

Malnutrition data, food security and the geography of food in a communal area of North West Zimbabwe

Nicholas James

Open University, UK*

Abstract

Analysis of malnutrition cases recorded in Nembudziya, Gokwe North provides evidence of relative food insecurity in some communal areas of Zimbabwe. Four important findings emerge from the data. First, the rise and fall in cases correlates closely with the rainy seasons. Second, cases of kwashiorkor have declined since the 1980s. Third, the greater peaks in the 1990s suggest the growing concern of malnutrition within the region. Fourth, cases in pellagra show peaks that relate to the 'hungry period' between September and December.

These findings pose concerns not only for the medical and health sectors but also for the section of society directly addressing the food security issue. To explain the findings a wider discussion addresses other issues including rural livelihoods, poverty, the political economy and agrarian change in the region's recent history. The conclusion points to the deepening and potentially chronic problem of severe food insecurity among some people and in some areas of rural Zimbabwe.



Introduction

Widespread famine following a loss of entitlements, hunger through food deficit at local levels and household food insecurity arise from a combination of biophysical realities (including drought and environmental degradation) and political and economic problems. Severe food insecurity is indeed a recurring reality in various parts of rural Africa. The recently cited “hungry seven” countries - Ethiopia, Eritrea, Zimbabwe, Zambia, Mozambique, Malawi and Angola - each have different magnitudes of famine, and their stories vary considerably (*The Guardian*, 2002). The southern African case in 2002 (involving five of the seven countries) relates to an extreme drought, the like of which has not been experienced in the region since 1949 (*The Guardian*, 2002; see Vaughan, 1987). Nevertheless, these five countries represent only half of the southern African countries suggesting that the famine is not exclusively related to drought. Historically parts of Zimbabwe experience droughts every four to five years. Historian David Beach (1977) described the shangwa areas in Zimbabwe prone to periodic drought and periods of severe hunger.

This essay aims to look more closely at the food security conditions in one cotton-growing region in the North West of Zimbabwe (see James, 2002a). The focus here is thus to assess to what extent the data on malnutrition is relevant to broader understandings of food security in the region. Data is taken from one hospital in Nembudziya (the District Service Centre for Gokwe North), which, whilst strictly not at the time a hospital, served a relatively large area (and arguably the entire district in times of crisis).¹

* Associate lecturer, Dept. of Geography, OU, Milton Keynes, UK. Email: sekayijames@aol.com

Data on malnutrition came from Health Information records compiled from *T5 forms* relating to each patient. A systematic collection of official records at Mtora Mission Hospital began in January 1988.² These recorded nutritional deficiencies in under-fives (U5s) and over-fives (over 5s) arriving at the hospital. After June 1993, the *T5 forms* became more detailed, itemising specific nutritional deficiencies including kwashiorkor, pellagra and ‘Other forms’. In addition, a further age group included the 5-14 years category to distinguish these from the U5s. These records alone say very little about the causes for the particular cases and nothing about the people affected, where they were from and expressly whether their conditions were related to food shortages. Furthermore, these official data are state owned and serve a particular purpose. For a complex array of reasons a significant number of people did not go to the hospital to register as being malnourished.

Data analysis nevertheless shows convincingly that there is an unmistakable relationship with drought circumstances and moreover, the number of cases of pellagra suggest a specific problem of severe food insecurity among some people and in unidentified areas within this communal area in Zimbabwe.

This paper provides textual summary analysis of the data followed by a wider discussion and conclusive commentary. This essay has four related objectives namely: To analyse the relationship between drought and malnutrition in Nembudziya; to describe the health and welfare situation for children in Nembudziya; to analyse, describe and explain trends in malnutrition in children and adults; to make some policy observations on food security and welfare in Nembudzia.

First however, before the analysis a review of the main terms for analysis.

Malnutrition

The roots of malnutrition extend beyond the reach and influence of health and nutrition remedies into *environment, traditions and economy of the people* (Madzingira, 1995: 246 [emphasis added]).

Malnutrition is also a result of a political economy with its changing agrarian structures resulting in the undermining of some livelihoods. According to Tagwireyi and Greiner (1994: 105ff.), during the early 1980s, Zimbabwe as a nation combined a “spirit of co-operation” with improvements in health, education and agriculture leading to a decline in under-nutrition.³ However, they also argue that household food security was only achieved nationally following expensive [rural development] policies, and programmes of food distribution, drought relief, and food subsidisation. This broadly refers to a state-led economy transforming through the persuasions of World Bank and International Monetary Fund Economic and Structural Adjustment Programmes (IMF ESAPs) into a more market-led economy in the late 1980s and 1990s.

It is important, analytically, to separate the concepts that intersect with food security, e.g. malnutrition, hunger, and famine. The treatment of malnutrition is a highly social and political issue (Council of Ministers, 1993; Fieldhouse, 1993; Tagwireyi and Geiner, 1994; Truscott, 1986; Young, 1992). Malnutrition (and undernutrition) belongs mainly to medical and health sectors, although clearly the causes of the deficiencies are social and economic (see *African Journal of Food and Nutritional Sciences*, 2001). Nutrition and diet

studies are a core part of food sciences (Fox and Cameron, 1989; Proceedings of the Third Africa Food and Nutrition Congress, 1988; Bender and Bender, 1995; Foster, 1992; King and Burgess, 1993; Latham, 1965; Wilson, 1990).

Young (1997: 19-26) discusses the concept of malnutrition by stressing the 'hidden hunger' of deficiencies in micro-nutrients such as iron and vitamins. An example of this is the prevalence of pellagra caused by the absence of alternative foods to maize and therefore a deficiency of niacin (Foster, 1992: 195). This relevant issue was raised during the 1980s and 1990s by the Food and Agricultural Organisation through recognising the value of 'minor crops' (FAO, 1985a; 1985b; 1988). Generally, the research into wild foods has formed part of the 'Sustainable Agriculture Program' at the International Institute for Environment and Development (IIED) called the "Hidden harvest" (see Scoones, Melnyk and Pretty, 1992). More recently the UK Department for International Development (DfID) has funded research into smaller less well-known food crops (see Plant Science Research Programme, 2002; IPGRI, 2002).

Pellagra sufferers experience a combination of three ailments including dermatitis, diarrhoea, and distemper (Bender and Bender, 1995: 278; see also Foster 1992: 195). The disease is caused by an extreme shortage of niacin (nicotinic acid and nicotinamide)(MAFF, 1995: 56). Tryptophan normally converted to niacin is present in cereals such as maize. However, it is bound up in complex hemicelluloses called niacytin and is therefore largely unavailable (Fox and Cameron, 1989: 149-150). Latham (1965: 104-109) states that the body has the capability of normally to convert the amino acid tryptophan into niacin. Therefore, vegetable and animal foods containing tryptophan help to prevent pellagra. Pellagra usually occurs in areas where maize is the staple diet and is generally uncommon in children (Latham, 1965: 104).

'Kwashiorkor' is a classic form of malnutrition (also referred to as undernutrition or Protein-energy Malnutrition - PEM). It occurs in a diet deficient in protein and normally associated with children under 5. Symptoms include swollen bellies (edema⁴), apathy, and skin and hair problems (Foster, 1992: 17). Kwashiorkor occurs as a result of a deficiency in protein relative to an intake of calories. In practical terms, the child may be eating carbohydrate based foods (porridge) but lacking in proteins (milk). The common occurrence and the origin for the name comes from the sudden weaning of a child when the mother becomes pregnant. The name has its origins in Ghana.

'Other forms' of nutritional deficiency refer to the assessed conditions that were not confirmed as either kwashiorkor or pellagra. A condition not included in the records is Marasmus described as semi-starvation because of the overall lacking in food. "Marasmus [a wasting disease] is most likely to occur in populations suffering extreme poverty, whose access to calories is very inadequate" (Young, 1997: 26).

Food Security

Food security is a much more widely based social concept. The concept embodies *nutritional science* and concerns about malnutrition; it is also connected with *politics in the household*, the community or region, and *access* to enough correct food; it is about the *struggles for livelihood* and the economics of *food availability*; food security is about the real constraints of *deprivation, vulnerability, marginality, disempowerment* and the loss of *entitlements* (see Devereaux and Maxwell, 2001).

Food studies have gained ground in recent years (see Goodman and Watts, 1994; 1997; Young, 1997).

Food studies, particularly food availability and security issues, have never lost their salience for many, but in the affluent world they have regained a political relevance in recent years; whether in pre- or post-abundance societies, food matters (Young, 1999: 122).

Food security, as a concept, has fluctuated in relevance since the 1970s when it was first coined. A higher proportion of research publications appeared in the 1980s and early 1990s. However, by the mid-1990s the concept of food security became less topical and gave way to debates and policies concerning 'poverty alleviation' (Maxwell, 1998; 1999). Any concern with poverty and food security has to recognise not only that they are *complex* and *multidimensional* but that:

Most of this [analysis] is going to be location specific. There is a strong consensus that *local conditions* vary and that *local perceptions* matter (Maxwell, 1999: 101, emphasis added).

Poverty alleviation became the prime focus for World Bank and United Nations development research and policy implementation during the 1990s (Maxwell, 1999).

Interest in the local and household scales (Maxwell, 1996; Guyer and Peters, 1987) interrelate with perspectives on 'livelihood' (see Chambers, 1995), 'marginality' (Blaikie and Brookfield, 1989) and 'vulnerability' (Watts, 1991; Downing, 1996; Watts and Bohle, 1993). Food security approaches remain embedded in the social and political research at the local scale.

The preferred definition is that suggested by Simon Maxwell following research carried out in the Sudan: "A country and people are food secure when their food system operates in such a way as to *remove the fear that there will not be enough to eat*" (Maxwell, 1988, emphasis added). Another plausible definition comes from the World Bank (1986: 1): "Food security is access by all people at all times to enough food for an active healthy life." One simple definition is that food security is the success of local livelihoods to guarantee access to sufficient food at the household level (Devereaux and Maxwell, 2001: 1).

In Maxwell's view (1996) the post-modern elements in capturing an understanding of household food security include shifts from global and national perspectives to household levels of analysis; from 'food first' (i.e. concerns *only* about supply and food availability) to 'livelihood perspectives' (i.e. concerns about access and people's rights to food); and from objective (or technical) indicators to broader and more subjective discussions on relationships with poverty and vulnerability. This post-modern perspective fits more neatly with interdisciplinary approaches, multiple and overlapping perspectives in the social sciences, focusing on diversity, complexity and specificity, and highlights the discussions on self-determination [agency] of the individual, household or group.

Firstly, by definition "sufficiency" of food refers to the nutritional standpoint (Devereaux and Maxwell, 2001). A sufficient supply of food has to be complemented with a feasible balance of nutrients so as not to jeopardise short and long-term health conditions.

Secondly, the concerns about ‘access’ and ‘entitlements’ to food include understanding of social relations and power struggles at the household and community level.

Thirdly, the issue of ‘security’ relates to wider issues of ‘vulnerability’ and ‘risk’. On the one hand, the lack of technology among relatively poor farmers means that they may be unwilling to take certain risks, and on the other hand, that risks that they do take may undermine rural livelihoods and increase their vulnerability and deprivation (Scoones *et al.*, 1996: 9).

Fourthly, it is crucial to be clear about the differences in food security based largely on a time-scale, whether chronic, transitory or cyclical (Maxwell and Frankenberger, 1992: 4). The persistence of chronic food insecurity among some people and in some households is of great concern. Maxwell and Frankenberger (1992: 4) advise researchers that: “Flexibility, adaptability, diversification and resilience are key words. Perceptions matter. Intra-household issues are central.”

In a situation of fading traditional moral economies (Mararike, 2001) the market economy leaves wealth differentiation and a void in welfare provisioning especially when the state increasingly fails to provide welfare and health support. Poverty Alleviation Action Programme (PAAP), the grain loan scheme, and the adoption of Nutrition Gardens are examples of welfare efforts to curtail food related problems.

Geography of Food

Food security and other interests in food also have geographical factors. First, research attention continues to focus on the global distribution of foods and changing dietary practices (Grigg, 1995: 339). Findings show that the dietary variations based on regional and cultural preferences continue despite the processes of globalisation.⁵ Moreover, food research has also examined internal complexes at regional, place and community levels showing evidence of the continued process of socio-economic differentiation and increasing inequalities. That, indeed, is the principal focus in that the demise of a traditional ‘moral economy’ (of welfare food provisioning at say the village level) has left a void to be filled by state, NGO and market institutions. As the state weakens or loses interest, the poor and vulnerable increasingly face the vagaries of market forces as well as uncertain biophysical realities (see Watts, 1983: 110-111).

Second, research focuses on the “spatial constitution of the food system” (Cragg, 2000: 273). Contained within that is an examination of the processes of ‘de-localisation’ in which food production and consumption increasingly associate with *modern* technology and the associated economy with the global markets. The local and ‘traditional’ systems of household food provisioning change further, as they always have done, and livelihoods become directly embedded into a market-based economy with prices for consumer items determined remotely in national and international spheres (see Andrae, and Beckman, 1985).

The third area of geographical focus is with: “The production of space and place through food...” (Cragg, 2000: 273). Addressed here are the re-creations of the domestic sphere and food provisioning in the home. One research area attempts to assess the extent the foods are culturally determined. For example, Sadza ne nyama (Polenta or maize-meal thick porridge with a meat relish) is culturally Zimbabwean, and a traditional food of

southern Africa. However, on closer examination, the components (maize-meal thick porridge and meat) are steeped in a complex and mixed history.

Food supply and rainfall: The relationship between drought and malnutrition

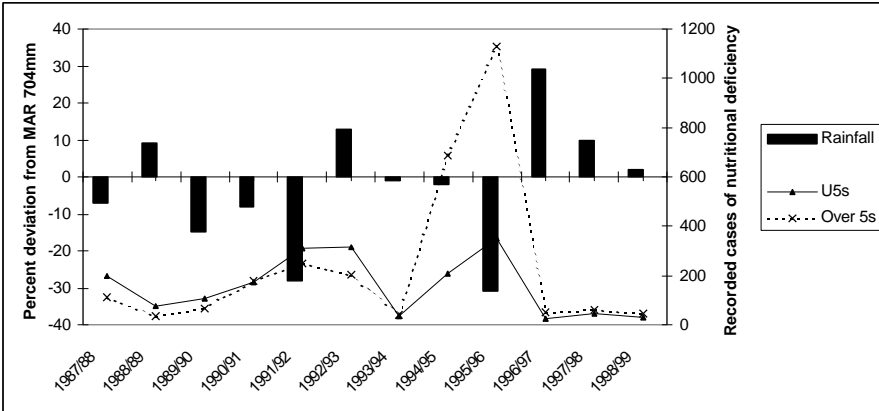


Figure 1: The relationship between the variation in rainfall and the rise and fall in malnutrition cases recorded at Mtora Mission Hospital, Nembudziya (Sources: Meteorological Offices, Harare; Mtora Mission Hospital and Gokwe Hospital).

The concentration of recorded malnutrition cases during relatively short periods relates more closely to the problems posed by insufficient rainfall or drought.

For instance, January 1996 recorded a quarter (25 percent) of the total number of cases over the eleven years. Further, the four months out of 147 (2 percent) from November 1995 to February 1996 recorded 34 percent of all the cases. In more detail, 47 months (34 percent) with thirty or more cases per month represented 83 percent of all the cases (N = 3,884/4697).

Most cases of malnutrition occurred following droughts (see figure 1). In 1988 six months recorded over thirty cases, in response to the drought in 1987 and 1988. 1991 and 1992 recorded seven and nine months respectively with over thirty cases following the 1991 to 1992 drought. Finally, 1995 and 1996 experienced ten and five months respectively with thirty or over cases, probably directly relating the intense drought during the rainy season of 1995 to 1996. In sum, thirty-eight of forty-seven months (81 percent), showing thirty or more cases of malnutrition, occurred during and following droughts.

Health and welfare for children: The decline in cases of kwashiorkor

The eleven years in which data was collected show a decline in recorded cases of under 5s with malnutrition. Nevertheless, analysis shows that from the eleven years of data, 40 percent of the malnourished were under 5. After June 1993, only a few significant peaks in kwashiorkor cases occurred. A small peak of eight cases featured in March 1994. Recorded cases of kwashiorkor did rise in the drought of 1995/96 but in summary the cases remained below five for all of the months through to 1999.

Has malnutrition increased?: The greater peaks in the 1990s

Without detailed data from the 1980s, it is difficult to compare the two decades. *Figure 1* shows a longer-term peak in malnutrition cases after the 28 percent decline in rainfall in 1991/92. In 1992/93 rainfall increased to 15 percent above the mean annual rainfall (MAR) of 704mm. However, the 1995/96 rainy season was marginally worse than 1991/92 with 31 percent below MAR. However, this season saw a significantly greater impact on malnutrition with 1,478 cases (compared to 1,082 cases over two years in the early 1990s). Also of interest is that the majority of the cases (76 percent) recorded in 1995/96 were over five years old.

Malnutrition among adults: Peaks in cases of pellagra

The majority of peaks (7/9) in records of pellagra occur in the months from September to December. These months represent the beginning of the rainy season.

In the season of 1993/94, the majority of months record fewer than three cases but these go up to eleven in December. In the following season of 1994/95 ten cases are recorded in December with another smaller peak in April. 1995/96 recorded the greatest number of pellagra cases (over 300) with over 50 percent in December and January. 1996/97 saw a small peak in October and the 1997/98 season recorded very few cases. In 1998/99, a small peak of five cases was recorded in September.

Discussion

Two important outcomes derive from the analysis: firstly, the important peaks in pellagra cases; secondly, the gradual decline in kwashiorkor cases.

The nine distinct peaks in pellagra cases offer interesting data because seven of them occur between September and December. That may relate to the shortages in foods other than maize and especially vegetables and wild fruit during this drier part of the year just before the rains. Table III “Phenology of indigenous and exotic fruits” in McGregor (1995: 171) shows the relative shortage of fruit available especially in August and September. Of the fourteen fruit described as available only five – *Lannea stuhlmannii*, *Grewia flavescens*, *Strychnos spinosa*, *Bauhinia thonningii* and *Parinari curatellifolia* – appear available in varying quantities in the Nembudziya area. (See Appendix 7.1 in James 2002a for further details and also Campbell, 1987).

In southern Africa, the period at the beginning of the rains (September to December) is the hungry period. Stocks have declined; some fruit are available in smaller quantities. Furthermore, people are busy preparing, ploughing and planting in the fields. In Nembudziya during this period, the demand for green vegetables outstrips supply.

The introduction of Nutrition Gardens has had some impact on the problems during this difficult period prior to the rainy season. The promotion of Nutrition Gardens by the government through the state extension service Agritex has helped sustain the supply of fresh vegetables. The provision of ‘food-aid’, in various schemes, relies only on maize distribution increasing the focus on maize-only diets, probably leading to pellagra among those that failed to get access to other foods. The provision of food aid including the ‘grain-loan-scheme’ focused entirely on the distribution of maize. In all, the HIO in Nembudziya made it very clear that pellagra cases are relatively rare and that the peaks usually represented clusters (or groups) of people arriving together to the hospital.

Thirdly, the peaks in the data for pellagra probably represent clusters or social groups of people arriving at the same time. The Health Information Officer in Nembudziya confirmed that, on several occasions, the malnutrition patients arrived in groups and frequently from as far as the distant corners of Gokwe North. As both the district centre and a main hospital, the urban centre Nembudziya and Mtora Mission Hospital are therefore a strong pull-factor for people during a crisis. The data for malnutrition is therefore more representative of the district than Nembudziya the Ward.

The cases of kwashiorkor have fallen since 1993-94. The trend is downward and further backed-up by data showing a continued decline since the late 1980s and early 1990s. Two observations can be made: One is that the new *T5 forms* brought into use during 1993 led to closer scrutiny of cases and therefore a tendency to record any uncertain cases as 'other' forms of malnutrition instead of being specific. The second is that, while elements of that point might be valid, the trend in the figures shows a significant decline in the monthly recordings of kwashiorkor cases during the eleven years. It is probable that the health programs highlighted by Tagwireyi and Greiner (1994) finally reached Nembudziya, and that with a new district created in 1993, concerted welfare efforts appear to have kept the number of cases down (see Chapters One and Four in James 2002a).

Overall, the malnutrition in U5s has declined through the 1990s. Besides the drastic drought in 1995/96 there were only few cases recorded in the late 1990s. Several health programmes highlighted by Tagwireyi and Greiner (1994) began to have effect in Nembudziya. The concentrated effort to tackle kwashiorkor has clearly worked.

However, the worrying factors perpetuate. One is that drought continues to be the main cause of malnutrition. Two, the greater peaks in the 1990s (and clearly in 2001/02) suggest a continuing problem for the people of Nembudziya and district-wise in Gokwe North. Clearly neither the "cotton Dollars" nor the state policies have succeeded to counter malnutrition among the adults.

Conclusion

The data used is not entirely satisfactory but the picture provided in the trends does show interesting dynamics in malnutrition. Furthermore, these findings suggest links with other qualitative analysis of the regional food security situation. The state has made policy on food security nationally and to some extent these targets have been reached. There are nevertheless major deficiencies in state policy. It is not clear how typical the findings are and therefore further research would be needed to make comparisons with other areas.

Analysis and discussion have focused closely on malnutrition data taken from one hospital in Gokwe North. While malnutrition is a medical and health related problem the links with food security are clear.

First, drought results in crop failure and therefore severe food insecurity for some households. The welfare system has not then been capable or efficient enough to reach people during seasons with insufficient rainfall. As the North West of Zimbabwe is a cotton and maize area arguments could point to an over-reliance on these cash crops. Cotton has the reputation of withstanding low rainfall conditions; however an early season or mid-season disruption to the rains is likely to kill-off young plants resulting in poor harvest.

Second, the evidence of pellagra cases particularly during the early part of the rains suggests a continuing alarm with severe food insecurity in some areas and among some households. While the fall in cases of kwashiorkor is commendable and welcome, this suggests an imbalance in the health welfare support. Children with kwashiorkor must be supported as a critical priority. However, the presence of pellagra in the 1990s is an indictment not only of the state welfare system but also suggests a link to the break-down of a traditional moral economy. This situation gives evidence of the deepening impact of the changing agrarian structures and adjoining geography of food. Dietary practices have changed, with a significant move away from wild and traditional foods (James, 2002b). This links also to the standardisation of food available through markets and 'Nutrition Gardens'. Household research into socio-economic conditions gives evidence that income generated from cotton and maize sales is insufficient to buy food throughout the year. The majority of people get by growing cotton but a significant number are too poor to do so and without the alternative sources of income they are vulnerable to severe food insecurity.

The understanding of food security is simultaneously local focused, concerned about the complexities of food itself including supply, diet, and nutrition. The research on livelihood makes emphasis on the quantifiable issues including access and rights to food, vulnerability, uncertainties and wider concerns with poverty and empowerment. The geographical relevance cannot be over emphasised. Food security is about livelihoods in specific place contexts.

Endnotes

¹ This information was gained from the local Health Information Officer in Nembudziya. The hospital had no regular doctor working there and was thus strictly a clinic. A District Service Centre describes the main town or urban development within a district. Nembudziya has now gained status to become a Growth Point.

² In some archival records (by Native Commissioners) there is also some discussion of malnutrition related illnesses in Sebungwe and Gokwe (see Chapter Four in James, N. 2002a).

³ Undernutrition is a specific form of malnutrition occurring when the diet is short of calories and protein to sustain normal growth maintenance. It is therefore specifically related to a food shortage.

⁴ Also 'famine oedema', a condition in which excess fluid stores in the body resulting in swollen belly and ankles.

⁵ Globalisation is here viewed as 'the end of geography' and a thesis that everywhere is becoming the same (Dicken, 2000: 315).

Bibliography

- African Journal of Food and Nutritional Sciences* (2001) Volume 1, Number 1 Nairobi, Kenya
- Andrae, G. and Beckman, B. (1985) *The Wheat trap: Bread and underdevelopment in Nigeria* London, Zed Press
- Beach, D. (1977) 'The Shona economy: Branches of production' in Palmer, R. and Parsons, N. (Eds.) (1977) *The Roots of Rural Poverty in Central and Southern Africa* London, HEB pp. 37-65
- Bender, A.E. and Bender, D.A. (1995) *A dictionary of food and nutrition* Oxford University Press
- Blaikie, P. and Brookfield, H. (Eds.) (1987) *Land Degradation and Society* London, Routledge
- Campbell, B.M. (1987) 'The use of wild fruits in Zimbabwe' *Economic Botany* 41: 375-385
- Chambers, R. (1995) 'Poverty and livelihoods: Whose reality counts?' *IDS Discussion Paper* 347
- Council of Ministers (1993) *African Regional Nutrition Strategy (1993-2003)* Fifty-eighth Ordinary Session 21-26 June 1993, Cairo Egypt CM/1785(LVII) OAU/UN/FAO

- Crang, P. (2000) 'Food, Geography of' definition in Johnston, R.J., Gregory, D., Pratt, G. and Watts, M. (Eds.) *The dictionary of Human Geography* (4th Edition) Oxford, Blackwell Publishers Ltd pp. 272-274
- Devereaux, S. and Maxwell, S. (Eds.)(2001) *Food security in sub-Saharan Africa* London, ITDG
- Dicken, P. (2000) 'Globalisation' in Johnston, R.J., Gregory, D., Pratt, G. and Watts, M. (Eds.) *The dictionary of Human Geography* (4th Edition) Oxford, Blackwell Publishers Ltd pp. 315-316
- Downing, T.E. (Ed.)(1996) *Climate Change and World Food Security* Heidelberg, Springer
- FAO (1985a) *Expert consultation on broadening the food base with traditional food plants* Harare, Zimbabwe 16-23 November, 1985 Food Policy and Nutrition Division, Food and Agricultural Organisation, Rome
- FAO (1985b) *The role of minor crops in nutrition and food security* Food and Agricultural Organisation Committee on Agriculture, Session 8, Rome
- FAO (1988) *Traditional food plants. A resource book for promoting the exploitation and consumption of food plants in arid, semi-arid and sub-humid lands in East Africa* FAO, Food and Nutrition Paper 42
- Fieldhouse, P. (2nd Edition)(1995) *Food and Nutrition. Custom and Culture*
- Foster, P. (1992) *The world food problem. Tackling the causes of undernutrition in the Third World* London, Adamantine Press Ltd.
- Fox, B.A. and Cameron, A.G. (1989) *Food science, nutrition and health* London, Edward Arnold (Fifth Edition)
- Goodman, D. and Watts, M. (1994) 'Reconfiguring the rural or fording the divide? Capitalist restructuring and the global agro-food system' *Journal of Peasant Studies* 22, 1: 1-49
- Goodman, D. and Watts, M.J. (Eds.)(1997) *Globalising food. Agrarian questions and global restructuring* London, Routledge
- Grigg, D. (1995) 'The geography of food consumption: A review' *Progress in Human Geography* 19: 338-354
- Guyer, J. and Peters, P. (Eds.)(1987) 'Special Issue. Introduction: Conceptualising the household: Issues of theory and policy in Africa' *Development and Change* 18, 2: 197-214
- IPGRI (2002) *Neglected and Underutilised Crop Species Research Programme by the Integrated Plant Genetic Resources Institute*, website: http://www.ipgri.cgiar.org/institute/fact_leafyveg.htm
- James, N. (2002a) 'A geographical study of Nembudziya, Gokwe North, Zimbabwe: The relationship between agrarian environmental change and household food security' *Unpublished Thesis* Edge Hill College, Lancaster University
- James, N. (2002b) 'Behind food security: Good meals, new delicacies and crying for the old foods. Learning from food culture in Nembudziya, Gokwe North, Zimbabwe' Paper presented to African Studies Association (ASAUK) Conference "What can we learn from Africa?" The Manor House, University of Birmingham 9-11 September, 2002.
- King, F.S. and Burgess, A. (2nd edition)(1993) *Nutrition for Developing countries* Oxford Medical Publications, OUP
- Latham, M. (1965) *Human nutrition in tropical Africa. A text book for health workers with special reference to community health problems in East Africa* Rome, Food and Agriculture Organization of the United Nations, United Nations Children's Fund and World Health Organization
- McGregor, J. (1995) 'Gathered produce in Zimbabwe's communal areas: Changing Resource availability and use' *Ecology of Food and Nutrition* 33, 3: 163-193
- Madziringira, N. (1995) 'Malnutrition in children under five in Zimbabwe: Effect of socio economic factors and disease' *Social Biology* 42, 3-4: 239-246
- MAFF (Ministry of Agriculture, Fisheries and Food)(1995) *Manual of Nutrition* Tenth Edition London, The Stationery Office
- Marariki, C. G. (2001) 'Revival of indigenous food security strategies at the village level: The human factor

implications' *Zambezia* XXVIII, I: 53-65

Maxwell, D. and Wiebe, K. (1999) 'Land tenure and food security: Exploring dynamic linkages' *Development and Change* 30, 4: 825-849

Maxwell, D.G. (1996) 'Measuring Food Insecurity - The Frequency and Severity of Coping Strategies' *Food Policy* 21, 3: 291-303

Maxwell, S. (1988) 'National food security planning: First thoughts from Sudan', Paper presented to workshop on food security in the Sudan, IDS, Sussex, 3-5 October, 1988 in Smith, M. *et al* (1993) 'Household food security: concepts and definitions. An annotated bibliography' *IDS Development Bibliography* 8 (p.28)

Maxwell, S. (1990) 'Food security in developing countries: issues and options for the 1990s' *IDS Bulletin* Volume 21, Number 3

Maxwell, S. (1996) 'Food security: A post modern perspective' *Food Policy* 21, 2: 155-170

Maxwell, S. (1998) 'Saucy with the Gods: nutrition and food security speak to poverty' *Food Policy* 23, 3-4: 215-230

Maxwell, S. (1999) 'International targets for poverty reduction and food security. A mildly sceptical but resolutely pragmatic view with a call for greater subsidiarity' *IDS Bulletin* 30, 2: 92-105

Maxwell, S. and Fernando, A. (1989) 'Cash Crops in Developing Countries: The Issues Facts, the Policies' *World development* 17, 11: 1677-1708

Maxwell, S. and Frankenberger, T. (1994) *Food Security: Concepts, Indicators and Measurement: A Technical Review* New York and Rome, UNICEF/IFAD

Plant Science Research Programme, DfID (2002) <http://www.dfid-psp.org/>

Proceedings of the Third Africa Food and Nutrition Congress (1988) 'Nutrition and food security' Two Volumes, Harare, Zimbabwe 5th to 8th September, 1988

Scoones, I., Melnyk, M. and Pretty, J.N. (1992) *The hidden harvest: Wild foods and agricultural systems. A literature review and annotated bibliography* London, IIED

Scoones, I., Chibudu, C., Chikura, S., Jeranyama, P., Machaka, D., Machanja, W., Mavadzenge, B., Mudhara, M., Mudziwo, C., Murimbarimba, F. And Zirezeza, B. (1996) *Hazards and Opportunities. Farming Livelihoods in Dryland Africa. Lessons from Africa* London, Zed Press

Tagwireyi, J. and Greiner, T. (1994) *Nutrition in Zimbabwe. An update* Directions in development, Washington, The World Bank

The Guardian (2002) 'Famine in Africa' Supplement published 1st December 2002

Truscott, K. (1986) 'Socio-economic factors in food production and consumption: A study of twelve households in Wedza Communal Land, Zimbabwe' *Food and Nutrition* 12, 1: 27-37

Vaughan, M. (1987) *The story of an African famine. Gender and famine in twentieth-century Malawi* Cambridge, Cambridge University Press

Wilson, K. (1990) 'Ecological dynamics and human welfare: a case study of population, health and nutrition in Zimbabwe' *Unpublished Ph.D. Thesis*, University of London

Young, E.M. (1997) *World Hunger* London, Routledge

Young, E.M. (1999) 'Review' Goodman, D. and Watts, M.J. (Eds.) (1997) *Globalising food. Agrarian questions and global restructuring* London, Routledge *Antipode* 31, 1: 122-124

Young, H. (1992) *Food Scarcity and famine. Assessment and response* Oxford, Oxfam Practical Health Guide No, 7

Watts, M. (1983) *Silent Violence: Food famine and Peasantry in Northern Nigeria* Berkeley: University of California Press

Watts, M. (1991) 'Entitlements or empowerment?' *Review of African Political Economy* 51: 9-26

Watts, M.J. and Bohle, H-G. (1993) 'The Space of Vulnerability: The Causal Structure of Hunger?' *Progress In Human Geography* 17, 1: 43-68

World Bank (1986) *Poverty and hunger: Issues and options for food security in developing countries*
Washington DC, World Bank Policy Study