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Hum Ecol Interdiscip J. 2010 June ; 38(3): 321–334. doi:10.1007/s10745-010-9312-8.**Adopting Cultivation to Remain Pastoralists: The Diversification of Maasai Livelihoods in Northern Tanzania****J. Terrence McCabe,**

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Paul W. Leslie: pwleslie@unc.edu**Abstract**

Over the past four decades, Maasai pastoralists in Tanzania have adopted agriculture, integrating it with their traditional pastoralism. This livelihood diversification has complex origins and profound implications for Maasai social organization, culture, and demography, and ultimately for their health and well being and for the local and regional environment. In this paper, we examine the process by which this engagement with, and increasing dependence upon, agriculture came about in Ngorongoro District, northern Tanzania. The process there was more complex and influenced by a wider variety of factors than has been reported by previous descriptions of Maasai livelihood diversification. It generally involved two stages: planting a garden first, and later expanding the garden to a farm. We found that some households adopted cultivation out of necessity, but far more did so by choice. Among the latter, some adopted cultivation to reduce risk, while for others it was a reflection of changing cultural and social norms. Motivations for adopting cultivation differed among people of different wealth categories. Diversification was part of wider cultural changes, and was also influenced by power differentials among Maasai age sets and by government policies.

Keywords

Pastoralists; Maasai; Tanzania; Livelihood diversification

Introduction

There are two dominant images of East African pastoral peoples. One is an image of young men—warriors—living in a pristine wilderness, moving their beloved livestock from one seasonal pasture to another, coping with the vagaries of nature and the danger of attack from

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wild animals. The other is of destitute families barely able to survive and most likely walking to, or living in, refugee or famine camps. One or the other of these images is promoted by NGOs, governments or tourist companies appealing to particular constituencies in the attempt to promote a product or encourage a donation. What is not often projected is an image of an African pastoralist swinging a hoe, guarding someone else's house, driving oxen in front of a plow, or, heaven forbid, driving a tractor. But it is a combination of these latter images that more accurately reflects the current reality of modern day pastoralists throughout much of Africa.

Pastoral peoples in Africa, and in fact in many areas around the world, have been rapidly diversifying their economies. Although the public images of pastoral peoples may not have kept up with this transition, those who have been studying pastoral peoples have been writing about the causes and consequences of adopting cultivation (e.g., O'Malley 2000; Brockington 2001; McCabe 2003; Homewood *et al.* 2005; Fratkin and Roth 2005). Anthropologists and geographers, among others, have also been writing about men, and to some extent women, migrating to find work (Batterbury 2001; May and McCabe 2004; Homewood *et al.* 2009) and entering the livestock trade or petty business (Little *et al.* 2001; Little 2003).

We (JTM and PWL) have been working with East African pastoralists for almost thirty years (first with the Turkana of Kenya and later with Maasai in northern Tanzania) and have witnessed many of the changes mentioned above. However it was during the time that the ban on cultivation was lifted in the Ngorongoro Conservation Area (NCA) in Tanzania that we realized the importance, and potentially overwhelming rapidity, of the transition. Within a two year period following the lifting of the ban in 1992, approximately 90% of the families living in the NCA had adopted cultivation. The adoption of cultivation in the NCA had important implications for the nutrition of children, the break of a downward spiral of impoverishment due to the overselling of livestock to purchase grain, and a long-term perspective of being in control of their livelihoods, as well as for wildlife conservation (McCabe 2003). We were able to document that the human population there has been steadily increasing while the livestock population fluctuated around a long-term mean, and hypothesized that this disarticulation of human population dynamics from that of the livestock population, was the principal factor driving the transition from pure pastoralism to agro-pastoralism (McCabe 2003).

The policy restrictions on cultivation in the NCA so strongly shaped livelihood diversification that the NCA case is of limited utility for understanding the historical roots of diversification among the Maasai elsewhere. In this paper we present the results of a multi-year study of the process of livelihood diversification among the Maasai in the Loliondo area, just north of the NCA. We argue that the process is more complex than has previously been appreciated, including in some of our own publications (McCabe 1997; McCabe 2003). We support the conclusions reached by others that the motivations for adopting cultivation differed among people of different wealth categories, but further argue that those decisions were part of a larger cultural shift and were also influenced by power differentials among Maasai age sets and by government policies.

Livelihood Diversification

Although people like the Maasai have been primarily understood as practicing “pure pastoralism”,¹ the advent of a livelihood strategy based exclusively on livestock is probably a relatively recent development (Marshall 1990; Spear 1993). Marshall has argued quite convincingly that there was a change in climate approximately 2,000–3,000 years ago that resulted in a bi-modal rainfall pattern. The resulting environmental conditions permitted people in East Africa to depend on the year-round availability of milk for food (Marshall 1990). Prior to this climatic shift, pastoral peoples in East Africa combined livestock keeping with small scale cultivation, hunting and gathering, and fishing. However, even in the recent past, people like the Maasai have been divided into sections that were purely pastoral, such as the Kisongo, and sections that practiced cultivation in addition to livestock keeping, like the Parakuyu and Arusha.

During the last thirty years most of the region’s purely pastoral peoples have diversified their economies. Reasons advanced to explain this change in livelihood strategies have included the alienation of rangelands due to the expansion of parks and protected areas (Homewood and Brockington 1999; McCabe 2003; Brockington 2001; Igoe 2003a, b; Goldman 2003), changes in land tenure and the privatization of land held as common property (Galaty 1994; Homewood 2004; Burnsilver 2007; Leserogol 2008), the penetration of the market economy (Ensminger 1992; Little 2003) the loss of livestock due to drought and disease (Western 1997; O’Malley 2000), and the increase in the human population while the livestock population remained steady or declined (McCabe 2003). A common theme in this literature has been that poor people are pushed into alternative livelihood strategies due to poverty, while wealthy pastoralists diversify as a risk avoidance strategy (Homewood *et al.* 2009; Brockington 2001; Little *et al.* 2001). The poor are seen as adopting cultivation, but also migrating for wage labor, selling milk (almost exclusively by women), and engaging in petty trade. The more wealthy people may move into commercial agriculture, livestock trading or even real estate.² Homewood and colleagues (2009) have argued that the diversification process affects all segments of pastoral society, while Little *et al.* (2001) have argued that wealthy and poor pastoralists diversify but those in the middle wealth category do not. Little has further argued that the economic diversification is cyclical and reflects the life histories of individuals and the developmental cycle of families, while others (e.g., Homewood *et al.* 2009; McCabe 2003) have argued that the process tends to be linear, permanent, and will eventually define the livelihood strategy of most, if not all East African pastoral peoples.

Another common theme has been that livelihood diversification has been accompanied by reduced mobility and this is associated with increasing impoverishment. However, Fratkin and colleagues present a more complex picture of pastoral sedentarization and the adoption of cultivation among the Rendille and Ariaal pastoralists in northern Kenya (Fratkin and Roth 2005).

¹Pure pastoralism is generally understood as meaning that the human population depends exclusively on livestock as their means of subsistence—this may mean that the people consume only livestock products or that livestock provide the means for acquiring grains and other goods through trade, in addition to providing livestock based foods.

²Although East African pastoralists have only very recently begun to invest in real estate, this process was reported on as typical for wealthy Middle Eastern pastoral peoples decades ago (Barth 1961).

This transition to a more diversified pastoral economy has also been observed for other peoples in the African rangelands. For example, Hampshire and Randall (2000) note that Fulbe livelihoods, in the West African Sahel, diversified following the 1973 drought. Individual men began migrating to cities to find seasonal work and families also began to adopt cultivation. They argue that this diversification encourages the persistence of large families as more people are needed to undertake the various necessary economic activities. Thebaud and Batterbury (2001) and LaRovere *et al.* (2005) have also published on the diversification and intensification of livelihood strategies among Sahelian pastoralists. Further, investigation of pastoral livelihood diversification has not been restricted to Africa—see for example the work of Mearns and others for Mongolia (Fernandez-Gimenez 2002; Fratkin and Mearns 2003; Marin 2008).

The Setting

The research reported here took place in the Loliondo Division of Ngorongoro District in northern Tanzania (see Fig. 1). The area is bounded to the north by the Kenyan border, to the south by the Ngorongoro Conservation Area, to the west by Serengeti National Park, and to the east by Lake Natron. The major towns in the area are Loliondo (the District headquarters) and Wasso, a short distance to the south. Research was conducted in smaller villages of the Division, including Olorien/Magaiduru, Ololosokwan, Arash, Maloni, and Soitsambu.

The northern part of Loliondo Division forms the southern extremity of the Loita Hills, while to the west the land drops off to the Serengeti plains. In the south the topography includes hills, plains and Arash mountain. Precipitation in the area varies from a high of approximately 1,400 mm/yr in the highest elevations to 500 mm/yr in the very low areas. Rainfall is generally bimodal with a short rainy season during the months of November and December and a longer more intense rainy season in late March, April and May. However, as is typical of arid and semi-arid areas, precipitation is highly variable, both spatially and temporally, and drought is a common feature of the climatic pattern. Wildlife is abundant in the area, especially during the months of January and February when the migrating wildebeest move through the eastern plains on their way to calf in the short grass plains of the Ngorongoro Conservation Area and the Serengeti.

The People

The Maasai occupy approximately 150,000 km² spanning northern Tanzania and southern Kenya. The Maasai in Kenya have experienced more development and changes in land tenure than the Maasai of Tanzania. In Kenya, group ranch schemes initially fragmented the common property regimes that were the basis of the traditional system of resource management; and more recently many of the group ranches have undergone subdivision into individually held properties (Galaty 1999; Burnsilver 2007). In Tanzania, common property has remained the core for the management of grazing resources, although many villages are experiencing significant shifts as individuals are being allocated private³ holdings and villages are designing land use plans that include areas for cultivation, livestock keeping, and sometimes wildlife conservation.

The people living in the study area are primarily Maasai of the Purko, Loita, and Laitoyoka sections. Town populations are more mixed and another agricultural ethnic group of Bantu origins, the Sonjo or Watemi, live in the hills to the east of the study area. There are also small pockets of other cultivating peoples with whom the Maasai have interacted, in particular the Iraqw (or Mbulu); as well as hunting and gathering peoples generally referred to as Dorobo. The different Maasai sections migrated into the study area sometime during the last 200–250 years and by the late 1800s had evicted the former occupants, the Barabaig (or Datoga, *II Tatwa* in Maa), from the entire region including the Ngorongoro Conservation Area (O'Malley 2000).

Although there are significant differences among the three sections of the Maasai living in the study area (O'Malley 2000), the important point for the purposes of this paper is that during the first half of the 20th century all three Maasai groups practiced a form of pure pastoralism, based on the raising of cattle, goats, and sheep.

Maasai social organization is based on three interlinking institutions: marriage and family relationships, territory, and the age set organization. The smallest social unit is the house or *enkaji*, consisting of a wife and her children. A man, his wives and dependents form the next organizational unit, referred to as *enkishomi* (translated as gate) or *olmarei*. This is the basic family unit responsible for the management of livestock. In the past it was typical for a number of *enkishomi* living together in a unit to be referred to as an *enkang*. One rather recent development is that there is a trend for an *enkang* to consist of a single *enkishomi*, but this varies across Maasailand, and appears to be less common in the Loliondo area than in other Maasai areas. All Maasai men are members of a clan (*olgilata*), and this forms the basic unit for mutual aid and redistribution of livestock.

Maasai are organized into territorial sections (*olosh*) in which all members have access to the grazing resources. This is the largest political unit for the Maasai, and in the past, sections have engaged each other in war. The age/grade, age/set system is the other basic unit of Maasai social organization. Together with other members of his cohort or age set, each male member of the society goes through a series of age grades (boy, warrior, junior elder, senior elder, retired elder), each with its own set of norms and responsibilities. During the warrior age grade members acquire a name that identifies them as an age set and remains with them throughout their life. Age sets have leaders (*olenguinani*), and constitute the political basis of the society. As senior elders they may wield significant power and authority over decisions relating to what is right or wrong with respect to the management of natural resources and articulating with outside entities (see results section).

Historically, few events influenced the current Maasai as much as the period known as *Emutai* that occurred in the 1880's and 1890's (Waller 1988). This period was characterized by a series of disasters beginning with an outbreak of contagious bovine pleuropneumonia, followed by an outbreak of rinderpest which was unknown in East Africa prior to that time and which devastated the cattle population. This was followed by an outbreak of small pox

³In many villages plots of land are being allocated to individuals, often in 3–10 acre allotments. Although individuals have rights to use these allocations they are legally not allowed to sell them.

among the human population. The last stage of these disasters entailed internecine warfare among many of the Maasai sections, as people attempted to rebuild herds by raiding any group that managed to prevent wholesale losses due to disease. One important impact of these events, for the study presented here, was that many people migrated to live with agricultural peoples who were much less affected by the disease outbreaks. Many men ended up living and marrying within these groups (Kikuyu, WaArusha, WaMeru). Eventually most of these men returned to Maasailand and brought their wives with their agricultural knowledge back with them.

Methods

The methods used in this research included open ended interviews with household heads, group interviews, and a survey of 93 household heads. The open ended interviews were conducted by the authors and served to provide a qualitative understanding of the process by which households adopted cultivation. Group interviews were conducted in a number of villages where the individual surveys were conducted, with the same goal in mind. We conducted additional group interviews after initial analysis of some of the surveys to clarify some points, especially with respect to the initial phase of cultivation. The household surveys were conducted by the authors, as well as by two research assistants who were hired from the local area. Both had been trained in survey techniques and were also supervised by DeLuca. The individuals interviewed during the survey phase of the research were all household heads and were chosen opportunistically. Although the sampling was not random we tried to ensure that those surveyed included all wealth and age classes. All age sets that had achieved elder status were represented in the sample, but only 5% of the household heads interviewed were in the youngest age set. These men, and the majority of the next youngest age set, were in the warrior age grade at the time that their family adopted agriculture. They were for the most part living in their father's *olmarei*, where they were responsible for much of the day-to-day herd management, but are reporting their understanding of decisions made by their father or other household members.

In addition to the interviews, we were able to draw on the work of Elizabeth O'Malley who had conducted earlier fieldwork on similar issues in the area under the supervision of McCabe (O'Malley 2000).

This analysis depends on the ability of informants to recall past events, situations, and decisions. There are potential difficulties inherent in dependence on retrospective data. We are confident that the data presented in the following sections accurately depict the decision-making process regarding the adoption of cultivation. However, we also recognize the difficulties in trying to reconstruct family histories that may go back a number of decades. Problems might arise from 1) imperfect recall and/or 2) selection bias.

Recall

Our confidence in the accuracy of our informants' memories is grounded in part on the fact that the central topics here entail the composition and dynamics of herds and families. These are two of the most persistently prominent concerns of Maasai life and figure centrally in their discussions and planning. Further, we endeavored to enhance recall accuracy in several

ways. In our experience, tying questions and discussion to salient events is an effective means of aiding recall related to life histories (e.g., Leslie and Dyson-Hudson 1999; Bernard 2006). We coupled the questions in our interviews to major events in the Maasai calendar—in particular, the opening and closing of age sets. These events are highly significant to the Maasai and are marked by important, memorable ceremonies and rituals; we believe that most people remember those who were living in their household at those particular times. Thus, with each household head we probed for each person present in the household at the times that these ceremonies were taking place, including their wives and children and others who may have been living in the *olmarei* at the time; we also asked married or widowed women about the number of children present.

The number of livestock reported by each family at these points in time is not likely to be precise, but should be quite sufficiently accurate to serve as an indication of wealth, useful for identifying trends, distributions of wealth, and the general economic context in which families were making livelihood decisions.

Selection Bias

Our analysis is based on the histories of a cross sectional sample of households present in 2001. If these households are not representative of those present at some point in the past, because households with certain characteristics (e.g., wealth) were less likely to persist long enough to be included in the sample, conclusions about that characteristic (or others associated with it) in the past may be distorted. The likelihood and implications of such bias are best addressed in the context of the presentation and discussion of specific results, as we do below. However, it is well to keep in mind that our results reflect the experience of the 93 families in our sample. We believe that they are representative of the Maasai living in the study area at the time of the study; if substantial numbers of families left the pastoral sector and area because of impoverishment or other reasons (and at this time we have no good indication of how common this was), some of our results may not fully represent the situation at earlier times.

Results

One of the first challenges we faced was to identify the time period that each family adopted cultivation. Based on the open ended and group interviews we were able to ascertain that the process usually involved two steps. The first was the planting of a small garden (*bustani* in KiSwahili), and the second was to expand to a farm (*shamba* in KiSwahili). The garden was usually planted by the wife or wives of a household head and the crops included pumpkins (squash), some other vegetables, and small plots of maize and sometimes beans. These were planted adjacent to the *enkang*, and most if not all work was done by women. The farm may or may not have been planted adjacent to the *enkang*, and was usually in excess of an acre in size. The crops planted were predominantly maize, sometimes intercropped with beans. For some families the transition from garden to farm was slow and gradual as the garden expanded. For other families the transition was rapid and may have occurred in a single year.

We determined the time that each family initially adopted cultivation, and their livestock holdings and family (*olmarei*) size at that time. We were able to do this by asking what age

set were warriors at this time and how close the time of adoption was to the opening or closing of the age set (opening and closing defines the span of years during which all boys become members of a given age set as they are circumcised). This gave us a good idea about the timing of adoption but the dates are not precise. We thus collapsed them into decades, as represented in Fig. 2. Numbers of cattle, goats and sheep were recalculated as Tropical Livestock Units.⁴ We used the same procedure for the time period when the garden became a farm and for the time of the survey, 2001. This gives us data at three points in time for each household—adoption of cultivation (start of garden), expansion to farm, and 2001. Note that the first two of these points are not fixed in time but refer to events in each family's history. With these data we can track economic and demographic change in families over time as well as examine the relationship between wealth and family size and the adoption and expansion of cultivation.

Initial Adoption of Cultivation

Figure 2 summarizes the timing of the initial planting of gardens.

The data clearly show that the peak of adoption occurred during the 1970s. Approximately 45% of the families interviewed adopted cultivation during this decade, and more than a third of these did so within a two to three year period (1975–1977). No other time period comes close to that for initiation of first planting a garden. By the 1990s, 100% of families were cultivating.

One of the first tasks was to describe the sample population in terms of wealth at each of the three time periods (adoption, expansion, and 2001). In previous publications McCabe (2003) has defined wealth using Potkanski's (1997) classification based on Tropical Livestock Units (TLU) per capita. They are: destitute, below 0.5; very poor, 0.5–1.25; poor, 1.25–2.50; medium, 2.5–5.0; rich, above 5. However because it takes between 4 and 5 TLU per capita to sustain a livelihood as a pastoralist (Fratkin and Roth 1990) the above 5 TLU per capita does not appear rich to us. Therefore we have divided the rich category into moderately wealthy: (5.0–10 TLU per capita); and wealthy (above 10 TLU per capita). There has also been much recent discussion about the proper assets to include in a categorization of wealth among pastoral people (e.g., Homewood 2008). Considering that at the time of adoption of cultivation the families in this study were purely pastoral and had experienced very little migration of young men or others outside the pastoral sector, the definition used here captures the differences in wealth among families and allows us to explore the dynamics of wealth change over time.

We began this research project with the hypothesis that a growing human population and a livestock population that fluctuated around a long-term mean would eventually push people into a diversified economy. The data on household wealth at the time of the adoption of cultivation do not support that hypothesis (see Table 1).

⁴Tropical Livestock Units were derived by multiplying total cattle numbers by 0.72 and small stock numbers by 0.17. This follows the procedure used by Grandin 1988 and Homewood *et al.* 2009.

Although the year that families adopted cultivation varied, it is clear that the great majority of people started gardens at a time when they had enough livestock to support their families—given our assumption about how many TLU per capita are needed to support pure pastoralism.

Table 2 summarizes the responses that people gave to an open ended question concerning their decision to begin cultivation. Both “push” factors and “pull” factors are involved in the diversification, and both categories are represented among the most commonly cited reasons. The push factors (those forcing people to cultivate in order to survive) are: not enough livestock, not enough milk, not enough food, the need to increase food, and sharp declines in livestock due to drought and disease.⁵ The pull factors (those that decrease risk or provide other benefits, but are not necessary for survival) are: the wish to diversify and to avoid selling livestock, the influence of neighbors, wanting to taste or eat more maize, the dislike of blood, and the influence of government. The reasons given also indicate some strong shifts in cultural norms. These include the influence of neighbors, wanting to eat more maize, the dislike of blood, and to some extent the influence of government.

The breakdown of the reasons given for adopting cultivation by wealth category demonstrates the different priorities of poorer and wealthier families. These data are presented in Table 3.

Although the push factors are represented in all wealth categories, the pull factors are seen primarily among the more wealthy households. This is somewhat consistent with what others have reported (Brockington 2001; Little *et al.* 2001). One difference here is that “not enough milk” and “not enough food” are identified as separate reasons from “not enough livestock.” This is an indication that there may be enough milking animals but they are not producing as much milk as might have been expected in the past. The explanation for this is twofold. First, there was a very high rate of calf mortality in the area due to tick borne disease, primarily East Coast Fever (Field *et al.* 1997); and second, there was a high disease load carried by cattle, again primarily from tick borne disease. Our interviews suggest that the decades of the 1970s and 1980s saw a significant increase in the amount of tick borne disease, especially East Coast Fever (ECF—*ndigana* in Maa). One potential reason for the rise in the incidence of ECF was that the Tanzanian government ceased providing acaricides. This left cattle with little resistance, and was particularly devastating to calves, with death rates often exceeding 50% (Field *et al.* 1997).

The spread of maize in many parts of East Africa was associated with the attraction of consuming a food eaten by people of higher status—in particular the Indians working on the railroad (hence the KiSwahili word for maize—*mahindi*), but this does not appear to be the case here. Unlike many other “purely pastoral” peoples, the Maasai have traditionally incorporated maize into their diet. Prior to the 1970s maize was bought from shops or by barter with traders in the form of ground maize meal. However, many Maasai said that they had not known what plant the maize that they were eating came from. When they saw people

⁵The sharp decline in livestock numbers could also be considered a pull factor, especially if herd-owners witnessed sharp declines in others herds but were not personally affected.

from other ethnic groups cultivating the plants, harvesting the maize, then grinding or pounding it into maize flour, some were interested in cultivating the plants themselves. Some of these “neighbors” included small groups of Mbulu or Iraqw living in the area, people hired as laborers working for the regional government, some Indian shop keepers, and some women from agricultural groups who had married Maasai men. Thus, the attraction of maize was not the wish to emulate others, including high status groups. Rather, Maasai wanted to cultivate maize in order to have access to more food and to reduce the pressure on their livestock. At the same time, they had developed a taste for maize and wanted to have readier access to it.

Despite this history of maize consumption, the Maasai have often been presented as the archetypical pastoralists, scorning cultivation and denigrating those who “scratch the earth”. The fact that Maasai household heads emulated neighbors (many of whom were non-Maasai) in cultivating indicates a major change in Maasai thinking about which livelihood practices are acceptable and which are not. The responses “the influence of neighbors” and “wanting to eat more maize” suggest an important shift in cultural norms.

An additional response that frequently came out in the group interviews but that was not expressed in the individual interviews was the notion that people could no longer depend on livestock. This also suggests an important shift in how people view future livelihoods, a dramatic change from the past. We will explore this topic in more detail in a later section.

Our data suggest that the decision to cultivate was generally made by the male household head. 54% of those interviewed said that the male household head made the decision alone. The decision to cultivate was made primarily by the household head’s mother in 23% of the cases and the by household head’s wife in 6.5% of the cases. Joint decisions were also reported: 14% of household heads said the decision was made in consultation with their father; 14% in consultation with their mother. None were reported to be made in consultation with their wife. The influence of mothers in individual and joint decisions is not surprising; it is often the case that a Maasai man will have his mother living with him after his father has died or has separated from his mother. These figures are based on the interviews with men; women might have a somewhat different view of decision making.

The apparent dominance of the household heads in the decision to adopt cultivation does not mean that these men invested their own labor in cultivation, especially in the case of small gardens, where women do most of the work. In the larger fields, men do often hoe or plow with ox-drawn plows.

Reasons for Adopting Cultivation at Different Times

We have discussed how the various push and pull factors related to the adoption of cultivation varied by wealth category. Here we consider how they may vary according to the time at which cultivation was adopted. We have divided the time of adoption into three periods: prior to 1970, during the 1970s, and from the 1980s on (see Table 4).

One issue that immediately becomes apparent in these data is the increased importance of disease-driven declines in livestock during the 1970s. As discussed below (see Tables 6 and

7), our data reveal a distinct trend of declining livestock numbers per person over time among the households included in this study. As the livestock numbers were holding steady or declining many of the study families were growing, and as mentioned in the section on wealth, livestock disease also depressed milk production. As will be discussed further in a later section there was a decrease in nomadic mobility in the 1970s and some herd-owners said that this led to an increase in livestock disease.

The change in cultural norms brought up in the section on the relationship of wealth to the adoption of cultivation is clearly seen in these data as well. “Wanting to eat more maize”, and “the influence of neighbors” peak during the 1970’s, and is rarely mentioned following this period. The “dislike of blood” is only mentioned in the latest period. For the early adopters the lack of livestock and lack of milk are clearly the predominant reasons given for the adoption of cultivation. There is no mention of the desire to diversify the household economy and little mention of wanting to avoid selling livestock. Some of the cultural issues mentioned above are reflected by the early adopters but they become prominent in the middle and late adopters. The changing cultural norms and their importance to this livelihood shift will be discussed further in the concluding sections.

The Expansion of Gardens to Farms

The distinction between garden (*bustani*) and farm (*shamba*) is not absolute, but farms are considered to be agricultural plots of one acre or larger and gardens are smaller in size. Farms are also devoted primarily to maize, sometimes intercropped with beans, while gardens may have a mixture of maize, beans, pumpkins, and greens. A few individuals experimented with growing sunflowers on farms but this was relatively rare.

For the most part people gradually expanded their gardens each year and after a number of years the garden was large enough to be considered a farm. Our data show that this process took about ten years. While the peak period for adopting cultivation was in the 1970s, the peak period for expansion began in the 1970s and extended into the 1980s (see Fig. 3). Very few (3%) of the families interviewed expanded cultivation to a farm before the 1970s. The decline in number after the 1980s is a function of the dwindling numbers of families who had not yet adopted agriculture.

Not all families gradually expanded their gardens—some expanded rapidly, in a single season. In our sample, 13 of the 93 households rapidly shifted from a garden to a farm. We will discuss this below.

The most common reasons given for the gradual expansion from gardens to farms, summarized in Table 5, were: (1) that the household head did not want to sell any more livestock in order to purchase food; (2) that the family was growing in size and needed more food; and (3) they faced decreased food availability, associated with declining livestock numbers and depressed milk production, so more land needed to be cultivated. The reasons given varied by wealth as was the case for initial adoption of cultivation. The poorer households tended to give reasons related to economic necessity while the more wealthy

households tended to explain the transition from gardens to farms in terms of not selling livestock, to improving the standard of living, and to diversifying the household economy.

For the 13 families who expanded rapidly from a garden to a farm, a similar picture emerges. Six of the 13 herd-owners who expanded rapidly said they did so because of the need for more food. Of these, four were classified as poor and two were of medium wealth. Five of the remaining seven rapid responders were from the moderately or very wealthy categories and the reasons given for the rapid expansion included wanting to increase livestock, the influence of others and just being able to do so.

Wealth Over Time

In this section we examine the economic histories of households over time. In terms of absolute numbers of livestock the households classified as poor, medium and moderately wealthy all showed steady increases over time (see Table 6). The very wealthy steadily lost livestock; the very poor increased livestock from the time of adopting cultivation to expansion but then experienced a decrease. The small numbers in the destitute, very poor and poor categories make the analysis somewhat problematic. Overall, these data do not support a marked or consistent decrease in livestock numbers as time progressed.

This situation is quite different when we divide the number of TLUs by the number of people depending on them. These data are presented in Table 7 and Fig. 4, which reflect the number of livestock in TLUs divided by the number of people depending on them—the size of the *olmarei*. Figure 4 illustrates the changes in overall wealth for the study population at the 3 time periods. Figure 5 shows the changing percentages of households in the different wealth categories at the 3 points in those households' histories.

The data clearly demonstrate a progressive impoverishment of households in terms of TLU per person. The data also show a steady increase in the proportion of households in the destitute, very poor, poor and medium wealth categories at each time period, with a concomitant decline in the percentage in the very wealthy category. Only the households in the moderately wealthy category do not follow this trend; the proportion in this category increased from the adoption of cultivation to the expansion to farms, but then declined by 2001.

As noted in the Methods section, it is possible that some poorer families lost so many livestock that they had to leave the area altogether, and their histories would not be included in the sample. It is thus worth considering the possibility that selection bias has affected the results of this analysis. If poorer families are more likely to fall out of the system, then the wealth distribution of families in earlier periods, judged by the experience of the present (2001) sample, would be biased toward greater wealth, and estimates of TLU/capita might be biased upward in the earlier periods. However, we argue that the apparent decline in wealth per capita over time is real. Families in the sample declined in wealth; for this result to be a product of selection bias, the unascertained families would have had to have increased in wealth, but it is reasonable to assume that the poorest households were unascertained because they became even more impoverished. Therefore, inclusion of “failed” households

(families not ascertained in the present sample) would if anything strengthen the conclusion that per capita wealth has declined. The absolute decline in the sample might not accurately reflect the absolute amount of decline that actually occurred in the population as a whole, but the trend detected remains correct. Note that many, perhaps most, of the members of failed households would have been taken in by other families to whom they were related. This may have contributed to the decline in per capita wealth of those receiving families.

There is little doubt that the overall decline in economic status is strongly influenced by the growth of household sizes over time. The average size of the *olmarei* for the study families at the time that cultivation was adopted was 7.4 individuals; at the time that gardens expanded to farms—10.5; and as of 2001—15.3. It should also be noted that as time progressed and families grew, significant increases in necessary expenses were also accruing. This is reflected in the following statement from one of the household heads during the interviews: “Life is expensive these days. There is a high demand in families for food, money for education, money for medical care—the livestock are not enough to fulfill these life requirements.” What these data demonstrate is that the livestock population taken as a whole experienced a modest decrease, while at the same time the households depending on those herds were undergoing significant growth. In addition, the households’ need for additional income was growing rapidly in response to the changing cultural, social, and political contexts in which they were living.

The Larger Context

The Environmental Context

During the interviews people often mentioned drought as playing a role in livestock mortality. Precipitation records show declines in rainfall occurring between 1975 and 1979, 1981 to 1984, and 1994 to 1997. The extent to which these dry periods contributed directly to a decline in livestock numbers is difficult to assess, but it was certainly the perception of many of those interviewed that it did. It was also the case that the incidence of tick-borne disease was increasing from the 1970s. In addition to the decreases in livestock numbers, the increase in livestock disease depressed milk production. The combination of periods of low rainfall, increased livestock mortality, and lower productivity resulted in many people losing confidence in livestock as a sole means of support. This signifies an important shift for the “people of the cattle.” The periods of reduced rainfall were not unusual for this region; droughts are a longstanding, recurrent feature of the environment. The larger environmental context consisted of a combination of periods of reduced rainfall, increases in livestock disease, a slowly growing livestock population, and an expanding human population.

The Political Context

The most important political events relevant to this paper were the sweeping changes throughout Tanzania associated with Ujamaa or the Villagization Program, part of Tanzania’s social and economic development policy following independence in 1961. This program required the development of village centers based around schools, clinics and shops. Homesteads were moved both voluntarily and forcibly around these centers, and each household was supposed to build permanent structures. Tanzania’s single political party (the

CCM) became the major decision-maker in terms of land management and the use of natural resources and did not recognize local customs or institutions. In Maasailand this program was called “Operation *Imparnati*” based on the Maasai word for permanent structure, *emparnat* (O’Malley 2000). For the Loliondo area, the influence of the villagization program began to be seen in the mid 1970s and was officially implemented in 1978. People were required to leave rural areas and live in permanent structures in proximity to village centers. They were also encouraged to cultivate.

According to O’Malley the program was both ill suited to the area and short lived. The pastoral people who moved into the villages knew that they would have to move with their livestock as conditions became drier and the government would have to allow for that. In addition, the Kagera War (in which Tanzania invaded Uganda and overthrew Idi Amin) was a major financial drain on the Tanzanian economy and made the monitoring of movement impossible. Within a few months of implementing Operation *Imparnati* most Maasai pastoralists returned to livestock herding. One of the long-term consequences was the exposure to cultivation and this had both direct and indirect influences on the decision to begin cultivation.

The Social and Cultural Context

We have mentioned the changing cultural norms as people became more involved in the modern world. We asked male elders what household heads needed now in order to be successful. Not surprisingly livestock, especially cattle, and the knowledge of livestock management were seen as extremely important. But new needs—for education, land for cultivation, and a way to make money—were also viewed as important.

Other changes that were mentioned by elders were increased sedentarization associated with cultivation and potential strains on social relationships with some people having access to cultivated maize while others did not. One man mentioned adopting cultivation because his children liked the taste of maize and they were stealing it from the fields of a neighbor. In order to reduce the potential for conflict, he began to cultivate himself. Reduced mobility was also mentioned as a possible contributor to increased livestock disease as this increased the exposure of animals to disease vectors, especially ticks. Finally, O’Malley (2000) mentions how plowing techniques changed as those Maasai men in the senior age grades retired. The older Maasai men did not feel that it was appropriate for cattle to be used as beasts of burden, but that this attitude was not shared by those in the younger age grades. She noted a distinct increase in use of animal traction for plowing fields as the senior elders retired.

Conclusions

In this paper we have examined the process by which Maasai pastoral people in northern Tanzania diversified their economy through the adoption of cultivation. We found that the process generally involved two stages: planting a garden first, and later expanding the garden to a farm. We found that some households adopted cultivation out of necessity, but far more households adopted cultivation by choice. For some of these households cultivation was a means to reduce risk, while for others it was a reflection of changing cultural and social

norms. To some extent this supports the findings of Brockington, Homewood and Little, but not completely. We found the process to be more complex and influenced by a variety of factors other than just economic ones. Eventually, Maasai from all wealth categories adopted cultivation, supporting the argument put forward by Homewood and her colleagues.

The changes observed during the period of fieldwork were couched within rapidly changing political and cultural contexts. Policy changes ranging from the implementation of the socialist villagization program in the 1970s to the decision to stop supporting the delivery of acaricides in subsequent decades had direct and indirect effects. The presence of non-Maasai cultivators—Indian shopkeepers, Kikuyu farmers, and Iraqw laborers—also influenced families to adopt cultivation. Changing norms, from diet to the roles that livestock play in the household, were also being contested and debated as families planted for the first time and expanded their gardens to farms. We hope that this paper will contribute to our understanding of livelihood diversification and the responses of pastoral peoples to a rapidly changing world.

Acknowledgments

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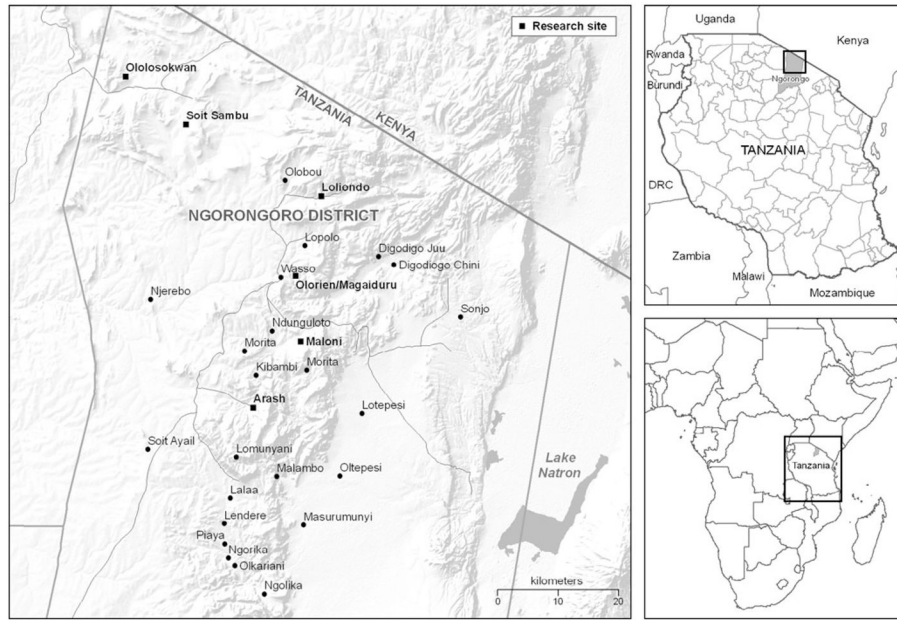


Fig. 1.
Map of study area

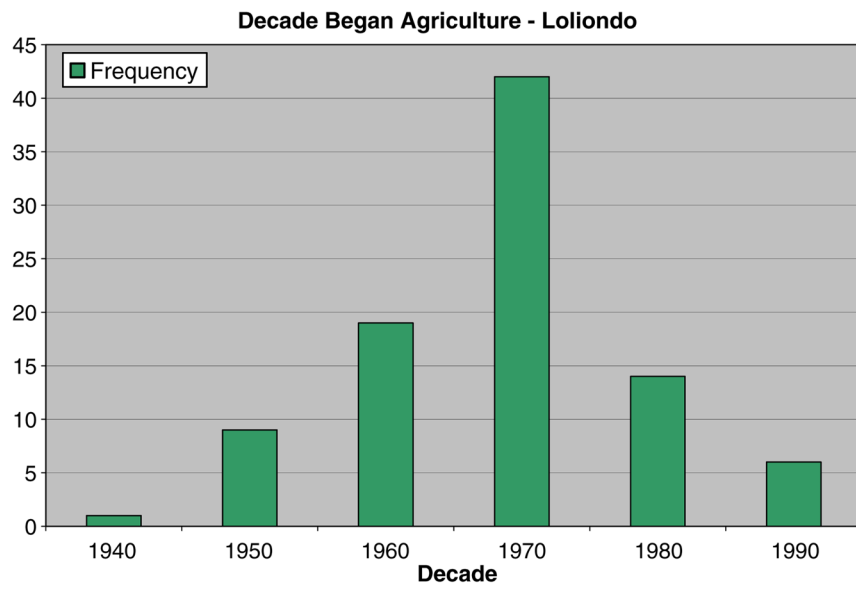


Fig. 2.
Number of households starting gardens, by decade

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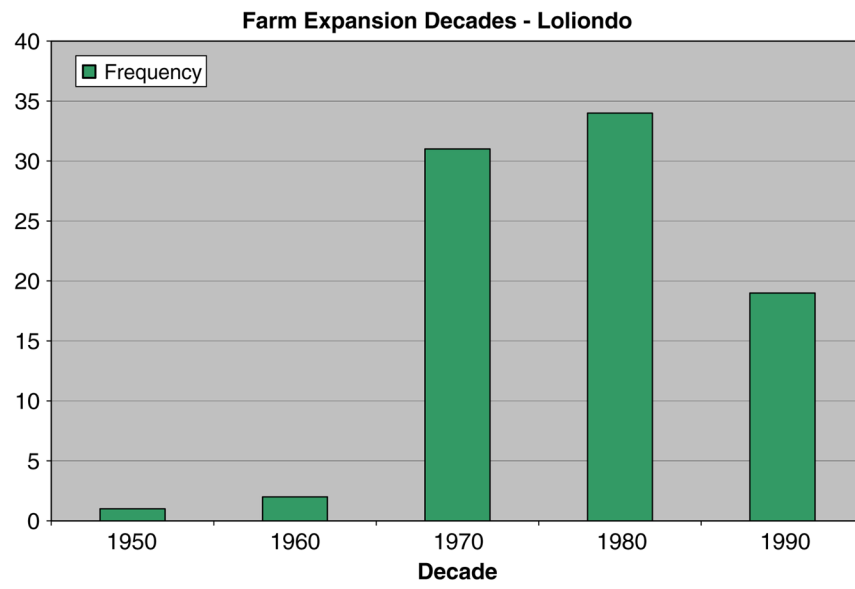


Fig. 3. Number of households expanding garden to farm, by decade

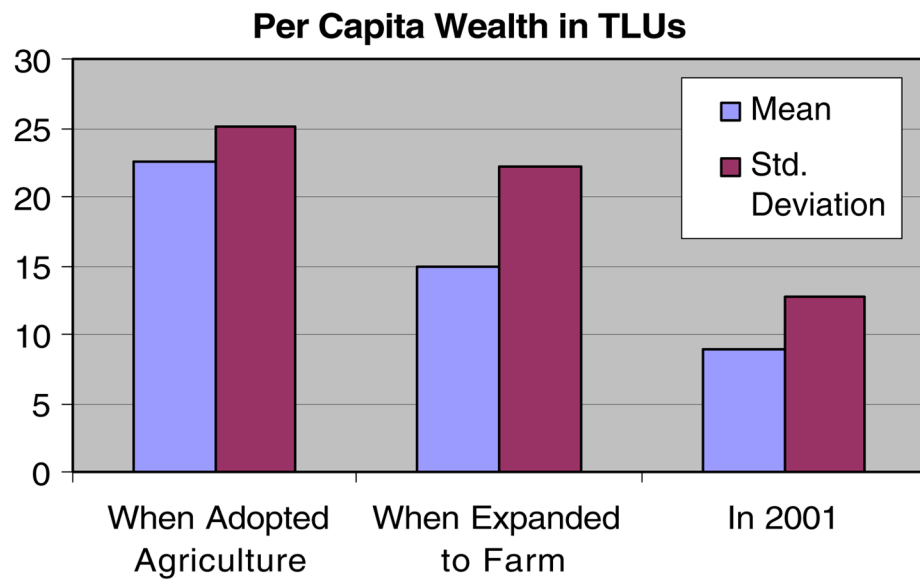


Fig. 4. Changes in per capita wealth for three time periods, in TLUs

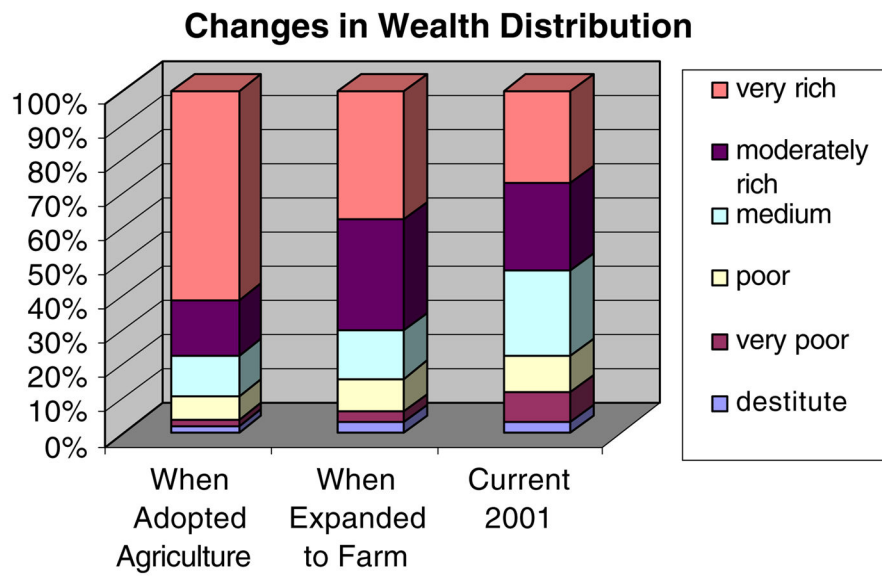


Fig. 5. Changes in percentage of households in each wealth category over time

Table 1

Household wealth at the time that cultivation was adopted

Wealth category	number	percent
Destitute	2	2.2
Very poor	2	2.2
Poor	6	6.5
Medium	11	11.8
Moderately wealthy	15	16.1
Wealthy	57	61.3
Total	93	

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Table 2

Reasons for adopting cultivation

Reasons	number	percentage ^a
<i>Push factors</i>		
Not enough livestock	27	20%
Not enough milk	15	11%
Sharp decline in livestock—disease	14	10%
Not enough food	9	7%
Need to increase food	8	6%
Sharp decline in livestock—drought	7	5%
<i>Pull factors</i>		
^b Influence of neighbors	16	12%
Want to diversify	16	12%
^b Want to eat more maize	13	10%
To avoid selling livestock	9	7%
^b Dislike blood	7	5%
^b Influence of government	2	1%

^aSome people gave more than one reason, so the total is greater than 100%

^bReasons that suggest change in norms.

Table 3

Reasons for adopting cultivation, by wealth

Reasons	Wealth category at time cultivating was begun						
	Destitute	Very poor	Poor	Medium	Moderately wealthy	Wealthy	
<i>Push factors</i>							
Not enough livestock	2 (7%) ^a	2 (7%)	4 (15%)	6 (22%)	4 (15%)	9 (33%)	
Not enough milk	–	–	–	3 (20%)	3 (20%)	9 (60%)	
Sharp decline in livestock—disease	–	1 (7%)	1 (7%)	1 (7%)	2 (14%)	9 (64%)	
Not enough food	–	1 (11%)	1 (11%)	–	–	7 (78%)	
Need to increase food	–	–	2 (25%)	–	2 (25%)	4 (50%)	
Sharp decline in livestock—drought	–	–	1 (14%)	–	2 (29%)	4 (57%)	
<i>Pull factors</i>							
Influence of neighbors	–	1 (6%)	2 (13%)	–	2 (13%)	11 (67%)	
Want to diversify	–	–	–	–	2 (22%)	7 (78%)	
Want to eat more maize	–	–	–	–	–	13 (100%)	
To avoid selling livestock	–	–	–	–	–	9 (100%)	
Dislike blood	–	–	–	–	–	7 (100%)	
Influence of government	–	–	–	–	1 (50%)	1 (50%)	

^aPercent of those offering a given reason that is in each wealth category

Table 4

Reasons for adopting cultivation by time of adoption

Reason ^a	Early (N=29) ^b (before 1970)	Middle (N=42) (1970s)	Late (N=20) (1980s and later)
<i>Push factors</i>			
Not enough livestock	7 (24%)	9 (21%)	6 (30%)
Not enough milk	8 (28%)	4 (10%)	3 (15%)
Sharp decline in livestock (disease)	2 (7%)	8 (19%)	3 (15%)
Not enough food	3 (10%)	2 (5%)	1 (5%)
Need to increase food	1 (3%)	7 (17%)	3 (15%)
Sharp decline in livestock (drought)	2 (7%)	3 (7%)	3 (15%)
<i>Pull factors</i>			
Influence of neighbors	4 (14%)	8 (19%)	2 (10%)
Want to diversify	0 –	7 (17%)	4 (20%)
Want to eat more maize	3 (10%)	11 (26%)	0 –
To avoid selling livestock	2 (7%)	3 (7%)	4 (20%)
Dislike blood	0 –	0 –	5 (25%)
Influence of government	0 –	2 (5%)	0 –

^a some information concerning the time of adoption is missing or questionable in the data set so the numbers included here may not match those presented in Table 3

^b N refers to the number of household in each time period. Percentages in table refer to percent of households offering a given reason. Sum of reasons in any period is greater than N and sum of percentages is greater than 100 because an informant could cite more than one reason.

Table 5

Reasons given for the expansion of gardens to farms, by wealth category

Reasons	Wealth category							Total
	Destitute	Very poor	Poor	Medium	Moderately wealthy	Wealthy	Total	
Avoid selling livestock	0	0	0	3	8	9	20	
Family growth	0	1	2	3	5	6	17	
Hunger	2	0	0	1	7	4	14	
Higher standard of living	0	0	3	3	0	3	9	
Wanted alternative foods	0	0	0	0	4	5	9	
Decreased livestock	0	1	2	2	2	0	7	
For money to buy livestock	0	0	1	0	1	1	3	
Influenced by others	0	0	0	0	1	1	2	
Preferred maize	0	0	0	0	0	2	2	
To get money for household	1	0	0	0	0	0	1	
Give to friend	0	0	1	0	0	0	1	
Was raided	1	0	0	0	1	0	2	
In case of drought	0	0	0	0	0	1	1	
Interested in cultivation	0	0	0	0	1	0	1	
Total	4	2	9	12	30	32	89	

Table 6

Changes in livestock holdings over time, in TLUs

Wealth category	When adopted cultivation	Time of expansion	2001
Wealthy	13,088	9,586	8,933
Moderately wealthy	730	1,583	1,871
Medium	347	902	1,173
Poor	89	242	680
Very poor	11	49	26
Destitute	0	4	0.3
TOTAL	14,265	12,366	12,683

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Table 7

Changes in wealth over time, by wealth category measured in TLU per capita

Wealth category	When adopted agriculture		When expanded to farm		In 2001	
	Number	Percent	Number	Percent	Number	Percent
Wealthy	57	61.3	35	37.6	25	26.9
Moderately wealthy	15	16.1	30	32.3	24	25.8
Medium	11	11.8	13	14.0	23	24.7
Poor	6	6.5	9	9.7	10	10.8
Very poor	2	2.2	3	3.2	8	8.6
Destitute	2	2.2	3	3.2	3	3.2
Total	93	100 ^a	93	100 ^a	93	100 ^a

^a Allowing for rounding.