Nutritional Response to the 1998 Bangladesh Flood Disaster: Sphere Minimum Standards in Disaster Response

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In this study we use a cross-sectional survey to evaluate the nutritional response to the 1998 Bangladesh Flood Disaster by 15 relief agencies using standards developed by the Sphere Project. The Sphere Project is a recent attempt by agencies around the world to establish universal minimum standards for the purpose of ensuring quality and accountability in disaster response. The main outcomes measured were resources allocated to disaster relief, types of relief activities and percentage of agencies meeting selected Sphere food aid and nutrition indicators. Although the process of nutritional response was measured, specific nutritional and health outcomes were not assessed.

This review found that self-reported disaster and nutritional resources varied widely between implementing agencies, ranging from US$58,947 to $15,908,712. The percentage of resources these agencies allocated to food aid and nutritional response also varied, ranging from approximately 6 to 99 per cent of total resources. Agencies met between 8 and 83 per cent of the specific Sphere indicators which were assessed. Areas in which performance was poor included preliminary nutritional analysis; beneficiary participation and feedback; disaster preparedness during non-emergency times; monitoring of local markets and impact assessment. Agencies were generally successful in areas of core humanitarian response, such as targeting the vulnerable (83 per cent) and monitoring and evaluating the process of disaster response (75 per cent).

The results here identify both strengths and gaps in the quality of humanitarian response in developing nations such as Bangladesh. However, they also raise the question of implementing a rights-based approach to disaster response in nations without a commitment to meeting positive human rights in non-disaster times.

Keywords: Bangladesh, disaster relief, flood, Sphere, nutrition.

Introduction

In 1998 Bangladesh experienced floods that were unprecedented in their scope, duration and resultant damage (Khan, 1999). They are widely regarded as the worst floods in living memory. Although seasonal flooding is normal in Bangladesh, the
unusual combination of excessive run-off from Himalayan snowmelt, excessive rainfall and unusually high tides in the Bay of Bengal conspired to cause abnormally severe flooding.

Between late August and the end of September 1998, approximately 100,000 square kilometres, or 68 per cent of the country, was flooded. Flood conditions lasted a mean of 65 days. Over 30 million people were affected, and more than one million displaced to government shelters. The official death toll caused directly by the flooding was 918 people (Choudury, 1998). This figure does not include excess mortality associated with displacement, increased food insecurity, etc. Also, since effective national systems for monitoring morbidity and mortality do not exist in Bangladesh, the actual death toll was probably much higher (Bacos and O’Donnell, 1999; Bennish and Ronsmans, 1992).

Flooding may affect the nutritional status of the population, and nutritional status is a critical determinant of health outcomes. The baseline prevalence of moderate to severe malnutrition in Bangladesh is 44.8 per cent in children less than five years as measured by stunting (UNICEF, 2002). According to one study, in Bangladesh the risk of dying from diarrhoea among severely malnourished children was 17 times that of other children (Fauveau, 1990). Disruption of food security, as is often seen during times of natural disaster, is an important risk factor for malnutrition (Biellik and Henderson, 1981).

Since 1943 Bangladesh has been struck by major natural disasters 40 times, or on average, once every 1.4 years (EM-DAT, 2002). The factors which render Bangladesh particularly susceptible to disaster include geographic factors such as the low elevation of the country, and the cyclone-prone Bay of Bengal. There are also many factors which increase the vulnerability of the population to disaster. Bangladesh’s per capita income in 1998 was $240 (Eves, 1999) thus leaving little income for food purchases in the market. The population density of 834 people per square kilometre (making Bangladesh the world’s most densely populated country) results in a large rural population (75 per cent of the total population) that has either small landholding inadequate to produce sufficient grain to sustain a family, or is effectively landless (World Bank, 2001). Although Bangladesh is nominally self-sufficient in grain production, the flood disaster had the potential to disrupt food production and distribution, damage existing stores and limit employment and income.

Disasters do not hit a population indiscriminately; often the poorest are most affected as they tend to live in more disaster-prone areas, and frequently have the least coping capacity to offset the hazard of disaster times (Webb and Harinarayan, 1999). Large-scale flooding in Bangladesh is thought to put an affected population that already has marginal food security and poor nutritional status at a very high risk of severe food shortages and resultant malnutrition (Khan, 1999). The recurrent nature of flooding in Bangladesh provides incentive to review carefully the effectiveness of the 1998 disaster relief and nutritional/food aid response.

In response to the 1998 Bangladeshi flood disaster, 163 local, national and international NGOs distributed relief items including food aid, water purification tablets, clothing and medicines to 2.4 million Bangladeshi families (Choudury, 1998). International donors contributed a total of $288,450,000 in cash and kind (through December 1998) that was then distributed through government and NGO channels. International and indigenous bodies committed over $751,000,000 to post-flood rehabilitation, although full funding had yet to be received by August 1999 (Choudury, 1998).
A map of flood-affected areas, September 1998 (by district) is provided. The areas marked as flooded and non-flooded are indicated in the Legend. The map shows the extent of the flood coverage in Bangladesh.

Food and other relief aid supplied during disasters is often poorly coordinated and ineffective in reaching its target population (Shoham, 1996). Concerns about the effectiveness of disaster relief, particularly in the context of international response to the flooding, put pressure on agencies to increase their accountability to both donors and beneficiaries (Salama 2001, Shoham, 1996). This trend toward accountability in the process of disaster relief is embodied in the Sphere Project.

The Sphere Project, presented in Humanitarian Charter and Minimum Standards in Disaster Response (Sphere Project, 1998a) was used in this study to evaluate nutritional interventions implemented during the 1998 Bangladesh flood disaster. The Sphere Project is a recently initiated attempt by agencies around the world to establish universal minimum standards, key criteria and benchmarks for the nutritional response to disasters.
purpose of ensuring quality and accountability in disaster response (Gostelow, 1999; Salama, 2001). The Sphere Humanitarian Charter is grounded in international humanitarian law, principles and human rights treaties (Sphere Project, 2000a). The Sphere minimum standards are technical guidelines that represent participating agencies’ collective technical experience in disaster relief. As the Sphere working group attempts to introduce these disaster response standards in different areas of the world, it is interesting and useful to examine how these standards are and are not met in current disaster response situations (Banatvala and Zwi, 2000).

**Methods**

For this study a sample of 15 agencies participating in nutritional relief during and following the flood disaster were analysed. These 15 agencies were selected to represent a spectrum of the 163 different organisations involved in relief efforts. The agencies surveyed included two bilateral donors, one UN body, one government of Bangladesh (GOB) agency, eight international NGOs and three local NGOs. All participating organisations were identified beforehand through key informant interviews as important actors in disaster response to the 1998 Bangladesh flood disaster.

Two questionnaires were administered to each agency. One questionnaire focused on obtaining qualitative information about the relief effort. This included questions pertaining to: criteria for intervention, rapid needs assessment, acute-phase interventions, transition and rehabilitative-phase interventions, monitoring and evaluation, disaster preparedness activities and donor response (Bacos and O’Donnell, 1999). This questionnaire was administered directly by the authors to representatives of the agencies studied.

The second questionnaire attempted to obtain quantitative information from each of the 15 agencies surveyed. Data were obtained on number of beneficiaries, total nutritional and food aid expenditure, cash grant expenditure, rehabilitation expenditure, disaster preparedness funding, staffing and total disaster response expenditure. These questionnaires were filled out by the organisations themselves. Both sets of questionnaires were then re-submitted to the agencies for verification.

The performance of each organisation was evaluated against the ‘Minimum Standards in Food Aid’ and ‘Minimum Standards in Nutrition’ selected from the 1998 edition of the Sphere manual. A newer edition has since been published; however changes have been largely in the organisation of materials (Sphere Project, 2000a). Agencies were evaluated using selected standards and indicators, since not all measures were relevant to the flood response in Bangladesh. The Sphere charter frames disaster response in terms of both nutrition and food aid; for the purpose of this study we have combined both under the rubric of nutrition. In the Bangladeshi context ‘food aid’ and ‘nutrition’ were considered part of the same programme area by the majority of agencies studied and for the purpose of analysing disaster response it made sense to use indicators from both Sphere sections.

The Sphere Minimum Standards were in the process of being piloted by various agencies engaged in disaster relief throughout the world at the time of the Bangladesh flood (Sphere Project, 1998b). It was not expected that the Sphere standards, per se, would form the basis for response to the Bangladesh flood; rather, we
Food aid standards | Key indicators selected
--- | ---
1. Analysis | Preliminary nutritional assessment
| Assessed impact/effectiveness
| Ongoing monitoring and evaluation
2. Requirements | Collected beneficiary feedback
3. Targeting | Monitored local markets
| Targeted vulnerable groups
4. Resource management | -----
5. Logistics | Monitored local markets
6. Distribution | Local participation
7. Human resource capacity and training | -----
8. Annex | Pre-existing disaster preparedness plan

- Each standard has key indicators to determine if the standard is met.
- Indicators from all standards except ‘Resource management’ and ‘Human resource capacity’ were included in order to capture the quality of agencies’ response and decision-making around food aid during the Bangladesh flood disaster.
- Disaster preparedness is not extensively discussed in the Sphere standards; rather the standards themselves are designed to be a template for disaster response.

Box 1 Sphere food aid standards and indicators selected for use in analysing nutritional response to the Bangladesh flood disaster
Derived from the Sphere Project, 1998a

assessed how well the agencies performed had these standards been in place. Although we have used Sphere standards for the purposes of retrospective analysis of implementation processes, it is important to acknowledge that the intended use of the Sphere manual is in prospectively guiding the disaster relief process.

Results and discussion

The 15 agencies included in this study, and the type of aid they provided, are detailed in Table 1 and Table 2. Three of these agencies were donor agencies, while 12 were primarily implementing agencies — although there was a significant degree of overlap in their relationships and activities. Budget figures are included in these tables in order to give some idea of the magnitude of the response to the disaster.
Total disaster funding by implementing agencies ranged from $58,947 to $15,908,712, with a median allocation of $1,142,313. Nutritional funding ranged from $13,644 to $8,269,957, with a median value of $309,299. For the agencies that were able to provide figures, numbers of beneficiaries for each project ranged between 16,000 beneficiaries for the nutritional project sponsored by Save the Children-USA and 3,245,715 served with nutrition/ration distribution services from CARE. Average expenditure per recipient over the intervention period ranged from $0.30 to $20.80, with most agencies spending $5.00 or less per beneficiary. Types of food aid included dry rations, wet feeding (foods prepared and served on site), nutrition centres and seed distribution, mineral and vitamin supplementation with de-worming, with the majority of agencies providing dry rations. Implementing agencies carried out interventions either by using their own staff and resources (N=5) or by collaborating with other partner agencies, typically local NGOs (N=7) (Bacos and O’Donnell, 1999).

Donor agencies also showed an enormous variation in resources, accounting methods and disbursement strategies (Bacos and O’Donnell, 1999). For the three agencies which functioned primarily as donors, the UK’s Department for International Development (DFID) donated a total of $36,666,667 with $20,160,000 (55 per cent) for food aid and nutrition; the US Agency for International Development (USAID) donated $120,000,000 with $15,183,764 (13 per cent) for food aid and nutrition; and UNICEF gave $8,000,000 with $800,000 (10 per cent) for food aid and nutrition.

Figure 1 shows the percentage of agencies meeting selected food aid and nutrition indicators of the Sphere Project. The minimum standards are core standards in that they reflect the primary goals of the Sphere Project: to improve the effectiveness of humanitarian efforts and to enhance the accountability of the humanitarian relief system. Although the numerator in the figure remains constant (N=12), not every agency is represented in every category, since not all indicators were relevant to the activities of all 15 agencies.

Eighty-three per cent of the agencies assessed ‘targeted the most vulnerable groups’, and 75 per cent performed some sort of ongoing monitoring and evaluation. One-half of the agencies assessed nutritional status before providing assistance. Fewer than half of relevant agencies — 42 per cent in each case — collected beneficiary feedback on the intervention, monitored local markets for how the importation of new food sources affected local prices or businesses, or sought local participation in their relief efforts. One-third of agencies had an existing disaster preparedness plan and only one agency (8 per cent) studied performed an assessment of the impact of their response, although many had participated in ‘lessons learned’ workshops.

Disasters are often associated with food and nutritional insecurity. Severe malnutrition has been shown to increase the incidence, duration and severity of infection (Young and Jaspars, 1995). Preventing malnutrition may reduce morbidity and mortality — particularly among the most vulnerable (Fauveau, 1990). Given the unprecedented magnitude and duration of the 1998 Bangladesh flood disaster, the nutritional response by government, local organisations and the international community appears to have been largely successful in preventing widespread mortality (Choudury, 1998). However, given the absence of baseline data, and the lack of systematic monitoring of morbidity and mortality in Bangladesh, it is difficult to document measures that support this conclusion. In the context of poor quantitative data, process measures can be of value in evaluating quality of disaster response.

Although Sphere’s ‘Humanitarian Charter and Minimum Standards’ had not been introduced at the time of the flood disaster, we chose to use the standards as a way...
### Table 1: Relief expenditures and type of food aid provided by 12 organisations involved in nutritional support – implementing agencies

<table>
<thead>
<tr>
<th>Agency</th>
<th>Country of origin</th>
<th>Total disaster funding, US$</th>
<th>Nutritional/food aid disaster funding; US$, (% of total funding)</th>
<th>Number of aid recipients</th>
<th>Expenditure per recipient, US$</th>
<th>Type of food aid provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>ActionAid</td>
<td>UK</td>
<td>1,142,313</td>
<td>179,644 (16%)</td>
<td>57,000</td>
<td>20.04</td>
<td>Dry rations</td>
</tr>
<tr>
<td>Bangladesh Rural Action Comm. (BRAC)</td>
<td>Bangladesh</td>
<td>7,869,573</td>
<td>601,751 (8%)</td>
<td>781,089</td>
<td>10.07</td>
<td>Dry rations</td>
</tr>
<tr>
<td>CARE</td>
<td>USA</td>
<td>15,908,712</td>
<td>10,532,513 (66%)</td>
<td>3,245,715</td>
<td>4.90</td>
<td>Wet feeding, dry rations, nutrition centres</td>
</tr>
<tr>
<td>Concern</td>
<td>Ireland</td>
<td>4,963,111</td>
<td>3,022,222 (61%)</td>
<td>1,262,000</td>
<td>3.93</td>
<td>Dry rations, nutrition centres</td>
</tr>
<tr>
<td>Disaster Management Bureau (GOB)</td>
<td>Bangladesh</td>
<td>6,977,778</td>
<td>191,000MT of food (N/A)</td>
<td>~4,000,000</td>
<td>~1.74</td>
<td>Dry rations</td>
</tr>
<tr>
<td>Helen Keller Intl (HKI)</td>
<td>UK</td>
<td>1,090,000</td>
<td>60,000 (6%)</td>
<td>N/A – Flood surveill-  ance</td>
<td>N/A</td>
<td>Seed distribution</td>
</tr>
<tr>
<td>Oxfam</td>
<td>UK</td>
<td>5,777,101</td>
<td>1,267,680 (22%)</td>
<td>304,185</td>
<td>18.99</td>
<td>Wet feeding, dry rations, nutrition centers, seed distribution</td>
</tr>
<tr>
<td>Proshika</td>
<td>Bangladesh</td>
<td>4,263,777</td>
<td>1,146,666 (27%)</td>
<td>1,350,000</td>
<td>3.16</td>
<td>Dry rations</td>
</tr>
<tr>
<td>Rangpur-Dinajpur Rural</td>
<td>Bangladesh</td>
<td>666,333</td>
<td>309,299 (46%)</td>
<td>127,216</td>
<td>5.24</td>
<td>Dry rations, nutrient supplement-</td>
</tr>
</tbody>
</table>
to capture process measures in the nutritional response to the flood disaster. The Sphere standards are mainly based on existing knowledge; the participating agencies (including parent organisations of agencies in this study) contributed to Sphere with experiences developed in disaster response. However, given that the Sphere standards, per se, were unfamiliar to the majority of the agencies studied, it was not expected that the agencies would have incorporated the standards into their nutritional response to the 1998 Bangladesh flood disaster. Rather, the Sphere standards provide measures of quality in the response that did occur, and provide an estimate of the gaps that will need to be addressed during any future disaster response in Bangladesh. Other conditions identified as prerequisites by the Sphere Project for application of the minimum standards were present in the Bangladeshi context: sufficient resources, access to affected populations and common goals among agencies (Sphere Project, 1998a).

Results from this study highlight major issues in nutritional response to disaster in resource-poor settings. It is noteworthy, given the $288 million spent on disaster relief during the 1998 flood disaster and the recurrent nature of disaster in Bangladesh (Siddique, 1991), that most agencies had very limited, if any, planning for nutrition interventions during disasters. In our study only three of 12 agencies had pre-existing disaster preparedness plans, and fewer still (one out of 12 agencies) assessed the effectiveness of their intervention in achieving a desired outcome. Adding to the difficulty in evaluation was the fact that most agencies did not define the outcome that they sought to achieve through their intervention. Past lessons learned have emphasised the importance of implementing disaster preparedness and coordination plans, with wide dissemination and rehearsed protocols (Rahman and Bennish, 1993).

The majority of agencies (83 per cent) did attempt to target the vulnerable, and performed ongoing monitoring (75 per cent). Methods for identifying vulnerable people varied from simple to sophisticated depending on agency. Definition of vulnerable populations to be targeted depended almost solely on the mandate and discretion of the individual agencies (Bacos and O’Donnell, 1999). Fewer than half of agencies met the three Sphere standards having to do with feedback and participation by beneficiaries. This is important because the Sphere charter, as a human rights framework, is grounded in local participation and communication (Salama, 2001).

**Includes both food aid and other nutritional programmes, but excluding cash grants.**
Table 2 Nutritional funding as a percentage of total disaster relief expenditures of donor agencies (1998)

<table>
<thead>
<tr>
<th>Agency</th>
<th>Total disaster funding, (US$)</th>
<th>Nutritional Disaster funding (US$)</th>
<th>Nutritional funding as a percentage of total disaster funding %</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFID</td>
<td>36,666,667</td>
<td>20,160,000</td>
<td>55</td>
</tr>
<tr>
<td>USAID</td>
<td>120,000,000</td>
<td>15,183,764</td>
<td>13</td>
</tr>
<tr>
<td>UNICEF</td>
<td>8,000,000</td>
<td>800,000</td>
<td>10</td>
</tr>
</tbody>
</table>

Note: Does not include USAID funding of government of Bangladesh programmes which included food distribution (self-reported data).

Implementing agencies differed in their use of resources according to their capacity, mandate, and scope. Since this study was not a programme evaluation, expenditures per recipient and type of aid delivered cannot be used to compare the efficiency of programmes. Variation between agencies represented not just differences in efficiency but also different ways of accounting for expenditures, defining nutritional assistance, and counting beneficiaries. On the other hand, it is interesting to note the extent of the range of expenditure per beneficiary even between agencies carrying out the same primary intervention.

Less-capacitated agencies were correspondingly less able to meet the selected Sphere standards (within this small unrandomised sample), presumably because they lacked appropriately skilled personnel, technical capabilities, operational experience and access to resources. Only the best-funded and capacitated agencies were able to meet the majority of the standards assessed (Bacos and O’Donnell, 1999). Sphere, as a potential coordinating framework, may be able to help address this issue by allowing agencies to share core competencies. A prerequisite for this approach is interagency planning and donor funding for the coordinating mechanism, as well as incentives for agencies to participate. One danger is that by insisting on standards for response, smaller, less-funded and capacitated agencies might be discouraged from participating in disaster response: ‘the best as the enemy of the good’ (Gostelow, 1999).

Interesting contrasts emerge in comparing donor agencies. USAID and DFID, in particular, took very different approaches to funding. USAID gave approximately $16 million to CARE and much smaller amounts to three other NGOs ($400,000 or less). The bulk of USAID funds were distributed through GOB channels in the form of monetised wheat, and thus not reported in the study questionnaire as nutritional expenditures by USAID. During the acute response, DFID gave nearly $1.6 million each to three agencies and the remaining $14.5 million was disbursed to 19 other smaller agencies. These different approaches to large funding of a single organization by USAID, and funding of smaller amounts to more organisations by DFID, reflect different funding philosophies as well as the constraints associated with different types of funding (for example, monetised wheat as opposed to direct funding).

In the results of our study there exists a strong possibility of recall and reporting bias on the part of the agencies, and selection bias on the part of the researchers. However, reporting and recall bias should tend in the direction of overstating the efficacy and quality of the response, and therefore the negative results should be stronger. Selection bias may have been introduced since identification of agencies for our study by key informants meant that better-known, competent and effective organisations may have been selected. Therefore, the agencies studied may
not necessarily represent the overall quality of disaster response by all 163 agencies involved in the 1998 Bangladesh flood disaster. Again, because of the direction of the bias, negative results will be more persuasive. In addition, a possible source of confounding is the fact that a standard was met does not necessarily ensure that it was used as an analytic tool as envisioned by the Sphere guidelines.

**Conclusion**

The Sphere Humanitarian Charter is derived from international human rights law, conventions and humanitarian principles. The Sphere Minimum Standards are technical norms derived from the collective experiences of humanitarian relief agencies. The Minimum Standards provide specific content to the humanitarian principles, while the Humanitarian Charter lends context, meaning and weight to the technical norms. The Sphere Humanitarian Charter and Minimum Standards are part of an expanding movement in public health, gender studies, development and now disaster response which brings together different fields and practitioners under a human rights framework (Mann, 1997; Leaning 2001; Oloka-Onyango, 1995; London, 2002). As such, Sphere may be expected to help form future customary law regarding the rights of beneficiaries to a specific quality of response in humanitarian disaster while
connecting these rights to universal principles of human dignity (IFRC, 2000: 153; Steiner and Alston, 2000: 231).

One controversy regarding the Sphere Project is that it is an attempt to apply a uniform set of standards to vastly different contexts and circumstances (Spiegel and Salama, 2001). Based on a human rights framework, the Sphere standards set forth what are deemed basic universal human needs which may not have been met pre-disaster. Proposing the right to adequate nutrition during times of disaster, for people who are baseline malnourished reveals the contradictions involved in responding to disasters in resource-poor settings (Griekspoor and Collins, 2001).

Suggested responses to this contradiction have included flexible standards to account for baseline poverty and malnutrition in poor nations (Sphere Project, 2000b), integrating development activities into disaster response more fully (Bacos and O'Donnell, 1999), or ‘triaging’ the most severely affected members of the population. (Griekspoor and Collins, 2001). Another perspective is simply to accept that disasters are special times with enhanced levels of resources and more acute needs. One benefit to the existence of widely promulgated minimum standards, from this perspective, lies in their utility in lobbying governments and donors for more resources in order to meet internationally recognised standards (Sphere Project, 2000b).

What needs to be done in order to prepare agencies involved in humanitarian response, in countries such as Bangladesh, for a future in which they will generally be expected to perform at a higher level (Burkle, 1999)? Answering this question requires further research on the role of standards (Banatvala and Zwi, 2000), such as Sphere, monitoring and assessment of interventions, integrating and coordinating response (Pavignani, 1999), as well as building a commitment for funding these initiatives into disaster response and preparedness programmes. Some of these answers should be supplied by the ongoing piloting and evaluation of Sphere standards by aid agencies in interventions around the world (Sphere Project website, accessed 2/02). If the results of this study are any indication, the challenges to be faced as Sphere is implemented will be those which require ongoing commitment of energy and resources, such as building avenues for local participation, disaster preparedness and mitigation and developing tools for coordination of response and impact assessment. Despite these challenges, Sphere has value in articulating a breadth and depth of technical standards in a way that is relevant and useful to an extraordinary variety of humanitarian disaster situations, and for a great diversity of agencies, organisations and individuals. In universalising these standards by yoking them to the humanitarian imperative, Sphere focuses disaster response on the human dignity of affected populations.

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