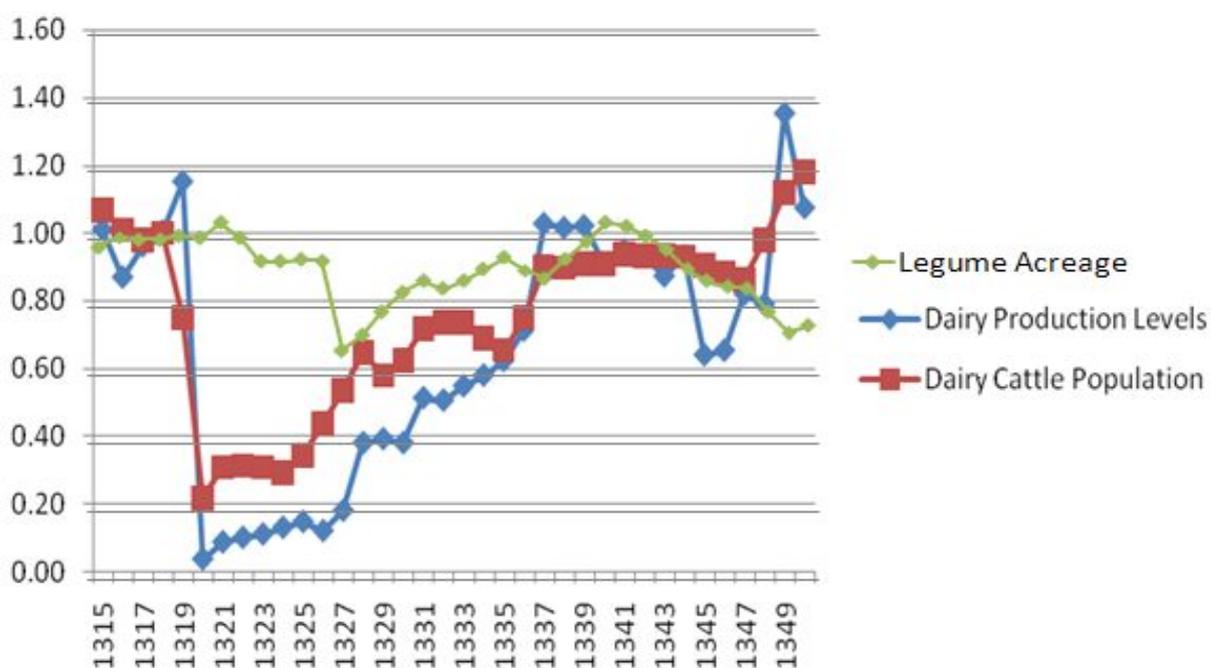


Figure 7. Annual Daily Produce Levels, Dairy Cattle Population and Legume Acreage in England, 1315-50 (logged on 1315-9)

Source: Manorial accounts database

If protein shortage indeed weakened the immune system of the developing adolescents, is it possible, then, that it also was that 'invisible beast' that made them easily susceptible to the plague some twenty-five or thirty years later? This possible connection between the two biological disasters should by no means be neglected. At this point, however, the possible link between the animal and human pestilences seems to be

³ Lucas (1930): three years (1315-7); Kershaw (1973) and Jordan (1996): seven years (1315-22).

coincidental. To establish this association, several necessary steps are to be taken. First, it is necessary to study the changes within food consumption patterns between *c.*1320 and 1350, as reflected in numerous contemporary household accounts. Second, an analysis of monastic infirmarers' accounts, recording the number of admitted patients and expenditure on medicine, is to be undertaken. Finally, it would be imperative to correlate bovine fatalities in 1319/20 to human mortality rates in 1348-51, *on the same manors*. To that end, a meticulous demographic analysis of several hundreds of manorial court rolls is required. If carried out properly, such studies are ought to render most exciting results, which shall shed much new light on one of the biggest mysteries in human history: the Black Death.

To conclude. The statistical evidence used in this study suggests that the food crisis of the early fourteenth century seems to have been somewhat more complex phenomenon than just a weather-induced crisis, as regarded by some scholars. In fact, it was a rather adverse combination of the environmental and institutional factors, tightly interwoven into each other (Figure 8). While there is no doubt that the environmental causes (weather anomalies, crop failures, bovine mortality) were the primary causes of the crisis, they were hardly the only ones. Thus, the food crisis was *created* by ecological factors and *intensified* by the institutional ones. Dangerous as it may be, we can speculate that without the manorial lordship and its derivatives (grain extraction, financial status and crop hoarding) on the one hand, and warfare with all its consequences (purveyance and plundering) on the other, the food crisis would have been on somewhat milder scale.

THE 'ECO-INSTITUTIONAL MODEL' OF SUBSISTENCE CRISIS

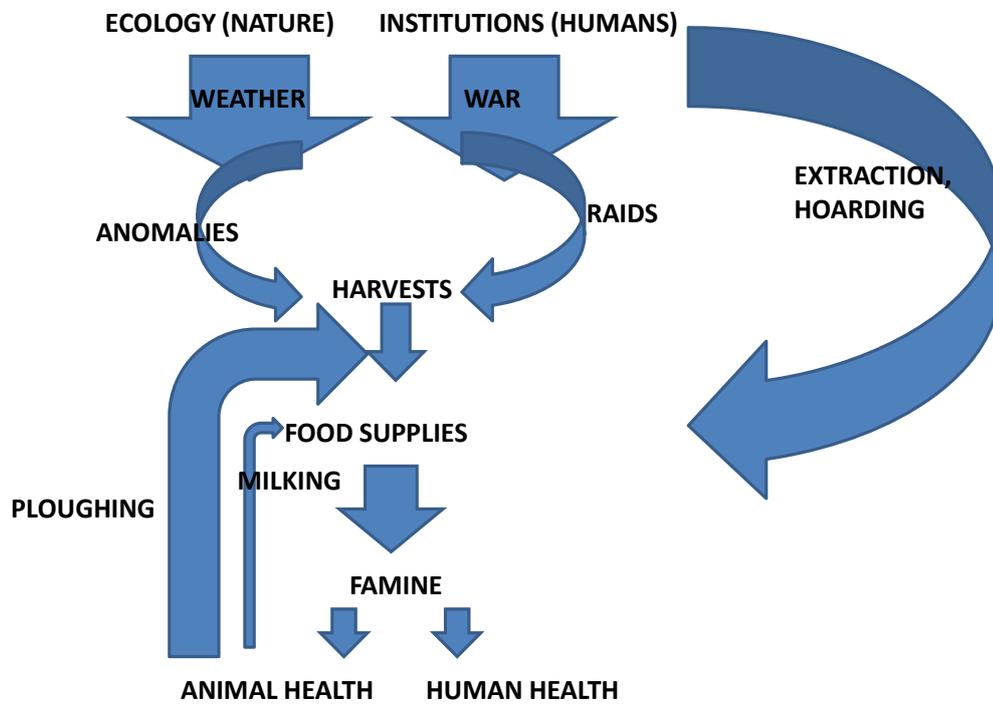


Figure 8. The 'Eco-Institutional' Model of Subsistence Crisis

SELECT BIBLIOGRAPHY

Campbell, Bruce M.S. 2009. "Nature as Historical Protagonist: Environment and Society in Pre-Industrial England." *Economic History Review*.

_____ 2008. 'Nature as historical protagonist', a podcast of the 2008 Tawney Memorial Lecture [WWW document]. URL <http://wip.ehs.org.uk/downloads.asp> (last accessed 10 December 2009)

_____ 2007, *Three centuries of English crop yields, 1211-1491* [WWW document]. URL <http://www.cropyields.ac.uk> (last accessed 1 December 2009)

Dodds, Ben. 2007. Durham Tithes Database, 1270-1536. Obtained from AHDS History (12 September 2007)

Greif, Avner. 2006. *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*. Cambridge: Cambridge University Press.

Jordan, William Chester. 1996. *The Great Famine: Northern Europe in the Early Fourteenth Century*. Princeton: Princeton University Press.

Kershaw, Ian. 1973. "The Great Famine and Agrarian Crisis in England, 1315-1322." *Past and Present* 59: 3-50.

Kershaw, Ian and Smith, David M. (eds.). 2000. *The Bolton Priory Compotus, 1286-1325*. Woodbridge: Boydell and Brewer.

Lucas, Henry S. 1930. "The Great European Famine of 1315-7." *Speculum*, 5 (4): 343-377.

Munro, John H.A. 2006. Munro's Revisions of the Phelps Brown and Hopkins 'Basket of Consumables' Commodity Price Series and Craftsmen's Wage Series, 1264-1700 [WWW document]. URL <http://www.economics.utoronto.ca/munro5/EngBasketPrices.xls>. [accessed on 28 October 2009]

Newfield, Timothy P. 2009. "A Cattle Panzootic in Early Fourteenth-Century Europe." *Agricultural History Review* 57(2): 155-190

Sen, Amartya Kumar. *Poverty and Famines: an Essay on Entitlement and Deprivation*. Oxford: Clarendon Press, 1981.

Slavin, Philip. 2010a. "The Fifth Rider of the Apocalypse: The Great Cattle Plague in England and Wales and its Economic Consequences, 1319-1350", in Simonetta

Cavaciocchi (ed.), *Le interazioni fra economia e ambiente biologico nell'Europa preindustriale, secc. XIII-XVIII*. Prato.