

**MEDIEVAL LAND RECLAMATION AND THE CREATION OF NEW SOCIETIES.
COMPARING HOLLAND AND THE PO VALLEY, c.800-c.1500***

ABSTRACT

One problem with scholarly research into land reclamation has been the tendency to overly focus on two questions - how and why did it happen? It has led to an over-emphasis on technological innovation and demographic and commercial pressures. Furthermore, it has obscured a far more fascinating and significant question – what were the social consequences of pre-industrial land reclamation? What kinds of societies emerged as a result of land reclamation? These questions are addressed through a comparative historical analysis of two cases of land reclamation in the medieval period: the peat lands of Holland (the Netherlands) and the Po Valley plains (Northern Italy). In the paper it is shown that medieval land reclamation led to the emergence of two very divergent societies, characterised by a number of different configurations in; (a) power and property structure, (b) modes of exploitation, (c) economic portfolios, and (d) commodity markets. In the final section, a further question is considered. To what extent was either of these societies inherently better configured to negate the potentially disastrous effects of land reclamation on the natural environment? In the conclusion it is argued that more ‘equitable’ and ‘freer’ pre-industrial societies were better placed to deal with the consequences of environmental degradation than those marked by polarisation and repression – even when those polarised societies made recourse to capital investment in technology.

KEYWORDS

Italy, Holland, Po Valley, medieval, reclamation, colonisation, societies, environment, flooding

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Land reclamation is the process by which people bring ‘unused’ or ‘waste’ land into ‘productive’ use.¹ In the pre-industrial era, this meant the assarting of woodlands, the clearing of bushes, the development of irrigation systems, or the drainage of wetlands, in order to create new land for cultivation and settlement. Although a slight simplification of a diverse process, there were two great periods of land reclamation in pre-industrial Europe. The first was from roughly the eleventh to the thirteenth centuries,² and went hand-in-hand with intense and sustained demographic growth³ and the formalisation of signorial lordships and the manorial system.⁴ At times, lords could invest heavily in marshland colonisation activity.⁵ In some parts of Western Europe, rural people were forced into new fortified settlements (the *incastellamento* process) by lords looking to secure territorial expansion through a group of colonists.⁶ Indeed, the castle and reclamation activity have frequently gone together in the literature.⁷ Alternatively, rather than coercion, in certain regions such as the Campine area of Brabant or the Odenwald region of South-West Germany, settlement and reclamation was

¹ Inverted commas are used since even ‘waste’ lands had productive use for pre-industrial societies; R. Hoffman, Economic development and aquatic ecosystems in medieval Europe, *American Historical Review* 101 (1996) 631-69.

² Although undoubtedly land reclamation had already begun in certain parts of Western Europe to varying extents in the early-medieval period; P. Squatriti, *Water and Society in Early Medieval Italy, AD 400-1000*, New York, 1998; S. Rippon, *The Transformation of Coastal Wetlands: Exploitation and Management of Marshland Landscapes in North West Europe during the Roman and Medieval Periods*, London, 2000.

³ For example see the interpretations offered in H. Hallam, Population density in medieval Fenland, *Economic History Review* 14 (1961) 78-9; E. Millar & J. Hatcher, *Medieval England: Rural Society and Economic Change, 1086-1348*, London, 1978, 53-63.

⁴ See the events presented in G. Duby, *La société aux XIe et XIIe siècles dans la région mâconnaise*, Paris, 1953; C. Higounet, *Défrichements et villeneuves du Bassin parisien, XIe-XIVe siècles*, Bordeaux, 1980.

⁵ J. Galloway, Storm flooding, coastal defence and land use around the Thames Estuary and Tidal River c. 1250-1450, *Journal of Medieval History* 35 (2009) 171-88.

⁶ L. Feller, *Les abruzzes médiévales – territoire, économie et société en Italie centrale du IX au XII siècle*, Rome, 1998, chp. 6; P. Toubert, *Dalla terra ai castelli. Paesaggi, agricoltura e poteri nell'Italia medievale*, Turin, 1997; M. Bourin, *Villages médiévaux en Bas-Languedoc: genèse d'une sociabilité: Xe-XIVe siècle. 1, Du château au village: Xe-XIIIe*, Paris, 1987; I. Martin Viso, Riflessioni sull'incastellamento nella penisola iberica: la Castiglia dell'Ebro e la Transierra di Madrid, *Archeologia Medievale* 28 (2001) 83-110 ; B. Kreutz, *Before the Normans: Southern Italy in the Ninth and Tenth Centuries*, Philadelphia, 1991, 134-5.

⁷ R. Friedrich, Siedlungskundliche Studien zu einer Gruppe vor Burghügeln im Hunsrück, in: *Interdisziplinäre Studien zur europäischen Burgenforschung. Festschrift für Horst Wolfgang*, Bohme, 2005, 55-74; W. Janssen, Zur Differenzierung des früh- und hochmittelalterlichen Siedlungsbildes im Rheinland, in: W. Besch (Ed.), *Die Stadt in der europäischen Geschichte. Festschrift Edith Ennen*, Bonn, 1972, 277-325; G. Fournier, *Le château dans le France médiévale. Essai de sociologie monumentale*, Paris, 1978; W. Meyer, Rodung, Burg und Wirtschaft. Ein burgenkundlicher Beitrag zur mittelalterlichen Siedlungsgeschichte, in: M. Heyer-Boscardin (Ed.), *Burgen aus Holz und Stein*, Freiburg, 1979, 43-80.

stimulated instead by elite concession – from territorial lords and ecclesiastical institutions respectively.⁸

Some of the most significant earliest medieval investors in land reclamation were monasteries,⁹ although an earlier notion that the Cistercians were the principal medieval frontiersmen or pioneers has now been revised.¹⁰ Medieval reclamation in some areas also necessitated the development of new technologies.¹¹ In parts of the Iberian Peninsula, the cultivation of new lands depended on the capacity of societies to bring more water to arid environments – through wells, trenches, and aqueducts.¹² The expansion and proliferation of new urban markets also frequently stimulated the enclosure of wastes, as seen in medieval Devon.¹³ The ‘type’ of reclamation was also widely divergent. In Midland England, it was the open fields that were extended to the very furthest corners of the parishes, and sometimes into ‘marginal areas’ entirely unsuited for cultivation.¹⁴ Elsewhere in England and North-West France, however, reclamations took the form of private enclosures and consolidated blocks, often undertaken by ‘free’, upwardly mobile, peasant colonists.¹⁵ In other places such as the Florentine *contado* of medieval Tuscany, land reclamation was linked to urban consolidation of property and led to the expropriation of peasant ‘safety-nets’ such as the commons and the

⁸ J-H. Nitz, The church as colonist: the Benedictine Abbey of Lorsch and planned Waldhufen colonization in the Oldenwald, *Journal of Historical Geography* 9 (1983) 105-23; W. Steurs, La région entre Dommel et Peel (Brabant septentrional). Peuplement rural, géographie politique et création de villes, 1200-1400 environ, *Revue Belge de Philologie et d'Histoire* 60 (1982) 791-808.

⁹ R. Magnusson, *Water Technology in the Middle Ages: Cities, Monasteries, and Waterworks after the Roman Empire*, Baltimore, 2001; J. Niermeyer, Het klooster Berne en de ontginning van de oostelijke Meijerij omstreeks 1200, *Agronomisch-Historisch Bijdragen* 6 (1964) 113-28.

¹⁰ I. Alfonso, Cistercians and feudalism, *Past & Present* 133 (1991) 3-30; C. Berman, *Medieval Agriculture, the Southern French Countryside and the Early Cistercians: a Study of Forty-Three Monasteries*, Philadelphia, 1986, 5-10; R. Comba, I cistercensi fra città e campagna nei secoli XII e XIII. Una sintesi mutevole di orientamenti economici e culturali nell'Italia nord-occidentale, *Studi Storici* 26 (1985) 237-61; W. Janssen, Zisterziensische Wirtschaftsführung am Niederrhein. Das Kloster Kamp und seine Grangien im 12.-13. Jahrhundert, in: W. Janssen & D. Lohrmann (Eds), *Villa, Curtis, Grangia: Landwirtschaft zwischen Loire und Rhein von der Romerzeit zum Hochmittelalter*, Munich, 1983, 205-11.

¹¹ P. Squatriti (Ed.), *Working with Water in Medieval Europe. Technology and Resource-Use*, Leiden, 2000.

¹² T. Glick, Hydraulic technology in Al-Andalus', in: S. Jayyusi (Ed.), *The Legacy of Muslim Spain*, Leiden, 1992, 974-86.

¹³ H. Fox, The chronology of enclosure and economic development in medieval Devon, *Economic History Review* 28 (1975) 181-202.

¹⁴ S. Oosthuizen, *Landscapes Decoded: the History of Cambridgeshire's Medieval Fields*, Hatfield, 2006, 51.

¹⁵ B. Roberts, A study of medieval colonisation in the Forest of Arden, Warwickshire, *Agricultural History Review* 16 (1968) 101-13; A. Chédeville, Un défrichement en Bretagne à la fin du XIe siècle: histoire économique et géographie féodale, in: J-M. Duvoisquel & E. Thoen (Eds), *Peasants and Townsmen in Medieval Europe. Studia in honorem Adriaan Verhulst*, Ghent, 1995, 397-428; J-F. Duval, Métallurgie et défrichement en forêt de Paimpont au Moyen Age, *Annales de Bretagne et des Pays de l'Ouest*, 107 (2000) 7-24.

establishment of new sharecropping farms.¹⁶ Frequently developments such as these brought protest from the village communities still using and benefiting from the ‘wastes’.¹⁷ The later part of this period also saw the first major attempts to colonise new ‘Slavic’ frontiers east of the River Elbe.¹⁸ The second phase of reclamation occurred roughly in the transition from the late-medieval to the early modern period, and instead went hand-in-hand with urban financial investment into new land – often ‘winning’ land back from the sea in the form of polders.¹⁹ Wealthy merchants and commercial elites invested high amounts of capital into these enterprises.²⁰

Thus, pre-industrial land reclamation now has a long historiography (particularly for Europe), but still the focus of the research remains somewhat problematic. Scholars have honed in on two questions – how and why reclamation happened - which has meant that the literature has often approached reclamation through frameworks of technological innovation, demographic pressure, or market integration. It is not in the objectives of this paper to discuss any potential flaws in these frameworks. Instead it shall simply be said that this focus on the ‘hows’ and ‘whys’ of colonisation has obscured research on an equally fascinating question: what were the consequences of pre-industrial land reclamation? To what extent did the colonisation of new lands and territories create structural changes to the social order in the pre-industrial period? Put simply, what kinds of societies emerged as a result of land reclamation? Furthermore, is it possible to assess which of these new societies were configured for success (able to give the greatest amount of prosperity and well-being to the largest section of its inhabitants), and which were ones were bound for stagnation or failure? These questions are addressed in this paper by recourse to comparative historical analysis of two cases of land reclamation across a large part of the medieval period (c. 800- c.1500): the peat lands of Holland (the Netherlands) and the plains of the Po Valley (Northern Italy). Land

¹⁶ C. de la Roncière, Rentabilité, bien commun, écologie. La forêt communale de San Gimignano, in: *Milieux naturels, espaces sociaux. Études offertes à Robert Delort*, Paris, 1997, 131-9.

¹⁷ C. Dyer, Conflict in the landscape: the enclosure movement in England, 1220-1349, *Landscape History* 28 (2006) 21-33.

¹⁸ A classic work on this being R. Bartlett, *The Making of Europe: Conquest, Colonization, and Cultural Change, 950-1350*, London, 1993. Also see H. Aubin, Medieval society in its prime: the lands east of the Elbe, in: J. Clapham & E. Power (Eds), *The Cambridge Economic History of Europe: Agrarian Life in the Middle Ages*, i, Cambridge, 1941, 361-97.

¹⁹ Two important works being J. Richards, *The Unending Frontier: an Environmental History of the Early Modern World*, Berkeley, 2003; S. Ciriaco, *Acque e agricoltura. Venezia, l’Olanda e la bonifica europea in Età Moderna*, Milan, 1994, esp. 208-42.

²⁰ C. Dekker & R. Baetens, *Geld in het water. Antwerps en Mechels kapitaal in Zuid-Beveland na de stormvloeden in de 16^{de} eeuw*, Hilversum, 2010, 219-25; R. Morera, Environmental change and globalization in seventeenth-century France: Dutch traders and draining of French wetlands (Arles, Petit Poitou), *International Review of Social History* 55 (2010) 79-101.

reclamation in both these areas has been addressed quite significantly in past literature – though far more extensively for medieval Holland than for the Po Valley.²¹

Through the course of the paper it is shown that in both these areas, medieval land reclamation led to the emergence of two very divergent societies, characterised by a number of different constellations in (a) power and property structure, (b) modes of exploitation, (c) economic portfolios, and (d) commodity markets. In the final section, a further question is considered: to what extent was either society better set up to negate potentially disastrous effects of land reclamation on the natural environment? A wealth of recent literature has made the point that actually ‘natural disasters’ have their roots in human decision-making.²² Following that strand of thinking, this paper considers to what extent environmental degradation can be avoided through the arrangement of societal constellations rather than mere application of technology or finance.

SUITABILITY AND LIMITATIONS OF THE COMPARATIVE APPROACH

Making systematic comparisons between regions in the discipline of history is an effective tool for emphasizing distinct features of societies, but only when the comparison is a fair one. Before entering into the material on medieval reclamation, a note must be made on the appropriateness of the comparative context chosen.

The main point of suitability for this comparison is that both regions had similar (though not exactly the same) chronologies for the development of land reclamation. A basic point here is that at the beginning of the research period (i.e. 800CE), both regions were characterised by high levels of ‘wasteland’. Medieval reclamation of the Po Valley began slightly earlier than in the marshes of Holland; written and archaeological sources suggest forest clearance had already begun in the late eighth century on the plains, while reclamation of the Holland peat lands took off after 900. It must be acknowledged, however, that prior to this reclamation there were slight differences in the extent to which the two areas had been

²¹ Indeed, land reclamation did not feature prominently in the seminal for Italian landscape studies; E. Sereni, *History of the Italian Agricultural Landscape*, trans. R. Litchfield, Princeton, 1997. A loose collection of papers addressed the basic theme of water management and land reclamation for both Northern and Southern Europe, but still a systematic comparative analysis was not performed; see E. Crouzet-Pavan & J-C. Maire Vigueur (Eds), *Water Control in Western Europe, Twelfth-Sixteenth Centuries (Proceedings Eleventh International Economic History Congress)*, Milan, 1994.

²² T. Steinberg, *Acts of God: the Unnatural History of Natural Disaster in America*, Oxford, 2006; J. Diamond, *Collapse: How Societies Choose to Fail or Succeed*, New York, 2005; P. Blaikie, B. Wisner, T. Cannon & I. Davis, *At Risk: Natural Hazards, People’s Vulnerability and Disasters*, London, 1994; C. Pfister & C. Mauch, *Natural Disasters, Cultural Responses: Case Studies Towards a Global Environmental History*, Lexington, 2009; Also the classic A. Sen, *Poverty and Famines. An Essay on Entitlement and Deprivation*, Oxford, 1988.

exploited. Up until the tenth century, the Holland marshes were almost entirely an inhospitable wasteland, where barely any cultivation or settlement was attempted or desirable.²³ Roman and early-medieval settlement and cultivation had remained inland where the soil was more conducive to the emergence of arable demesne farming.²⁴ There was a level of early-medieval Frisian settlement in areas now comprising parts of North Holland (West Frisia), but this paper only focuses on the later settlement of the marsh lands in Central and South Holland.²⁵ The only habitation in Central and South Holland in the Carolingian period limited itself to the peat lands behind the sandy ridges and the clay-soils formed along the river mouths.²⁶ Thus the Holland peat reclamations which began from the tenth century were made almost entirely on a 'blank canvas'. The Po Valley, however, had known more intensive exploitation, including arable farming during the Roman period.²⁷ Indeed, investments were made into major hydraulic works to control the flow of water in the Po Valley and to protect the arable lands.²⁸ The state had a vested interest in this because it looked to widen its tax base; therefore employing coercive measures on the peasantry in order to use their labour for water management tasks.²⁹

Nonetheless, eventually the transition from the Roman into the early medieval period brought with it a collapse of the hydrological systems in the Po Valley, and a retraction in the cultivable and settled area.³⁰ The *Fosse Augusta*, a canal which had been dug to transport water from the Po River into the lagoon of Ravenna, was not navigable by the sixth century.³¹ The Po Valley experienced widespread reforestation and re-establishment of marshes, which created an economy reliant on the pasture of pigs and hunting and fishing in the marshes –

²³ B. van Bavel, *Manors and Markets: Economy and Society in the Low Countries, 500-1600*, Oxford, 2010, 40.

²⁴ P. Henderikx, *De beneden-delta van Rijn en Maas: landschap en bewoning van de Romeinse tijd tot ca. 1000*, Hilversum, 1987, 81-114.

²⁵ On the different settlement trajectory of North Holland see W. TeBrake, Ecology and economy in early medieval Frisia, *Viator* 9 (1978) 1-30; J. Besteman, North Holland AD 400-1200: turning tide or tide turned?, in: J. Besteman, J. Bos & H. Heidinga (Eds), *Medieval Archaeology in the Netherlands. Studies Presented to H.H. van Regteren Altena*, Assen, 1990, 91-120.

²⁶ W. van Es, H. Sarfatij & P. Woltering (Red.), *Archeologie in Nederland. De rijkdom van het bodemarchief*, Amersfoort, 1988, 95.

²⁷ A. Zarpellon, *Verona e l'agro veronese in età romana*, Verona, 1954, 98-9; F. Sartori, Verona romana. Storia politica, economica, amministrativa, in: *Verona e il suo territorio*, i, Verona, 1960, 223.

²⁸ Squatriti, *Water*, 68-9.

²⁹ P. Leveau, Mentalité économique et grands travaux hydrauliques: le drainage du lac Fucin. Aux origines d'un modèle, *Annales: ESC* 48 (1993) 3.

³⁰ V. Fumagalli, L'agricoltura durante il medioevo. La conquista del suolo, in: A. Berselli (Ed.), *Storia dell'Emilia Romagna*, i, Imola, 1976, 465-6.

³¹ P. Fabbri, *Il Padenna: l'uomo e le acque nel ravennate dall'antichità al medioevo*, Ravenna, 1975, 16.

exploited through systems of common rights.³² All major attempts to introduce land clearance policies or dike building ended,³³ and the maintenance of water management systems was more difficult with severe population decline that accompanied the breakdown of the Roman political and economic structures.³⁴ Many settled sites were abandoned.³⁵ Roman centuriation tracks are often found under palustrine deposits.³⁶ Thus, although the Po Valley had known a previous history of more intensive exploitation than the Holland marshes, the retraction in cultivation in the early Middle Ages meant that both areas c. 800 were characterised by large amounts of wasteland, allowing for a full transformation of the landscape through reclamation. Nonetheless, we must at least acknowledge the fact there were some structural differences between the Po Valley and Holland before the great reclamation phase starting in the ninth and tenth centuries: it is simply argued in this paper that the differences were strengthened, enhanced and made more significant through the reclamation process.

There are other basic strengths to this comparison. Both areas are flat and both have always had (and still do have) problems of 'too much water'. Both areas also had similarities with the style of reclamation performed, particularly from the high Middle Ages onwards. Indeed, a frequent feature found in the marshes of the Po Valley and Holland was the pattern of long narrow strips, along which colonists reclaimed in a linear and standardised fashion (although more pronounced in Holland). One could argue that there was some difference in the 'type of waste' being reclaimed. In Holland, it was almost always the drainage of marshland, while in the Po Valley the 'type of waste' came in two phases of colonisation. Much of the early-medieval reclamations were connected to the clearing of bush and woodland, but from the high Middle Ages onwards, drainage of the marshes became more of a dominant feature.

As with any comparative research, however, there are some methodological issues which need to be overcome or limited. One such issue is the environmental and physical

³² M. Montanari, *L'alimentazione contadina nell'alto Medioevo*, Naples, 1979, 34-5, 48-9, 267-70; P. Racine, *Poteri medievali e percorsi fluviali nell'Italia padana*, *Quaderni Storici* 61 (1986) 9-32.

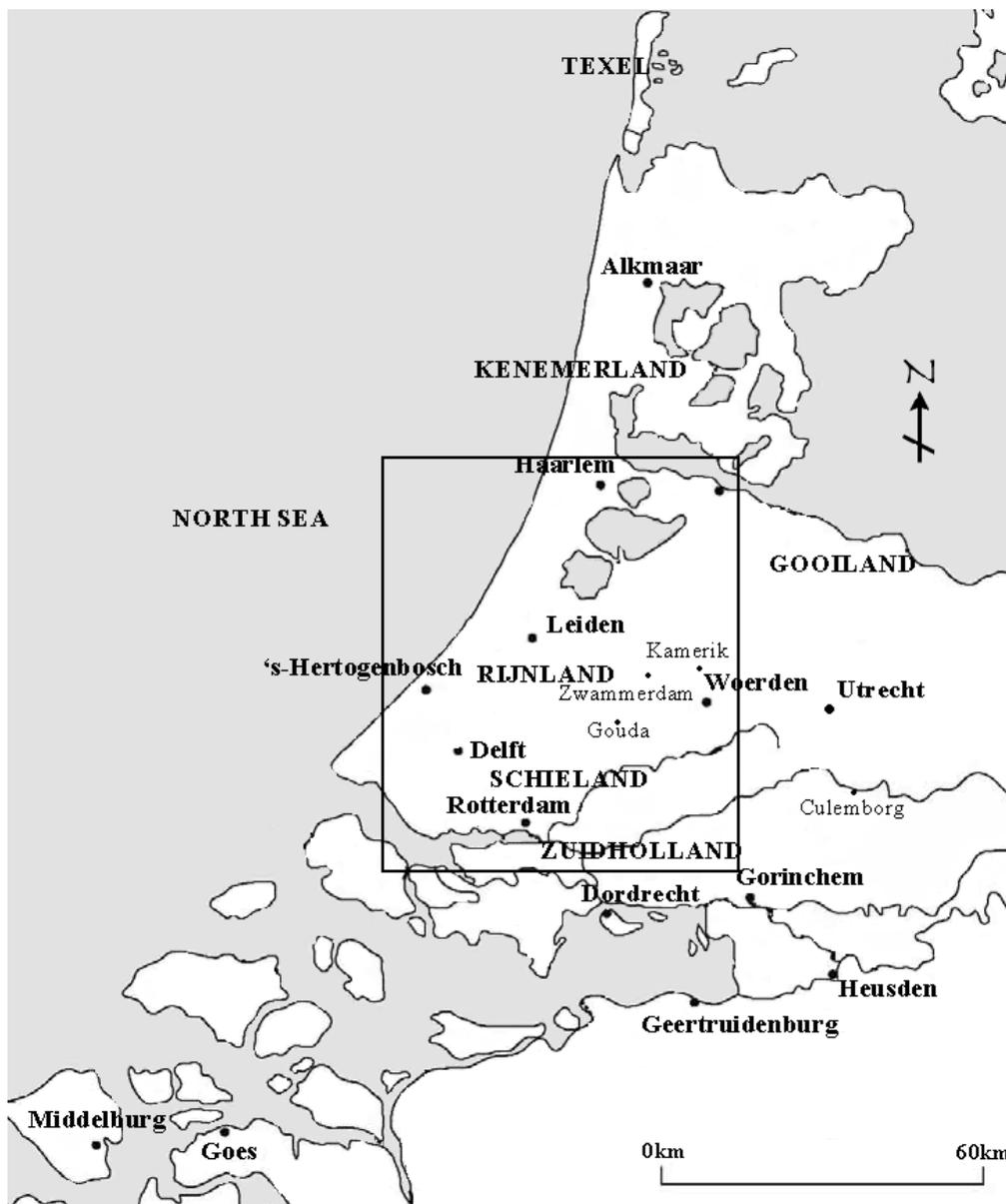
³³ R. Magnusson & P. Squatriti, 'The technologies of water in medieval Italy', in: *Working with Water*, 217-66.

³⁴ G. Pinto, *Dalla tarda antichità alla metà del XVI secolo*, in: L. Del Pantà, M. Livi-Bacci, G. Pinto & E. Sonnino (Eds), *La popolazione italiana dal Medioevo a oggi*, Rome, 1996, 27. Although there is dispute over the extent of early-medieval population decline; see E. Lo Cascio & P. Malanima, *Cycles and stability. Italian population before the demographic transition (225 BC–AD 1900)*, *Rivista di Storia Economica* 21 (2005) 12-6.

³⁵ F. Saggioro, *Late antique settlement on the plain of Verona*, in: W. Bowden, L. Lavan & C. Machado (Eds), *Recent Research on the Late Antique Countryside*, Leiden, 2004, 509-25.

³⁶ A. Veggiani, *Degrado ambientale e dissesti idrogeologici indotti dal deterioramento climatico nell'Alto medioevo in Italia. I casi riminesi*, *Studi Romagnoli* 34 (1983) 123-46; C. Ravazzi, *Analisi polliniche del riempimento del fossato. Dati paleoecologici sulle variazioni ambientali*, in: B. Brea & M. Cremaschi (Eds), *La terramara di Poviglio*, Reggio Emilia, 1989, 31-6.

differences between the two areas selected. The Po Valley is a larger geographical area than South and Central Holland, and as a result has more diverse environmental conditions. The conditions found in the Duchy of Parma, for example, were not the same as that of the Venetian Terraferma. In order to limit this problem, this paper restricts itself only to the central ‘core’ area of the plains comprising (by the early modern period) the Duchy of Parma and Piacenza, the Duchy of Modena, the *contadi* of Mantova and Cremona, and the lands around Verona, Padova, and Ferrara, but not including the eastern parts of the Republic of Venice or the Venetian Terraferma, the State of Milan, or the lands south of Bologna.



Holland by c.1500 (area of study highlighted)³⁷

³⁷ Own drawing. Boundaries based on those found in P. Hoppenbrouwers, *Town and country in Holland, 1300-1550*, in: S. Epstein (Ed.), *Town and Country in Europe, 1300-1800*, Cambridge, 2001, ?

The Po Valley in Northern Italy by c.1500 (area of study highlighted)³⁸



³⁸ Own drawing. Boundaries based on those found in C. Belfanti, Town and country in Central and Northern Italy, 1400-1800, in: *Town and Country in Europe*, 293.

Another issue that remains is more related to the environmental context in which reclamation was performed. Indeed, in this article it is suggested that it was the organisation of society itself which could lead to societal resilience or vulnerability against environmental crises and degradation (perhaps caused by land reclamation). Of course, this necessitates a similar level or number of exogenous environmental pressures in both regions to create a fair comparison. If climatic conditions were far worse in either Northern or Southern Europe, for example, this would make the comparative approach taken in this paper far weaker, and this is a pressing point given recent literature has tried to emphasize how distinctive the ‘Mediterranean World’ was – particularly in reference to climatic variability.³⁹ Much of this issue revolves around the so-called ‘Little Ice Age’ which represented a global cooling in temperatures in the mid sixteenth century⁴⁰ following the ‘warming period’ of the high Middle Ages.⁴¹ Indeed, in general it has been suggested that Northern Europe bore the brunt of the terrible and unpredictable weather conditions much more than the South – particularly in Scandinavia.⁴² However, in response to this, three things must be made clear. First of all, data on climate for Northern Europe at the moment far exceeds that available for Southern Europe.⁴³ Second, the much cited divergence in tree growth time series (tree growth depressed around 1550 in Northern Europe, but not in the Mediterranean)⁴⁴ is dubious evidence because in fact the trees react positively to wet springs and summers – counteracting the negative consequences of the cold weather.⁴⁵ Third, very recent research is now showing

³⁹ Thinking in particular of P. Horden & N. Purcell, *The Corrupting Sea: a Study of Mediterranean History*, London, 2000, 176. Also on a related theme; A. Grove & O. Rackham, *The Nature of Mediterranean Europe: an Ecological History*, New Haven, 2001.

⁴⁰ Although some have argued for a long-term cooling and a ‘long’ Little Ice Age starting from the early fourteenth century; see C. Pfister, G. Schwarz-Zanetti & M. Wegmann, Winter severity in Europe: the fourteenth century, *Climatic Change* 34 (1996) 103.

⁴¹ The original work on this being the classic E. Le Roy Ladurie, *Histoire du climat depuis l’an Mil*, Paris, 1967.

⁴² B. Campbell, Nature as historical protagonist: environment and society in pre-industrial England, *Economic History Review* 63 (2010) 310; K. Briffa, P. Jones, F. Schweingruber & T. Osborn, Influence of volcanic eruptions on Northern Hemisphere summer temperatures over the past 600 years, *Nature* 393 (1998) 450; M. Kalela-Brundin, *Climate Information from Tree Rings*, Umeå, 1999, 15-6, 199-203; L. Leijonhufvud, *Grain Tithes and Manorial Yields in Early Modern Sweden: Trends and Patterns of Production and Productivity c.1540-1680*, Uppsala, 2001, 255-8.

⁴³ G. Alfani, Climate, population, and famine in Northern Italy: general tendencies and Malthusian crisis, ca. 1450-1800, *Annales de Démographie Historique* 2 (2010) 23-4.

⁴⁴ P. Kuniholm, Long tree-ring chronologies for the Eastern Mediterranean, in: S. Demirci, A. Ozer & G. Summers (Eds), *Archaeometn 94*, Ankara, 1994, 401-9.

⁴⁵ M. Baillie, *A Slice through Time: Dendrochronology and Precision Dating*, London, 1996; B. Campbell, Cause and effect? Physical shocks and biological hazards’, in: S. Cavaciocchi (Ed.), *Le interazioni fra economia e ambiente biologico*, Florence, 2010, 13-32; C. Loehle, A 2000-year global temperature reconstruction based on non-tree ring proxies, *Energy & Environment* 19 (2007) 1049-58.

that the Mediterranean parts of Europe were equally hit by adverse climatic conditions and the differences only lay in the precise timing of events such as severe rainfall.⁴⁶ Although some divergence in extreme climatic conditions experienced in the Po Valley and Holland likely took place, it is now seemingly unlikely that these differences were substantial. This legitimises a comparative approach giving more precedence to intrinsic societal constellations than exogenous conditions.

MEDIEVAL RECLAMATION AND THE EMERGENCE OF DIVERGENT SOCIETIES, c.800-c.1500

Power and property structure

The reclamation of the peat lands of Holland from c. 900 onwards led to the emergence of a highly free and equitable society; especially when placed against the medieval Po Valley. In fact, the reclamation context led Holland to become one of the most egalitarian societies within medieval Western Europe. One of the realities of land colonisation was that it was a difficult and arduous process that required a substantial amount of labour. In order to organise that labour, elite interest groups interested in land reclamation granted favourable concessions and freedoms to colonising farmers and peasants. In the Low Countries, territorial lords managed to usurp complete regalian rights over vast expanses of wasteland after the collapse of the Carolingian Empire in the tenth century.⁴⁷ Rather than reclaiming these waste lands to economically exploit them directly, they looked to colonise these new lands to broaden their territorial area, thereby expanding their tax base.

The consequences of this process were significant for large parts of Holland from the tenth century onwards. Both the Bishop of Utrecht and the Count of Holland (but sometimes also local lords) lured colonists to the scarcely-inhabited marshes by offering personal freedoms from serfdom and full peasant property rights to the land.⁴⁸ The rural people that reclaimed the Holland peat lands between the tenth and fifteenth centuries barely knew of the

⁴⁶ See the recent superb G. Alfani, *Calamities and the Economy in Renaissance Italy: the Grand Tour of the Horsemen of the Apocalypse*, trans. C. Calvert, Basingstoke, 2013. Also D. Camuffo & S. Enzi, Reconstructing the climate of Northern Italy from archive sources, in R. Bradley & P. Jones (Eds), *Climate since A.D. 1500*, London, 1992, 143-54; L. Mariani, Clima ed agricoltura in Europa e nel bacino del Mediterraneo dalla fine dell'ultima glaciazione, *Rivista di Storia dell'Agricoltura* 46 (2006) 3-42; M. Pavese & G. Gregori, An analysis of six centuries (XII through XVII century A.D.) of the climatic records from the upper Po Valley, in W. Schröder (Ed.), *Historical Events and People in Geosciences*, Frankfurt am Main, 1985, 185-220.

⁴⁷ B. Lyon, Medieval real estate developments and freedom, *American Historical Review* 63 (1957) 51.

⁴⁸ H. van der Linden, *De cope: bijdrage tot de rechtsgeschiedenis van de openlegging der Hollands-Utrechtse laagvlakte*, Assen, 1956, 160-82; Het platteland in het Noordwesten met de nadruk op de occupatie circa 1000-1300, *Algemene Geschiedenis der Nederlanden* 2 (1982) 48-82.

manor or signorial dues,⁴⁹ although admittedly recent archaeological evidence has pointed to the existence of some limited manorial *hoven* from as early as the ninth century.⁵⁰ In fact, many of the colonists in the Holland peat-lands originated from heavily manorialised societies and looked to escape the constrictions of serfdom further inland.⁵¹ Each colonist received a standardised strip of land of their own but also enjoyed favourable jurisdictions over the waste (*recht van opstrek*) which allowed all colonists to reclaim as much of the marshes as they wanted by extending their linear plots until they met up with a natural boundary or were stopped by another property (see a classic structure in the figure below).⁵² The same process can be traced for the Frisian and German coastal marshes too.⁵³



⁴⁹ J. de Vries & A. van der Woude, *The First Modern Economy: Success, Failure and Perseverance of the Dutch economy, 1500-1815*, Cambridge, 1997, 159-65.

⁵⁰ M. Dijkstra, *Rondom de mondelingen van Rijn en Maas*, Leiden, 2011, 291.

⁵¹ Van Bavel, *Manors and Markets*, 86-7.

⁵² J. de Vries, *The Dutch Rural Economy in the Golden Age, 1500-1700*, New Haven, 1974, 56.

⁵³ K. Brandt, Die mittelalterliche Siedlungsentwicklung in der Marsch von Butjadingen (Landkreis Wesermarsch). Ergebnisse archaologischer Untersuchungen, *Siedlungsforschung* 2 (1984) 123-46; P. Hoppenbrouwers, Grondgebruik en agrarische bedrijfsstructuur in het Oldambt na de vroegste inpolderingen (ca.1630–ca.1720), in: J. Elerie & P. Hoppenbrouwers (Eds), *Het Oldambt. Nieuw visies op geschiedenis en actuele problemen*, ii, Groningen, 1991, 73-95.

Standardised ‘cope’ reclamations north of Woerden (border between modern-day provinces of Holland and Utrecht)⁵⁴

Through this reclamation context, there also developed a peasant society characterised by highly egalitarian distribution of property. Landownership was small-scale and in the hands of peasant farmers themselves, with agriculture in the initial phases highly unspecialised.⁵⁵ Aristocratic landownership was minimal; only 5-10% of the total area in the late Middle Ages.⁵⁶ This free peasant property structure remained in place from the moment that reclamation took off up to the 1500s.⁵⁷ Even by 1560 farms of more than 20 hectares were scarce.⁵⁸ It was only in the late sixteenth century that peasant landownership gave way to urban capital.⁵⁹ After 1500, the free peasant character of Holland was lost through urban expropriation of rural lands, and disappeared further through a new wave of polder reclamations initiated by urban capital investment from powerful institutions and wealthy burgers.⁶⁰

To some extent this transition from small-peasant farming society to one more dominated by urban elite investment and landownership in the sixteenth century was facilitated by the favourable institutional framework and flexible land markets which emerged through the reclamation context. In many parts of the pre-industrial world, the transfer of land was complicated and hindered by overlapping signorial, ecclesiastical, communal, and kin-based rights and claims. In medieval Western Europe, it would be incorrect to even speak of

⁵⁴ Topografische Militaire Kaart, Utrecht Stad, 1849 taken from <www.watwaswaar.nl>.

⁵⁵ B. van Bavel, Rural development and landownership in Holland, c.1400-1650, in: O. Gelderblom (Ed.), *The Political Economy of the Dutch Republic*, Farnham, 2009, 167-96.

⁵⁶ A. Janse, *Ridderschap in Holland. Portret van een adellijke elite in de late Middeleeuwen*, Hilversum, 2001, 129-39. On the weaknesses of the Holland aristocracy see H. van Nierop, Het Quade Regiment: de Hollandse edelen als ambachtsheren, 1490-1560, *Tijdschrift voor Geschiedenis* 93 (1980) 433, 443.

⁵⁷ P. Hoppenbrouwers, Mapping an unexplored field. The Brenner debate and the case of Holland, in: P. Hoppenbrouwers & J.L. van Zanden (Eds), *Peasants into Farmers? The Transformation of Rural Economy and Society in the Low Countries (Middle Ages-19th Century) in the Light of the Brenner Debate*, Turnhout, 2001, 41-66.

⁵⁸ B. van Bavel, P. van Cruyningen & E. Thoen, The Low Countries, 1000-1750, in: B. van Bavel & R. Hoyle (Eds), *Social Relations, Property and Power. Rural Economy and Society in North-Western Europe, 500-2000*, Turnhout, 2010, 183.

⁵⁹ By 1560 urban landownership in Holland comprised 30-35% of the total area; Van Bavel, Rural development, 181-2. Supported by estimates in P. Hoppenbrouwers, Van waterland tot stedenland: de hollandse economie, ca.975-ca.1570, in: T. de Nijs & E. Beukers (Eds), *Geschiedenis van Holland*, i, Hilversum, 2002, 146.

⁶⁰ C. Baars, *De geschiedenis van de landbouw in de Beijerland*, Wageningen, 1973, 81-7, 111-7; Ciriacocono, *Acque e agricoltura*, 208-42; M. van Tielhof & P. van Dam, *Waterstaat in stedenland. Het hoogheemraadschap van Rijnland voor 1857*, Utrecht, 2006, 152-79.

‘landownership’: ownership was not over ‘land’ per se but a complicated bundle of use rights and obligations.⁶¹ Tallages, recognition fees, and obligations blocked the transfer of land – particularly in societies slow to cast off the shackles of feudalism.⁶² The lack of a feudal tradition from the point of reclamation in Holland favoured the easy transfer of land when urban institutions and burghers began to expropriate peasant holdings in the sixteenth century.⁶³ Taxes on the sale of land did not exist in Holland and any that were implemented (such a ‘Twentieth Penny’ tax on immovable goods transfer in 1569) were abolished quickly after complaints.⁶⁴

In contrast to medieval Holland, the reclamation of the Po Valley was carried out through a context of coercion and repression, and furthermore, the reclamation process perpetuated and crystallised coercive structures. Reclamation also contributed to widespread social and economic polarisation. The process of bringing more land into cultivation in the Po Valley can be divided into three clear phases. First, reclamation initiated under a context of the earliest manors and large landownership from the late eighth century, second, reclamation connected to the crystallisation of signorial lordships between the tenth and twelfth centuries, and third, land clearances performed under a context of coercive urban jurisdiction in the late Middle Ages.

Earliest evidence of attempts to clear the forests and drain the wetlands is mentioned in charters from the late eighth century, for example, around Carpi in Emilia-Romagna.⁶⁵ Archaeological evidence also indicates the emergence of new settlements in marshes and woodlands around Verona in the ninth century.⁶⁶ Indeed, the settlement of Bovolone, for example, was only made possible by the digging of canals that separated the settlement from the surrounding swamps.⁶⁷ This sort of early-medieval reclamation was conducted through,

⁶¹ B. van Bavel & R. Hoyle, Introduction: social relations, property and power in the North Sea area, 500-2000, in *Social Relations*, 12.

⁶² P. Schofield, *Peasant and Community in Medieval England, 1200-1500*, Basingstoke, 2003, 65-9; L. Genicot, *L'économie rurale Namuroise au Bas Moyen Age*, iii, Louvain, 1982, 78-9; E. Thoen, *Landbouweconomie en bevolking in Vlaanderen gedurende de late Middeleeuwen en het begin van de moderne tijden. Testregio: de kasselrijen van Oudenaarde en Aalst, einde 13de–eerste helft van de 16de eeuw*, Ghent, 1988, 411.

⁶³ De Vries & Van der Woude, *First Modern Economy*, 169-75.

⁶⁴ F. Grapperhuis, *Belasting, vrijheid en eigendom. Hoe belastingheffing leidde tot meer zeggenschap voor burgers en meer eenheid tussen staten, 517-1787*, Amsterdam, 1989, 146-91.

⁶⁵ C. Brühl (Ed.), *Codice diplomatico longobardo*, iii, Rome, 1973, no. 41.

⁶⁶ F. Saggiaro, Insedimenti, proprietà ed economie nei territori di pianura tra Adda e Adige, in: G. Brogiolo, A. Arnau & M. Valenti (Eds), *Dopo la fine delle ville: le campagne dal VI al IX secolo*, Mantova, 2005, 91-4.

⁶⁷ F. Saggiaro, A. Mancardi, G. di Anastasio, C. Malaguti & L. Salzani, Insedimento ed evoluzione di un castello della Pianura Padana (Bovolone VR) (1995-2002), Località Crosare e Via Pascoli, *Archeologia Medievale* 32 (2004) 169-86.

but also reinforced, large landownership structures and the manorial system.⁶⁸ Bipartite estates appear in charters from 740 onwards with demesnes clearly distinguished from tenant plots.⁶⁹ This was the basic economic and socio-political framework for the development of the land clearance process. Lords and especially powerful ecclesiastical institutions entirely controlled the reclamation process – and sometimes were involved in disputes over the ownership of wastes. The Silva de Ostilia, a large expanse of swamps and woods between Mantova, Padua, and Verona, became the object of a dispute between the monastery of Nonantola and the Count of Verona in the early ninth century – a dispute which the monastery won.⁷⁰ Upon securing the right of possession, the monastery instigated land clearance by granting standardised farms of around 100 x 1500 metres to colonists with fixed contracts of 29 years, who were ordered to clear the land and build and maintain drainage systems.⁷¹ Inventories of ninth-century manors show how initial reclamation in the Po Valley was affirmed through large estates.⁷² The *polyptych* of the monastery of S. Giulia in Brescia reveals that from c.800-1000, the forest belonging to the *curtis* became substantially smaller, supporting 2000 pigs instead of 4000.⁷³ Further *polyptychs* of the monastery of S. Colombano of Bobbio show the replacement of woodland for arable fields in the ninth century: woodland was cleared for 32 new farms in 883.⁷⁴ In the lands granted to the monastery of S. Benedetto

⁶⁸ On large-landowner dominance over wastes see C. Fasoli, *Monasteri padani*, in: *Monasteri in alta Italia dopo le invasioni saracene e magiare (sec. X-XII)*, Turin, 1966, 189; V. Fumagalli, *Le origini di una grande dinastia feudale. Adalberto-Atto di Canossa*, Tübingen, 1971, 8-9; A. Castagnetti, La distribuzione geografica dei possessi di un grande proprietario veronese del secolo IX: Engelberto del fu Grimoaldo di Erbè, *Rivista di Storia dell'Agricoltura* 9 (1969) 22.

⁶⁹ C. Wickham, *Framing the Early Middle Ages: Europe and the Mediterranean, 400-800*, Oxford, 2004, 297-9; J-P. Devroey, *Contrats agraires et rapports de travail dans l'Europe carolingienne : unité et diversité*, in: A. Cortonesi, M. Montanari & A. Nelli (Eds), *Contratti agrari e rapporti di lavoro nell'Europa medievale*, Bologna, 2006, 27-64.

⁷⁰ E. Rossini, *Contributi alla storia dell'agricoltura veronese*, Verona, 1979, 37-42; C. Manaresi (Ed.), *I placiti del 'Regnum Italiae'*, i, Rome, 1955, 95-8.

⁷¹ A. Castagnetti, La pianura Veronese nel medioevo, in: G. Borelli (Ed.), *Un città e il suo fiume*, ii, Verona, 1977, 49; M. Baruzzi & M. Montanari, *Silva runcare. Storie di cose, di parole, di immagini*, in: B. Andreoli & M. Montanari (Eds), *Il bosco nel Medioevo*, Bologna, 1988, 101.

⁷² G. Pasquali, L'azienda curtense e l'economia dei secoli VI-XI, in: A. Cortonesi (Ed.), *Uomini e campagne nell'Italia medievale*, Rome, 2002, 19-20; P. Toubert, L'Italie rurale aux VIIIe-IXe siècles. Essai de typologie domaniale, in: *I problemi dell'Occidente nel secolo VIII*, i, Spoleto, 1973, 95-132.

⁷³ V. Fumagalli, Il paesaggio delle campagne nei primi secoli del Medioevo, in: B. Andreoli, V. Fumagalli & M. Montanari (Eds), *Le campagne italiane prima e dopo il Mille. Una società in trasformazione*, Bologna, 1985, 101; A. Andreoli & M. Montanari, *L'azienda curtense in Italia. Proprietà della terra e lavoro contadino nei secoli VIII-XI*, Bologna, 1983, 147-60.

⁷⁴ A. Castagnetti, M. Luzzati, G. Pasquali & A. Vasina (Eds), *Inventari altomedievali di terre, coloni e redditi*, Rome, 1979, 127-65.

in Polirone near Mantova in 1007, a number were clearly areas recently cleared – affirming large landownership.⁷⁵

As central authority collapsed in large parts of Western Europe, local and territorial lordships began to fill the vacuum in power.⁷⁶ Thus, already powerful lords and ecclesiastical institutions in the Po Valley used land reclamation to crystallise strengthened signorial dominion over tenants and property. As a result, land reclamation in the Po Valley expanded from the tenth century onwards.⁷⁷ All across the plains of Lombardy, new irrigation canals began to be constructed between the Adda and Serio Rivers.⁷⁸ New toponyms such as *Runco* or *Ronco* appear from the Latin ‘*runcare*’, and referring to uprooting of bushes and reclamation of swamps.⁷⁹ Through reclamation of new land, elite aristocratic landlords were able to confirm impositions on colonists – forcing them to dig and maintain canals.⁸⁰ Colonists were fined and lost usufruct rights if land went untilled.⁸¹ For example, the Bishop of Modena granted land to some families to ‘clear and work it’ but on the proviso that colonists failing to clear their portion after 2 years had to return the land and pay a fine of 20 imperial *solidi* per quarter of a hectare.⁸² Near Mantova, the monastery of S. Benedetto in Polirone forced rural communities to clear land near the Po River and repair dikes.⁸³ In a land grant from the same monastery, every inhabitant of Villabona had to build dikes to protect

⁷⁵ R. Rinaldi, C. Villani & P. Golinelli (Eds), *Codice diplomatico polironiano (961-1125)*, Bologna, 1993, no. 14.

⁷⁶ C. Wickham, Rural economy and society, in: C. La Rocca (Ed.), *Italy in the Early Middle Ages*, Oxford, 2001, 137; S. Reynolds, *Kingdoms and Communities in Western Europe, 900-1300*, Oxford, 1997, 101-54; T. Bisson, The Feudal Revolution, *Past & Present* 142 (1994) 6-42.

⁷⁷ F. Saggiaro, Insediamento e monasteri nella pianura veronese tra VIII e XIII secolo, in: R. Francovich & S. Gelichi (Eds), *Monasteri e castelli fra X e XI secolo. Il caso di San Michele alla Verruca e le altre ricerche storico-archeologiche nella Tuscia occidentale*, Florence, 2003, 178.

⁷⁸ F. Menant, *Campagnes lombardes au moyen age. L'économie et la société rurales dans la région de Bergame, de Crémone et de Brescia du Xe au XIIIe siècle*, Rome, 1993, 172-6, 183-93.

⁷⁹ F. Saggiaro, Ricognizioni, paesaggi ed esperienze di ricerca nei territori di pianura tra Veneto e Lombardia, in: N. Mancassola & F. Saggiaro (Eds), *Medioevo, paesaggi e metodi*, Padova, 2006, 79-81.

⁸⁰ V. Fumagalli, Precarietà dell'economia contadina e affermazione della grande azienda fondiaria nell'Italia settentrionale dall'VIII all'XI secolo, *Rivista di Storia dell'Agricoltura* 15 (1975) 19-21; A. Castagnetti, *La pieve rurale nell'Italia padana. Territorio, organizzazione patrimoniale e vicende della pieve veronese di San Pietro di Tillida dall'alto medioevo al secolo XIII*, Rome, 1976, 85-7.

⁸¹ F. Panero, *Terre in concessione e mobilità contadina. Le campagne fra Po, Sesia, e Dora Baltea (secoli XII e XIII)*, Bologna, 1984, 84-94; V. Fumagalli, L'evoluzione dell'economia agraria e dei patti colonici dall'alto al basso Medioevo. Osservazioni su alcune zone dell'Italia settentrionale, in: *Le campagne italiane*, 1032-3.

⁸² E. Vicini, *Regesto della Chiesa Cattedrale di Modena*, ii, Rome, 1936, no. 627.

⁸³ A. Castagnetti, *Le comunità rurali dalla soggezione signorile alla giurisdizione del comune cittadino*, Verona, 1983, 7.

their fields.⁸⁴ The abbey of Pomposa in 1156 imposed labour obligations on the inhabitants of Codigoro, which were linked to the excavation of new canals and dikes.⁸⁵ Lords used reclamation projects to move and settle whole communities into new areas, thereby strengthening their territorial presence.⁸⁶ Lords also took advantage of ancient communal and collective duties such as water management by reasserting them as signorial obligations – effectively imposing their will on collective organisation.⁸⁷

However, it would be wrong to frame reclamation as an entirely coercive and repressive process in the Po Valley. Rural communities did proceed occasionally through their own initiative, such as the repopulation of the area at Brescello near Reggio Emilia.⁸⁸ According to a chronicle, peasants tried to reoccupy land abandoned after the Lombard invasion.⁸⁹ Nonetheless, even this reclamation eventually came under the authority of a territorial lord, as the Marquis Adalberto-Atto was able to secure jurisdiction over the territory and force peasants to build a castle.⁹⁰ The imposition of lordly authority was not always simply accepted by submissive rural populations. Rural communities frequently strived for recognition of use rights to wastelands.⁹¹ Groups of fishermen at Pavia consistently tried to enforce rights of access to the Ticino River in the twelfth century.⁹² Rural

⁸⁴ P. Torelli (Ed.), *Regesto mantovano. Le carte degli Archivi Gonzaga e di Stato in Mantova e dei monasteri Mantovani soppressi (Archivio di Stato in Milano)*, i, Rome, 1914, 365-6.

⁸⁵ M. Zucchini, Di un documento pomposiano sulla laboreria, *Rivista di Storia dell'Agricoltura* 5 (1965) 95-101; R. Rinaldi, *La disciplina delle acque nell'Alto Medioevo: problemi e letture*, Bologna, 2000, 28-9.

⁸⁶ T. Bacchi, Conquista del territorio e modificazione dei modelli impeditive. Le aziende fondiarie nel Ferrarese (secoli XI-XII), in: *Le campagne italiane*, 144-9.

⁸⁷ F. Provero, Le corvées nelle campagne dell'Italia settentrionale, in: M. Bourin & P. Martinez Sopena (Eds), *Pour une anthropologie du prélèvement seigneurial dans les campagnes médiévales (Xie-XIVe siècles). Réalités et représentations paysannes*, Paris, 2004, 375-7; S. Bortolami, Comuni e beni comunali nelle campagne medioevali: un episodio della Scodosia di Montagnana (Padova) nel XII secolo, *Mélanges de l'École Française de Rome* 99 (1989) 560-1; G. Bognetti, Sulle origini dei comuni rurali con speciali osservazioni per territori milanese e comasco, in: S. d'Amico & C. Violante (Eds), *Studi sulle origini del comune rurale*, Milan, 1978, 143-50.

⁸⁸ A. Settia, *Castelli e villaggi nell'Italia padana*, Naples, 1984, 139-40, 255-6.

⁸⁹ Cronica sancti Genesii episcopi et antistitis Brizelli, in: G. Cappellenti (Ed.), *Le chiese d'Italia dalla loro origine ai nostri giorni*. Venice, 1859, 451.

⁹⁰ V. Fumagalli, *Le origini di una grande dinastia feudale. Adalberto-Atto di Canossa*, Tübingen, 1971, 23; F. Provero, Il sistema di potere carolingio e la sua rielaborazione nei comitati di Parma e Piacenza (secoli IX-XI), in: R. Greci (Ed.), *Studi sull'Emilia occidentale nel Medioevo: società e istituzioni*, Bologna, 2001, 43-64.

⁹¹ Menant, *Les chartes*, 239-40; V. Fumagalli, *Terra e società nell'Italia padana. I secoli IX e X*, Turin, 1974, 62-3.

⁹² E. Occhipinti, Fortuna e crisi di un patrimonio monastico e le sue grangie fra XII e XIV secolo, *Studi Storici* 26 (1985) 302-1; C-R. Bruhl & C. Violante (Eds), *Honorantie Civitatis Papiæ*, Tübingen, 1983, 20; M. Venditelli, Diritti ed impianti di pesca degli enti ecclesiastici Romani tra X e XIII secolo, *Mélanges de l'École Française de Rome. Moyen Age* 104 (1992) 407-8.

communities and lords also disputed the possession of reclaimed land.⁹³ For example, a confusing situation emerged in the late twelfth century at Pegognana, where land reclamation had begun on peasant initiative but thereafter completed by the monastery of S. Benedetto in Polirone.⁹⁴ Both parties asserted ownership rights over the new lands. Such moves towards evasion of lordly restrictions through land reclamation were the first steps towards the establishment of freedom charters and supposed self-rule of rural communities.⁹⁵

However, these peasant reclamation initiatives did not bring widespread freedoms or the ‘emancipation of the common man’ from the high Middle Ages onwards, as shown in certain regions from Bryce Lyon’s influential article.⁹⁶ Although signorial lordships and manorialism withered away very early in North and Central Italy, these old elements of rural repression were replaced by new forms of urban domination.⁹⁷ In Northern and Central Italy, the urban population doubled between 1000 and 1300 – a higher rate than elsewhere in Western Europe (except Holland and Flanders).⁹⁸ As these urban agglomerations grew in size, number and stature, the numbers of ‘non-productive’ or dependent citizens also grew.⁹⁹ Cities realised they had to (a) create direct explicit legal relationships with their hinterlands,¹⁰⁰ and (b) exploit these hinterlands more intensively. In that sense, urban institutions, governments and burghers became the new ‘feudal lords’ of the late Middle Ages and early modern period in Europe.¹⁰¹ This was not a sharp discontinuity with previous social and political organisation. A clear distinction between ‘urban’ and ‘rural’ elite interest groups was not always clear-cut; frequently rural *signori* with land and castles in the *contadi* were at the same

⁹³ C. Wickham, Land disputes and their social context in Lombard-Carolingian Italy, in: W. Davies & P. Fouracre (Eds), *The Settlement of Disputes in Early Medieval Europe*, Cambridge, 1986, 105-24.

⁹⁴ *Regesto mantovano*, i, 261-2.

⁹⁵ F. Panero, Signori e servi: una conflittualità permanente, in: M. Bourin, G. Cherubini & G. Pinto (Eds), *Rivolte urbane e rivolte contadine nell’Europa del Trecento: un confronto*, Florence, 2008, 305-21.

⁹⁶ Lyon, Medieval real estate developments.

⁹⁷ D. Waley, *The Italian City-Republics*, New York, 1988, 84-5.

⁹⁸ P. Malanima, Urbanisation and the Italian economy during the last millennium, *European Review of Economic History* 9 (2005) 99-102. For urban population developments in Holland see B. van Bavel & J.L. van Zanden, The jump-start of the Holland economy during the late-medieval crisis, c.1350-c.1500, *Economic History Review* 57 (2004) 505.

⁹⁹ S. Ciriaco, L’economia regionale veneta in epoca moderna. Note a margine del caso bergamasco, in: *Venezia e la Terraferma. Economia e società*, Bergamo, 1989, 45; G. Del Torre, *Venezia e la Terraferma dopo la guerra di Cambrai. Fiscalità e amministrazione (1515-1530)*, Milan, 1986, 199-216.

¹⁰⁰ M. Vaini, *Dal comune alla signoria. Mantova dal 1200 al 1328*, Mantova, 1986, 137-64, 316-22. Mantova had a particularly repressive hold over the countryside; C. Mozzarelli, *Mantova e i Gonzaga dal 1382 al 1707*, Turin, 1987, 53-80.

¹⁰¹ S. Epstein, Cities, regions and the late medieval crisis: Sicily and Tuscany compared, *Past & Present* 130 (1991) 3-50; Town and country: economy and institutions in late medieval Italy, *Economic History Review* 46 (1993) 453-77.

time urban citizens or burghers.¹⁰² In that way rural lordships were easily integrated into new cadres of control established by cities in the countryside.¹⁰³ Newly colonized areas fitted into the larger story of the subordination of the countryside to the political and economic aims of the cities. Cities extended their control over an expanding *contado* by reclaiming more land, but supported these colonisation activities through jurisdictions that subsumed rural communities into their governmental structure.¹⁰⁴ Land reclamation became an effective framework for legitimisation of urban control and socio-political influence over the countryside in the Po Valley.¹⁰⁵

Just like signorial lords before them, urban governments also tried to enforce labour works on rural communities in the interests of water management. In the second half of the eleventh century, Pavia asked nearby communities to work the locks of the Ticino River.¹⁰⁶ As a result of Verona's food-supply problems in the twelfth and thirteenth centuries, the commune reclaimed new land by settling colonists within free boroughs such as Villafranca in 1184 or at Palù; each given a standardised plot to work and to build a house (see figure below).¹⁰⁷ Elsewhere at the swamps of the commune of Verona, the waste was bought by a consortium of Veronese citizens belonging to a professional and commercial class, as well as aristocrats and office-holders.¹⁰⁸ Similar urban-led reclamation occurred in the *contado* around Cremona.¹⁰⁹

¹⁰² On this issue see D. Curtis, Florence and its hinterlands in the late Middle Ages: contrasting fortunes in the Tuscan countryside, 1300-1500, *Journal of Medieval History* 38 (2012) 493.

¹⁰³ Epstein, Town and country; G. Tabacco, *Egemonie sociali e strutture del potere nel medioevo italiano*, Turin, 2000, 142-67; P. Jones, *The Italian City-State: from Commune to Signoria*, Oxford, 2004, 288-332.

¹⁰⁴ P. Cammarosano, Città e campagna: rapporti economici e politici, in: *Società e istituzioni dell'Italia comunale: l'esempio di Perugia (secoli XII-XIV)*, Perugia, 1988, 303-49; G. Varanini, L'organizzazione del distretto cittadino nell'Italia padana dei secoli XIII-XIV (Marca Trevigiana, Lombardia, Emilia), in: G. Chittolini & D. Willoweit (Eds), *L'organizzazione del territorio in Italia e Germania, secoli XIII-XIV*, Bologna, 1994, 133-233. On the weak position of village communities; S. Zamperetti, Sinedri dolosi; la formazione e lo sviluppo dei corpi territoriali nello stato regionale Veneto tra '500 e '600, *Rivista Storica Italiana* 99 (1987) 269-320.

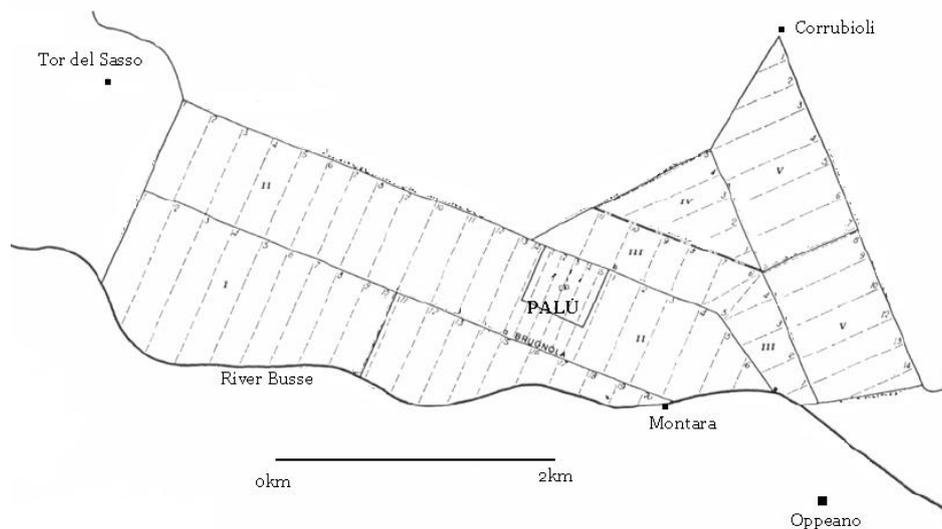
¹⁰⁵ G. Chittolini, Cities, city-states, and regional states in North-Central Italy, *Theory & Society* 18 (1989) 689-706.

¹⁰⁶ P. Grillo, Comuni urbani e poteri locali nel governo del territorio in Lombardia (XII-inizi XIV secolo), in: L. Chiappa Mauri (Ed.), *Contado e città in dialogo. Comuni urbani e comunità rurali nella Lombardia medievale*, Milan, 2003, 45-6.

¹⁰⁷ A. Castagnetti, Primi aspetti di politica annonaria nell'Italia comunale. La bonifica della 'palus comunis Verone' (1194-1199), *Studi Medievali* 13 (1974) 363-481.

¹⁰⁸ *Ibid.*, 399-410.

¹⁰⁹ G. Chittolini, I beni terrieri del Capitolo della cattedrale di Cremona fra il XIII e il XIV secolo, *Nuova Rivista Storica* 49 (1965) 218-24.



Standardised regular reclamations in the marshes of Palù, near Verona¹¹⁰

Rural communities became compelled in the thirteenth and fourteenth centuries to colonise wastes, as attested to in the city-statutes.¹¹¹ The Statutes of Reggio Emilia ordered assarting of trees near to the village of Rivalta.¹¹² Cities invested in the construction of canals to expand field irrigation.¹¹³ Cities also struck up agreements with large rural landowners, such as the pact between Bologna and a consortium of lords who agreed to work on a canal bringing water from the Reno River to the city.¹¹⁴ The Statutes of Parma in the 1200s noted that any rural communities benefiting from the canal which ran across the lands of Sant'Ilario, Taneto, and Prato Ottesola, had to maintain the structure.¹¹⁵ The Statutes of Ferrara around the same time show that officials of the city had to discuss with inhabitants of local communities any matters regarding the improvement of water management, and furthermore, rural communities had to provide a labour force to work the river embankments.¹¹⁶ In Reggio Emilia consuls from the rural communities had to appear in front of courts every month to

¹¹⁰ Own drawing.

¹¹¹ Fumagalli, *Il paesaggio*, 104-5; G. Fantoni, *L'acqua a Milano. Uso e gestione nel basso medioevo (1385-1535)*, Bologna, 1990, 39.

¹¹² A. Campanini (Ed.), *I rubricari degli statuti comunali di Reggio Emilia (secc. XIII-XVI)*, Reggio Emilia, 1997, 31-58; A. Cerlini (Ed.), *Consuetudini e statuti reggiani del sec. XIII*, Milan, 1933, 23.

¹¹³ P. Boucheron, Water and power in Milan, c.1200-1500, *Urban History* 28 (2001) 180-93.

¹¹⁴ D. Balestracci, La politica delle acque urbane nell'Italia comunale, *Mélanges de l'Ecole Française de Rome. Moyen Age* 104 (1992) 442.

¹¹⁵ *Monumenta Historica ad provincias parmensem et Placentia pertinentia*, Parma, 1860, 382.

¹¹⁶ R. Zupko & R. Laures, *Straws in the Wind. Medieval Urban Environmental Law. The Case of Northern Italy*, Boulder, 1996, 69.

report malfunctions in the infrastructure.¹¹⁷ Some village statutes were actually integrated into the Public Water Statutes of Milan in the 1300s.¹¹⁸

As land reclamation legitimised increasing urban jurisdiction and control over its rural hinterlands, the distribution of property by the late Middle Ages became more inequitable.¹¹⁹ In Lombardy 57% of land in the Cremonese *contado* was owned by burghers of Cremona.¹²⁰ A similarly high proportion of the land was controlled by urban interest groups in the late-medieval territories of Parma, Piacenza, and Bologna.¹²¹ Outside the core area of study in the Venetian *terraferma* urban citizens also owned half up to two-thirds of the land.¹²² The benefits of landownership for urban residents became even more apparent in the late Middle Ages, where burgher lands were taxed a rate four to eight times lower than a peasant.¹²³ In fact, one of the reasons behind urban expropriation of peasant lands may have been sharp increases in fiscal pressures experienced in the countryside.¹²⁴ The commons also were almost entirely eroded on the plains by the late Middle Ages.¹²⁵ Wealth was also distributed unequally in the Po Valley; for example, three-quarters of taxable wealth in the district of Brescia belonged to urbanites.¹²⁶

¹¹⁷ A. Campanini (Ed.), *Quam partem dugalium tenentur facere mezadri et laboratores*, in: *I rubricari degli statute comunali di Reggio Emilia (secc. XIII-XVI)*, Reggio Emilia, 1997, 193, 232.

¹¹⁸ G. Porro Lambertenghi (Ed.), *Statuti delle strade e delle acque del contado di Milano fatti nel 1346*, *Miscellanea di Storia Italiana* 7 (1869) 415-20.

¹¹⁹ G. Cherubini, *La proprietà fondiaria nei secoli XV-XVI nella storiografia italiana*, *Società e Storia* 1 (1978) 9-33.

¹²⁰ S. Epstein, *The peasantries of Italy*, in: T. Scott (Ed.), *The Peasantries of Europe from the Fourteenth to the Eighteenth Century*, London, 1998, 89

¹²¹ L. Arcangeli, *Giurisdizioni feudali e organizzazione territoriale nel Ducato di Parma (1545-1587)*, in: M. Romani (Ed.), *Le corti farnesiane di Parma e Piacenza, 1543-1622*, i, Rome, 1978, 97; G. Chittolini, *La formazione dello stato regionale e le istituzioni del contado*, Turin, 1979, 261-5.

¹²² On late-medieval urban land acquisition in the *terraferma* of Venice see G. Gullino, *Quando il mercante costruì la villa: le proprietà dei Veneziani nella Terraferma*, in: *Storia di Venezia. Dal Rinascimento al Barocco*, iv, Rome, 1994, 875-924; D. Beltrami, *La penetrazione economica dei veneziani in Terraferma. Forze di lavoro e proprietà fondiaria nella campagne venete dei secoli XVII e XVIII*, Venice, 1961.

¹²³ G. Chittolini, *Notes sur la politique fiscale de Charles Quint dans le duché de Milan: le nuovo catasto et les rapports entre ville et campagne*, in: W. Blockmans & N. Mout (Eds), *The World of Emperor Charles V*, Amsterdam, 2004, 147-8; G. Vigo, *Fisco e società nella Lombardia del Cinquecento*, Bologna, 1979, 160.

¹²⁴ J. Ferraro, *Proprietà terriera e potere nello stato veneziano: la nobiltà bresciana del '400-'500*, in: G. Cracco & M. Knapton (Eds), *Dentro lo 'stado italico'. Venezia e la terraferma fra Quattro e Seicento*, Trento, 1984, 159-82.

¹²⁵ L. Chiappa Mauri, *Riflessioni sulle campagne lombarde del Quattro-Cinquecento*, *Nuova Rivista Storica* 69 (1985) 129; G. Panjek, *Beni comunali: note storiche e proposte di ricerca*, in: A. Tagliaferri (Ed.), *Venezia e la Terraferma attraverso le relazioni dei Rettori*, Milan, 1981, 371-82.

¹²⁶ A. Rossini, *Le campagne Bresciane nel Cinquecento: territorio, fisco, società*, Milan, 1994, 33, 195.

In sum, reclamation in the Po Valley was stimulated by a variety of dominant interest groups in the Middle Ages; but the key point is that land reclamation provided a context for the establishment and reinforcement of coercive structures and unequal distributions of power and property. In medieval Holland this was never the case, and the hands-off attitude of the territorial lords allowed society to emerge largely free from signorial restrictions, dominant interest groups, and the manorial system.

Modes of exploitation

The reclamation of the marshes of medieval Holland created legally free and relatively (to other parts of Western Europe) egalitarian societies, which in turn impacted on the modes of exploitation undertaken there. Land was worked by the people that colonised it and owned it almost outright - the peasants.¹²⁷ What emerged from the earliest moments of colonisation all the way through to the 1500s was a proliferation of small to medium-sized farms, which were exploited by the peasant household directly. Even at the end of the sixteenth century, 80% of the land belonging to the remaining peasants was used themselves.¹²⁸

As well as no tradition of feudal subjugation and manorial exploitation, there was a very limited and restricted emergence of a market for lease land.¹²⁹ Indirect exploitation of land was not commonplace in medieval Holland until the sixteenth century, and even then it did not proliferate until the century-end.¹³⁰ This situation contrasted with other parts of late-medieval Western Europe, where the emergence of absolute and exclusive property rights went hand-in-hand with a clearly defined system of leasing.¹³¹ The main reason was the assortment of disruptive customary rights that tenants tried to claim over the land, making the termination of a lease relationship an arduous process for the owner.¹³² Tenants often assumed

¹²⁷ Van Bavel, *Rural development*, 167.

¹²⁸ B. van Bavel, The emergence and growth of short-term leasing in the Netherlands and other parts of Northwestern Europe (11th-16th centuries). A preliminary investigation into its chronology and causes, in: B. van Bavel & P. Schofield (Eds), *The Development of Leasehold in Northwestern Europe, c.1200-1600*, Turnhout, 2008, 179-213.

¹²⁹ P. Hoppenbrouwers, *Een middeleeuwse samenleving. Het Land van Heusden, ca.1360-ca.1515*, Wageningen, 1992, 437.

¹³⁰ See limited amounts of early sixteenth-century leasing in H. van Gelder, *Nederlandse dorpen in de 16de eeuw*, Amsterdam, 1953, 18; W. Diepeveen, *De vervening in Delfland en Schieland*, Leiden, 1950, 57-63; E. van Dissel, *Grond in eigendom en huur in de ambachten van Rijnland omstreeks 1545, Handelingen en Mededelingen van de Maatschappij der Nederlandsche Letterkunde* (1896-7) 152-4.

¹³¹ B. van Bavel, The land market in the North Sea area in a comparative perspective, 13th-18th centuries, in: S. Cavaciocchi (Ed.), *Il mercato della terra secc. XIII-XVIII*, Prato, 2003, 119-45.

¹³² J. de Smidt, *Rechtsgewoonten: de gebruiken en plaatselijke gebruiken waarnaar het Burgerlijk Wetboek verwijst*, Leiden, 1954, 92-6.

a right to ‘silent sub-letting’, whereby they believed in an unspoken hereditary right to remain on the land and former tenants often resorted to violence against new tenants that moved in.¹³³ The close attachment to these tenant rights was rooted in custom but sometimes explicitly formalised in local by-laws.¹³⁴ It was only after these unfavourable conditions disappeared that indirect exploitation of land proliferated in Holland (stricter punishments against sub-letting and inheritance of leases by the government), in tandem with a break in the general arrangement of property constellations as urban investment in land took hold in the late 1500s.¹³⁵

While the manorial mode of exploitation was almost entirely absent in Holland, the rationale for the earliest stages of medieval reclamation in the Po Valley was the affirmation of large estates and their reorganisation through a series of manors. Aristocratic lords strengthened their influence over wastes in order to increase the cultivation of grain and vines.¹³⁶ Monasteries also provided impetus for increased production levels.¹³⁷ *Curtēs* were able to extract large surpluses: for example, the monastery of S. Giulia of Brescia at the end of the ninth century collected a surplus of around 20% grain and wine combined, after accounting for self-consumption and seeds.¹³⁸ Vineyards were kept in demesne from the eighth century, and many of the *corvées* imposed on tenants were to maintain newly planted vines.¹³⁹ In fact the planting of vineyards in the newly reclaimed lands was highly encouraged by lay and ecclesiastical lords, and there is evidence from monasteries such as Nonantola reducing rent on vineyards to 25% of the output in order to stimulate cultivation.¹⁴⁰ Some manors specialised in olive production, particularly near Verona.¹⁴¹ The extension of the cultivated area through the context of large manorial estates laid the foundation for the revival of urban markets from the eighth or ninth centuries.¹⁴² There were, however, grave consequences for some of the rural communities who had come to rely on the wastes that

¹³³ J. Kuys & J. Schoenmakers, *Landpachten in Holland, 1500-1650*, Amsterdam, 1981, 23-5.

¹³⁴ B. de Geer (Ed.), *De heerlijkheid van Langerak en hare rechten*, *VMOVR* 3 (1898) 173-5.

¹³⁵ Van Bavel, *Rural development*, 177, 180.

¹³⁶ Pasquali, *L'azienda curtense*, 57-8.

¹³⁷ C. Wickham, *L'Italia e l'alto medioevo*, *Archeologia Medievale* 15 (1988) 148.

¹³⁸ G. Pasquali, *I problemi dell'approvvigionamento alimentare nell'ambito del sistema curtense*, *Archeologia Medievale* 8 (1981) 93-116.

¹³⁹ A. Cortonesi, *Agricoltura e tecniche nell'Italia medievale. I cereali, la vite, l'olivo*, in: *Uomini e campagne*, 217-9; *Vite e olio nell'alto Medioevo*, in: *L'ambiente vegetale nell'alto Medioevo*, Spoleto, 1990, 329-70; G. Pasquali, *Vite e vino in Piemonte (secoli VIII-XII)*, in: *Vigne e vine nel Piemonte medievale*, Cuneo, 1990, 17-33.

¹⁴⁰ C. Violante, *La società Milanese nell'età precomunale*, Bari, 1953, 79-80.

¹⁴¹ A. Brugnoli, *Una specializzazione agricola altomedievale. L'olivicultura veronese nel sistema curtense dell'Italia padana*, *Civiltà Padana. Archeologia e Storia del Territorio* 4 (1993) 117-40.

¹⁴² B. Ward-Perkins, *The towns of northern Italy: rebirth or renewal?*, in: R. Hodges & B. Hobley (Eds), *The Rebirth of Towns in Western Europe AD700-1050*, London, 1988, 24.

were a source of subsistence for medieval peasants in the Po Valley. In 824, for example, conflict broke out between the monastery of Nonantola and the inhabitants of Fiesso, who under the threat of the loss of their fishing and grazing rights in the woodlands, pointed to an earlier document which had decreed that the Lombard King Liutprand had granted usufruct rights to all the residents in domicile of San Lorenzo.¹⁴³

When signorial-led land reclamations began to be replaced by reclamations stimulated through urban investment and coercion in the high Middle Ages, new modes of exploitation appeared in the Po Valley. While late-medieval Holland was still characterised by its predominantly peasant-owner property structure and direct exploitation, short-term leasehold had already made its way to the Po Valley by 1300 due to urban consolidation of land in the countryside – facilitated by the urban grip over reclamation.¹⁴⁴ The urban elite used the political power of towns to achieve surplus extraction.¹⁴⁵ Thus by the late Middle Ages, there emerged on the plains of Lombardy a proliferation of large tenant farms, often between 50 and 130 hectares in size, and paying fixed-rents.¹⁴⁶ In contrast to the sharecropping regions of Central Italy where the labour market was inhibited, most of these large farms in the Po Valley were worked by wage labourers.¹⁴⁷ These farms were made possible by the investment of wealthy urbanites in the irrigation of large expanses of new land.¹⁴⁸ By the 1500s, tens of thousands of hectares of new land had come into cultivation through urban-led water drainage.¹⁴⁹ Urban capital also funded the proliferation of mills

¹⁴³ *I placiti*, i, no. 36.

¹⁴⁴ B. van Bavel, Markets for land, labor, and capital in Northern Italy and the Low Countries, twelfth to seventeenth centuries, *Journal of Interdisciplinary History* 41 (2011) 510.

¹⁴⁵ Belfanti, Town and country'.

¹⁴⁶ D. Sella, Household, land tenure and occupation in North Italy in the late sixteenth century, *Journal of European Economic History* 16 (1987) 491; D. Dowd, The economic expansion of Lombardy, 1300-1500: a study in political stimuli to economic change, *Journal of Economic History* 21 (1961) 148-9, 154; G. Chittolini, Avvicendamenti e paesaggio agrario nella pianura irrigua lombarda (secoli XV-XVI), in: A. Guarducci (Ed.), *Agricoltura e trasformazione dell'ambiente (secoli XIII-XVIII)*, Le Monnier, 1984, 555-65; L. De Angelis Cappabianca, Le cassine tra il XII ed il XIV secolo: l'esempio di Milano, in: *Paesaggi urbani dell'Italia padana nei secoli VIII-XIV*, Bologna, 1988, 375-415.

¹⁴⁷ Van Bavel, Markets for land, 527.

¹⁴⁸ G. Chittolini, Alle origini delle 'grandi aziende' della bassa lombarda: l'agricoltura dell'irriguo fra XV e XVI secolo, *Quaderni Storici* 39 (1978) 828-44; E. Occhipinti, L'economia agraria in territorio milanese fra continuità e spinte innovative, in: *Milano ed il suo territorio in età comunale*, Spoleto, 1989, 245-63; E. Roveda, Il beneficio delle acque. Problemi di storia dell'irrigazione in Lombardia tra XV e XVII secolo, *Società e Storia* 24 (1984) 269-80.

¹⁴⁹ F. Cazzola, *Bonifiche e investimenti fondiari. Storia dell'Emilia Romagna*, ii, Bologna, 1978, 209-28; B. Rigobello, *Le bonifiche estensi in Poestine dopo le rotte di Malopera e di Castagnaro*, Lendinara, 1976.

powering complex hydraulic systems,¹⁵⁰ while new canals improved urban-rural transportation and physical connections.¹⁵¹

Economic portfolios

In medieval Holland, the land reclamation process created a favourable ecological and institutional setting for the emergence of a diverse array of economic activities. Between 1000 and 1200, peasant households performed a number of different activities in the interests of subsistence – combining hunting, gathering,¹⁵² and fishing with arable farming.¹⁵³ However by the late Middle Ages, the variety of economic activities grew even wider (within the region), but individual peasant households also specialised production towards the market. The conditions of reclamation allowed this to happen. First, the persistent drainage of the marshes through dikes in order to extend the cultivable land changed the environmental conditions within many parts of rural Holland. Peat extraction left the top layer of soil exposed to oxidisation, in turn lowering the soil level in relation to the water.¹⁵⁴ Not only did this make Holland peasants more vulnerable to flooding, but their lands became too wet to grow crops on¹⁵⁵ (although recent work has shown mixed arable farming lingered on longer than previously assumed).¹⁵⁶ This situation encouraged free peasants to look towards proto-

¹⁵⁰ L. Chiappa Mauri, I mulini ad acqua nel milanese (secoli X-XV), *Biblioteca della Nuova Rivista Storica* 36 (1984) 67.

¹⁵¹ E. Orlando, Governo delle acque e navigazione interna. Il Veneto nel basso medioevo, *Reti Medievali Rivista* 12 (2011) 251-93.

¹⁵² R. Kok, *Wonen op het veen. Archeologisch en ecologisch onderzoek van een twaalfde-eeuwse boerderij in de oostpolder te Gouda*, Gouda, 1999, 83-6.

¹⁵³ T. Edelman, Oude ontginningen van de veengebieden in de Nederlandse kuststrook, *Tijdschrift voor Economische en Sociale Geografie* 49 (1958) 239-45.

¹⁵⁴ D. de Boer, *Graaf en grafiek: sociale en economische ontwikkelingen in het middeleeuwse 'Noordholland' tussen c.1345 en c.1415*, Leiden, 1978, 222; P. van Dam, Sinking peat bogs: environmental change in Holland, 1350-1550, *Environmental History* 6 (2001) 32-45.

¹⁵⁵ It has been argued that wet ground allowed only summer grains in J.L. van Zanden, Op zoek naar de 'missing link'. Hypothesen over de opkomst van Holland in de late middeleeuwen en de vroegmoderne tijd, *Tijdschrift voor Sociale Geschiedenis* 14 (1988) 372. The lowest-lying lands were completely unsuitable for cultivation; A. van Braam, *Zaandam in de middeleeuwen*, Hilversum, 1993, 99.

¹⁵⁶ W. Ettema, Boeren op het veen (1000-1500): een ecologisch-historische benadering, *Holland* 37 (2005) 239-58. Others have accepted a gradual transition from arable to pastoral farming but are unsure if the cause was environmental degradation; G. Borger, Draining – digging – dredging: the creation of a new landscape in the peat areas of the Low Countries, in: J. Verhoeven (Ed.), *Fens and Bogs in the Netherlands: Vegetation, History, Nutrient Dynamics and Conservation*, Dordrecht, 1992, 148.

industrial alternatives instead, often focused towards the market.¹⁵⁷ By the end of the 1400s, around half of the rural population of Holland was engaged in ‘non-agricultural’ work.¹⁵⁸ Former agricultural peasants specialised in reed and peat-cutting, sweet water fishing, fowling, eel fishing, salt-making, ship-building, water transportation, brick-making, spinning and weaving, brewing, labouring on dikes and ditches, as well as new forms of dairy production. Nearby regions of the Low Countries which actually took an earlier path towards commercialisation, failed to get anywhere near the level of proto-industry found in Holland.¹⁵⁹

The lack of exploitative feudal structures or urban jurisdictions within the reclamation process also created a favourable institutional context for the emergence of diverse specialised non-agricultural activities to emerge in the Holland countryside. First, the lack of signorial or manorial presence meant rural producers could keep high proportions of any surplus made.¹⁶⁰ Apart from standard rents to territorial lords, the total exactions were minimal – encouraging rural people into market-orientated activity. Second, it was important that the reclamation process did not become dominated by oppressive urban jurisdictions. Indeed, it has been shown that the late-medieval towns of Holland did not exploit their close hinterlands like Italian *contadi* to feed non-productive populations – instead they were supplied by grain from north-east France and parts of the eastern Low Countries.¹⁶¹ Actually from the first reclamations and right through the Middle Ages, Holland towns did not achieve any sort of dominance over the countryside, unlike in Flanders.¹⁶² This can be connected to a

¹⁵⁷ J.L. van Zanden, A third road to capitalism? Proto-industrialisation and the moderate nature of the late medieval crisis in Flanders and Holland, 1350-1550, in: *Peasants into Farmers?*, 85-101; B. van Bavel, Early proto-industrialization in the Low Countries? The importance and nature of non-agricultural activities on the countryside in Flanders and Holland, *Revue Belge de Philologie et d'Histoire* 81 (2003) 1109-65.

¹⁵⁸ J.L. van Zanden, Taking the measure of the early modern economy. Historical national accounts for Holland in 1510/14, *European Review of Economic History* 6 (2002) 135-9.

¹⁵⁹ B. van Bavel, Proto-industrie tussen de Gelderse rivieren? Een eerste verkenning naar de niet-agrarische, marktgerichte activiteiten op het platteland van het Gelderse rivierengebied, 1300-1600, *Bijdragen en Mededelingen Gelre* 93 (2002) 55-78.

¹⁶⁰ R. Brenner, The Low Countries in the transition to capitalism, in: *Peasants into Farmers?*, 310-5.

¹⁶¹ For grain from the eastern Netherlands see M. van Tielhof, *De Hollandse graanhandel, 1470-1570: koren op de Hollandse molen*, Den Haag, 1995, 231-5; For grain from north-east France see M. Tits-Dieuaide, *La formation des prix céréaliers en Brabant et en Flandre au Xve siècle*, Brussels, 1975. In the sixteenth century a grain trade with the Baltics emerged; M. van Tielhof, *The Mother of All Trades: the Baltic Grain Trade in Amsterdam from the Late 16th to the Early 19th Century*, Leiden, 2002.

¹⁶² P. Hoppenbrouwers, Town and country in Holland, 1300-1550, in: *Town and Country*, 64-7, 69-71, 76-9. For urban control in Flanders see D. Nicholas, *Town and Countryside: Social, Economic and Political Tensions in Fourteenth-Century Flanders*, Bruges, 1971, 59-65, 142-6, 187-9; W. Blockmans, *De volksvertegenwoordiging in Vlaanderen in de overgang van Middeleeuwen naar nieuwe tijden, 1384-1506*, Brussels, 1978, 107-27.

series of weak urban guilds,¹⁶³ which were unable or unwilling to prevent rural production of items like cloth and beer, and furthermore, were unable to put restrictions on worker mobility.¹⁶⁴ Immigrants were actively recruited for labour projects in fifteenth-century Holland. Specialisation and investment in the late Middle Ages was further enhanced by the well-functioning and unrestricted markets for capital.¹⁶⁵ Interest rates were consistently low and credit was accessible to a wide section of the rural and urban population.¹⁶⁶

In the Po Valley, colonists were initially urged by both manorial lords and urban governments to grow cereals and plant vines: this surplus would serve as a supply of food for the region's numerous urban markets. A large proportion of rural inhabitants in the early and high Middle Ages were reliant on exploitation of the commons, and rural communities were able to defend their rights to hunt and fish and take wood for their homes – a famous case being the Nonantola villagers against the local monastery.¹⁶⁷ In general, however, signorial- and urban-led reclamations only served to reduce the options for communal economic activities.¹⁶⁸ Indeed, as wealthy urbanites invested more in hydrology and consolidation of land, economic organisation was adapted. First, a basic point was that rural producers lost

¹⁶³ B. van Bavel, The medieval origins of capitalism in the Netherlands, *BMGN: Low Countries Historical Review* 125 (2010) 57. Weak guilds perpetuated by free trade interests of mercantile elites; C. Lis & H. Soly, Different paths of development: capitalism in the Northern and Southern Netherlands during the late Middle Ages and the early modern period, *Review* 20 (1997) 230-6.

¹⁶⁴ B. de Munck, P. Lourens & J. Lucassen, The establishment and distribution of craft guilds in the Low Countries, 1000-1800, in: M. Prak, C. Lis, J. Lucassen & H. Soly (Eds), *Craft Guilds in the Early Modern Low Countries: Work, Power, and Representation*, Aldershot, 2006, 32-73; B. van Bavel, Rural wage labour in the sixteenth-century Low Countries: an assessment of the importance and nature of wage labour in the countryside of Holland, Guelders, and Flanders, *Continuity & Change* 21 (2006) 65-6.

¹⁶⁵ J. Zuijderduijn, *Medieval Capital Markets: Markets for Rents between State Formation and Private Investment in Holland (1300-1550)*, Boston, 2009, 242-6; Accessing a medieval capital market. The capacity of the market for renten in Edam and De Zeevang (1462-1563), *Jaarboek voor Middeleeuwse Geschiedenis* 11 (2009) 138-64.

¹⁶⁶ J. Zuijderduijn, J.L. van Zanden & T. De Moor, Small is beautiful. On the efficiency of credit markets in late medieval Holland, *European Review of Economic History* 16 (2012) 3-22.

¹⁶⁷ G. Alfani, Le partecipanze: il caso di Nonantola, in: G. Alfani & R. Rao (Eds), *La gestione delle risorse collettive nell'Italia settentrionale (secoli XII-XVIII)*, Milan, 2011, 48-62; P. Cremonini, Dispute tra il monastero di Nonantola e la comunità rurali sulla proprietà e l'utilizzazione delle terre incolte, *Mélanges de l'École Française de Rome. Moyen Age – Temps Modernes* 99 (1987) 585-614; M. Debbia, Il territorio di Nonantola durante il medioevo: partecipanza o beni comuni? Il significato dei beni comuni nella storia della comunità locale, in: *Terre e comunità nell'Italia padana. Il caso delle partecipanze agrarie emiliane: da beni comuni a beni collettivi*, Mantova, 1992, 123-30.

¹⁶⁸ Evidence for encroachment into the commons in the Po Valley is plentiful; G. Comino, Sfruttamento e redistribuzione di risorse collettive: il caso della confraria del S. Spirito nel Monregalese dei secoli XIII-XVIII, *Quaderni Storici* 81 (1992) 687-702; R. Rao, Risorse collettive e tensioni giurisdizionali nella pianura vercellese e novarese (XII-XIII secolo), *Quaderni Storici* 120 (2005) 753-76; Lo spazio del conflitto. I beni comunali nel Piemonte del basso Medioevo, *Zapruder* 11 (2006) 8-25.

their land to urban landlords, and ended up working as labourers on large tenant farms. Second, as a result of improved irrigation on the plains, tenant farmers moved away from arable cultivation and instead began to turn land over to meadows (a third of the total area in places) and focus on meat and dairy produce oriented on urban markets.¹⁶⁹ Labour demands for these enterprises were smaller and increased the level of underemployment in the countryside.¹⁷⁰ In the irrigated plain south of Milan, peasant landownership was basically nothing, although in other areas of the Po Valley, agricultural labourers managed to scrape together a meagre existence by combining wage work with their own micro-plots.¹⁷¹

Outside of agriculture, the opportunities for work for a large portion of the rural population were limited. Whereas in medieval Holland the reclamation context led to the emergence of a wide range of specialised and commercialised proto-industrial activities in the countryside, in the Po Valley the economic portfolio was much more restricted. From the high Middle Ages all the way through to the sixteenth century, this was generally down to the impositions put on rural manufacturing by urban governments using guilds. Some of the strongest blocks to economic activities in the countryside were imposed around Mantova, and legal proceedings were even started up against entrepreneurs from small communities in the *contado* making cheap woollen cloth.¹⁷² In fact, manufacturing did not appear in the countryside of Mantova until the eighteenth century in the form of silk.¹⁷³ Those rural people of Mantova who defied the guilds were resented such as the shoemakers who were regarded as parasites by shoemaking guilds.¹⁷⁴ The rural *contado* of Bologna was also rigorously controlled and the production of silk was almost entirely concentrated within the city itself.¹⁷⁵ This trend was not limited to the core area of the Po Valley focused upon in this paper but was found across much of Northern Italy. For example, as Venice expanded its *terraferma* in the fifteenth century, it ensured it rigorously regulated all economic activities within its rural

¹⁶⁹ G. Alfani, Population and environment in Northern Italy during the sixteenth century, *Population* 62 (2007) 566-8.

¹⁷⁰ On the lack of work for agricultural labourers see C. Cipolla, Prezzi, salari e teoria dei salari in Lombardia alla fine del Cinquecento, in: *Saggi di storia economica e sociale*, Bologna, 1988, 113-24; C. Cipolla & G. Aleati, Contributo alla storia dei consumi e del costo della vita in Lombardia agli inizi dell'età moderna, in: *Ibid*, 87-112.

¹⁷¹ E. Roveda, Piccola e grande proprietà nella pianura lombarda fra '400 e '500, in: *Rapporti tra proprietà, impresa e mano d'opera nell'agricoltura italiana dal IX secolo all'Unità*, Verona, 1984, 74-5.

¹⁷² Belfanti, Town and country, 311.

¹⁷³ C. Belfanti, Dalla città alla campagna: industrie tessili a Mantova tra carestie ed epidemie (1550-1630), *Critica Storica* 25 (1988) 443-53.

¹⁷⁴ C. Belfanti, *Mestieri e forestieri. Immigrazione ed economia urbana a Mantova fra Sei e Settecento*, Milan, 1994, 103-10. Also in Milan; E. Merlo, *Le corporazioni. Conflitti e soppressioni a Milano nei Sei e Settecento*, Milan, 1996, 44.

¹⁷⁵ C. Poni, Per la storia del distretto industriale serico di Bologna (secoli XVI-XIX), *Quaderni Storici* 25 (1990) 98-9.

hinterlands.¹⁷⁶ Rural cloth production in the *terraferma* and smaller towns was restricted by the Venetian State, although markets did appear for inferior quality rural cloths.¹⁷⁷ However, there were some exceptions to the urban guild regulation of rural economic activity.¹⁷⁸ Indeed, many rural boroughs and communities around Milan experienced a growth in cloth production activity, stimulated through privileges granted by the lords of Milan.¹⁷⁹

By the sixteenth century, there were signs that (frequently poor) rural inhabitants were disregarding urban restrictions – for example, fishing in the rivers preparing hemp thread.¹⁸⁰ Hat-making under the putting-out system employed thousands of impoverished rural workers also.¹⁸¹ Rural labourers found seasonal work south of Ravenna on the salt marshes.¹⁸² For the most disadvantaged rural inhabitants in the Po Valley, however, the only solution was migration. Most of the significant proto-industries emerged away from the plains and in the mountains:¹⁸³ limestone processing around Lake Maggiore, silk textiles in Trentino,¹⁸⁴ silver and copper mining in the mountains north of Vicenza,¹⁸⁵ and iron production north of Bergamo and Brescia.¹⁸⁶ The emergence of these proto-industries set the foundations for the de-industrialisation of the cities which occurred in the seventeenth and

¹⁷⁶ S. Ciriaco, *Venise et ses villes. Structuration et déstructuration d'un marché régionale (XVIe-XVIIIe siècle)*, *Revue Historique* 276 (1986) 288-9.

¹⁷⁷ D. Sella, *The rise and fall of the Venetian woollen industry*, in: B. Pullan (Ed.), *Crisis and Change in the Venetian Economy*, London, 1968, 106-26; W. Panciera, *L'arte matrice. I lanifici della Repubblica di Venezia nei secoli XVII e XVIII*, Treviso, 1996, 39-66.

¹⁷⁸ C. Belfanti, *Rural manufactures and rural proto-industries in the Italy of the cities*, *Continuity & Change* 8 (1993) 261-4; S. Ciriaco, *Proto-industria, lavoro a domicilio e sviluppo economico nelle campagne venete in epoca moderna*, *Quaderni Storici* 18 (1983) 60-3.

¹⁷⁹ Chittolini, *La formazione*, 76-7; *Governo ducale e poteri locali*, in: *Gli Sforza a Milano e in Lombardia e i loro rapporti con gli Stati italiani ed europei (1450-1535)*, Milan, 1982, 27-42; H. Beonio Brocchieri, *Artigianati, manifatture e proto-industrie fra città e campagna: la Lombardia del XVI secolo*, *Studi di Storia Medievale e Diplomatica* 14 (1992) 193-209.

¹⁸⁰ D. Sella, *Peasant strategies for survival in Northern Italy, XVI-XVII centuries*, *Journal of European Economic History* 37 (2008) 458; *L'economia lombarda durante la dominazione spagnola*, Bologna, 1982, 237-42.

¹⁸¹ C. Poni & S. Franzoni, *L'economia di sussistenza della famiglia contadina*, in: *Cultura popolare nell'Emilia Romagna*, iii, Milan, 1979, 13-6.

¹⁸² C. Casanova, *Il sale: risorsa e svantaggio. L'evoluzione politico-sociale di una città 'camerale'*, in: D. Bolognesi & A. Turchini (Eds), *Storia di Cervia*, iii, Rimini, 2001, 166-77.

¹⁸³ G. Chittolini, *Quasi-città. Borghi e terre in area lombarda nel tardo medioevo*, *Società e Storia* 13 (1990) 3-26.

¹⁸⁴ D. Sella, *Commerci e industrie a Venezia nel secolo XVII*, Venice, 1961, 80-1.

¹⁸⁵ R. Vergani, *Miniere e società nella montagna del passato. Alpi venete, secoli XIII-XIX*, Verona, 2003, chp. 8.

¹⁸⁶ M. Calegari, *Forni 'alla bresciana' nell'Italia del XVI secolo*, *Quaderni Storici* 70 (1989) 77-99; J-F. Belhoste, *Le migrazioni dei fabbri bergamaschi in Delfinato*, in: G. Fontana, A. Leonardi & L. Trezzi (Eds), *Mobilità imprenditoriale e del lavoro nelle Alpi in età moderna e contemporanea*, Milan, 1998, 49.

eighteenth centuries.¹⁸⁷ Other than that, impoverished rural people sought work in the cities or in the military as the last resort.¹⁸⁸

Markets

The fact that land reclamation in medieval Holland was not undertaken supporting a manorial system and was not imposed through coercive urban jurisdictions allowed for the emergence of a flexible marketing framework for commodities, not dominated by powerful interest groups.¹⁸⁹ As a result there was little attempt to create urban market monopolies or staples (coercion of commodity flow to one market), in contrast to the situation that developed in the Po Valley, but also in nearby Flanders or in Groningen. Only limited exceptions existed such as Dordrecht.¹⁹⁰ Holland inhabitants chose from a wide variety of rural and urban marketing opportunities for their produce and furthermore, this vast network often amounted to informal trading venues.¹⁹¹ Institutional barriers and exclusive privileges in the marketing structure were minimal when compared to the English burgesses, for example.¹⁹² Furthermore, due to the absence of feudalism, there were no villages with markets in Holland which rose up out of favourable signorial concessions to instigate trade as what happened in England with burgage tenure.¹⁹³ The only exceptions were towns in the borders between South Holland and Brabant, which were given charters of liberties as compulsory trading venues for their hinterlands.¹⁹⁴ In sum, the lack of urban and feudal restrictions which accompanied the process of reclamation

¹⁸⁷ A. Moioli, La deindustrializzazione della Lombardia nel secolo XVII, *Archivio Storico Lombardo* 112 (1986) 189-90; P. Malanima, *La perdita del primato. Crisi e riconversione nell'Italia del Seicento*, Milan, 1988, 102-4; R. Corritore, Il processo di 'ruralizzazione' in Italia nei secoli xvii-xviii. Verso una regionalizzazione, *Rivista di Storia Economica* 10 (1993) 353-86.

¹⁸⁸ Sella, Peasant strategies, 464.

¹⁸⁹ A thesis put forward in the excellent J. Dijkman, *Shaping Medieval Markets. The organisation of Commodity Markets in Holland, c.1200- c.1450*, Leiden, 2011.

¹⁹⁰ D. Beulink, Dordrecht en Schoonhoven: conflicten over stapel- en marktrecht, *Historische Encyclopedie Krimpenerwaard* 14 (1989) 61-88; Dijkman, *Shaping Medieval Markets*, chp. 4.

¹⁹¹ Dijkman, *Shaping Medieval Markets*, chp. 3.

¹⁹² O. Gelderblom, The decline of fairs and merchant guilds in the Low Countries, 1250-1650, *Jaarboek voor Middeleeuwse Geschiedenis* 7 (2004) 199-238. Except transportation tolls mentioned in D. Aten, 'Als het gewelt com...' *Politiek en economie in Holland benoorden het IJ, 1500-1800*, Hilversum, 1995, 22-63. For formalised markets with trading privileges in England see R. Britnell, The proliferation of markets in England, 1200-1349, *Economic History Review* 34 (1981) 209-21; J. Galloway, Town and country in England, 1300-1570, in: *Town and Country*, 117-8. On blocks to informal marketing in England see C. Dyer, The hidden trade of the Middle Ages: evidence from the West Midlands of England, *Journal of Historical Geography* 18 (1992) 141-57.

¹⁹³ R. Goddard, Small boroughs and the manorial economy: enterprise zones or urban failures?, *Past & Present* 210 (2011) 3-31.

¹⁹⁴ R. Rutte, *Stedenpolitiek en stadsplanning in de Lage Landen (12de-13de eeuw)*, Zutphen, 2002, 125-7.

in Holland led in turn to a flexible marketing structure, based around informal trading centres and without coercive elements or exclusive privileges benefiting dominant interest groups. 'Outsiders' had freedom and access to this marketing structure,¹⁹⁵ and producers were not forced to sell their goods.¹⁹⁶

The emergence of markets for commodities in the Po Valley was instead tied in with more repressive contexts of land reclamation. As manorial lords and monasteries encouraged the extension of cultivation, they looked to market their surplus in their nearest towns, but also on manors with marketing and fiscal privileges conferred by kings or the Emperor (kept in storehouses known as '*dispensae*').¹⁹⁷ Many of the monasteries which traded goods were actually located in towns anyway.¹⁹⁸ Good evidence for early medieval markets in the Po Valley is still meagre,¹⁹⁹ however what can be said is that regional exchange was very limited from 800-1000.²⁰⁰ Urban markets depended on produce from the close hinterlands rather than long-distance trade – revealing the importance of land reclamation.²⁰¹ Of the small trade that was undertaken down the rivers, we can be sure, nonetheless, that tolls and taxes were applied.²⁰²

Later in the medieval period, it should come as no surprise that urban-stimulated land reclamation which led to the formalisation of urban jurisdiction over wider rural *contadi* also led to highly regulated and monopolised market networks. Frequently colonists who were told where and what to cultivate were also told they had to sell their output in specialised city markets.²⁰³ Cities took exclusive and prioritised access to the food supply of their hinterlands,

¹⁹⁵ Dijkman, *Shaping Medieval Markets*, 89-96.

¹⁹⁶ A. Janse, *Grenzen aan de macht. De Friese oorlog van de graven van Holland omstreeks 1400*, The Hague, 1993, 300-6. In contrast to forced sales in England; J. Masschaele, *Peasants, Merchants, and Markets. Inland Trade in Medieval England, 1150-1350*, New York, 1997, 36-41.

¹⁹⁷ Violante, *La società Milanese*, 3-40.

¹⁹⁸ R. Balzaretto, The monastery of Sant' Ambrogio and dispute settlement in early medieval Milan, *Early Medieval Europe* 2 (1993) 1-18; G. Pasquali, Gestione economica e controllo sociale di S. Salvatore-S. Giulia dall'epoca longobarda all'età comunale, in: G. Brentagni & C. Stella (Eds), *S. Giulia di Brescia. Archeologia, arte, storia di un monastero regio dai Longobardi al Barbarossa*, Brescia, 1992, 131-46.

¹⁹⁹ R. Balzaretto, The curtis, the archaeology of sites of power, in: R. Francovich & G. Noyé (Eds), *La storia dell'alto medioevo italiano (VI-X secolo) alla luce dell'archeologia*, Florence, 1994, 99-108.

²⁰⁰ A cellular society described in C. Wickham, Problems of comparing rural societies in early medieval Western Europe, *Transactions of the Royal Historical Society* 42 (1992) 221-46.

²⁰¹ R. Balzaretto, Cities, emporia and monasteries: local economies in the Po Valley, c.AD700-875, in: N. Christie & S. Loseby (Eds), *Towns in Transition: Urban Evolution in Late Antiquity and the Early Middle Ages*, Aldershot, 1996, 228; C. Wickham, *Early Medieval Italy*, London, 1981, 96-7.

²⁰² For example the eighth-century Pact of Comacchio; G. Bognetti, La navigazione padana e il sopravvivere della civiltà antica, *L'Età Longobarda* 4 (1964) 541-53; C. Mor, Un'ipotesi sulla data del 'Pactum' c.d. liutprandino coi 'milites' di Comacchio relative alla navigazione sul Po, *Archivio Storico Italiano* 135 (1977) 493-502.

²⁰³ A. Guenzi, *Pane e fornai a Bologna in età moderna*, Padua, 1982, 9-18.

essentially enforcing monopolies from the high Middle Ages up to the sixteenth century (and sometimes beyond).²⁰⁴ Price controls, bans on exporting, and forced sales during times of scarcity occurred in rural areas around Pavia, for example, but also south of the study area in Bologna.²⁰⁵ Inevitably, this led at times to unpredictable market regulations and frequently high transaction costs.²⁰⁶

THE CONFIGURATION OF NEW SOCIETIES AND COPING WITH ENVIRONMENTAL DEGRADATION

From the ninth century in the Po Valley and the tenth century in the Holland marshes, new societies began to form as a result of land reclamation – a process which continued unabated into the late Middle Ages. However, land reclamation is a process which is known to have environmental consequences. New drainage channels can cause water to flow in unnatural directions, building up pressure and making lands susceptible to flooding. Deforestation can lead to the fast run-off of water, landslides, and furthermore, can contribute to the ruination of the soils. These kinds of problems caused by land reclamation often led to the irreversible decline or collapse of certain pre-industrial societies. It has been argued above, however, that reclamation produced different ‘types’ of societies. Indeed, medieval colonisation of new land in the Po Valley and Holland led to two entirely divergent arrangements of societal constellations. In this final section, some consideration is given to whether the particular structural configuration of society played an important role in negating or lessening potentially disturbing environmental degradation through the effects of land reclamation.

There is evidence that reclamation in the Po Valley and Holland caused environmental damage. It has already been discussed how the drainage of the Holland marshes, and in particular the digging of peat through the Middle Ages, caused a lowering of the soil surface – perhaps one metre every century. As a result, peasants frequently dealt with drainage problems and flooding.²⁰⁷ Many of the very early reclaimed settlements were lost to the water.²⁰⁸ The Po Valley also experienced degradation through reclamation. The

²⁰⁴ Ciriaco, *L'economia regionale veneta*, 45.

²⁰⁵ D. Zanetti, *Problemi alimentari di una economia preindustriale. Cereali a Pavia dal 1398 al 1700*, Turin, 1964, 40-50; B. Farolfi, *Strutture agrarie e crisi cittadina nel primo Cinquecento bolognese*, Bologna, 1977, 35-6.

²⁰⁶ G. Tocci, *Le terre traverse. Poteri e territori nei ducati di Parma e Piacenza tra Sei e Settecento*, Bologna, 1985, 280-9.

²⁰⁷ See cases in M. Gottschalk (Ed.), *Stormvloed en rivieroverstromingen in Nederland, 500-1700*, 3 vols, Assen, 1971-7.

²⁰⁸ C. van der Esch & T. Groeneveld, *Het verdrinken dorp Cruyskerck c.q. Erkentrudenkerke gevonden, Westerheem* 51 (2002) 50-61; J. Moree, *Barendrecht bouwt Carnisselande, een dijk van een wijk. Archeologisch onderzoek in een nieuwbouwwijk naar het middeleeuwse dijkdorp Carnisse in de verdwenen Riederwaard*, in: B.

embankments which constrained the rivers in unnatural directions led to the subsidence of the banks, further worsened by the discharge of water into the rivers through canals, and leading to frequent and high magnitude flooding.²⁰⁹ Franciscan chronicler Salimbene de Adam described terrible flooding of the Crostolo River near Reggio Emilia in 1276, which submerged all land between Rivalta and Bagnolo in Piano, claiming numerous victims.²¹⁰ A third of the whole territory of Mantova was flooded in 1293.²¹¹ Later in the Middle Ages there is an abundance of evidence of ‘water disasters’ often linked with badly designed canals.²¹²

However while both areas faced challenging environments as a direct result of land reclamation, the societies of medieval Holland appeared better set-up and more resilient, or at the very least, more pro-active in their attempts to ensure long-term sustainability. The water management structures which emerged in Holland in the 1100s were effective because a larger proportion of the newly colonised free society had direct participation and a stake in the process. The dikes were well-maintained by formalised institutions (waterboards) which often overlapped with village communities of small landowning peasant farmers.²¹³ Every farmer had responsibility for maintaining a portion of a dike in relation to their landholding. Local committees inspected the work and imposed sanctions on deficiencies, giving all stakeholders the incentive not to ‘free-ride’.²¹⁴ Faced with serious threats to their existence, village communities cooperated and pooled resources together to build dams (such as the twelfth-century Zwammerdam), stopping the flow of water from higher grounds.²¹⁵ When peat-

Wouda (Ed.), *Ingelanden als uitbaters. Sociaal-economische studies naar Oud- en Nieuw- Reijerwaard, een polder op een Zuid-Hollands eiland*, Hilversum, 2003, 45-69; G. Renting, *Verdronken land, herwonnen land. Historische geografie van het Eiland van Dordrecht*, Alphen aan den Rijn, 1993.

²⁰⁹ M. Marchetti, Environmental changes in the central Po Plain (northern Italy) due to fluvial modifications and anthropogenic activities, *Geomorphology* 44 (2002) 367-9; D. Camuffo & S. Enzi, The analysis of two bi-millennial series: Tiber and Po River floods, in: P. Jones, R. Bradley & J. Jouzel (Eds), *Climatic Variations and Forcing Mechanisms of the Last 200 Years*, New York, 1996, 439, 444-5.

²¹⁰ S. de Adam, *Chronica*, (Ed.) G. Scalia, ii, Bari, 1966., 723.

²¹¹ Fumagalli, *Il paesaggio*, 119.

²¹² Alfani, *Population*, 581.

²¹³ H. van der Linden, Geschiedenis van het waterschap als instituut van waterstaatbestuur, in: B. de Goede (Eds), *Het waterschap, recht en werking*, Deventer, 1982, 13-33; P. Henderikx, De ontginningen en de zorg voor de afwatering en dijken in het Hollands-Utrechtse veengebied (tiende tot dertiende eeuw), in: D. de Boer, E. Cordfunke & H. Sarfatij (Eds), *Holland en het water in de middeleeuwen. Strijd tegen het water en beheersing en gebruik van het water*, Hilversum, 1997, 57-70; B. Dolfing, Vroegste ontwikkeling in het waterschap, in: J. Raadschelders & T. Toonen (Eds), *Waterschappen in Nederland: een bestuurskundige verkenning van de institutionele ontwikkeling* Hilversum, 1993, 61-80.

²¹⁴ P. van Dam, Ecological challenges, technological innovations. The modernization of sluice building in Holland, 1300-1600, *Technology & Culture* 43 (2002) 32-45.

²¹⁵ H. van der Linden, Rijnland. Oorsprong en oudste ontwikkeling van een streekwaterschap, in: A. Kouwenhoven, G. Adriaan de Bruijne & M. Heslinga (Eds), *Geplaatst in de tijd*, Meppel, 1984, 292-7.

digging became more of a problem in the fourteenth century, the Rijnland drainage authority established rules and regulations preventing unbridled destruction of the common good.²¹⁶

That is not to say we should fall into the trap of uncritically supporting a clichéd ‘poldermodel’ philosophy, dictating that Dutch society was founded on notions of cooperation and consensus.²¹⁷ While the institutions necessary for water management may have been effective for some time through the Middle Ages, it is clear that Holland society changed after 1500. It lost its original peasant characteristics and became dominated by wealthy urban interest groups who financed (amongst other things) further land reclamation and expropriation. As Holland became socially and economically polarised, it is inevitable that some of its water management structures changed too.²¹⁸ Tim Soens has skilfully shown that in Coastal Flanders, the water management system broke down simultaneously when property was consolidated in the hands of rich urban burghers and institutions and worked by large tenant farmers. Absentee owners had less interest in investing their income from rents back into effective water management, thereby leaving the reclaimed polders highly susceptible to environmental collapse.²¹⁹ The ferocity of the storm surges and flooding in coastal Zeeland and Flanders was testament to this.²²⁰ It remains to be seen whether a similar thesis could be argued for Holland in the transition from the Middle Ages to the early modern period, though the severity of disastrous flooding after 1500 suggests it is feasible.²²¹

²¹⁶ W. TeBrake, Land drainage and public environmental policy in medieval Holland, *Environmental Review* 12 (1988) 90.

²¹⁷ M. van Tielhof, Op zoek naar het poldermodel in de waterstaatsgeschiedenis, *Tijdschrift voor Geschiedenis* 122 (2009) 149-61; P. van Dam, Water en land, *Bijdragen en Mededelingen Betreffende de Geschiedenis der Nederlanden* 124 (2009) 459-66.

²¹⁸ Including a transition of power from local to regional waterboards; C. Postma, *Het Hoogheemraadschap van Delfland in de middeleeuwen, 1289-1589*, Hilversum, 1989, 352-66; S. Fockema Andreae, *Het Hoogheemraadschap van Rijnland: zijn recht en zijn bestuur van den vroegste tijd tot 1857*, Leiden, 1982, 95-112.

²¹⁹ T. Soens, *De spade in de dijk? Waterbeheer en rurale samenleving in de Vlaamse kustvlakte (1280-1580)*, Gent, 2009, 73-105; Floods and money: funding drainage and flood control in coastal Flanders from the thirteenth to the sixteenth centuries, *Continuity & Change* 26 (2011) 348-50.

²²⁰ J. Buisman & A. van Engelen, *Duizen jaar weer, wind en water in de lage landen*, 2 vols, Franeker, 1996-2000; A. de Kraker, Flood events in the Southwestern Netherlands and coastal Belgium, 1400-1953, *Hydrological Sciences Journal* 51 (2006) 913-29.

²²¹ M. van Tielhof, Texel, kerstavond 1593. De ramp die Tesselschade haar nam gaf, in: M. Damen & L. Sicking (Eds), *Bourgondie voorbij. De Nederlanden 1250-1650. Liber alumnorum Wim Blockmans*, Hilversum, 2010, 311-24; Gottschalk (Ed.), *Stormvloeden en rivieroverstromingen*, ii, 388-90; J. De Bruin & D. Aten, *Een gemene dijk? Verwickelingen rond de dijkzorg in West-Friesland. De watersnood van 1675-1676*, Purmerend, 2004; A. Wikaart et al., *Nijet dan water ende wolcken: de onderzoekscommissie naar de aanwassen in de Verdrongen Waard (1521-1523)*, Tilburg, 2009; C. Rooijendijk, *Waterwolven. Een geschiedenis van stormvloeden, dijkbouwers en droogmakers*, Amsterdam, 2009.

In the medieval Po Valley, the environmental problems inevitably caused by prolific land reclamation were to some extent limited by coercive jurisdictions by lords and cities, urging rural inhabitants to maintain dikes, ditches and river banks. However, the more repressive and inequitable nature of societies within the Po Valley formed and crystallised through land reclamation (especially in comparison to Holland) actually made large parts of Northern Italy very susceptible and vulnerable to crisis – which by the end of the Middle Ages manifested itself in famine, flooding, and death.²²² In the late Middle Ages, the whole hydraulic system of the Po Valley was in a precarious state – quite simply the water flow did not know which way to turn.²²³ Canals which had been a source of wealth by bringing new watercourses into cities had begun to create serious imbalances by depositing silt and sand into the Po basin leading to frequent flooding.²²⁴ Ineffective drainage systems had left areas of land submerged under water for long periods of time, leading to malaria epidemics.

By the 1500s, rural people of the plains had begun to flee to the mountains or swarm upon the cities in search of food (forcing many to close their gates to beggars and vagrants).²²⁵ The environmental degradation caused by land reclamation hit the people of the Po Valley harder than the people of Holland. The outward migration to the cities first of all meant that the peasant assistance in the maintenance of the hydraulic works completely unravelled.²²⁶ The proletarianisation of the countryside thanks to early urban encroachment had left many rural people landless – and therefore not interested or willing to provide labour for the water works. Migration to the Appennines led additionally to further deforestation in the mountains (the sources of the main rivers across the Po Valley), making the plains more susceptible to flooding.²²⁷ Most importantly, however, land reclamation in the Po Valley had created an inequitable society, dominated by select urban interest groups. As flooding became more frequent, a higher pressure was put upon reserves of grain to stave off famine as so many

²²² E. Guidoboni, Human factors, extreme events and floods in the lower Po Plain (Northern Italy) in the 16th century, *Environment & History* 4 (1998) 279-308. On the general poor state of Northern Italy in the late sixteenth century see N. Davidson, Northern Italy in the 1590s, in: P. Clark (Ed.), *The European crisis of the 1590s*, London, 1985, 157-76. For population decline see A. Belletini, *La popolazione di Bologna dal secolo XV all'unificazione italiana*, Bologna, 1961, 25-6, 47-8; G-L. Basini, *L'uomo e il pane*, Milan, 1970, 14, 17.

²²³ F. Cazzola, La terra costruita, in: A. Visser Travagli & G. Vighi (Eds), *Terre ad acqua. La bonifiche ferraresi nel delta del Po*, Ferrara, 1990, 35-50.

²²⁴ A. Giacomelli, Appunti per una rilettura storico-politica delle vicende idrauliche del Primaro e delle bonifiche nell'età del governo pontificio, in: *La pianura e le acque tra Bologna e Ferrara: un problema storico*, Ferrara, 1983, 101-254.

²²⁵ J. Gutton, *La société et les pauvres en Europe, XVIe-XVIIIe siècles*, Paris, 1974, 104-6.

²²⁶ M. Cattini, Strade liquide e archipelaghi di terre: lo spazio estense visto da Ferrara, in: G. Papagno & A. Quondam (Eds), *La corte e lo spazio estense*, Rome, 1982, 119-30.

²²⁷ See criticisms in A. Alberti & R. Cessi (Eds), *Un codice veneziano del 1600 per le acque e le foreste*, Rome, 1934.

harvests were ruined.²²⁸ Land reclamation, however, had led to a society that (a) had lost the means to the production, and (b) were faced with an absentee landlord group that had turned large areas of land from arable to meadow. Not only did the move towards the production of meat and dairy for an elite urban market reduce the amount of work available in the countryside, but it reduced the grain supply – and left the greatest number of people facing terrible shortages in subsistence foodstuffs by the 1500s.²²⁹ The deficit in basic foods became a serious problem in many parts of Northern Italy.²³⁰ In accordance with Amartya Sen's work on twentieth century Bangladesh, 'natural disasters' hit the poor the hardest in the Po Valley.²³¹

In sum, medieval reclamation of the marshes of Holland and the plains of Northern Italy had created two divergent societies. Medieval Holland was characterised by egalitarian distribution of property, high levels of freedom and autonomy for its inhabitants, secure rights to property and a modern system of property transfer, a wide range of specialised and commercialised (non-agricultural) economic activities, and a flexible and unrestricted market for commodities and capital. In contrast, the Po Valley was characterised by two different forms of repression (manorial and then urban), increasingly higher levels of polarised distributions of landownership, an entirely restricted and manipulated set of economic activities, and markets subject to domination by interest groups through monopoly. In this paper it has been argued that societies based around notions of equality and freedom were better placed to deal with the consequences of environmental degradation (this time through land reclamation) than those marked by polarisation and repression – even when those polarised societies made recourse to capital investment in technology. Perhaps these sentiments can be applied to the modern world, where technology has become the answer to all of life's problems.

²²⁸ Alfani, *Population*, 581.

²²⁹ M. Bellabarba, *Seriolanti e arzenisti. Governo delle acque e agricoltura a Cremona fra Cinque e Seicento*, Cremona, 1986; Zanetti, *Problemi alimentari*, chp. 4; G-L. Basini, *Sul mercato di Modena tra Cinque e Seicento. Prezzi e salari*, Milan, 1974, chp. 3; M. Romani, *Nella spirale di una crisi: popolazione, mercato e prezzi a Parma tra Cinque e Seicento*, Milan, 1975, chp. 3.

²³⁰ B. Belotti, *Storia di Bergamo e dei Bergamaschi*, ii, Milan, 1940, 264; V. Beonio-Brocchieri, 'Piazza universale di tutte le professioni del mondo'. *Famiglia e mestieri nel Ducato di Milano in età spagnola*, Milan, 2000, 66; O. Raggio, Social relations and control of resources in an area of transit: eastern Liguria, XVI-XVII centuries, in: *Domestic Strategies: Work and Family in France and Italy, 1600-1800*, Cambridge, 1991, 21; D. Sella, Coping with famine: the changing demography of an Italian village in the 1590s, *The Sixteenth Century Journal* 22 (1991) 185-7.

²³¹ Sen, *Poverty and Famines*.