# Rejoinder

## An untenable hypothesis on the causes of famine

**Peter Bowbrick**

*This is a rejoinder to Professor Sen's reply.[1] It is argued that Professor Sen has not attempted to answer most of the criticisms or to defend his misstatements. Where he has, he has introduced new misstatements. There are also some new errors.*

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[1]Amartya Sen, 'The causes of famine: a reply', *Food Policy*, Vol 11, No 2, 1986, pp 125–132, replying to P. Bowbrick, 'The causes of famine: a refutation of Professor Sen's theory', *Food Policy*, Vol 11, No 2, 1986, pp 105–24. My main points are summarized on pages 122 and 123.

[2]Sen, *op cit*, Ref 1, p 128. Sen's quotation marks.

[3]Bowbrick, *op cit*, Ref 1, p 112.

[4]The Famine Commission (Famine Inquiry Commission, *Report on Bengal*, New Delhi, Government of India, 1945, p 207) made no other changes to production figures in the period covered by Sen, but made changes of less than quarter of 1% to 1928–32 figures. They did make some changes to import figures for the period he covers, not the production figures as he says, essentially changing the coverage rather than adjusting for error: this amounted to less than 1.25% of the total. G. Blyn, *Agricultural Trends in India 1891–1947: Output, Availability and Production*, University of Pennsylvania Press, Philadelphia, PA, USA, 1966 was written years after the event and could hardly have made any 'corrections'. Sen's reply, p 128, has Blyn giving figures which he admits in A.K. Sen, 'Starvation and exchange entitlements: a general approach and its application to the Great Bengal Famine', *Cambridge Journal of Economics*, No 1, 1977, p 39, that Blyn did not give.

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In Professor Sen's reply to my paper he has not attempted to respond to most of the points I made.[1] However, he has attempted to show that he made rather fewer analytical errors and one fewer misstatement than I said, and that some of my arguments do not stand up. Even if it were accepted that he were right on all these points, the major part of my criticism would remain. However, I propose to examine those points he did make.

*Production statistics*

I concluded, after an analysis of contemporary criticisms of the production statistics, that the figures Sen uses are not accurate to within ±50% and that the difference between the estimates of two years, which he relies on, is only accurate to ±3000%. He suggests that the figures had been adjusted to allow for all the criticisms I quote, and were therefore far more accurate than I said. He says:

> . . . what Mr Bowbrick does not mention is that the Famine Inquiry Commission had criticized official production statistics (pp 206–207) as a prelude to making its own corrections, and the Commission presented 'adjusted' output and supply figures making 'reasonable allowances' for 'errors and omissions' . . . The corrections . . . included . . . 'those suggested by Professor Mahalanobis who has studied the subject'.[2]

I did indeed mention this.[3] Further, as I pointed out, the *only* adjustment made by the Famine Commission (or indeed by Sen) to the production forecasts that Professor Sen quotes was to increase the acreage figures for the December crop by 20% for all previous years. No attempt whatsoever was made to adjust the yield figures, or to attempt to 'correct' the many errors which the Famine Commission and others knew to exist, for the very good reason that one cannot do a crop survey on a crop that was harvested two years earlier.[4]

I also presented other evidence which suggested that the production statistics were not just unreliable but wrong. Only one sentence of this is challenged. Sen dismisses the statement that the rice traders thought the December 1942 crop was 'the worst for the last 20 years'.[5] He appears to do so purely on the grounds that an official in the Civil Supplies Department described the trade's warnings as 'exaggerated statements' and 'propaganda, perhaps interested, in certain trade circles' and talked of psychological causes of the high price of rice[6] – in spite of the fact that the predictions of the trade proved to be right and those of the Department disastrously wrong. What is the basis for Professor Sen's apparent belief that civil servants are always both truthful and omniscient, while traders always lie? The fact is that the Bengal government decided at the beginning that there was no decline in food availability and rejected the mounting evidence to the contrary until it was too late, calling it political agitation and propaganda.

*Carryover*

Professor Sen denies repeatedly that

he ever assumed zero carryover, and accuses me of misrepresentation.[7] This is untrue. The dramatic statement on which his thesis is based, the statement which he himself uses in his later work as a complete summing up of his whole argument on availability, is 'choosing – wherever the data permit – an assumption as unfavourable to 1943 as possible. Current availability of food was at least 11 per cent higher in 1943 than in 1941, when there was nothing remotely like a famine.'[8] This calculation is based on the assumption that there was zero carryover, as is shown in the key table in his presentation, entitled 'Foodgrains availability in Bengal, 1938–1943'. This table takes availability to be production plus imports, with no allowance for carryover.[9] The assumption is not inadvertent, because he discusses and rejects carryover: he has a footnote to this saying that his moving average analysis would have had a difference of only 1% and he rejects this, not altering either his 11% or his statement that he has taken the assumptions most unfavourable to 1943.[10]

If he had meant his moving averages to be taken seriously, rather than being ignored, he would have said that current availability of food was 1% higher in 1943 than in 1941, not 11%. This would have removed all the impact of his dramatic thesis. Because the two figures were so close, any inaccuracy in the statistics would have invalidated the thesis. 1941 was a year when 'distress [ie starvation] prevailed in many areas of the province, and relief measures on a considerable scale had to be organized'[11] to protect a population that was badly fed at the best of times. If supplies were only 10% lower than this in 1943 there must have been famine, with the aggravating mechanisms I discussed. With 20% less there would certainly have been a famine of the degree recorded, even without these mechanisms. Both the 1941 and 1943 figures are subject to error. The figures Sen considers accurate are no more than guesses at what the harvest would be several months later – guesses which were heavily biased as I showed in my paper.

I also quoted Desai who showed that in about one year in five the official figure differed from the sample estimate (itself by no means perfect) by 50%.[12] It is quite possible, therefore, that the true availability in 1943 was only 53% of the figure Sen quotes. It is possible that the December 1940 figure was also wrong, in which case supply in 1941 could have been three and a half times that in 1943. Accordingly, even if the only data available were the production forecasts that Sen uses, and their errors were unbiased, there would be a good 0.4 probability that the difference in available supply was sufficient to cause the famine. The errors were biased though. If one also takes into account all statistics other than the production forecasts, and all the other data, the weight of evidence is solidly against him.

I showed that the assumption of zero carryover conflicted with all the available evidence. Sen now accepts that there may have been a smaller carryover into the famine year than the previous year.[13] This of course totally contradicts his dramatic statement that there was *at least* 11% more food available in 1943 than in 1941. There was perhaps a three month carryover into 1941, very little into 1942 after a year of shortages, and even less into 1943, on his own admission, so there would have been perhaps 11% *less* food in 1943, hence the famine. Again, if one allows for errors in the data the shortage was much worse.

*The model*

I have presented a model showing that even if Sen's production and import figures were correct, the stock position in November 1943 would be the lowest for 17 years at least.[14] He does not challenge the validity of the model nor that it is a possible explanation for the famine.

He challenges only my assumptions; the conclusion is unchanged whatever arbitrary opening stock you use. The other assumption, of 1% per annum population growth, was used by Sen himself. However, the same general conclusion is reached if one takes a 0.46% population growth rate or if

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[5]Sen, *op cit*, Ref 1, p 128, quoting Famine Inquiry Commission, *op cit*, Ref 4, p 33.

[6]Famine Inquiry Commission, *op cit*, Ref 4, p 33.

[7]Sen, *op cit*, Ref 1, pp 128–30.

[8]A.K. Sen, *Resources, Values and Development*, Blackwell, Oxford, UK, 1984, p 461; Sen, 1977, Ref 4, p 39; A.K. Sen, 'Ingredients of famine analysis: availability and entitlements', *Quarterly Journal of Economics*, August 1981, p 442.

[9]Sen, 1977, *op cit*, Ref 4, p 41; A.K. Sen, *Poverty and Famines*, Clarendon Press, Oxford, UK, 1981, p 61; Sen, 1981, *op cit*, Ref 8, p 442. His source, Famine Inquiry Commission, *op cit*, Ref 4, p 215, uses the term 'current supply' rather than 'availability' for these figures, and it can hardly be thought that Sen made the change to 'availability' inadvertently.

[10]I have shown elsewhere that his claims to have used conservative estimates cannot be sustained (Bowbrick, *op cit*, Ref 1, p 115). I do not see the logic behind the moving averages: indeed Sen now says 'I do not believe that moving average analysis is a good method of dealing with carryovers in *all* contexts'. (Sen, *op cit*, Ref 1, p 129).

[11]Famine Inquiry Commission, *op cit*, Ref 4, p 11.

[12]See Bowbrick, *op cit*, Ref 1, p 112 and R.C. Desai, *Standard of Living in India and Pakistan, 1931–32 to 1940–41*, Popular Book Depot, Bombay, India, 1953.

[13]Sen, *op cit*, Ref 1, p 129.

[14]See Bowbrick, *op cit*, Ref 1, Table 1, p 114.

one takes the more realistic assumption that more is eaten in years of high production. Total production had remained static over at least 17 years[15] while population was rising by perhaps 1% per annum. Average production for the five years before the famine was lower than the average for the period as a whole. In other words, there was extreme pressure on emergency reserves for five years. The fact that two such bad years had followed so closely would have meant that security reserves were not re-established.

*Purchasing power*

In discussing Sen's explanation of uneven expansion of purchasing power, I used the only analysis he gave. He now tells us that it was purely illustrative, and not meant to refer to reality.[16]

I asked how a 1.8% increase in demand arising from an income change could possibly lead to a famine affecting 40 million people. He replies by criticizing my choice of income elasticity. My estimate is consistent with the consumption data. However, even if an elasticity double or treble my value is used, his model is no more believable.

Sen also states that I was wrong to ignore price elasticities. Surely, Professor Sen cannot think that an increase in *demand* is the same as an increase in *consumption* – I should indeed have allowed for price elasticities if I had been calculating consumption changes.

There seems to be the same error in his argument that there was a massive increase in demand in Calcutta because of foodstuff schemes and the wartime boom, and that therefore I must have been factually incorrect to dismiss the role of Calcutta in the famine.[17] (I had presented a large amount of evidence, including the tonnage consumed, to show that Calcutta actually reduced its consumption during the famine rather than increasing it as he had said). Here again he appears to think that increased *demand* is identical to increased *consumption*.[18] In fact, his demand argument gives the strongest possible support for my argument rather than refuting it. If there was a much increased demand, as he says, and a reduced consumption, as the statistics show, it can only mean that there was a sharp drop in supply.

He repeatedly implies that a famine can occur because of an increase in demand, even if this is not accompanied by any change in consumption. This is not so. People died because they did not get enough rice to eat, so, in the final analysis, consumption is what matters and demand is only one of the factors determining consumption. If it cannot be shown that some people ate more, then the only possible explanation for the fact that 40 million people went hungry is that there was a decline in food supply.[19] It has been shown that there was a decline in food consumption in Calcutta. Sen must show therefore than 12 million people elsewhere in Bengal had a real increase in income and bought more food, for how else could 40 million people have gone hungry? It would be extremely difficult to find a quarter of a million who ate more.

*Speculation*

Sen says that his 'causal hypothesis' of speculation was not meant to indicate the cause of the famine, but merely to indicate 'an influence'.[20] I make no apology for treating every point that was presented as a 'causal hypothesis' as though it was meant to be taken seriously. Sen's followers certainly do take them seriously – though no two of them agree on which are his key hypotheses – and some do interpret him as saying that speculation was the root cause.[21]

Whether we are looking at a cause or an influence though, the speculation hypothesis still conflicts with the accepted theory and the evidence, both of which suggest a shortage. Sen says that it is possible to construct a model under which speculation is destabilizing: it is indeed, but not if the assumptions have to square with the reality of the Bengal famine.

*Shortages and FAD*

I developed my degrees of shortage because it is remarkably unhelpful just to say that there was or was not a food availability decline – how much did it

[15]Famine Inquiry Commission, *op cit*, p 215.

[16]Sen, *op cit*, Ref 1, p 130.

[17]Sen, *op cit*, Ref 1, p 131. I have covered some of the factual errors in this argument under 'Misstatements' below. In addition, if the argument on subsidized rice is to be credible, one must make an awful lot of assumptions on price and income elasticities and cross elasticities as well as on prices and incomes – assumptions which, unlike my income elasticity that Sen complains about, have no empirical basis. We know that for most workers the rice issue was a substitute for an income rise, so their consumption may not have been much affected. We know too that the middle classes ate less than the working classes. In fact one can argue the Giffen hypothesis, the reverse of Sen's: with the higher price of rice, people could not afford to buy both rice and luxury foods, so they reverted to a rice diet. This could have aggravated the famine.

[18]Increased demand is identical to increased consumption only with a perfectly elastic supply. Supply for Bengal as a whole was nearly perfectly inelastic during the famine year, and regions and segments of the population faced perfectly inelastic supply curves because of geographical separation, government allocation of supply to different areas, preferential supply schemes, price control, retention of own produce, etc.

[19]Neither Sen nor his sources have suggested a massive carryover at the end of the famine, nor massive exports, the only other possibilities.

[20]Sen, *op cit*, Ref 1, p 132.

[21]For example, Professor Nora Lustig in 'Direct and indirect measures to ensure access to food supplies', *World Food Security; Selected Themes and Issues*, FAO, Rome, 1985, p 39, sums up Sen as saying that 'a speculative process occasioned by a rise in purchasing power for one sector of the population . . . is at the root of the Great Bengal Famine of 1943'.

decline? Will the decline cause a famine? Must we import? Is it enough to have rationing? I have, I think, used the terms consistently with my definitions throughout the paper. I certainly did not confuse 'shortage' with food availability decline – it is *necessarily* true that if there is no FAD, there is no 'shortage', but it is not true that any FAD must imply a 'shortage'. Sen's confusion between the two appears to lie partly in the fact that he uses one or more of his own definitions of shortages, 'eg there being currently no excess demand at the ruling prices',[22] when interpreting my carefully defined term. His confusion is compounded by the fact that his concept of food availability decline also keeps changing – his attacks on FAD appear to cover any economist who has so much as suggested that there could have been a decline in food availability in any famine.[23]

His belief that any economist working on famines could ignore demand is odd. Mainstream economists have been obsessive about the demand side of famines for centuries and have certainly not forgotten it in the last 50 years. Since 1939, the UK has been carrying out an annual National Food Survey which was started precisely to find out how the poor were eating during the war, and which continues to give information on the nutrition of different socioeconomic groups. Commercial market research is no less interested in the ability of different socioeconomic groups to buy products. The existence of working class cost of living indices in India in 1943 (which Sen quotes) shows that the matter was on economists' minds then. It is impossible that anyone in a country with a shortage would not be aware of the problem. I am now working in a country with a food problem and every day colleagues, friends or casual acquaintances give me detailed budgets to show that they cannot afford to buy rice. The message is hammered home by the near riot in the queue for relief rice outside my office.

*Imports*

I argued that if there is no decline in food availability, then imports are not *essential*. Sen assures us that he does not believe this.[24] He is clearly wrong: logically, if there is no FAD, a country can restore the distributional status quo with rationing and relief; practically, a large number of countries were doing this successfully in 1943, in spite of greater wartime booms and inflation than were experienced in India. Some countries found that they could manage in spite of having a decline in food availability, provided that they did not have a second- or third-degree shortage. (In fact the UK improved the nutrition of the population as a whole by more equitable distribution.)

Though I said that it was *possible* to do without imports and to rely on rationing and relief works if there was no more than a first-degree shortage, I argued that 'the practical problems are such that it would be unsafe to rely on it'.[25] I also said since there was a third-degree shortage in Bengal, imports were *essential* to break the famine.

My main message throughout the paper was that it is always possible to cure a famine by importing more food and instituting the appropriate relief measures. There are many famines that cannot possibly be cured without imports, and in practice it is impossible for a Third World country to be certain that there is enough food for rationing to be even a theoretical possibility. An error here is disastrous. Failure to import or impose strict rationing when there is a first-degree shortage can bring about a second- or third-degree shortage. It is very dangerous indeed not to import on the grounds that you think the shortage may not be so bad really. It is all too easy to turn a mild shortfall into a famine. I concluded that any analysis is dangerous if, like Sen's, it underestimates the degree of shortage and encourages people to ignore supply – it will lead to inadequate relief measures and to a worsening of the famine.

It is very odd, therefore, that Sen talks of 'Bowbrick's rejection of food imports' and says 'Bowbrick would not accept the merit of food imports, simply because the excess demand happened not to have resulted from a decline in food supply'.[26]

[22]Sen, *op cit*, Ref 1, p 126.
[23]See P. Bowbrick, *A Critique of Professor Sen's Theory of Famines*, Institute of Agricultural Economics, Oxford, UK, 1986, for a selection of some of the more severe attacks.
[24]Sen, *op cit*, Ref 1, p 126. His confusion between failure to import as a *cause* of famine, and failure to import as a failure to take a necessary corrective measure is a separate error, covered in Bowbrick, *op cit*, Ref 1, p 121.
[25]Bowbrick, *op cit*, Ref 1, p 108.
[26]Sen, *op cit*, Ref 1, p 126.

*Misstatements*

I concluded that:

> There are repeated misstatements and misquotations from his sources – on the 'indifferent crop', on his conservative figures, on the number of people covered by relief schemes, on the actions of the government of Bengal, on the Famine Commission's support for his statements about speculation and hoarding, on the rice denial policy, on the size of other famines and on Mahalanobis, Mukkerjee and Ghosh's statistics for instance. In addition, the evidence presented is selective. Taken together they cast the gravest doubt on his rigour and reliability.[27]

Sen challenges me on only one of these, reasserting that 'almost the entire normal population of Calcutta [was] covered by distribution arrangements at subsidized prices'.[28] It has been shown above that his analysis based on this is incorrect, but here it will be shown that the statement remains factually incorrect, as I said. He takes figures from the Famine Commission report[29] to show that there were 1.09 million employees covered by the various 'foodstuff schemes' and he implied that there were three dependents per employee. In fact the very sentence from which he gets the figure for the Bengal Chamber of Commerce Scheme, which accounted for the bulk of this 1.09 million, contradicts him on the number of dependents: ' . . . by December 1942 the number had risen to 620,000 and the total number of persons served, including dependents, to approximately one million'. Elsewhere, the Famine Commission indicates that a similar dependency ratio existed for Greater Calcutta as a whole (p 203). In my paper I quoted the actual tonnages going to these schemes, as well as to all the 'controlled shops' and 'approved markets', using Sen's own sources, and showed him to be wrong.[30] These tonnage figures show that all these schemes together received 32% of the rice available in Calcutta in the first quarter of 1943, 43% in the second, 23% in the third and 18% in the fourth. These statistics are based on government accounts and so may be expected to be more accurate than any others relating to the famine. Nevertheless they are maxima: with the all-pervasive corruption, a large part of these supplies was diverted to the black market.

It has been shown above that there were further misstatements, on easily checkable points, in his reply.

It is a matter of concern that, since I first raised the matter at the Agricultural Economics Society in March 1985, Professor Sen has not taken any of the opportunities open to him to acknowledge errors in his work. On the contrary, his books on the subject are still on sale, unaltered in any way.

[27]Bowbrick, *op cit*, Ref 1, p 123.
[28]The original statement is to be found in Sen, 1977, *op cit*, Ref 4, p 51, and Sen, 1981, *op cit*, Ref 9, p 77. He re-stated it at the meeting of the Development Studies Association in reply to my paper. He then re-stated it in Sen, *op cit*, Ref 1, pp 130–131.
[29]Famine Inquiry Commission, *op cit*, Ref 4, pp 30–31.
[30]See Bowbrick, *op cit*, Ref 1, pp 117–118 and Famine Inquiry Commission, *op cit*, Ref 4, pp 30–31, 63–65, 219–233.