

Urban Food Security and Health Status of the Poor in Dhaka, Bangladesh

Wolfgang-Peter Zingel, Markus Keck, Benjamin Etzold,
and Hans-Georg Bohle

19.1 Introduction: Hunger and Vulnerability After the Urban Turn

Amartya Sen, in his seminal work on food entitlements and deprivation (1981), has effectively demonstrated that food security is first and foremost a question of access to food rather than of general availability. Furthermore, research has shown that not only the rural populations are vulnerable to food insecurity, but that it is a significant challenge to urban dwellers as well (Sen 1981: 32; Pryer and Crook 1988; Watts and Bohle 1993). This is particularly true after the so-called “urban turn” – more than half of the world’s population now live in urban habitats (UN 2008). The global food price hike of 2007 and 2008 again has taught national governments and the international aid community that an undisturbed supply of and access to food are the basic prerequisites for urban food security where basically all urban populations depend on food markets to access food.

According to Michael Watts (1983) the lack of access to food can be regarded as “silent violence”; it constitutes a ‘normal’ crisis for the poor, despite the fact that sufficient amount of food is available in the country to avoid hunger, although on a low average level. This paradox will be examined in this chapter in the light of the concept of social vulnerability. Generally, social vulnerability refers to “exposure to contingencies and stress, and difficulty in coping with them” (Chambers 1989: 1). Vulnerability is a dynamic, multilayered and multidimensional social condition, which is structured by intersecting social, political, economic and ecological forces in specific places at specific times (cf. Watts and Bohle 1993). Social vulnerability

W.-P. Zingel (✉) • M. Keck
South Asia Institute, University of Heidelberg, Heidelberg, Germany
e-mail: h93@ix.urz.uni-heidelberg.de

B. Etzold • H.-G. Bohle
Geography Department, University of Bonn, Bonn, Germany

is rooted in actors' (or communities') capacities to cope with and recover from all kinds of stressors, among which are environmental hazards, global economic transformations and personal misfortunes (Bohle 2008: 39). Vulnerability to urban food insecurity has been examined in detail (cf. Ruel et al. 1998; Maxwell 1999; Bohle and Adhikari 2002; Pryer 2003; Community-Studies-Team 2007) and acknowledged in 'flagship reports' of international organisations, e.g. by FAO (FAO 2004: 18f) or UN-HABITAT (2006: 104ff). Experts agree on the fact that urban food security is first and foremost a question of income and of households' (HH) social access to food. The fact that the urban poor spend a greater portion of their income on purchasing food than the middle and upper strata makes them particularly susceptible to food price hikes; low and unstable incomes, in turn, seriously hamper the satisfaction of their nutritional and health-related needs (cf. Lam 1982: 53, Pryer and Crook 1988: 26ff, Maxwell 1999: 1945, Bohle and Adhikari 2002: 411, Pryer 2003: 141).

This chapter on urban food security and health in the megacity of Dhaka examines food security in terms of the availability, accessibility and utilization of food and its specific health outcomes. For this exercise, a food entitlement perspective is employed, and linked to the ideas of social vulnerability. The focus is on the urban poor living in selected slums of Dhaka. While most academic work deals with the consequences of food scarcity on a national level only, in this chapter we look at local impacts, and also take the considerable social stratification of the urban poor into account. It is assumed that prices of food as well as income and entitlement opportunities of the poor are the factors that count, and that locality contexts and differentiations within the poor are highly important aspects of food security and health status of the most vulnerable populations in the megacity.

With these assumptions in mind, we present the Coping Strategy Index (CSI) developed by Maxwell (1996) as a methodology to measure food security and related health risks. In the first section, the global food price hike is examined as a stressor for Bangladesh's food supply. In the next sections the vulnerability of the poor to food and health insecurity in Dhaka is analysed against the background of the Coping Strategy Index, taking a comprehensive food and health survey as a base. The respective problems of food availability, accessibility and outcomes in terms of food security and health are discussed in empirical terms. The last section, which is again based on the CSI, examines the coping strategies and the capabilities of the poor to deal with the food price hikes and food insecurities in the megacity. In conclusion, we stress that global food crises have to be investigated as local-level experience of the poor and vulnerable, particularly in the growing megacities and their increasing number of slum dwellers. We also point to the considerable social differentiation within these slum areas, with extreme vulnerabilities to food insecurity and health risks for female-headed households. We also show that the urban poor, in order to cope with the crisis, heavily rely on their informal social networks.

19.2 Methodology: The Coping Strategy Index (CSI)

In order to investigate the vulnerability to food insecurity and health risks of low-income groups in Dhaka's slums we rely on the work of Daniel Maxwell (1996), who developed the Coping Strategy Index (CSI), a tool to measure food insecurity on the household (HH) level that is frequently applied by the World Food Programme. The CSI is based on the assumption that the way how people deal with insufficient food in critical times provides a general indication for the food security status of HHs. It combines context specific coping strategies, people's perceived severity of these strategies and the frequency of their use into a composite index.¹

The coping strategies that were used in a standardized Food Consumption Survey in nine slum areas in the megacity of Dhaka (April–June 2009; $n = 205$)² encompass information on food access, dietary change and rationing strategies within HHs. As access to food in urban areas largely depends on the HH's income, the assessment of coping strategies was based on the simple question "What do you do if you do not have enough money to buy sufficient food?" In order to rank the different strategies, the perceived severity and frequency of having to cope with insufficient food was assessed. It was asked "How severe are the following ways of dealing with insufficient money to buy food?"³ and "How often did your HH had to manage in the following ways in the last week?"⁴ The coping strategies mentioned by the interviewees were the following:

- "We try to work and earn more than before to make up for higher expenses."
- "We buy food in the local food stall or in the grocery shop on credit."
- "We eat less preferred but less expensive food (e.g. less meat or fish)."
- "We borrow food or money from relatives or neighbors."
- "The mother eats less in order to ensure that children have enough food."

¹We are grateful to Patrick Sakdapolrak from the Geography Department, University of Bonn, for introducing the methodology to us. He applied the CSI-method in a vulnerability study of slum households in Chennai, India (Bohle and Sakdapolrak 2009; Sakdapolrak 2011)

²Nine slum settlements were selected for the survey, located in different parts of Dhaka, six within the Dhaka City Corporation (Begunbari-Tilatek, Pallabi; Bishil and Sarang Bari Baste, Mirpur; Bhuiapara road, Khilgaon; Kunipara, Tejgaon; Adabar No-10 Baste, Mohammadpur; Natun Jurain Baste, Alambagh, Shyampur), and three within Dhaka Union (Kamranginchar; Abdullapur, Dakshin Khan; Harirampur, Turag). 18–31 household interviews were carried out in each of the slums. Their population ranged from 3,000 to 30,000. The households were randomly selected from a sample that was drawn at the same time at the very same study sites by the INNOVATE research consortium from the Universities of Bielefeld and Humboldt at Berlin. Their Public Health Survey was conducted under the supervision of Dr. MMH Khan and O. Grübner. We, hereby, would like to thank Dr. Khan and his colleagues for the co-operation in conducting the research and for letting us use parts of their data set

³Perceived severity of the respective coping strategy: 1 = 'not severe', 2 = 'little severe', 3 = 'severe', 4 = 'very severe'

⁴Frequency of applying the respective coping strategy within the last week: 0 = 'never (0 days)', 1 = 'hardly at all (1 day)', 2,5 = 'once in a while (2–3 days)', 5 = 'pretty often (4–6 days)', 7 = 'all the time (everyday)'

Table 19.1 Validity of the Coping Strategy Index (CSI) (based on a food consumption survey in nine slums in April–June 2009, $n = 205$; the higher the score, the worse is the food security situation)

“Do you sometimes go to bed hungry?”	Share of all HH (%)	CSI-Score
“Yes, a few times a week”	7	68
“Yes, but seldom”	53	62
“No, never”	40	54
Total/mean	100	59

- “We save less and send less money to our family in rural areas than before.”
- “We eat less/We eat smaller portion sizes of meals.”
- “We sell personal goods (e.g. jewelleryes) to get enough money for food.”
- “We eat prepared food from a local food stall/roadside shops instead of cooking at home.”
- “We skip two meals a day.”
- “We do not eat anything a whole day.”
- “We send our children to eat with relatives or neighbors.”
- “We buy cheaper food from BDR shops/Open Market Sales (Public Food Distribution).”

In order to assess the food (in)security status of each of the interviewed HHs, the respective severity score of each coping strategy was multiplied with the respective frequency score. If one adds up the respective weighted scores for all the 13 coping strategies, every HH gets a total coping strategy index score. In case of our survey in Dhaka, the lowest CSI-score of all 205 respondents was 17, while the highest was 132. The higher the CSI-score, the higher is the vulnerability of a household to food insecurity. A simple test of the CSI-score against a ‘classical’ question in food security research (“Do you sometimes go to bed hungry?”) shows the validity of the CSI-method for assessing the food security status of a household (see Table 19.1).

In the following sections of this chapter, the CSI-score is used as a proxy indicator for food security.

19.3 The Global Food Price Hike as a Stressor for Bangladesh’s Food Security

In most of South Asia rice is the major staple of the people, regardless of their economic or social class, caste or ethnic background. In late 2007 the price of the major rice exporters showed a pronounced increase with a peak in mid-2008; by the end of 2008 prices finally started to fall. The price of high quality Thai rice quadrupled (!) within a period of 1 year, only. In the period of August 2004 until November 2006 it had risen from 250 US\$ per metric ton (MT) to 300 US\$/MT, while afterwards it jumped up to more than 1,000 US\$/MT in mid-2008. From



Fig. 19.1 Daily retail rice prices in Dhaka, in Bangladesh Taka (Source: Ministry of Agriculture, Government of the People's Republic of Bangladesh (2009))

the end of 2008 onwards prices fell and remained at a high level of around 600 US\$/MT.⁵

Global price hikes have a damaging effect in countries that have to import at any price. If the government is not interfering in between and subsidizes food imports (directly or indirectly) those who have to rely on the market have to pay the higher prices, often impossible for the urban poor, who to a large extent have to depend on their exchange entitlements for accessing adequate amounts of food (Sen 1981). Figure 19.1 provides data on low quality (coarse) rice that is mainly consumed by low income groups in Dhaka. Here, prices more than doubled in the mentioned period, i.e. from 16.5 Bangladesh Taka (BDT) in January 2006 to 35 BDT in December 2008. Since the beginning of the year 2009 prices have come down again to a rate of 20 BDT to 25 BDT.

Experts identified several factors being responsible for rising global prices, such as the increasing world energy prices (of oil and gas) that in turn raised the prices of major agricultural inputs such as fertilizer and water (via diesel for pumps and tractors); an increasing demand for rice in developing countries with a high income elasticity like China and India; more land used to grow fuel crops; the weak US-Dollar; and massive price speculation in agricultural commodities (Cohen and Garrett 2009). But how does the particular situation look like in Bangladesh?

Bangladesh's rice granaries are located in north-western and northern regions of the country. Rice is grown on small farms of less than 2.5 acres (1 ha). Up to three harvests are possible in a year, i.e. *aman*, *boro* and *aus* (Ahmed 2001: 2; Dorosh et al. 2004: 14). In the fiscal year 2006/07 55% of the total rice production stemmed from the *boro* season, whereas *aus* lost its importance and plays only a marginal role now with hardly 6% (FPMU 2009: 1). Bangladesh has been able to more than triple rice (paddy) production since Independence in 1971. Domestic production

⁵According to www.indexmundi.com, accessed: 20.08.2009

rose from 14.9 mio MT in 1971 to 43.1 mio MT in 2007 and to a record harvest of 46.9 mio MT in 2008. This success was possible only because yields increased from 1,602 kg/ha in 1971 to 3,995 kg/ha in 2008. Since all arable land is cultivated for long, the area harvested increased only from 9.3 mio ha to 11.7 mio ha, mostly by multiple cropping and irrigation. Today, Bangladesh holds the fourth position among the world's rice producing countries (FAOSTAT 2010).

But despite all impressive production increases, Bangladesh is still not in a position to feed its population. More than 3 mio MT foodgrains had to be imported in 2007: 2.4 mio MT wheat, 0.6 mio MT (milled) rice and 0.2 mio MT maize (FAOSTAT 2010).⁶ For many years around one-tenth of all food-grains consumed in Bangladesh had to be imported; thanks to marked improvements in production that ratio has fallen. Due to the poor monsoon rains of 2009 rice imports are projected at 0.6 mio MT in 2010 after 0.4 mio MT in 2009. In 2008 they were well over 1 mio MT as in the year before (FAO 2009b: 25). Food imports not always reflected food requirements. This never came out as clearly as in 1974 when emerging shortages were seen too late and donors were hesitant to help. The crisis resulted in a famine in the same year and political turmoil in the following one. Food imports initially fully depended on donors' preparedness to help and on the availability of foreign exchange for commercial imports. 1999 saw another poor harvest: a record 2.2 mio MT of milled rice had to be imported on top of 2.4 mio MT of wheat after severe floods and harvest losses (FAOSTAT 2010). In 2007 floods and the cyclone Sidr brought devastation and much of the paddy crop was destroyed. Consequently the country had to import large quantities of grain just when world market prices started to rise to unprecedented heights.

Bangladesh's market liberalization of the 1990 s coincided with India's removal of export restrictions. India's rice exports increased dramatically from 0.9 mio MT in 1994 to 4.9 mio MT in 1995. India started dominating the rice imports of her neighbour, thus replacing Thailand as the major source of rice imports to Bangladesh (Dorosh and Murshid 2004: 109). One has to bear in mind, however, that India had been exporting rice to Bangladesh also before, although illegally and unrecorded. The long and winding border was never effectively controlled and whenever prices differed in the two neighbouring countries large quantities would be smuggled across. But also after India started to liberalize its foreign trade, she continued to look at her consumers first: In times of high world market prices, India restricts her exports rather than allow her domestic prices to rise. As a consequence, India's rice exports were reduced from 5 mio MT in 2007 (FAO 2008: 32) to 3.57 mio MT in 2008 (FAO 2009a: 29) at a time when Bangladesh needed to import. One of the peculiarities of the world cereal market is that rice is traded much less than wheat or maize; less than one-tenth of the world rice production is internationally traded. Consumers also do not easily change their eating habits;

⁶According to the FAO (2008) 1.4 mio MT of rice were imported in 2007. Note: FAOSTAT differentiates between paddy (unmilled rice), (milled) rice, broken rice and other varieties. As paddy loses weight in the milling process (in the order of one third), quantities cannot be easily added up

making bread from wheat flour is also very different from cooking rice. The world market, thus, reacts sharply to changes of supply and demand of rice. Otherwise it could not be explained how upward changes of world market prices of rice could affect a country so much, that imports only a few percent of its total consumption.

19.4 Vulnerability of the Poor to Food Insecurity in Dhaka

19.4.1 Food Availability in the Megacity of Dhaka

The most food insecure areas of Bangladesh are the North-West Region (Dinajpur, Rangpur), northern *char* islands (sand bars emerging as islands within Jamuna and other river channels), the ‘drought zone’ in the West (western parts of Nawabganj, Rajshahi, Noagaon), the Sylhet *hoar* basin (a wetland ecosystem in north-eastern Bangladesh), the southern coastal belt and Chittagong Hill Tracts in the South-East (GOB/WFP 2004). In these regions, subsistence production is often insufficient to feed the families of small farmers or to provide work to landless labourers throughout the year, in particular during the *monga* period (a season of poverty and hunger in some areas of Bangladesh prior to the major rice harvest); additional resources are necessary to buy food from local markets. Rural food insecurity, widespread poverty, and a general lack of employment are thus among the most important driving forces of migration to Dhaka and partly cause of its rapid population growth.

Because of the limited absorption capacity of industry and government service in the capital, this rural exodus contributes to an ever growing ‘informal’ economy. People from the aforementioned areas settle down in one of Dhaka’s countless slums (makeshift huts rather than run-down inner city houses). They sustain their livelihoods by means of self-employment, e.g. as rickshaw pullers, street food vendors (Etzold et al. 2009; Hackenbroch et al. 2009), or by taking up jobs under often dangerous and unhygienic conditions, e.g. in construction, in the plastic recycling and processing industry (Kulke and Staffeld 2009), the garment or the emerging pharmaceutical sectors.

Less rice was traded in Dhaka’s six major markets in early 2009 as compared to early 2008, e.g. 1.424 mio kg per day and 1.527 mio kg.⁷ These markets can be considered to be fairly representative for Dhaka: At a rate of 0.5 kg of rice per person per day⁸ they supply rice for three million people or one-third to one-half of

⁷Surveys were conducted in February and March 2008 and again in the same months in 2009 in the Mirpur 11, Malibag, Jatrabari North, Mirpur 1, Kochuket and Babubazaar/Badamtuli

⁸The net availability of rice in Bangladesh was 188.4 kg in 2004–2005; it was a little less in the year before (BBS 2008:411)

the population of the ‘inner city’ that comes under the administration of the Dhaka City Corporation (cf. Keck et al. 2008: 30).⁹ A reduction of 7% from 2008 to 2009 meant on average 35 g or 120 Kcal¹⁰ less per person and day – a substantial amount for people who often have a food energy intake of 2,200 Kcal per day.¹¹

19.4.2 The Urban Poor and Their Access to Food

Livelihood groups in Dhaka can be distinguished by occupation (Pryer 2003). A look at the CSI-scores of the respective labour groups¹² shows that workers with a permanent job in private services or in agriculture enjoy the highest level of food security (mean CSI-score 40 and 46) (see Table 19.2). Moreover, their HH income as well as their food expenditure are far above the respective averages. On the contrary, HHs depending on incomes from working as domestic servants or security guards (household services) have the lowest income, spend the smallest amounts of money on food, are most likely undernourished and are the least food secure according to the CSI-score (mean CSI-score 63). Self-employed people in retail (e.g. street food vendors) or transport sectors (e.g. rickshaw pullers), and factory workers are situated in between the above mentioned extremes. Among all, cooks and day labourers (in the group of ‘others’) have the highest mean CSI-score with 74 and 66 respectively. It becomes clear from these numbers that urban vulnerability to food insecurity is largely determined by (gainful) employment.

Table 19.3 backs this statement. It shows a clear connection between the level of income and food security and health. HHs in the poorest income quintile have less than half of the average income at their disposal. Consequently, there is less money available per head to purchase the required amount of food and the HHs are less food secure (as indicated by a high CSI-score). There exist, however, marked disparities within each income group.¹³ This brings additional factors into play. The fact that 28% of the HHs within the poorest quintile are female headed

⁹The last population census was in 2001. 5.3 mio people were counted in the area under DCC (BBS 2008: 94). At an annual growth rate of 5% their number would have increased to 8.2 million in 2010

¹⁰Rice in Bangladesh on average has a nutrient content of 347 Kcal per 100 g (BBS 2008: 398)

¹¹In urban areas average per capita calorie intake per day was around 2,200 Kcal since the late 1980 s; it was 2,193 Kcal in 2005 (BBS 2008: 397)

¹²Labour groups have been identified by the economic sector in which the head of the household earns his/her main income

¹³This might be explained by the fact that the CSI-Method brings out the perceived sensitivity of households and their coping behaviour. If a HH with a relatively higher income has to cut down its expenditure on meat and fish in order to ensure a provision with ‘good’ rice, the deteriorated food situation might result in a higher CSI-score as compared to a family just surviving on rice, oil and some vegetable and without having been used to eating meat and fish of good quality

Table 19.2 Occupational groups, income, food expenditure, food security and health in Dhaka's slums (based on a food consumption survey in nine slums in April–June 2009, $n = 205$)

Economic Sector, in which main income earner of household works	Share of all HH (%)	Share of HH headed by women (%)	Share of HH in lowest income quintile (%)	HH income per person in HH, per month ^a (BDT)	HH food expenditure per person in HH per month (BDT)	CSI-Score	% of HH with underweight Body Mass Index <18.5 kg/m ²	Health status
Finance and private service industry	7	7	27	1,662	1,416	40	40	3.5
Agriculture	3	0	0	1,898	1,403	46	57	3.4
Construction	13	4	4	1,449	1,120	58	23	2.9
Manufacturing (incl. RMG sector)	8	12	24	1,799	815	60	35	2.9
Transport (incl. rickshaw puller)	25	4	16	1,538	1,551	60	41	2.9
Trade/Retail (incl. street vendors)	25	6	16	1,619	1,464	61	35	3.0
Household services (incl. maid)	5	40	50	789	876	63	50	3.1
Other	13	19	33	1,177	1,198	67	40	3.6
Total/mean	100	9	19	1,515	1,316	59	37	3.1

Body Mass Index and Health Status were calculated on the basis of data provided by the Bielefeld-Berlin INNOVATE consortium's Public Health Survey (cf. Khan et al. 2009). According to the World Health Organisation a Body Mass Index (BMI; weight/height) of below 18.5 is an indicator of underweight, a BMI of 18.5–25 indicates normal weight, a BMI of 25–30 overweight and a BMI above 30 obesity. The question regarding the health status was: "In general, how do you rate your health?": excellent = 1; good = 2; so-so = 3; fair = 4; poor = 5. The higher the mean value, the worse the average perceived/self-reported health status of that group

^aIn Bangladeshi Taka; at the time of the survey (April–June 2009) 100 BDT = 1.062 EUR

highlights the importance of social factors that also determine access to employment and income. Divorced (and to some extent also widowed) women are especially stigmatized and socially excluded, with severe consequences for all their family members' food security and health status. Social mechanisms like these need to be considered when thinking of fighting food insecurity in Bangladesh.

19.4.3 Utilization of Food and Health Outcomes

Fifty six percent, more than half, of all income is spent on food in Bangladesh; breads and cereals account for 50% of food expenditures; another 20% of food expenditure is spent on other foods, beverages and tobacco (USDA 2010). Dhaka's

Table 19.3 Relative income quintiles, food expenditure, food security and health in Dhaka's slums (based on a food consumption survey in nine slums in April–June 2009; $n = 205$)

Relative Income Group based on total HH income per month	Share of all HH (%)	Share of HH headed by women (%)	HH income per person in HH, per month (BDT)	HH food expenditure per person in HH, per month (BDT)	CSI-Score	Share of HHs with underweight BMI <18.5 kg/m ² (%)	Health status
Poorest quintile	19	28	791	980	60	46	3.4
Poor quintile	17	3	1,038	1,168	60	38	2.7
Middle quintile	36	8	1,380	1,277	58	38	3.0
'Rich' quintile	7	0	2,109	2,057	61	13	3.3
'Richest' quintile	21	0	2,643	1,595	53	31	3.1
Total/mean	100	9	1,515	1,320	58	36	3.1

See FN 19: data provided by the Bielefeld-Berlin INNOVATE consortium (cf. Khan et al. 2009)

poor spend even more on food: sometimes even more than they earn. Spending 127% of household income on food alone as has been reported by respondents in the poorest quintile (see Table 19.4) is only possible if the household income is measured by earnings only and if consumption can also be funded by debt. As poor people do not have access to bank loans, family members and friends are the major source of credit. Of course, there are micro credit schemes in the country of the Peace Nobel Price laureate Mohammad Yunus. But micro credits are meant to finance investments for self-employment rather than consumption and daily survival. But even if they were available, it seems that the outcome still is the same, i.e. that poor families become more and more indebted.

The largest share of food expenditure is spent on rice (see Fig. 19.2). On average, a slum HH consumes about 12 kg of rice per week and spends about 71 BDT on every person that needs to be fed. The most vulnerable HHs, in turn, spend more than half of their food budget on rice, almost exclusively of the lower quality (coarse rice such as *guti*, *pari*, *mota*, or *lali*). In contrast, the families that are relatively better-off not only buy more rice per person, but also better rice.

Important to note is that the better-off a HH is, the more money it spends on fish. While the poorest almost exclusively buy small fishes (*choto mach*) in only small quantities, the more affluent buy bigger species, mostly carps such as *rui* or *katol*, and the rather expensive but highly valued fish *hilsha*, i.e. the 'national fish' of Bangladesh. The same applies to meat: the poorest can hardly afford it and only spend 2% of their food budget on small quantities, whereas, the more affluent families spend up to 9% on meat. For dairy products, poor slum dwellers spend just 1%, while the richest slum HHs can afford to spend 4% on milk, cheese, curd and other dairy products. Another interesting aspect is that while both income groups spend more than 20% of their food budget on 'eating outside', the poorest spend comparatively more on readily available snacks, small dishes, and sweat tea from roadside shops and mobile street vendors (Keck et al. 2008; Etzold et al. 2009).

Table 19.4 Relative income, food expenditure, rice and fish consumption patterns in Dhaka's slums (based on a food consumption survey in nine slums in April–June 2009; $n = 205$)

Relative Income Group based on total HH income per month	Share of total income spent on food (%)	Rice expenditure p. pers. in HH per week (BDT)	Rice expenditure as share of total food expend (%).	Rice amount consumed in HH (per week) (kg)	Share of HH eating lowest quality rice (coarse rice) (%)	Fish amount consumed in HH (/week) (kg)	Share of HH eating mainly dried fish (Choto Mach) (%)	Meat amount consumed in HH (/week) (kg)
Poorest quintile	127	65	56	11	90	1.6	85	0.25
Poor quintile	116	72	35	12	79	2.3	65	0.23
Middle quintile	96	73	40	13	74	2.7	54	0.66
'Rich' quintile	93	61	20	9	73	3.2	40	0.53
'Richest' quintile	69	78	35	13	60	2.5	59	0.94
Total/mean	99	71	40	12	75	2.4	62	0.57

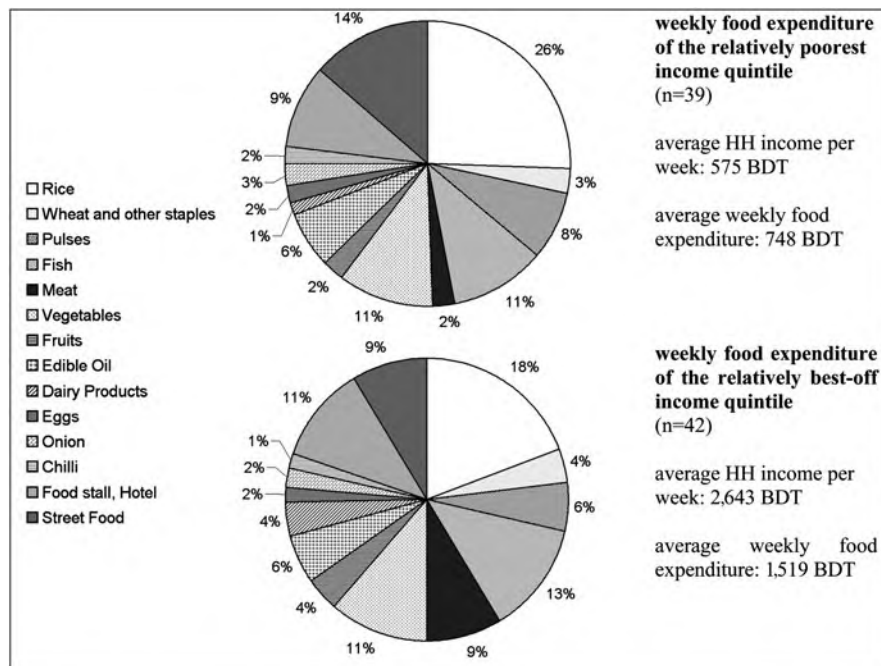


Fig. 19.2 'Food Basket' of slum households in Dhaka (based on Food Consumption Survey in nine slums in April–June 2009; $n = 205$)

As indicated in Tables 19.1 and 19.2 the health of slum dwellers varies strongly with occupation and income. The relation between food provision, the utilization of the nutrients within the body and health consequences are too complex to be dealt with in detail here. For the limited purpose of this study two simple measurements might suffice, i.e. the HH's health situation as perceived by the respondents themselves as a subjective and their Body Mass Index (BMI) as an objective one.

The high vulnerability to food insecurity of the occupational group of HH services (mean CSI-score 63) is reflected by the high share of underweight persons: 50% of respondents from this group have a BMI below 18.5, a clear indication of under-nourishment according to Pryer (2003: 149ff). The self-perceived health status of domestic servants and security guards is, however, not so bad: 40% said that they have a good health, 30% stated that their health is 'so so', while another 30% rated their health as 'fair' or 'poor'. In contrast, those HHs that depend on urban agriculture for their main income, which are the group with the highest average HH income per person, and which are among the least food insecure according to a mean CSI-score of 46, have the highest share of underweight persons with 57% and also a health status below average: 57% of them rate their own health as 'fair' or 'poor', while 43% stated that they have a good health. Interestingly, the healthiest occupational groups in our sample were those HHs that depend on construction work: only few of these families are in the lowest income quintile;

nevertheless their HH income and food expenditure are slightly below the total average, while their food security status (mean CSI-score 58) is average. With 23%, the share of underweight persons in this group is, however, the lowest. Twenty seven percent of construction workers HHs rate their own health as 'excellent' or 'good' and only 15% as 'fair' or 'poor'.

If only the HH income is taken as a basis for calculation (see Table 19.2) then it shows that the poorest income quintile is not only the most food insecure (lowest food expenditure per person and mean CSI-score of 60), but also the group with the highest share of underweight persons (46%); 18% are severely thin (BMI < 16), while 44% have normal weight. This goes in hand with this group's worst health status of all income groups (mean = 3.4): while 20% see themselves as being in good health (the same percentage as in the highest income quintile), 39% said their health was 'fair' or 'poor' (in contrast 20% said so in the highest income group).

If the aforementioned results are 'turned on their head', it shows that the BMI also has strong explanatory value for a HH's food security condition and its health status (Table 19.5). Households, in which the interviewed person was underweight (BMI < 18.5), disproportionately often had women as the main (and often also the sole) income earner. Moreover, most of the undernourished are in the lowest income quintile, their food insecurity status (mean CSI-score 62) is worse than average, and so is their health. If only the 9.5% of all interviewees that are severely thin (BMI < 16) are looked at, the data becomes even more contrasting: 21% of these HHs are headed by women, they are likely to be in the lowest income group, they have the lowest average HH income per person and also the lowest average food expenditure per person, with 65 their CSI-score is the highest of all, and with 3.5 they have the worst health status. While 28% of the underweight persons rated their health as 'fair' or 'poor', 37% of the severely thin people said so; in turn, only

Table 19.5 Body Mass Index, income, food expenditure, food security and health status in Dhaka's slums (based on a food consumption survey in nine slums in April–June 2009; $n = 205$)

Body Mass Index (kg/m ²) based on weight/height of interviewees	% of all HH ($n = 200$)	% of HH headed by women	% of HH in lowest income quintile	HH income per pers. in HH per month (BDT)	HH food expenditure per pers. in HH per month (BDT)	CSI-Score	Health status
Underweight (BMI < 18.5)	38	13	24	1,458	1,377	62	3.3
Severe thinness (BMI < 16)	9.5	21	37	1,026	993	65	3.5
Moderate thinness (BMI 16–17)	8.5	12	18	1,463	1,264	61	3.1
Mild thinness (BMI 17–18.5)	19.5	10	21	1,660	1,617	61	3.3
Normal weight (BMI 18.5–25)	50	8	17	1,561	1,250	59	2.9
Overweight (BMI 25–30)	11	0	19	1,257	1,251	52	3.2
Obese (BMI > 30)	2	0	0	1,456	1,163	46	3.0
Total/mean	100	9	17	1,488	1,298	59	3.1

See FN19: BMI and Health Status data provided by the Bielefeld-Berlin INNOVATE consortium (cf. Khan et al. 2009)

11% of the severely thin and only 15% of the underweight persons said they were in good health (none said their health was excellent), for the people with normal weight the respective figure is 33%. This observation fits into the overall picture: All over South Asia a food related gender bias can be observed: South Asian women and girls are not only less well fed than South Asian men and boys, they are also less well fed than women and girls coming from similar income groups in Africa (Smith and Haddad 2000; Pryer 2003; Gragnolati et al. 2006).

19.5 Coping with the Food Price Hike in Dhaka

The price hike of food in 2008 was a severe shock for the ‘rice nation’ of Bangladesh. The media reported extensively on price changes and how people from all classes had to change their food consumption patterns. In contrast to poor rural HHs, slum dwellers in cities have no direct access to rice and therefore depend on the market, on government (important especially for people in government service) and on NGOs. As the national government’s efforts to curb the spiraling prices were not as effective as expected (or hoped), the urban poor were hit the hardest by the price hike. Within Dhaka’s slums 77% of HHs in the poorest income quintile stated that the price hike of particularly rice affects them very severely. Additionally, also 45% of the comparatively most affluent slum HHs perceived the price hike to be ‘very severe’ (see Table 19.5).

Due to public pressure the government of Bangladesh took up public food distribution – if only half-heartedly – again that were almost abolished for several decades. The food procured by the government was sold through sales units set up by the Bangladesh Rifles (BDR), so called BDR markets, or through ‘open market sale’ (OMS) shops, i.e. licensed retail shops selling subsidized rice. Every person was allowed to buy up to 3 kg of rice at a rate of 25 BDT per kg when market prices were already at 30–35 BDT.¹⁴

The public food distribution schemes, however, did not reach all HHs affected by the price hike. Many slum and also pavement dwellers could not afford to stand in a queue for hours in order to get a few kilograms of rice as this time was lost for income generating activities. Our data shows that only a meagre portion of slum dwellers buys rice, pulses and/or vegetable oil from BDR shops; most people buy their food at normal market rates from the local bazaars and retail shops. Moreover, hardly any slum dweller benefits from group feeding programmes that operate through NGOs or community centres; in particular the neediest ones do not have access to such social charity schemes (see Table 19.6). Social networks are therefore highly important for the food provisioning of slum dwellers. In this regard, the family plays an important role. It seems that the more affluent slum dwellers are more in a position to maintain their ties to their families in the home districts, especially those who own some land in the village and can manage to go there

¹⁴Interview with Mr. Hiran Maya Barai, Chief Controller Dhaka Rationing, on 21 January, 2008

Table 19.6 Coping with the price hike: Relative income, coping strategies and food security in Dhaka's slums (based on a food consumption survey in nine slums in April–June 2009; $n = 205$)

Relative Income		Share of HHs that ...												
Group based on total HH income per month		... perceive price hike of rice as very severe (%)	... never buy food from BDR shops (%)	... never get free food from NGOs, community centre, neighbours, etc. (%)	... sometimes bring food from their village (%)	... daily buy food from retailer on credit (%)	... never borrow food/money from relatives/ neighbours (%)	... never send children to eat with relatives/ neighbours (%)	... daily eat less preferred, but less expensive food (%)	... daily save less and send less money to family in rural areas (%)	... daily try to work and earn more than before (%)	... never skip meals during a day (%)	in which the mother often or daily eats less so that children can eat more (%)	... go to bed hungry a few times a week (%)
Poorest quintile		77	87	97	0	21	31	69						
Poor quintile		59	88	97	12	35	24	62						
Middle quintile		54	89	94	8	38	33	82						
'Rich' quintile		40	93	80	20	27	33	60						
'Richest' quintile		45	81	93	24	33	43	76						
Total		56	87	94	11	32	33	73						
<i>Relative Income Group based on total HH income per month</i>		Share of HHs that ...												
		... daily try to work and earn more than before (%)	... daily save less and send less money to family in rural areas (%)	... daily eat less preferred, but less expensive food (%)	... daily eat less in quantity (%)	... never skip meals during a day (%)	in which the mother often or daily eats less so that children can eat more (%)	... go to bed hungry a few times a week (%)						
Poorest quintile	54	13	16	8	31	15	13							
Poor quintile	35	6	27	0	47	6	9							
Middle quintile	49	20	25	3	58	4	3							
'Rich' quintile	60	20	20	0	60	0	7							
'Richest' quintile	50	9	19	0	69	2	7							
Total	49	14	22	3	54	6	7							



Photo 19.1 People queue up at a public food distribution point of the Bangladesh Rifles (BDR) in Dhaka in order to get subsidised rice during the food price crisis in 2008 (Picture: M. Keck, February 2008)

regularly and bring food to the city. The poorest HHs, in contrast, cannot even afford a trip to their village (Photo 19.1).

The family also serves as the most important source of credit: On average two-thirds of the slum HHs borrow food or money from their family or neighbours; the poorest families particularly depend on this type of social capital. Thirty percent of them occasionally send their children to eat with other family members or neighbours. Another important group in this regard is local businessmen. Due to irregular and insecure income one-third of the interviewed families buy food items from ‘their’ local grocery shop or retailer on credit on a daily basis. Trust plays a pivotal role in these informal relations. Nevertheless, interest rates can be high, adding to a HH’s overall debt. Seventy seven percent of the HHs in the poorest income quintile, for instance, stated that at the end of each week they have a severe financial gap to fill (in contrast to only 17% of the most affluent quintile). Fifty nine percent of them said that they are heavily indebted (in contrast to only 19% of the most affluent quintile).

The most important coping strategy that slum HHs pursue under conditions of a food price crisis is again related to their labour power. Almost half of all respondents stated that they are forced to work more, which is considered to be ‘very severe’ by 43% of the respondents. Permanent employment, in particular in

public services, goes usually along with long-term security, better access to health and educational services, and thus a better food security and health status (Pryer 2003: 36ff). For the majority, though, this formal labour market stays barred. For them getting a job in the informal urban labour market again heavily depends on their social standing and their social capital.

Another coping strategy is to change the diet. In the wake of the food price crisis, 22% of the slum HHs studied in Dhaka ate cheaper food, which they preferred less. They bought cheaper and less valued rice or substituted expensive fresh with cheaper dried fish. Likewise, the size of portion had to be reduced, in the case of members of the poorest income quintile on a daily basis. Seventy percent of this group occasionally skipped meals in order to save money and 13% went to bed feeling hungry several times a week. Another coping strategy that is applied by 15% of the poorest households regularly, but far less common for the relatively more affluent slum dwellers, is food abstinence of mothers for the sake of their children. While this practice ensures the feeding of the children at the lowest nutritional level, it is highly detrimental for the food security and thus also for the health of the women.

19.6 Conclusion and Research Needs

In his book on “Globalisierte Nahrungskrisen. Bruchzone Kairo”, Jörg Gertel (2010) has shown how global food crises pierce down to the local levels of Cairo in Egypt, and even to the bodies of the individuals. The same is true to our study of slum dwellers in the megacity of Dhaka: the global food crisis has had its impacts on food security and the health of poor slum populations. Slums in Dhaka, however, are by no means homogenous, as the disaggregation of our data in terms of employment, income and the health of slum families has proved. It appears that the lack of income, in the context of dramatically rising food prices, is the most serious threat not only to food security, but also to health. Access to employment and income is particularly limited for female-headed households, i.e. the families of divorced or widowed women.

The recent food crisis has also shown that the urban poor rely heavily on their informal networks. In the context of limited access to the formal social system, help and support from family members, from neighbours and sometimes also from traders becomes crucial. Data from our survey prove that government distribution and aid programmes, managed by national and international NGOs, had hardly any impact on the extreme poor.

Looking at both food insecurity and ill-health through a vulnerability lens has provided the opportunity in this chapter to broaden our perspective beyond exposure and stress for vulnerable populations. Actor-oriented perspectives on vulnerability, as employed in this chapter, can address the agency of actors who are at risk to food insecurity and ill-health. They can highlight the multiple ways

how vulnerable people cope with and adapt to social and natural environments in crises situations (Bohle 2008).

Our chapter has also shown that a number of crucial questions regarding food and health of the poor in megacities still remain open. One aspect is that social and cultural factors that shape labour markets and income opportunities in the megacity have to be further scrutinized. A second aspect is that the linkages of slum dwellers to their former home villages need to be further investigated, since they seem to be of major importance to buffer food crisis and health risks. Moreover, a focus on the poor and vulnerable only which neglects middle and upper classes is too narrow to understand vulnerabilities in terms of food and health. As Lohr and Dittrich (2007) have demonstrated, it is frequently the higher classes that decide upon the poor's access to employment, food and health. The study of slum dwellers and poor sections of the megacity alone will not provide us the information that is necessary to critically address present-day challenges. Ideas on supporting systems of "adaptive food governance" (Bohle et al. 2009) may be regarded as one of these challenges.

References

- Ahmed R (2001) Retrospects and Prospects of the Rice Economy of Bangladesh. Dhaka
- BBS (2008) Statistical Pocket Book Bangladesh 2007. Dhaka
- Bohle HG (2008) Food Vulnerability and Health Vulnerability: Convergence and Common Ground in Global Change Research. In: Exner, M. et al. (Ed.): Towards Sustainable Global Health. SOURCE 11/2008. Bonn, pp. 38–41
- Bohle HG and Adhikari J (2002) The Metropolitan Food System of Kathmandu - Conceptual Considerations and Empirical Evidence. In: Die Erde 133, H. 4, pp. 401–421
- Bohle HG and Sakdapolrak P (2009) Chennai. Alltagskampf um Wasser, Nahrung und Gesundheit. In: Geographie und Schule 31, H. 181, pp. 4–10
- Bohle HG et al. (2009) Adaptive Food Governance. In: IHDP Update 3, Magazine of the International Human Dimensions Programme on Global Environmental Change, pp. 53–58
- Chambers R (1989) Editorial introduction: vulnerability, coping and policy. In: IDS bulletin 20, H. 2, S. 1–7
- Cohen M, Garrett JL (2009) The food price crisis and urban food (in)security. London / New York
- Community-Studies-Team (2007) Food and Nutritional Security in the Slums of Hyderabad. Berlin
- Dorosh PA et al (2004) Overview of the Bangladesh Foodgrain Economy. In: Dorosh, P. A. et al. (Ed.): The 1998 Floods and Beyond. Towards Comprehensive Food Security in Bangladesh. Dhaka, pp. 13–52
- Dorosh PA, Murshid KAS (2004) Trade Liberalization and National Food Security: Rice Trade between Bangladesh and India. Dhaka
- Etzold B et al (2009) Informality as Agency. Negotiating Food Security in Dhaka. In: Die Erde 140, H. 1, pp. 3–24
- FAO (2004) The State of Food Insecurity in the World 2004. Monitoring progress towards the World Food Summit and the Millenium Development Goals. Rome
- FAO (2008) Rice Market Monitor. April 2008. Washington D.C. (Volume XI - Issue 1)
- FAO (2009a) Rice Market Monitor. February 2009. Washington D.C. (Volume XII - Issue No. 1)
- FAO (2009b) Rice Market Monitor. December 2009. Washington D.C. (Volume 7 - Issue No. 2)

- FAOSTAT (2010) Database on Food Production and Trade, Food and Agricultural Organisation of the United Nations (FAO), <http://faostat.fao.org>, accessed: 07.02.2010
- FPMU (2009) Bangladesh Food Situation Report. Volume 78. Dhaka
- Gertel J (2010) Globalisierte Nahrungskrisen. Bruchzone Kairo. Bielefeld
- Government of Bangladesh und WFP (2004) The Food Security Atlas of Bangladesh. Towards a poverty and hunger free Bangladesh. Dhaka
- Gragnotati M et al (2006) India's Undernourished Children. A Call for Reform and Action. Washington D.C.
- Hackenbroch K et al (2009) Spatiality of Livelihoods: Urban Public Space and the Urban Poor in Dhaka. In: *Die Erde* 140, H. 1, pp. 47–68
- Keck M et al (2008) Reis für die Megacity. Die Nahrungsversorgung von Dhaka zwischen globalen Risiken und lokalen Verwundbarkeiten. In: *Geographische Rundschau* 60, H. 11, pp. 28–37
- Khan, MMH et al (2009) Comparison of Health-Related Outcomes between Urban Slums, Urban Affluent and Rural Areas in and around Dhaka Megacity, Bangladesh. In: *Die Erde* 140, H. 1, pp. 69–87
- Kulke E, Staffeld R (2009) Informal Production Systems - The Role of the Informal Economy in the Plastic Recycling and Processing Industry in Dhaka. In: *Die Erde* 140, H. 1, pp. 25–43
- Lam, T T-F (1982) Food for the City: The Role of the Informal Sector. In: *Geo Journal Supplementary Issue Vol. 4*, pp. 49–59
- Lohr, K and Dittrich C (2007) Changing food purchasing and consumption habits among urban middle-class in Hyderabad. Research Reports for Analysis and Action for Sustainable Development of Hyderabad. Report 3. Berlin
- Maxwell D (1996) Measuring Food Security: The Frequency and Severity of 'Coping Strategies'. In: *Food Policy* 21, H. 3, pp. 291–303
- Maxwell D (1999) The Political Economy of Urban Food Security in Sub-Saharan Africa. In: *World Development* 27, H. 11, pp. 1939–1953
- Pryer J, Crook N (1988) Cities of Hunger. Urban Malnutrition in Developing Countries. Oxford
- Pryer J (2003) Poverty and Vulnerability in Dhaka Slums: The Urban Livelihood Study. Aldershot
- Ruel MT et al (1998) Urban Challenges to Food and Nutrition Security: A Review of Food Security, Health, and Caregiving in the Cities. Washington D.C. (FCND Discussion Paper No. 51.)
- Sakdapolrak P (2011) Orte und Räume der Health Vulnerability. Bourdieus Theorie der Praxis für die Analyse von Krankheit und Gesundheit in megaurbanen Slums von Chennai, Südindien. Dissertation. Universität Bonn (Geographisches Institut). Bonn
- Sen A (1981) Poverty and Famines: an Essay on Entitlement and Deprivation. Oxford
- Smith L, Haddad L (2000) Overcoming Child Malnutrition in Developing Countries. Past Achievements and Future Choices. Washington D.C.
- UN-Habitat (2006) State of the World Cities 2006/7. The Millenium Development Goals and Urban Sustainability. 30 Years of Shaping the Agenda. New York
- UN (2008) World Urbanization Prospects: The 2007 Revision. Highlights. New York
- USDA (2010) International Food Consumption Patterns Database, United States Department of Agriculture. Economic Research Service
- Watts M (1983) Silent Violence: Food, Famine, and Peasantry in Northern Nigeria. Berkeley
- Watts M, Bohle HG (1993) The space of vulnerability: the causal structure of hunger and famine. In: *Progress in Human Geography* 17, H. 1, pp. 43–67