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Coping with Risk: Subsistence Crises in the Scottish Highlands and Islands, 1600–1800

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Abstract With their climatic variability and low crop yields, the Highlands and Islands formed a risk-laden environment for traditional farming communities. Yet whilst the major or exceptional famines between 1600 and 1800 are well-recorded, there has been less comment about the more frequent low-order crises that afflicted communities on a regular, even routine basis, leaving them without sufficient meal for a month or so before the new harvest was ready. Evidence for the nature and frequency of these low-order crises is discussed. Continually threatened with the problems posed by them, it is argued that the typical farming community would have been skilled in their response. Two forms of response are explored. First, the paper reviews some of the different ways in which Highland and Hebridean husbandry would have been organised so as to minimise risks. Second, it is argued that when these risk aversion strategies failed, communities buffered themselves against shortage by resorting to a range of alternative famine foods, from seaweeds and shell foods to the edible weeds of arable and grassland. We need to see major famines as occurring not just when exceptional or bad conditions prevailed, but also, when both these risk aversion and risk buffering strategies failed.

With their complex mosaic of exposed, rain-sodden and extreme environments, the Scottish Highlands and Islands posed many risks for traditional farming communities, risks that were over-whelming during some of the extreme environmental events that swept across the region in the more severe phases of the Little Ice Age.[1] The impact of these events on farming communities is manifest through the recurrent subsistence crises that afflicted the region down to the mid-nineteenth century. The frequency and scale of these crises were such as to ensure that most Highlanders and Hebrideans living before the mid-nineteenth century would have experienced the realities of famine more than once in their life. Yet with the notable exception of the Highland potato famine of the 1840s,[2] we know relatively little about these subsistence crises or about how Highland farming communities coped with them.

As a contribution to the debate, this paper will look at the crises and scarcities that occurred in the Highlands during the seventeenth and eighteenth centuries. Rather than approaching them solely from an event-based perspective, concentrating on the more serious crises or scarcities, those that produced the major famines, it will try to take a more context-based approach, building up a picture of the endemic risks that faced

traditional Highland and Hebridean communities. Taking an approach that emphasises the occasional major famines too easily creates the impression that the risks involved were somehow exceptional events which disrupted an otherwise smoothly working rural economy. Instead, this paper will argue that we can better understand the risks facing Highland society if we see subsistence crises, large and small, not as random, unforeseen environmental events that every now and then disrupted an otherwise steady-state township economy, but as failures to a township economy that dealt with food scarcities as routine occurrences and which, for that reason, was already organised to deal with fairly marked fluxes in output. In other words, major subsistence crises occurred in a knowing context, a context in which communities had evolved practices of husbandry, customary forms of social response, and strategies of food procurement that helped to combat recurrent scarcities and famines.[3] Environmental events capable of producing very poor harvests (i.e. late springs, wet harvests, etc) occurred regularly but were moderated in their effects through these practices, strategies and responses. When serious famine did occur, it was because all these various forms of buffering had failed to cope. Without such buffering, major subsistence crises would probably have been more frequent. If this was the case, then it follows that if we are to fully grasp the scale of endemic risks facing traditional Highland communities, we need to go beyond the major famines and explore their wider context and the risk aversion strategies through which communities tried to moderate the risks involved.

In developing this argument further, I want to explore, first, the sorts of risk that faced traditional Highland communities; second, how frequently these risks produced subsistence crises; third, how communities tried to buffer themselves against such crises through risk aversion strategies; and fourth, the different coping strategies used to combat scarcity when these risk aversion strategies proved inadequate.

What were the risks facing Highland communities?

Climatic hazards were the easily the most obvious and recurrent source of risk facing the traditional township economy. As a threat to the township economy, an economy that included a high proportion of subsistence arable and was vulnerable for that reason, the nature of these climatic hazards would not have been uniform across the region. Townships in the main body of the Highlands faced more continental-type conditions, with greater extremes of temperature, a shorter growing season, more frost, and more days of snow cover, especially in spring, all climatic variables that were exaggerated by the greater proportion of high and exposed ground. By comparison, communities along the western seaboard suffered from exposure of a different sort, being more prone to wind, rain and storms but without the extremes of temperature or frost.[4] Patently, these were not discrete categories. Townships in both areas shared many problems in common, but each would have confronted some risks to which they were more prone. Furthermore, we need to understand the varied ways in which these risks affected farming, from the effects of wet ground conditions or late frosts on ploughing and sowing to the effects of damaging storms, wet summers, lack of sunshine or early frosts and snow on the size and quality of harvest.

The different ways in which such climatic hazards affected farming meant that the threat of reduced output was ever-present. In practice, most examples of serious crop failure tended to occur when a number of circumstances or adverse conditions came together, or when poor conditions were sustained, year on year. The subsistence problems of 1671, for instance, arose out of 'Great losse by raines, winds, frosts, the Spring too drye, snow and hard frost, the seed time cold and wett, the summer and fore harvest constant rain, then ensued tempestuous winds, all our south and north had incredible losse by shakeing, and many parts in our Highlands rotting, blasting and mildew destroyed corn'.[5] In 1782–3, scarcity and famine started with a very poor wet summer. What already promised to be a poor harvest was then followed by an early snowfall that buried the crop before it could be harvested. The prospects for the subsequent harvest were then greatly reduced by a frost-laden and snowy spring, which, in turn, was followed by a wet and stormy summer.[6] The most documented run of sustained poor harvests was the so-called 'ill-years' or king William's lean years, 1695–1702, although, in fact, the poor harvests had finished by 1700.[7] Invariably, a very bad harvest could leave communities without sufficient seed for the following season's sowing, so that it did not need adverse weather across two years to produce a run of poor harvests. This was the case with the crises of 1744–5 and 1771–2, the second year suffering from a lack of seed carried over from the first year's harvest.[8]

Overall, we can expect the degree of risk to have been greater during a period of climatic degradation such as the Little Ice Age, 1300–1900, and especially during heightened phases of cold and storminess like those of the late sixteenth and early seventeenth centuries, the second half of the seventeenth and early eighteenth centuries and across the late eighteenth and nineteenth centuries.[9] During such phases, the increased frequency of extreme weather patterns and the resulting failures of crop and losses of stock would, if sustained across a succession of years, have led to a retreat from the more risk-laden sites. Even during times of climatic amelioration, sustained population growth or demand could push settlement onto more physically marginal sites which, by their very nature, carried a greater risk of crop failure or stock loss. We need only consider the shieling sites that were being turned into permanently occupied farms by the early eighteenth century to appreciate the force of this point.[10] In this cycle of expansion and contraction, upland communities would have suffered most at the point when the onset of a new phase of climatic degradation turned a phase of expansion into contraction, for it would have accentuated rather than eased the marginality of those sites already at the limits of settlement.

The increased frequency of climatic hazard was only part of the problem. In assessing the risks that faced Highland communities, the effect of weather patterns has to be seen in relation to the crop surpluses available to them. Logically, a farming community that could routinely boast an output comfortably in excess of needs, as opposed to one whose output hovered around what was barely sufficient, could more easily cope with a climatic regime under which weather patterns would frequently reduce crop output because of its variability. Data for crop yields in Highland and Hebridean townships, including data for Tiree that was systematically gathered on a township by township basis over a four-year period, show returns on seed for oats of between 2 ½ and 4x. Bere or barley was better,

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but there were many townships where it was still only 4 and 5x returns on seed.[11] Such returns have a direct bearing on the impact of poor harvests. Being so low, it would not have taken much variability in yields for a sufficient harvest to become a scarce harvest, especially if we take out what farmers needed for seed and the substantial amounts of grain handed over as rent by even the most isolated Hebridean communities.[12] With such tight margins, it becomes easy to see how phases of worsening climate and increased variability, like the second half of the seventeenth century, must have been phases when scarcity was so frequent as to be endemic.

Climate also created more indirect environmental risks. The most significant of these was the localised damage caused by flooding and by sandblow. In some cases, the damage was sufficient to threaten the subsistence base of communities. As regards flooding, the level of risk was due as much to the tendency for Highland communities to plough their haugh land as to the frequency of heavy downpours and the surge of flow beyond the capacity of river channels. During times of population growth especially, cultivating flat, low-lying ground must have appealed whatever the risks. Macfarlane's *Geographical Collections* talked about farmers in Glen Shira catching salmon where they had previously cultivated oats.[13] Tacks and surveys throughout the Highlands suggest that estates were alive to these risks by the seventeenth and early eighteenth centuries, banning tenants from ploughing close to river banks[14] and binding them to establish flood control banks.[15] Yet to judge from the ease with which reports of damage can be found, extreme events always exceeded average expectations. Reports of serious flooding, such as the 'muckle spate' that devastated Speyside and Strathspey in 1829, are freely available for the large and highly-braided rivers of the north-east and southern Highlands,[16] but they are also available for many lesser rivers throughout the region.[17]

The problem of sand blows, notably along the western seaboard, was comparable to river floods in that whilst damaging events occurred as a result of storms, their impact was often accentuated by communities ploughing out vulnerable machair soils or pulling up vegetation like marram grass. This was despite attempts by estates, either through tack agreements or local courts, to restrain them.[18] As with the major river floods, the effect of damaging storms can be documented for most areas where extensive machair or sandy soils were present. On Tiree, for example, eighteenth-century sources report the loss of large areas of arable along its west-facing coasts and around the edge of The Reef, an area of sandy machair soils that runs across the island.[19] There was a deeper history to this erosion of arable. When we look at mid-sixteenth-century rentals for Tiree, they report townships like those of The Reef and Bee as lying 'waist'. In fact, both had disappeared altogether from rentals by the seventeenth century.[20] Between the late seventeenth and the mid-eighteenth century large amounts of arable were also lost to sandblow on the islands that lay around the southern and western coast of Harris,[21] whilst eighteenth- and early nineteenth-century sources for North Uist, especially on its constituent islands of Baleshare and Kirkibost, make it clear that arable in townships along its western side also suffered acutely from sandblow, with extensive areas of arable soils being literally blown away and other areas being buried by blowing sand.[22] Today, the former toun site of Illeray on Baleshare consists of a series of scattered house platforms surrounded by tidal inlets and flats. Prior to the mid-eighteenth century, these house platforms would have

been surrounded by arable, much of which was probably blown away in mid-eighteenth-century storms.[23]

How frequently did Highland communities face conditions of food scarcity?

Whilst the wider range of available data, including burgh records and better price data, provides us with a fairly good indication of the famines or subsistence crises that occurred in Lowland Scotland from 1500 to 1800,[24] evidence for those that particularly afflicted the Highlands is less complete. At best, we can only claim to know about the major Highland famines. Like the failure of the oat and barley crop in 1602, when the harvest throughout the Highlands yielded 'no meal but lick-dusted trash', contemporary accounts sometimes document the 'great mortality' that resulted from these major crises.[25] Where we are able to see their effects in more detail, many had a strong regional component when it came to their more devastating effects. Thus, the famine of 1782–3, by far the most documented of the pre-1800 subsistence crises in the Highlands and one so severe that its causes and effects were subsequently debated in a parliamentary paper, had its greatest impact in the Grampians and around the Moray Firth.[26] By comparison, an area not too many miles to the west, like Kintail,[27] recorded no scarcity in 1782–3 though, further west still, on Skye, there was scarcity.[28] Subsistence crises were invariably rooted in failures of crop, though the consequent scarcity of grain and straw could also lead to stock losses.[29] Of course, there were also disasters that only affected stock, either because they involved some form of cattle disease or because they involved prolonged and damaging winter storms.[30] Nineteenth-century commentators reckoned that winter storms devastated stock on a twenty-year cycle, with between one third and one half of all stock perishing.[31] Although the effects were patently not as general or as significant as cattle disease or storm damage, some farms also reported regular cattle loss due to the hazards of their topographical setting.[32]

As Fenton and Smout demonstrated,[33] the frequency of major subsistence crises, albeit at a regional level, can also be established through grain prices. Long-run price data is not available for the main body of the Highlands but is available for Perthshire, a county that contains a mixture of highland and lowland. Post has argued that when grain prices rose by more than fifty per cent in a single year and held their increase for at least a year, then it was invariably associated with a subsistence crisis of sufficient severity to produce an increase in mortality.[34] If we take Perthshire prices of meal for measure, and plot the occasions during the seventeenth to eighteenth centuries when a price jump of this magnitude occurred, it suggests that, over the period 1630–1800, there may have been seven such events (see figure 1). Where we can add commentary to this price data, it confirms that price surges of this order were associated with major dislocations in food supply sufficient to cause famine and mortality. Prices in 1772, for instance, rose by just over fifty per cent. This was a year of profound scarcity throughout the Highlands.[35] In the Highland hinterland of Perth itself, a letter written in January by Robertson of Lude talked about how 'in the neighbourhood of this country people are dying very fast'.[36] The same can be said of 1782–3, a year when, again, the price of meal by measure in

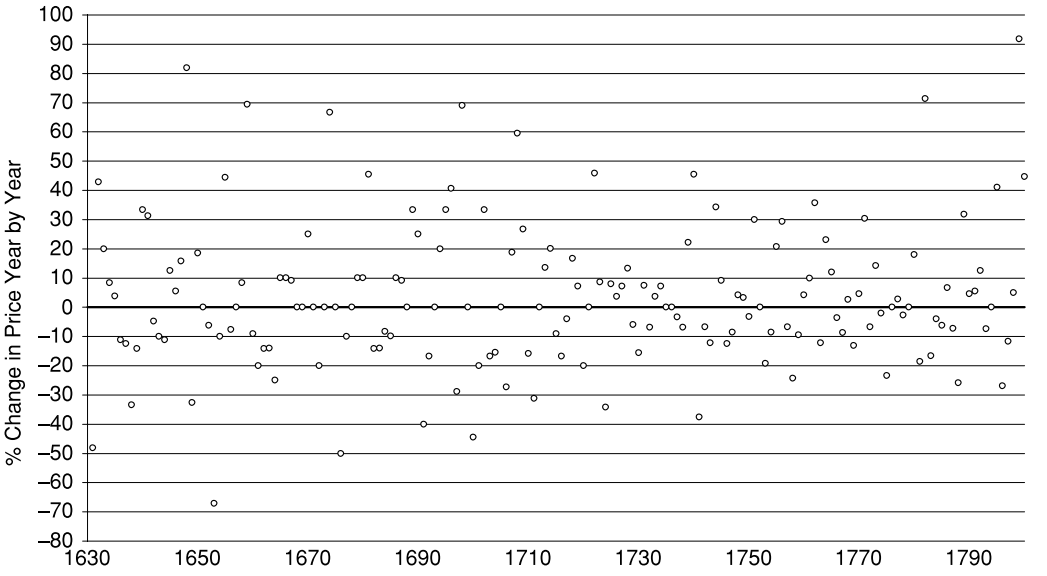

Figure 1. Meal by measure prices in Perthshire. Based on data abstracted from the 'Scottish Economic History Database 1550–1780' collected and made available by Dr. A. J. S. Gibson: http://www.ex.ac.uk/~ajgibson/scotdata/scot_database_home.html.

Perthshire rose by over fifty per cent. This too, was a year when famine was widespread in the central Highlands and when many were reported to have died, particularly in the eastern Highlands.[37]

To rely solely on Post's parameters though, would be to take an event-based approach to the problem of subsistence crises, one that stresses the occasional impact of major famines. Arguably, the price of Perthshire meal by measure data has more to tell us. When we look at the overall trend in prices between 1630 and 1800, the seven occasions when prices jumped by over fifty per cent in one year were not starkly isolated peaks in the data, but occurred amidst a random succession of lesser price events. Altogether, there were 29 occasions when prices jumped by twenty per cent or more, that is, once every six years (figure 1). The food supply problems that underpinned these price jumps were not necessarily generated from within Perthshire itself. Some may have been the effect of scarcity in other regions, exporting a demand for grain into adjacent regional markets.[38] Yet even when qualified in this way, the peakiness of the data underscores the point that the major famines probably occurred amidst a succession of lesser scarcities and short-term crises that may have been sufficient to produce hardship and temporary suffering, perhaps for a month or so before harvest, but which were not so severe as to produce outright famine or marked increases in mortality. Arguably, what our understanding lacks is a better grasp of these lesser, more numerous scarcities and short-term subsistence crises. Communities may have marked the generations by the great famines, but coping with the lesser scarcities and subsistence crises was part of the year-on-year routines.

The extent to which lesser scarcities and crises were endemic in the Highlands and Islands is captured by those contemporary writers who tried to estimate their frequency

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of occurrence. Estimates of how often scarcity occurred vary between once every four to once every seven years. At one extreme, Dr. James Walker talked about 'every fourth crop lost through lateness of harvest and inclemency of weather'.[39] At the other, Martin Martin estimated that crop failure sufficient to produce famine conditions occurred once every seven years.[40] However, much depends on precisely what was meant by scarcity or famine. Many communities in some Highland areas were reportedly affected by a shortfall of meal virtually every summer during the months immediately prior to harvest, a shortfall sufficient to cause hardship but not famine, at least in a normal year. This is what Thomas Pennant meant when he observed that islands like Canna 'annually experience a temporary famine'.[41] Once a hungry gap of this sort existed in normal years, any variability of output – such as that during a phase like the Little Ice Age – would have turned such seasonal discomfort into real stress for communities on a regular basis. This much was implied by Dr. Samuel Johnson who, referring to Mull, suggested that a poor harvest on the island meant not 'scarcity, but emptiness', as if the oscillations of harvest were not about feast and famine but about scarcity and complete emptiness, so that those whose best harvest 'was barely a supply of natural and present need', must, when that 'slender stock fails ... perish with hunger'.[42]

The point I am trying to make here is that we only fully understand regions like the Highlands if we appreciate how the major or historic famines that so challenged the peasant economy occurred within a context in which lesser crises were commonplace. In such circumstances, we can expect communities to have employed all means possible with which to buffer themselves against such crises, dampening their worse effects. When serious famine broke out, it was not simply because weather patterns conspired to cause an exceptionally severe failure of crop, but also, because the variability involved was too much even for tried and tested strategies of husbandry and social support that were already in place to avert or reduce risk.

Did Highland Communities Practise Risk Aversion?

All peasant societies exposed to high levels of environmental risk and variability evolved such risk aversion or risk minimisation strategies. That was a pre-condition for their long-term survival in such environments. In the Scottish Highlands, two forms of risk aversion can be identified: one social and the other based on a mix of cultivation techniques and husbandry practices. The social involved the flows of food that developed within the chiefly exchange systems of the region. The nature of such systems has been detailed elsewhere.[43] All that need be noted here is the way that they functioned as an insurance against risk. In their most basic form, exchange systems comprised flows of foodstuffs between tenants and their chief or landlord. Some of these flows involved staple foodstuffs, such as meal, cheese and hens. Others involved foodstuffs that were important to the chiefly household economy, such as bere, cattle, veal and salmon. Initially, these flows of food had two functions. They helped to sustain patterns of chiefly behaviour, including feasting, feuding and marriage alliances. In addition, chiefly girnal houses and bowhouses provided a store of food from which chiefs could offset local problems of scarcity, giving out meal from the former and helping to re-stock farms from the latter. The fact that many

of the great Highland estates covered a range of different habitats would have reduced the likelihood that all parts suffered in the same way. Poor harvests, and storms that devastated herds and flocks, not only took away a community's immediate subsistence, but also limited its capacity to sow for the next harvest or breed replacement stock.[44] The widespread use of steelbow tenure in the southern and south-western Highlands, a system whereby the estate routinely provided so much 'steelbow' seed, plough horses, and cattle, as well as working capital in the form of strenth silver, may well have developed out of chiefly responses to the repeated crises of the region.[45] As a form of tenure, it shared the risks between tenant and estate and provided a means whereby a tenant whose farm economy had been devastated by such a crisis could acquire the seed and stock needed to continue farming.

By the start of the seventeenth century, what survived of the chiefly system was already under strong pressure to change. The Statutes of Iona (1609) effectively undermined what remained of the chiefly consumption of food rents, forcing landowners to market the food rents which they had previously used to sustain their household and fighting men. By the late seventeenth century, however, many had started to convert their food rents into cash rents.[46] These successive shifts had different effects. Where landlords began to market their food rents, the export of food out of the local economy may have served to increase the risks facing local communities although it could also be argued that by increasing the flow of grain into the marketplace, such grain was still accessible.[47] However, when and where landlords commuted such payments into cash, communities were able to shift the burden of rent away from grain onto livestock,[48] marketing one or two cattle a year to raise the cash rents needed. In effect, the eventual switch into cash rents, a switch well underway by the late seventeenth century when poor harvests were a common occurrence, meant that tenants were able to increase the amount of grain that could be consumed as subsistence, possibly by as much as a third.[49] Seen in this way, the switch from payments in kind to cash rents served to redraw the margin at which poor harvests turned into a crisis.

The second form of risk aversion involved a range of cultivation techniques and husbandry practices. Significantly, some of these techniques and practices were condemned by the improvers who began to comment on the region over the late eighteenth century. Much has already been written about how, even in the more benign conditions of Lowland Britain, the fragmentation of landholding and its spread of arable across different micro-ecologies could serve as an insurance against risk, a point that can be accepted even if risk aversion was not the *prima causa* for such fragmentation. It hardly needs saying that the risk aversion benefits of such landholding would have been even more potent in a Highland context. Yet arguably, it was no more effective in spreading risk than the widespread use of lazy beds, or raised soil beds, a cultivation technique that deepened thin soils and enabled arable to be lifted across difficult, more waterlogged soils.

Potentially more significant for farming communities who lived in risk-laden environments were the risk aversion benefits gained through a diversified portfolio of cropping, one that combined crops capable of responding to different environmental circumstances. At first sight, the standard mix of oats and bere in early Highland and Hebridean townships might not seem to offer a diversified spread of risk but there is a

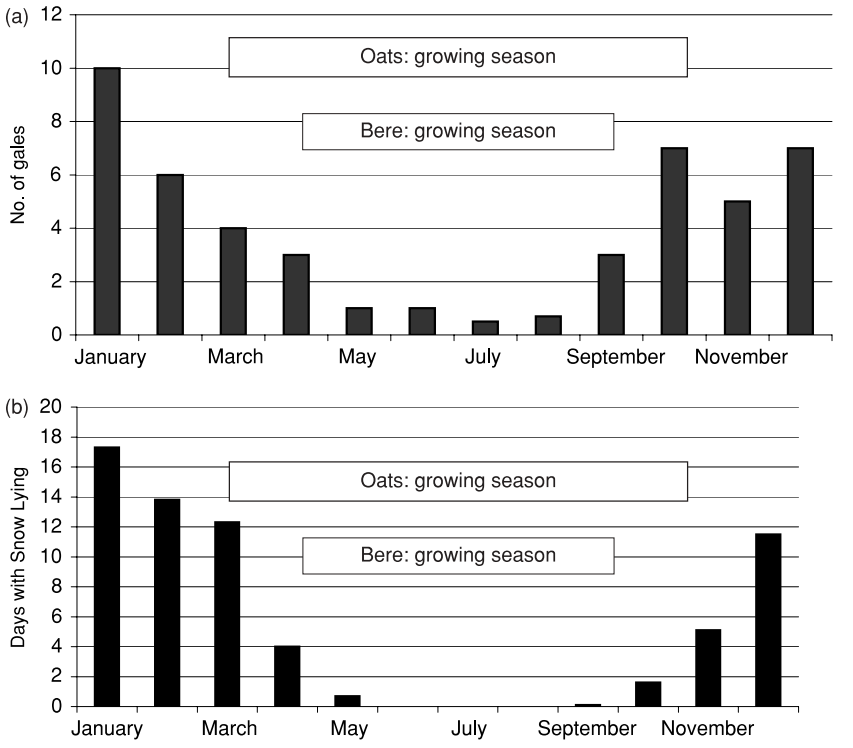

Figure 2. Measures of Risk: (a) Number of days with gales, Stornoway, 1940: (b) number of days with snow lying, Braemar, 1913–49. In both cases, the data has been set against the average growing season for oats and bere as recorded in eighteenth-century sources. Based on data provided by G. Manley, *Climate and the British Scene* (London, 1952), appendix. The data used is for the first half of the twentieth century but, in all probability, the frequency of gales and the number of days with snow lying is likely to have been greater during the sixteenth–eighteenth centuries.

vital point to be made here. Highland communities usually divided their core arable into three cropping breaks, cropped one year with bere or barley then two years with oats.[50] This was the case both with the infield systems of the mainland and inner Hebrides and the grass-arable systems of the outer Hebrides. Such a division of cropping might be seen as linked to the needs of manuring, since only one break, invariably the bere break, was manured each year. Yet whilst oats and bere were cropped on a ratio of 2:1, their differences in yield were such (effectively 1:2) as to make their differences in acreage less significant.[51]

This comparability in terms of output takes on a greater meaning when we look at their respective dates of sowing and harvesting. Bere was, on average, sown at least a month later (late April/early May) than oats (late March/early April) and harvested at least a month earlier (mid August/early September) compared to oats (late September/early October).[52] For a region like the Highlands, such differences in sowing and harvesting meant that oats and bere were exposed to different levels of risk. Some indication of the seasonal risk profile for arable farming in the Highlands and Islands can be gained from the graphs of monthly frequency of days with gales, and of days with snow lying (figure 2).

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Though one or two writers thought that summer (with its potential problems of winds, heavy rain and lack of sunshine and, therefore, of ripening) could be a time of risk for the west coast and Hebridean farmer,[53] the time of greatest risk for most areas would have been at those points in the year when the basic routines of arable farming came up against waterlogged soils or late frosts and snows in spring or when the standing crop was damaged by severe storms in late summer/autumn or by early frost and snows.[54] Seen in this context, the much shorter cropping regime of bere[55] meant that it avoided a significant proportion of the risks that could threaten the farmer over March and early April and those that threatened him or her over late September/October. In effect, the use of bere, and its forcing through the application of all available manure (livestock, seaweed, compost, etc), served as a risk aversion strategy.

The low yields of Highland crops were generally attributed to the varieties used, grey oats (*avena strigosa*) and four row bere, an early form of barley. Yet despite their low yielding characteristics, they had the merit of not being easily shaken in wind and of coping with rain better. Indeed, like other older varieties of grain, they had a much wider tolerance of climatic variability compared to modern varieties. Though it did not convince improvers, who surveyed the region in increasing numbers over the mid-late eighteenth century, the climatic tolerance of local grains was appreciated by local farmers, presumably for its added insurance against risk.

Given the high risks that also faced stock farming, we might ask whether there were husbandries that helped to minimise risk as regards stock farming. The greater diversity of stocking that existed before the Clearances may have provided some insurance given the different grazing patterns of different stock. Both native Highland cattle and sheep breeds were renowned for being able to forage across poor grazings, a factor that would have helped in times of scarcity. But in a region subject to severe winter storms, a risk heightened during times like the Little Ice Age, the main form of risk aversion when it came to stock management lay in the winter housing of stock. When we look at the region in the late eighteenth century, communities everywhere appear to have made some effort to house stock over winter, in the Hebrides no less than in the main body of the Highlands. But if we push our perspective back into the early eighteenth century, it is clear from a range of sources that stock were not housed in many parts of the Hebrides.[56] We can explain the difference by the fact that prior to the mid-eighteenth century, Hebridean townships used seaweed for manure[57] whilst townships in the main body of the mainland used stock manure and, as a consequence, housed stock over winter so as to accumulate their manure.[58] Yet such differences may not be wholly explained by their differences in manure use. With their milder climates and machair pasture, Hebridean townships were able to winter stock outdoors without risk. By contrast, townships on the mainland experienced far harsher winters and were far more prone to winter stock loss. We only rarely glimpse the stock losses that followed from these damaging winter storms,[59] but patently, wintering a proportion of stock indoors provided some insurance against loss. Yet ultimately, winter stock loss, like manure production, was also about winter feed. Whilst hay production was more significant on the mainland, it was still modest by, say, alpine standards.[60] To judge from contemporary comments, this modest use of hay in the Highlands meant some stock did not last the winter owing to lack of feed.[61] In other

words, whilst housing might have spared some stock from the devastations of winter storms, poor feeding would have worked in the opposite direction.

Responses to Scarcity

Three aspects of how Highland communities coped with crisis and scarcity require comment. The first concerns how tenants responded in landholding terms; the second concerns the extent to which they were able to respond by securing grain from other areas; and the third concerns the extent to which communities made use of what we can call famine foods.

The Landholding Response

Information on the first of these aspects can be gleaned from rentals, accounts and other estate material. Accounts are especially useful in this context, for they deal with what was actually paid as rent each year, the agreements reached over rests of rent, rebates, and breaks in occupancy. Rentals and accounts for four estates have been used: the Campbell of Cawdor's Islay estate; the MacLeod of MacLeod Estate on Skye, Harris and the smaller islands to the south and west of Harris; the Breadalbane estate in Argyll and Perthshire; and the Robertson of Lude Estate in Perthshire. In each case, particular use has been made of rentals and accounts for the 1690s and early 1700s, during the so-called ill-years, supplemented by more general data culled from across the seventeenth and eighteenth centuries. Between them, they provide clues with which we can establish a pathology of famine years, if by no means a complete pathology.

For the 1690s and early 1700s, three particular responses are evident. First, we see widespread adjustments of rent. On the case of the Netherlorn portion of the Breadalbane estate, two forms of adjustment were used: an ease of rent, effectively a discount, with part of the rent being written off, and a rest or deferral, with part of the rent being deferred and added to the following year. Given that a high proportion of the rent paid in kind consisted of grain, any such ease or deferral served to feed grain back into the household economy. In 1698, 25 out of 37 townships in Netherlorn were given eases or deferrals of rent, or were allowed to keep hold of their teind payments, whilst 27 were allowed eases or rests in 1700.[62] Such rests or eases of rent were not a feature simply of the 1690s and early 1700s. The Breadalbane estate used them as part of their response to tenant difficulties throughout the seventeenth century, whenever conditions were bad.[63] Other estates can also be seen responding to crises with rests or eases of rent. The MacLeod of MacLeod estate was allowing rests of rent on the lesser islands that fringed Harris as soon as their accounts bring arrangements into view during the late 1670s, but the scale of such rests increased during the 1690s.[64] Likewise, on the Robertson of Lude's estate, a court session held in 1706 'Anent the Tennents in Ranoch' to determine 'what ease they are got of ther rent and presents for the following year' shows that most of the touns had accumulated eases stretching back into the 1690s.[65] As in other marginal areas, such problems were endemic for the estate's Rannoch tenants. A court session held in 1726 found that 42 tenants had rent rests following poor seasons in 1723 and 1724.[66]

Here and there across these various records, we find explicit references to the fact that the discounts or remittances involved were due to the run of poor seasons or scarcity. The 1698 rental for the Netherlorn portion of the Breadalbane estate noted that Ardloing had 'remitted to ye tenants for the badness of their cornes 9 bolls 2 firlotts'.[67] Likewise, a 1701 account covering touns on the island of Pabbay refers to a tenant in Northtown who, 'in consideration of his poverty and the badness of the years he has ane half stone forgiven him',[68] whilst tenants in Leragan (Rannoch) reported to Robertson of Lude's court session of 1706 that they were given an 'ease of rent' in response to 'the badness of the late ill yeires' during 1699, 1700 and 1701.[69]

Another response to poor harvests was the increased turnover of tenants as those faced with the rising burden of accumulated back rents abandoned their tenancies. Different trends were at work here. We can see this best in regard to late seventeenth- and early eighteenth-century data for townships on Islay. Sampling the data simply for Killarow parish, fifty per cent of all farms saw a change in one or more tenant occupiers during the latter part, and immediate aftermath, of the so-called ill-years, 1699–1705.[70] In some touns, tenant numbers declined, as tenants abandoned their holdings, leaving them waste. In other cases, tenant numbers actually increased, probably as tenants adjusted to smaller holding and smaller liabilities. Such dislocations were noted elsewhere. The *New Statistical Account* for Nigg parish characterised the ill-years as a time when not only many died and the rich became poor, but also, when 'lands changed occupants'.[71]

An inevitable consequence of tenants abandoning their tenancies during these years was the rising level of land described as waste in accounts. In Killarow parish on Islay, for instance, thirty-three per cent of all townships were reported as wholly or partially waste at some point during the years 1699–1705.[72] Rentals for the Argyllshire portion of the Breadalbane estate and for the Rannoch portion of the Robertson of Lude estate also record townships lying waste during the 1690s and early 1700s, either wholly or in part, though not on the same scale as in Islay.[73] Despite the excellent coverage of its rentals and accounts for the 1690s and early 1700s and the fact that it embraced risk laden environments, there are few explicit references to land lying waste on the MacLeod of MacLeod estate during the ill-years 1695–1702, but the disappearance of Middleton and the reduced assessment of Northtown, two of Pabbay's main townships, are ample indication that parts of the estate did suffer in the 1690s.[74] Yet whilst noting the scale of land that can be found lying waste, we also need to be clear about what it meant. All the land involved was tenant land. For such land to be abandoned as waste was as much to do with a tenant's failure to cope with the level of output required by his or her rent payments, even when discounted with rests or eases, as it was to do with the impact of weather patterns on levels of crop growth. Difficulties with finding the surplus needed for rent could force the abandonment of a holding before poor harvests actually threatened basic subsistence.

Scarcity and Markets

Turning to how communities coped with the food scarcities that accompanied such crises, the first question we need to ask is how far those affected were able to solve all or part

of their food shortages by drawing in grain or meal supplies from elsewhere. There is a strong case for arguing that the Lowland market towns that skirted the eastern and southern edge of Highlands may have seen a growing volume of grain passing through their markets over the seventeenth and eighteenth centuries. Much of this increase was probably sustained by a growing grain output from Lowland areas.[75] In addition, there would have been some grain from within the Highlands. As noted earlier, most Highland estates traditionally gathered in grain as rent. Some embraced areas that were productive, at least in the context of the region.[76] With the Statutes of Iona (1609), and the restrictions placed on chiefly patterns of consumption,[77] some of this grain began to flow out of the region.[78] In fact, when such estates began to convert such payments into cash rents, they appear to have maintained grain rents from these more productive areas for longer. Yet by the early eighteenth century, grain rents from even these areas were being converted to cash. As it unfolded, this conversion would have reduced the flow of grain onto the open market from within the Highlands itself but, in the process, it left more grain in the household economy, raising its capacity to withstand fluxes in output.

Of course, the Highland peasant economy hardly operated in steady state across the eighteenth century. Increases in population over the eighteenth century greatly increased the burden on it, with holding size per family falling significantly in many parts of the region.[79] The region does not appear to have shared the improved grain output experienced by the Lowlands from the late seventeenth century but the adoption of the potato from the 1730s provided some ease, enabling more people to be supported for each acre of arable and more marginal land to be cultivated. As the potato moved to being the staple of the peasant diet during the closing decades of the eighteenth century, the peasant farm economy would have shifted away from grain.[80] When it came to subsistence crises, therefore, imports from outside the region would, increasingly, have become the only source of grain or meal supplement.

Sen has argued that famines were as much about food entitlements, about issues of food distribution and who had access to food via the market, as about problems of food production.[81] In other words, it is not sufficient to establish that markets skirting the Highlands had grain surpluses flowing through them over the seventeenth and eighteenth centuries. We need to understand whether Highland communities had social access to such markets. Only during the exceptional crises would the Highlands and adjacent Lowland areas have both experienced grain deficits, creating a crisis that embraced the country at large and one without an immediate solution. The majority of crises would have been more local or regional in their effect so that areas of deficit would have been juxtaposed with nearby areas that still had modest surpluses. Survival for the former would have depended on how well they could access or buy into the latter.

Those highlanders who joined the seasonal movement of labour out of the region to help with Lowland harvests, a migration that involved Hebridean islands like Islay and Skye as well as mainland areas, would have had some access to supplies of Lowland grain if a poor season threatened at home.[82] For those who remained, much would have depended on the degree to which they were already engaged in marketing goods or produce, so that looking to Lowlands markets for extra grain in times of scarcity would have seemed a natural response provided they could afford prevailing prices. There were

communities set at a distance that had developed market links by the eighteenth century. On the mainland, few were more isolated or more marginal than those of Knoydart. With access to only limited amounts of arable, townships in Knoydart evolved a subsistence strategy that involved selling cheese and butter at Inverness market and using the money raised to purchase grain.[83] More generally, Highland communities were able to draw on a range of other materials and products, often in modest quantities,[84] that could be traded against purchases of grain.[85] Such householding, or trading in use values, would have had disadvantages as well as advantages when it came to food scarcities. During local or regional scarcities, their dealings would have served to link them to areas that were still marketing a grain surplus. However, this dependence on market supplies even in normal years would have worked against them when scarcity was more general and such supplies were forthcoming only at a high price.

There were parts of the western Highlands and Islands though, where communities had no direct dealings with Lowland markets for much of the period under review. Even when many began to supply a few cattle to the local drove, it was the drover or dealer who handled the market transaction not the tenant. Furthermore, the sale of cattle was intended to raise cash for rents not to offset the deficiencies of a subsistence economy. For all intents and purposes, what constituted the subsistence economy operated as a closed economy, communities subsisting on what they had to hand. Yet in these situations, we can still find landlords assuming some responsibility for alleviating severe shortages. During the seventeenth century, they did so by over-seeing the movement of grain from those parts of their estate that still had surplus to those parts that were in need. Needless to say, such a strategy only worked during crises that had a strong spatial component, so that not all areas on an estate suffered equally. In practice, where we can see the processes involved, landlords simply took grain that had been gathered in as rent from one part of their estate and sold it at the market or below market price to tenants in other parts who were suffering food shortages.[86] By the mid eighteenth century, the widespread conversion of grain rents into cash payments meant that for landlords to move grain around within the estate economy was no longer an option. Instead, when major crises occurred, landlords or land agents acted as markets agents, purchasing grain on the open market and distributing it to tenants.[87] Towards the close of the eighteenth century, we can expect this reliance on imports to have gradually increased as the amount of arable per family declined. The combined effect of these trends would have been to shift some areas into regular food deficit by the end of the century, communities now being dependent on grain imports even in normal years. In some areas, the annual grain imports were substantial,[88] suggesting that, by this point, there must have existed well-developed flows supported by a network of dealers and traders. Yet to restate Sen's point, food shortages are not simply about the availability of grain. They are also about its social accessibility. For a region that shifted into a cash economy only slowly, the problem for the more remote or poorer parts was that many were simply unable to buy their way out of shortage, even where grain was available at a price, owing to the shortage of money in the local economy. Estate accounts suggest that whilst the levying of cash rents in lieu of grain or stock rents denoted a change in how estates wanted to calculate their income, the reality was that some appear to have simply accepted cattle of equivalent

value.[89] In effect, the cash economy came sooner to the estate economy than to the peasant economy.

Scarcity and Famine Foods

For those communities unable to access market supplies of grain or food, other responses were needed. In these circumstances, communities resorted to the use of what can be called famine foods. Logically, those faced with scarcity could only cope through the exploitation of resources that were not so directly affected by adverse weather, or other risks, in the way that field crops or stock might be. The key to their survival strategy lay in having access to ecological diversity. Communities needed to have access to ecosystems, to edible species of plant or animal, that were still capable of yielding output under conditions when their field crops failed or which were available during those times of the year when meal supplies ran out. As with the nature of risk itself, different parts of the region had a differing potential here. Compared to townships in the main body of the Highlands, Hebridean and west coast townships had access to a potentially greater range of biodiversity. Admittedly, the former could take advantage of game animals, birds and black fish, as well as of a range of woodland resources, but the tight regulation of game hunting and fishing meant that they were only accessible at a price. In a well documented incident in 1684, when large numbers of deer retreated from Rannoch in a heavy snowstorm, those inhabitants in townships on the eastern edge who slaughtered some of them must have thought it providential. In fact, the estate punished them heavily for it.[90]

If we were to draw up an inventory of the resources to which coastal and mainland communities potentially had access, noting only those for which evidence of use is available, the famine menu open to the former would be longer, and more appetising, than the latter. The foods concerned were used in times of famine or scarcity or to cover for hungry gaps, but some were also used in times of plenty, especially by the cottars, cottagers and labourers who filled out the farming community and for whom food was about satisfying basic need, not about surplus, even in the best of years.

Much depended on how food scarcities were calendared, and what local ecosystems could provide at particular times of year. The commonest season of scarcity was during the months immediately before the harvesting of the new crop. For coastal communities, shell food was especially important at this point, if scarcity threatened. In Duirinish (Skye), 'it was much prized by the poorest of people, to many of whom it affords sustenance in the latter end of summer, when, generally, every other provision fails'.[91] The term shell food covers different types of shell fish, but for summer, cockles were the staple food of scarcity, mussels being more of a winter food, supplemented by welks, limpets, lobsters, crabs and clams. At Tongue (Sutherland), Macculloch described how 'everyday at low water', the mouth of the river was 'crowded with men, women and children, who were busily employed in digging for these shell-fish', particularly cockles, following the poor harvest of 1817.[92] Cockles were also a food used in times of scarcity on North Uist, being combined with milk and bread in a stew, and eaten along with other shell fish, like razor fish, spout fish, welks, mussels, limpets, lobsters, crabs and clams.[93] Even in

good years, coastal townships made use of a wide range of so-called marine vegetables: pepper dulse, badderlock, kelp, laver (red and black), slake, and carrigeen moss. All can be documented as foods whose use became a critical supplement in times of famine,[94] with a seaweed like slake being available from March and a seaweed like badderlock being gathered mainly in September. Some, like dulse, could be eaten fresh from the sea, but others, like badderlock, a seaweed used mainly for its stalk, were first cooked.

Fish also provided an obvious dietary supplement in any sort of summer, not just one of scarcity, but when it came to a season of scarcity, some of the key fish eaten were not always obliging in their movements. The main season for herring off the west coast tended to be over the winter months, so that whether they could be smoked or salted became critical in terms of how far they could offset scarcity at other times of year, although, for some communities, drying them in the sun sufficed.[95] But combating the seasonality of herring, was only part of the problem. As a fish, they were notoriously fickle, shoaling in different lochs each year so that any dietary reliance on them brought with it new risks.[96] However, a range of other fish were available, whose presence was more reliable.[97] Yet whilst west Highland and Hebridean townships had ample access to fish, there remains doubt over how much dietary use was actually made of them prior to the late eighteenth century. Some sources suggest that the west Highlander and Hebridean had much less interest in fishing compared with, say, the Orcadian.[98] Pre-eighteenth-century references to large scale fishing in the region make it clear that it was driven by outsiders, including Clydesiders.[99] There are few indications that fishing was a significant part of the peasant economy at this point. Yet once detailed descriptions become available over the mid-eighteenth century, we come across townships that clearly depended on fishing for a basic part of their diet.[100] By this point, however, population growth was starting to marginalise township economies and more communities, often with estate help over boats and fishing gear, were exploiting the fishing around their shores, a shift emphasised by those early crofting townships that were laid out as fisher crofts.[101] More and more, therefore, we can expect coastal communities to have used fish to cover for the late summer hungry gap. Macculloch, for instance, could still talk about the region having 'a disinterest in fish'[102] then went on to say that when it came to a famine like that of 1817, 'maritime inhabitants suffered little, compared to those who had no access to fish'.[103] Of course, the sea brought other sources of diet that could fill a plate when crops failed. Sea mammals like seals and whales were regularly used for food as well as oil, whilst coastal communities on breeding islands like St Kilda and the Shiants, also had access to sea-birds like puffins, guillemots and gannets, for their flesh as well as their eggs.[104]

As noted earlier, temporary summer scarcities were a common occurrence. More serious were the famines that followed a disastrous harvest so that food scarcity was already apparent by the following spring. These prolonged famines were the famines that led to increases in mortality. In these circumstances, communities faced the challenge of finding food by late spring or early summer. Many responded by using weeds of arable and pasture. A number of such weeds can be identified as famine supplements: silverweed, wild carrot, sorrel, wild spinach, mugwort, ground elder, cow parsley, Scotch parsley, common white blite, burdoch, nettles and even the common thistle.[105] Some like

silverweed and wild carrot were used for their root and others like ground elder and nettles were used for their leaf. Those like nettles, wild spinach, wild mustard and mugwort were used together to make what one writer called 'a wholesome and savoury mess'.[106] On Tiree and Coll, silverweed was 'known to support the inhabitants for months togither, during a scarcity of provisions'.[107] Significantly, it abounded in barren and impoverished soils and 'in seasons that succeed the worse for other crops so they never fail to afford a most seasonable relief to the inhabitants in times of the greatest scarcity'.[108] The use of such weeds during times of famine means that the dense presence of weeds – the runches and skellochs noted by many observers in the Highlands and Hebrides[109] – and what seemed like the obstinate care with which farmers avoided ridding their land of them and their concern to allow the natural re-generation of grassland, could all be seen as serving a purpose, spreading their risks in a calculated rather than chance way. The way such a diverse family of weeds responded differently to wet and dry conditions, and the way they yielded food supplements at different times of the summer, meant that they offered a valuable fall-back position after crop failure. The ecological diversity within what appeared outwardly to be a simple and narrow cropping scheme is well captured by Marshall. 'Oats', he wrote, were 'universally, hid under a canopy of weeds in blow; the wild mustard and the corn marigold predominant; the spurrey, corn scabious, and the thistle were next in prevalency; with a numerous tribe of minor weeds ... Some of the oats ... overcame the weeds and, in their turn, overtopped them; thus gaining the appearance of a tolerable crop'.[110] Weeds that some condemned as 'obnoxious'[111] offered the possibility of sustenance when all else failed. There is a definition of weeds as a plant for which a use has not been found. There is a sense in which we might invert that and say it is a plant whose use has lapsed.

A strong case has been made by a number of writers for an expansion of farm output in the Lowlands over the second half of the seventeenth and early eighteenth centuries, that is, before the so-called Improving Movement (1750+) led to more striking gains. Combined with an increase in burgh trade over the same period, some see this improved output as sufficient to have brought about a reduction in the frequency of famines from the 1660s, a reduction that is detectible in the evidence.[112] What makes this improved output and greater access to food all the more significant is that it occurred at a time when Scotland, like other parts of Europe, was experiencing the worst phases of the Little Ice Age. Yet whilst the basis for the argument is convincing, it can only be accepted as applying to the Lowlands. Arguably, conditions in the Highlands and Islands were different. There is no evidence that there was any notable improvement in grain output in the Highlands over the century or so after 1660. Indeed, all the signs are that the amount of land per family may have declined as population grew and that, despite the widespread adoption of the potato with its ability to support more per acre, many families became marginalised by the end of the century.[113] In the circumstances, and given that the period after 1660 may actually have seen increased climatic risks for farming in the region, we cannot be surprised if subsistence crises continued to be a feature of the region or that commentators who visited the region in the eighteenth century reported seasonal scarcity and famine as still being routine occurrences. For such communities, strategies of risk aversion, as well as customary responses to famine, would still have mattered.

Acknowledgements

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Notes

1. For comment on the phasing of the Little Ice Age, see H. Lamb, *Climate History and the Modern World* (London, 1982), pp.211–41; M. E. Mann, R. S. Bradley and M. K. Hughes, 'Global-Scale Temperature Patterns and Climate Forcing over the Past Six Centuries', *Nature*, 1998, 778–87, especially p. 783; B. Fagan, *The Little Ice Age: How Climate Made History* (New York, 2000), pp. 47–59.
2. T. Devine, *The Great Highland Famine* (Edinburgh, 1988).
3. In stressing the role played by these buffering mechanisms, I am not discounting Sen's argument that famines were as much about food entitlements, as about problems of food production. See A. Sen, 'Food Entitlements and Economic Chains', in L. F. Newman (ed.), *Hunger in History: Food Shortage, Poverty and Deprivation* (Oxford, 1990), pp. 374–86.
4. A good illustration of the climatic problems created for farming is shown by entries in the Assynt Factors reports, 1823–6. In 1823, April was reported as 'colder and stormier than usual', July affected by 'incessant rain' whilst September was 'unusually stormy', National Library of Scotland, Sutherland Papers, 313/1025, Assynt Factors and Sutherland Ground Officers, 1823–6. The climatic risks are also well shown by the maps of average dates for the earliest and latest frosts, in F. H. W. Green, 'The Climate of Scotland', in J. H. Burnett (ed.), *The Vegetation of Scotland* (Edinburgh, 1964), pp. 18–19. The maps of oceanicity in D. A. Ratcliffe and D. B. A. Thompson, 'The British Uplands: Their Ecological Character and International Significance', in M. B. Usher and D. B. A. Thompson (eds.), *Ecological Change in the Uplands*, British Ecological Society special publication 7 (Oxford, 1988), p. 14 are also relevant.
5. W. Mackay (ed.), *Chronicles of the Frasers*, Scottish History Society, 47 (1903), 491–2.
6. A good description of the causes of the 1782–3 famine can be found in J. E. Handley, *Scottish Farming in the Eighteenth Century* (London, 1953), p. 35; J. E. Handley, *The Agricultural Revolution in Scotland* (Glasgow, 1963), p. 71; A. J. Youngson, *After the Forty-Five* (Edinburgh, 1973), p. 86; *Old Statistical Account* (hereafter *OSA*), vi, p. 432.
7. Detailed discussion of the ill-years, especially of their demographic effects, is provided by M. Flinn (ed.), *Scottish Population History from the Seventeenth Century to the 1930s* (Cambridge, 1977), pp. 164–86. See also, T. C. Smout, *A History of the Scottish People, 1560–1830* (London, 1969), pp. 153–5; I. D. Whyte, *Agriculture and Society in Seventeenth Century Scotland* (Edinburgh, 1979), pp. 246–51.
8. A letter written on Skye, about the MacLeod of MacLeod estate in 1745, referred to the 'bad situation', 'we all made use of our Sowing Seed (except a verie few) unless we will get a relief within a few days the most of us will perish for want of Bread, etc', see Dunvegan Castle, MacLeod of MacLeod Papers, 5/151, Letter, dated 12th May, 1745. Likewise, a letter written in April 1772, from Skye during the crisis of 1771–2 described the loss of cattle and 'to add to yr Calamity having nothing to eat or sow in ye Ground' if the frost and frequent snows would permit them. See *ibid*., 4/304/1-2, Letter dated 28th April, 1772. For another example, in relation to the scarcity of 1782–3, see W. Macgill, *Old Ross-shire and Sutherland*, vol. 1 (Inverness,1909), p. 173.
9. These phases are based on the temperature gradients provided by Mann, Bradley and Hughes, 'Global-Scale Temperature Patterns', p. 783.
10. Well documented examples of shieling sites being upgraded into permanent settlements are documented in V. Gaffney (ed.), *The Lordship of Strathavon*, Third Spalding Club (Aberdeen, 1960), pp. 28–32.

11. For further details, see R. A. Dodgshon, *From Chiefs to Landlords: Social and Economic Change in the Western Highlands and Islands, c.1493–1820*, (Edinburgh, 1998), pp. 218–22.
12. A good example of the heavy payments of grain even from remote and risk laden touns is provided by the three touns on Pabbay, off the coast of Harris, which paid 38 bolls (Kirktoun), 13 bolls (Lingay) and 12 bolls (Northtown) of meal respectively, see Dunvegan Castle, MacLeod of MacLeod Papers, 487/14, Rental of Harris, 1694. See also, 2/487/22, Rental of the Barrony of Harris as sett 1735.
13. W. Macfarlane, *Geographical Collections Relating to Scotland Made by W. Macfarlane*, Scottish History Society, lii (Edinburgh, 1907), ii, 146. The floods described by Macfarlane occurred ca.1700 and destroyed both houses and arable in Glen Shira.
14. A good illustration of the restrictions on ploughing close to rivers that might flood is provided by the act banning all ploughing within 'Sixteen fute to any River sik as Urquhay Dochart or Loquhay, And within Auchtin fute to any uther great water' listed as in operation in 1615, SRO, Breadalane Papers, GD112/17/1/1/5, Actis made befoir Colene Campbell of Glenurquhay and be Sir Duncan Campbell.
15. See, for example, R. C. MacLeod (ed), *Book of Dunvegan, 1340–1920*, Spalding club (Aberdeen, 1938–9), ii, 79. National Library of Scotland, Sutherland Papers, 313/3160/18, Assynt Tacks.
16. The Speyside flood of 1829 is well documented by T. D. Lauder, *An Account of the Great Floods in the Province of Moray, and Adjoining Districts* (Edinburgh, 1830). Mackay (ed.), *Chronicles of the Frasers*, describes a great inundation in the north east that occurred in 1637, p.272. See also, *OSA*, iii, 410–11 and 541; G. Donaldson (ed.), *Accounts of the Collectors of Thirds of Benefices*, Scottish History Society, 3rd series, xlii, 1909, 133.
17. Examples of damaging floods on lesser rivers are provided by Scottish Record Office, E729/7, Report of Francis Grant, 1756 and E746/79/10, Letter from Simon Mackenzie of Langwell,1772; J. R. N. Macphail (ed.), *Highland Papers*, Scottish History Society, 2nd series, xii (1916), ii, 343; *OSA*, iii, 410–11; *OSA*, xvii, 163.
18. For example, Inveraray Castle, Argyll MSS, vol. 65, Remarks on the Island of Tiree, 1771.
19. Typical of the eighteenth-century reports that refer to sand blowing on Tiree is that of 1750, the Chamberlain of Tiree, which talks about the sea having made 'considerable inroads' on the north coast and the fact that Kelis, Ballewilline, Kylepoll and Queyish had suffered considerable damage from sandblow, see Inveraray Castle, Argyll MSS, vol. 65 Instr. For the Chamberlain of Tyrie, 23rd Oct, 1750. A 1771 report, ibid., Remarks on the Island of Tiree, 1771, suggests that sandblowing had also affected Kenovay.
20. The disappearance of these two touns is shown by a comparison of G. P. Macneill (ed.), *Exchequer Rolls of Scotland, xvii, 1537–1542* (Edinburgh, 1897), pp. 647–8, with Inverary Castle, Argyll Papers, Box 251, Rentall of Tiry, what it payed in:52, and in all years thereafter, 1675. Both touns were already listed as lying 'waste' in 1541. By 1652, they had disappeared from the listings altogether.
21. Dunvegan Castle, MacLeod of MacLeod Papers, 2/487/15, Rental of Harris, 1698; Ibid., 1/466/24, Description of Harris, 1772; M. MacKay (ed), *The Rev Dr. John Walker's Report on the Hebrides of 1764 and 1771* (Edinburgh, 1980), p. 13.
22. Macfarlane (ed.) *Geographical Collections*, ii, 18; MacKay, *John Walker's Report*, p. 64: Clan Donald Centre, Lord Macdonald Papers, GD221/5914, Valuation of North Uist per Neil Maclean, 1830.
23. The 1718 rental for North Uist shows Illeray still occupied by eleven tenants, with only a small amount lying waste, the latter possibly overwhelmed by the storms of the 1690s, see SRO, Forfeited Estates, E656/1 Judiciall Rental of North Uist, 1718. Its devastation was probably in the 1756 storm, see MacKay, *John Walker's Report*, p. 64.
24. A long-run listing of major famines and subsistence crises, mainly based on Lowland data, can be pieced together from S. G. E. Lythe, *The Economy of Scotland in its European Setting 1550–1625* (Edinburgh, 1960), pp. 17–23; T. C. Smout, 'Famine and Famine Relief in

Scotland', in L. Cullen and T. C. Smout (eds.), *Comparative Aspects of Scottish and Irish Economic and Social History, 1600–1900* (Edinburgh, 1977), pp. 22–7; H. H. Lamb, *Climate, History and the Modern World*, 2nd edition (London, 1995), p. 221.

25. Mackay (ed.), *Chronicles of the Frasers*, p. 236.
26. PP, *House of Commons Sessional Papers*, 1846, London, xxxvii, 281–334.
27. *OSA*, vi, 252.
28. *OSA*, xi, 552.
29. A 1772 example is instanced by A. Millar (ed.), *Selection of Scottish Forfeited Estates 1715; 1745*, Scottish History Society, Edinburgh, lvii (1909), 85.
30. Examples of the devastation of stock numbers through winter storms are documented by E. Henderson (ed.), *The Annals of Dunfermline and Vicinity from the Earliest Authentic Period to the Present Time 1069–1878* (Glasgow, 1879), year 1709; C. S. Scott, 'Wintering Hill Sheep', *Transactions of the Highland and Agricultural Society of Scotland*, 4th series, xvii (1886), 125; Orr, 'Development of Stock Farming', *Transactions Highland and Agricultural Society of Scotland*, 5th series, xliii, 1931, 47. Millar (ed.), *Selection of Scottish Forfeited Estates*, p. 85. An instance of devastation caused by livestock disease is provided by the outbreak of cattle murrain in northern Skye, 1716, which led to the loss of 485 horses, 1026 cows and 4556 sheep, SRO, Forfeited Estate Papers, E656/23 declaration of wadsetters and tenants of Trotternish over poverty caused by murrain, 1716.
31. J. Macdonald, 'Agriculture of Sutherland', *Transactions of the Highland and Agricultural Society of Scotland*, xii (1888), 80; Orr, 'Development of Stock Farming', p. 47.
32. When surveyed in the 1770s, farms in Knoydart reported a routine loss of cattle caused by 'bone break' when stock were moving back and forth to the hill pastures via the steep cliffs that backed townships, see SRO, Forfeited Estate Papers, E741, Barrisdale. Reports Concerning Farms 1771. See also, SRO, GD112/9/3/3/4 Barcaldine's Instructions of Glenorchy 1693 refers to 'Borhyles West' as having lost cows 'falling over ye Craigs' sufficient to discount half his rent. These losses did not disappear with the clearances. For instance, GD112/16/13/4/18 Report by Sir Alexander Campbell Nether Lorne Estate 1852 refers to the 'considerable loss from accidental death, in bogs, and over rocks' on the farm of Degnish.
33. The value of using long-run grain prices to establish the frequency of scarcities was noted by T. C. Smout and A. Fenton, 'Scottish Agriculture before the Improvers – An Exploration', *Agricultural History Review*, xiii (1965), 73–8.
34. J. D. Post 'Nutritional Status and Mortality in Eighteenth-Century Europe', in Newman (ed.), *Hunger in History*, p. 241.
35. The local impact of scarcity in 1771–2, which helped generate a surge in emigration out of the region, can be documented through two sources. First, it is recorded through a series of letters written about north-west Skye. One written in 28th April, 1772, talks about 'most part of the Inhabitants are already ruined by ye loss of yr Cattle' and that 'to add to yr Calamity, having nothing to eat or sow in yr Ground tho' the frost & frequent snows would prevent them', see Dunvegan Castle, MacLeod of MacLeod Papers, 4/304/1, Letter dated 28th April, 1772. Another, again written in 1772, referred to 'ye deplorable Condition of the people, as hundreds will starve', *ibid*., 4/304/2. For similar problems on Harris, see, *ibid*., 1/466/23, Letter dated Jan 30th, 1772.
36. SRO, Robertson of Lude Papers, GD132/784/19, Letter, 23rd January, 1772.
37. Many contemporary sources comment on the 1782–3 famine, e.g., *OSA*, iii, 526–7; iv, 315; xi, 348; but the most detailed source is PP, *House of Commons Sessional Papers*, 1846, London, xxxvii, 281–334.
38. Embracing both Highland and Lowland, Perthshire prices probably reflect the workings of two divergent markets. As Smout and Fenton argued, there is a case for believing that output and the marketing of grain increased in Lowland Scotland during the seventeenth century. This increased output, combined with an assumption that there were fewer bad harvests over the second half of the seventeenth and opening half of the eighteenth century,

led them to suggest that there were fewer scarcities or famines over this period, see Smout and Fenton, 'Scottish Agriculture', pp. 73–93.

39. Mackay, *John Walker's Report*, p. 210.
40. M. Martin, *A Description of the Western Islands of Scotland*, 2nd edition (London, 1716), p. 14.
41. Cited in J. Knox, *View of the British Empire* (London, 1784), p. 78.
42. S. Johnson, *A Journey to the Western Islands of Scotland*, ed. M. Lascelles (New Haven, 1971), p. 138.
43. Dodgshon, *From Chiefs to Landlords*, pp. 55–98.
44. A good illustration of this point is provided by a letter from Skye dated, 12th May, 1745 which declared that 'we all made use of our Sowing seed (except a verie few) unless we will get a relief within a few days the most of us will perish for want of Bread', Dunvegan Castle, MacLeod of MacLeod Papers, 4/151.
45. Examples of the steelbow provision of seed and plough horses, as well as strenth silver, are abundant in the rentals and accounts of the Breadalbane estate. See, for example, SRO, Breadlbane Muniments, GD112/9/3/3/3/3, The Earle of Breadalbane's Rentall in Argyll Shyre 1680; *ibid.*, GD112/9/3/3/7, Rentall of the Earle of Breadalbane's Estate in Argyleshire, 1697; *ibid.*, GD112/9/40, Rentals 1717–20.
46. Dodgshon, *From Chiefs to Landlords*, pp. 107–17.
47. We need only calculate the scale of grain being extracted by the MacLeod of Macleod estate from islands like Pabbay (65 bolls of meal each year), known as the 'granary of Harris', to appreciate the problems that might have emerged once estates like MacLeod of MacLeod started selling grain rather than storing it locally in a girnal house: see Dunvegan Castle, MacLeod of MacLeod Papers, 487/14, Rental of Harris, 1694; *ibid.*, 2/487/22, Rental of the Barrony of Harris as sett 1735; R. Heron, *General View of the Natural Circumstances of those Isles, Adjacent to the North-west Coast of Scotland, Which Are Distinguished by the Common Name of Hebudae or Hebrides* (London, 1794), p. 21.
48. The sale of cattle would not have greatly affected Highland diets as whilst they made dietary use of milk, cheese and butter, and bled cattle during famine conditions, they did not consume meat on a significant scale, see A. J. S. Gibson and T. C. Smout, *Prices, Food and Wages in Scotland, 1550–1780* (Cambridge, 1995), pp. 226–9. For the bleeding of cattle, see W. Marshall, *General View of the Agriculture of the Central Highlands* (1794, London), p. 21.
49. Where we can analyse the proportions involved, the old saying that each crop gave a third for seed, a third for meal and a third to pay the laird with appears broadly accurate, see Smout and Fenton, 'Scottish Agriculture', p. 74.
50. See R. A. Dodgshon, 'Strategies of Farming in the Western Highlands and Islands of Scotland prior to Crofting and the Clearances', *Economic History Review*, xlvi (1993), 679–701.
51. Data is presented in Dodgshon, *From Chiefs to Landlords*, pp. 218–22.
52. Sowing and harvesting dates are freely provided in the *Old Statistical Accounts*. See, for example, *OSA*, xiv, 141; x, 355; xi, 300; xiv, 139–56; xix, 266; x, 462; ii, 552; xvi, 187.
53. The OSA report for Harris made this point with the words that crops 'are more frequently blasted by the severity of the weather in their progress towards maturity, than shaken full ripe by autumnal storms'. His suggestion that farms 'have their corns cut down before' the tempest of the autumnal equinox, though, hardly squares with the usual dates given for harvest (mid August-October): see, *OSA*, 10, 355. SRO, Forfeited Estates, E746/151, also makes a relevant point about the weather during the summer months when it said that 'nor are the crops to be depended on because of the frequent rains to which the west coast is exposed'.
54. J. Macculloch, *The Highlands and Western Isles of Scotland* (London, 1824), iii, 215, argued that, in respect of autumnal rain, farmers invited the problem by not harvesting until late,

with half the loss over autumnal rains being 'due to laziness over harvesting'. His suggestion that they wait until crops are 'dead ripe' but at risk of 'being blown away by the winds' should be compared with the comment by the reporter for Harris in *OSA*, x, 355, who suggests they harvest half ripe grains rather than risk storm damage in the autumn. The effect of early frosts on field crops is well documented in the *New Statistical Account* (hereafter *NSA*) report for Laggan, xiv, 420–1.

55. The average growing period was 8–10 weeks, see for example, *OSA*, xiv, 141; x, 355; xi, 300; xiv, 139–56; xix, 266; x, 462; ii, 552; xvi, 187.
56. See, for example, M. M. Mackay, *John Walker's Report*, pp. 185 and 208–9.
57. Ibid., pp. 14–15, 42, 55, 63, 65, 77, 88,104, 172,181, 185, 205 and 210.
58. Millar (ed.), *Scottish Forfeited Estates*, p. 141 provides an excellent 1772 description of indoor wintering in Stratherrick, 'one of the highest countries in Scotland'. Being 'very stormy for upwards of half the year, which it makes it necessary to cover within their houses their whole crop, and cattle, as otherwise they would be totally destroyed by the uncommon severity of the weather'.
59. Writers like Martin attributed the heavy stock loss over winter to the poor provision for winter feed, see Martin, *Description of the Western Islands of Scotland*, p. 337; Macculloch, *Highlands and Western Isles of Scotland*, 3, 90.
60. See, for example, A. Fenton, *Scottish Country Life* (Edinburgh, 1973), p. 136. Many contemporary commentators and surveys confirm the lack of interest in haymaking. One of the few references to hay production is provided by SRO, Breadalbane Muniments, Rental of Glenorchy, 1697, which shows touns as levied with a demand for large amounts of 'straw and hay'.
61. SRO, RH2/8/24, John Blackadder's Description and Valuation of Lord Macdonald's Estates of Sky and North Uist, 1799 and 1800; Macculloch, *Highlands*, 3 (1824), 90.
62. SRO, Breadalbane Muniments, GD 112/9/35, Rentall Book of Netherlorne 1693–1704.
63. For example, ibid., GD112/9/10, Rental of Victual Payments, 1618–22. Within a year or so of the ill-years, 1695–1702, the estate was again remitting rents: ibid., GD112/9/1/3/16 Rental of Nether Lorne 1705 refers to eases of '4 bs meill given Down to the tennents of Over Ardlarich 4 bs meill to the tennents of Dowarhae 4 bs to the tennents of Barauchhervie in respect ther Cropt ffailed this yeir'.
64. For example, Dunvegan Castle, MacLeod of MacLeod Papers, 2/487/ 11–16.
65. SRO, John Macgregor Collection, GD50/136/2 Barony Court Books. Menzies and Rannoch, vol11, 1694–1708, May 5th, 1706.
66. Ibid., GD50/56 Barony Court Book of Lude 1621–1806, Feb 21st, 1726.
67. SRO, Breadalbane Muniments, GD 112/9/35, Rentall Book of Netherlorne 1693–1704.
68. Dunvegan Castle, MacLeod of MacLeod Papers, 2/487/14, A brief rentall of yr Harris as it was att Whitsunday 1697; ibid., 2/487/16.
69. SRO, John MacGregor Collection, GD50/136/2 Barony Court Book of Menzies and Rannoch, vol 11, 1694–1708, 1706. SRO, Breadalbane Muniments, GD112/9/35, Rentall of Book of Netherlorne 1693–1704, also notes the 36 bolls of meal remitted to the tenants of Ardluing in 1698 as 'for the badness of their cornes'.
70. Cawdor Castle, Campbell of Cawdor Papers, Bundle 721: Rent of Ilay for the Years 1703, 1704, 1705, 1706 and 1707. For comparison, Cregeen published data on partially or wholly waste townships (26 out of 90) on Mull during the crisis of 1744, see E. R. Cregeen, 'Tacksmen and their Succesors: A Study of Tenurial Reorganisation in Mull, Morvern and Tiree in the Early Eighteenth Century', *Scottish Studies*, 13 (1969), 93–144. As with the crises of 1771–2 (see above, note 34), Cregeen draws out how the stress created by subsistence crises like that of 1744–5 led to a disruption of customary relationships between landowners, tacksmen and tenants.
71. The words used were 'many died of want, the rich became poor, the land changed occupants', *NSA*, xiv, 27. There was also much debate in Aberdeenshire about whether the ill-years

reduced many farmers to poverty, and led to abandonment, see G. S. Keith, *A General View of the Agriculture of Aberdeenshire* (Aberdeen, 1811), pp. 143, 151–2 and 154.

72. Cawdor Castle, Campbell of Cawdor Papers, Bundle 721: Rent of Ilay for the Years 1703, 1704, 1705, 1706 and 1707.
73. For example, SRO, Breadalbane Muniments, GD112/9/35, Rentall Book of Netherlorne 1693–1704.
74. Pabbay is full rated as 16 pennylands down to the early 1690s, but post 1700 rentals reduce it to 10 pennylands. Even the 1724 rental for the estate still referred to Pabbay as 'being once Sixteen pennie Land now only Ten pennies', Dunvegan Castle, MacLeod of MacLeod Papers, 2/487/19, Rental for 1724.
75. See, for example, Smout and Fenton, 'Scottish Agriculture', pp. 73–93.
76. We need only look at the large quantities of grain that the Campbell of Breadalbane estate gathered in from an area like Netherlorne, or which the MacLeod of MacLeod estate gathered in from islands like Pabbay to appreciate this point.
77. Dodgshon, *From Chiefs to Landlords*, pp. 105–7.
78. Ibid., pp. 234–5.
79. M. Gray, *The Highland Economy, 1750–1850* (Edinburgh, 1957), pp. 24–9, 197–8 and 240–1.
80. Ibid., pp. 143, 181–2.
81. See A. Sen, 'Food Entitlements and Economic Chains', in Newman (ed.), *Hunger in History*, pp. 374–86.
82. Typical of the evidence for this migration is the comment that 'our poor goe in Great Shoals to the Low Country for two or three Months in the harvests to reap the corns there, and immediately return, with what they have sav'd' in SRO, GD14, Campbell of Stonefield Papers, GD14/17, Mr. Campbell of Knockbuy's Epistle about Encouraging Manufacturing in Argyllshire, 1747. As Professor Chris Smout has pointed out (personal communication), the very fact that those who joined such labour flows were out of the Highlands in the month or so prior to the start of harvest in the Highlands would, itself, have been a form of risk aversion, providing them access to food at a time of year when many Highland areas experienced a shortfall in meal.
83. SRO, Forfeited Estates, E78/42, Report on the Estates of Barrisdale and Kinlochmoidart, c.1755. The sale of butter and cheese was also a feature of Coigach, the markets at Tain and Dingwall being used, see SRO, Forfeited Estates Papers, E729/ Report of Captain John Forbes Factor upon the Annexed Estates of Lovat and Cromarty, 1755, Coigach section.
84. *Burt's Letters from the North of Scotland*, with Introduction by R. Jamieson (London, 1876 edition), 1, 28–9 clearly could not adjust to the petty nature of much market trading in use values. In reference to Inverness market, he says that 'one has under his Arm a small Roll of Linen, another a Piece of coarse Plaiding; these are considerable Dealers. But the Merchandise of the greatest Part of them is of a most contemptible Value, such are these, viz – two or three cheeses, of about three or four Pounds weight a piece; a Kid sold for sixpence or Eight pence at most; a small Quantity of Butter, in something that looks like a Bladder, and is sometimes set down in the Street; three or four Goat skins; a Piece of Wood for an Axeltree to one of the little Carts, &c'.
85. Trade across the Highland line would have driven as much by differences in costs as much as by any principle of complementarity. Some Highland communities had a range of goods that could be marketed in a raw or processed form, such as skins, hides, yarn, cloth, stockings, timber, candle fir and whisky, whose sale could help with grain purchases in years of scarcity. A variety of skins and hides were traded, including those of sheep, lambs, goats, kids, deer, fox, otters and martins, with markets like Crief and Inverness being major outlets, see A. M. Smith, *Jacobite Estates of the Forty-Five* (Edinburgh, 1982), pp. 127–9. The isle of Harris, for instance, was said to export the skins of sheep, otters and seals, see Dunvegan Castle, MacLeod of MacLeod Papers, 1/466/24 Description of Harris, 1772. During the middle decades of the eighteenth century, attempts were made to develop flax

spinning and knitting on a putting out basis in parts of the highlands, see R. A. Dodgshon, *Land and Society in Early Scotland* (Oxford, 1981), pp. 313–14; Smith, *Jacobite Estates*, pp. 113–23. Though such outworking was not successful in the long term, it must have given those households that became involved the extra margins by which they could purchase some grain in times of scarcity. In parts of Grampian, Perthshire and in the south-west Highlands, the illicit distilling of whisky was extensive, but whilst it raised cash for rents it did so only through the consumption of bere: see, for example, Inveraray Castle, Argyll Papers, Bundle 2530, Instructions to His Grace 1761, which refers to many tenants 'distilling their Barley privately into Whisky'. Distilling made use of peat as a fuel. In some areas, the peat also yielded bog fir. That harvested from the Black Wood of Rannoch reportedly kept Perthshire supplied in candle fir (personal communication, Prof. Chris Smout). The living wood too, provided many opportunities for supplying markets with goods that could be traded against grain. As well as supplying local tanners, many were involved in the harvesting and selling of tanning bark via markets like Stirling, see *OSA*, vi, 90 and x, 125. The MacLeod of MacLeod Papers contains a report on Glenelg woods, 1778, listing the price received for 'manufactured' couple trees and and plough beams, see Dunvegan castle, MacLeod of MacLeod Papers, 2/500, Mr. Nicol's Report on the Value of the Woods of Glenelg, 1778. As Professor Chris Smout has suggested (personal communication), there were individuals across the Highlands living wholly off the harvesting and/or processing of woodland resources.

86. The meal that Campbell of Breadalbane arranged to be transferred from Netherlorne to Glenorchy following the latter failure of crop in 1696 (see note 50), provides an instance of this. In a letter written in March 1697, Campbell of Breadalbane wrote to his factor saying that 'I empower you to give to such tenants in Glenurchy such proportiones of the meall as will be found at your meiting with them, that they are responsible to pay or find credit for it', SRO, Campbell of Barcaldine Muniments, GD170/629, letter, March 14th, 1697. By 1698, the problems were more widespread, with letters referring to the condition of Benderloch as equally acute, but adding 'desolation is universal in the Highlands, Lord help it', GD170/629, Letter, March 2nd, though subsequent correspondence shows that many tenants were too indebted following poor harvests to pay for the meal that was delivered. Increasingly, any role played by landowners was replaced by government action, see T. C. Smout, 'Famine and Famine Relief in Scotland', in L. Cullen and T. C. Smout (eds.), *Comparative Aspects of Scottish and Irish Economic and Social History, 1600–1900* (Edinburgh, 1977), pp. 21–31.
87. An example of such purchases is provided by a letter from Captain Fraser, dated 1772, to the Board of Commissioners for the Forfeited Estates asking for permission 'to purchase 400 bolls of meal from Aberdeen or Banffshire, to be sold to the tenants in small quantities, and some to be given to the poor to prevent them from starving, most of the gentlemen of estates in that neighbourhood and in the highlands finding themselves under the necessity of nursing their tenants upon this melancholy occasion, when the crop turned out so ill, and so many of their cattle perished for want of fodder in the severe winter and spring', see Millar (ed.), *Scottish Forfeited Estates*, p. 85. See also, *OSA*, vi, 252.
88. In a general observation, Thomas Pennant suggested that many parts of the Highlands were into grain deficit and having to import meal by the mid-eighteenth century, see T. Pennant, *Tour in Scotland and Voyage to the Hebrides 1772* (Chester, 1774), i, 211. See also, Gray, *Highland Economy*, pp. 142–4.
89. Examples are provided by SRO, Cromartie Papers, GD305/1/119, Acct of the Milk Cows uplifted from the tennents of Coigach at Beltane 1691; Inverary Castle, Argyll papers, Instructions for Archibald Campbell ... Chamberlain of Tyrie, 10th Oct, 1748. The scarcity of money in the peasant economy and the way it inhibited the buying in of grain from Lowland markets is well indicated by a letter written during the 1772 crisis by MacLeod of Ulinish. As well as referring to the 'deplorable Condition of the People' and how 'hundreds will starve', he talks about communities being 'wtout Sowing, without bread to support

Nature, without money or Credit', see Dunvegan Castle, MacLeod of MacLeod Papers, 4/304/1-2, Letter dated 28th April, 1772.

90. SRO, GD50, John Macgregor Collection, Barony Court Book – Menzies and Rannoch, 20th March, 1684. The Robertson of Lude estate actually maintained a control over poaching based on a degree of trust. Each year, all tenants attended a court sitting where they were called upon to declare whether they had caught any deer, game birds or black fish, the court normally settling the matter with a fine.
91. *NSA*, xiv, p. 328.
92. Macculloch, *Highlands*, 3, 349. See also, *OSA*., iii, 522; NSA., xv, 172.
93. *OSA*, iii, 522; *NSA*., xiv, 167.
94. J. Lightfoot, *Flora Scotica* (London, 1792), ii, 935, 939, 954 and 967–8; *OSA*, vii, 207; *OSA*, x, 268; *NSA*, x, 268.
95. *OSA*, x, 268; *NSA*, xiv, 328. See also, Martin, *A Description*, p. 55; Macculloch, *Highlands*, 3, 242.
96. See, for example, T. Pennant, *A Tour of Scotland 1769* (London, 1776 ed.), p. 239; *NSA*, xiv, 77; Youngson, *After the Forty-Five*, pp. 131. At Kintail, the crop scarcity of 1791 was said to have been eased because the following season was one in which, to their good fortune, the herring appeared in abundance in Loch Duich, *OSA*, vi, 252.
97. Reports of fish caught along the west coast include ling, cod, skate, mackerel, haddock, turbot, saithe and cuddies as well as herring. See, for example, *OSA*, iv, 131; ibid., xiv, 175–6.
98. The view that the Hebridean had little interest in fish was deep-rooted, see W. F. Skene, *Celtic Scotland*, iii, appendix a, 430.
99. *The Highlands of Scotland in 1750*, with introduction by A. Lang (Edinburgh, 1898), p. 33; Dunvegan Castle, MacLeod of MacLeod Papers, 1/466/24, Description of Harris, 1772; Youngson, *After the Forty-Five*, pp. 106–7
100. The OSA report for Kilmuir, Skye, noted that 'the fish are caught, not by regular fishermen, but by the country people, for the use of their families', *OSA*, ii, 548; see also, *OSA*, x, 268 and 348; *OSA*, xi, 425; SRO, Forfeited Estate Papers, E741, Barrisdale, Reports concerning farms, 1771; ibid., E746/73, Report on the Judiciall Rental of the Cromarty Estate, 1755; R. J. Adam (ed.), *Survey of Assynt*, Scottish History Society, 3rd series, lii, 1960, 10.
101. The duke of Argyll was creating fishing crofts on Mull and Tiree by the 1780s, see *OSA*, xiv, 176; E. R. Cregeen (ed.), *Argyll Estate Instructions 1771–1805*, Scottish History Society, 4th series, i (Edinburgh, 1964), 1 and 137.
102. Macculloch, *Highlands*, p. 242.
103. Ibid., p. 350.
104. See, for example, *ibid*., 3, 183.
105. J. Lightfoot, *Flora Scotica*, 1, 147, 148, 158–9, 209, 268–9, 261–2, 389, 426–7, 445–6, 459 and 468–9. See also, *OSA*, xiv, 167; *NSA*, xiii, 125; *NSA*, xiv, 167.
106. *NSA*, xiv, 475.
107. Lightfoot, *Flora Scotica*, 1, 268–9.
108. Ibid., p. 269. See also, Martin, *A Description*, 267; Heron, *General View*, p. 23. The latter refers to it as 'Brifgeen, or wild fherrat', 'a succulent root, which the common people, boil, and use for potatoes or bread'.
109. *OSA*, vii, 197; *OSA*, xiv, 90; *NSA*, vii, 388.
110. Marshall, *General View of the Agriculture of the Central Highlands*, pp. 38–9.
111. *OSA*, xi, 602.
112. Smout and Fenton, *Scottish Agriculture*, p. 75.
113. Gray, *Highland Economics*, pp. 24–5, 29–31.