

CHAPTER 11

COMMUNICATING CLIMATE CHANGE AND ITS IMPACT TO DHAKA'S URBAN POOR – GRASSROOT WORKSHOPS FOR ADULTS AND CHILDREN

Annika Salingré and Boris Braun

ABSTRACT

Bangladesh's urban poor face numerous obstacles, especially during times of disastrous natural events. The effects of global warming will pose new threats for them as frequencies and magnitudes of natural hazards are likely to increase. Thus, current and formerly successful coping and adaptation strategies will be challenged in the future. The urban poor need to be informed and empowered so that they can develop their own strategies in response to the expected local effects of climate change. Our research aims at grassroot workshops as a means of communication with slum dwellers in Dhaka which not only convey possible climate change impact on livelihoods but also create relevance for the individuals and options for action. More than 20 workshops including men, women, and children have been conducted and analysed.

**Risks and Conflicts: Local Responses to Natural Disasters
Community, Environment and Disaster Risk Management, Volume 14, 251–278
Copyright © 2013 by Emerald Group Publishing Limited
All rights of reproduction in any form reserved
ISSN: 2040-7262/doi:10.1108/S2040-7262(2013)0000014017**

The final workshop design incorporates a mix of participatory and input-oriented elements in order to overcome the problem of psychological distance.

Keywords: Communication; urban poor; natural hazard; grassroots workshop; Bangladesh

INTRODUCTION

Bangladesh is renowned for frequent natural disasters such as floods, cyclones, and earthquakes. Coupled with its relative poverty and low development, these impose a major challenge to the country and its people. Thus, coping with natural disasters is a common aspect of the lives of many Bangladeshis. Local responses and coping strategies are numerous and astonishingly successful. Even though, for example, dealing with flooding during rainy season is a usual aspect of traditional rural lifestyles, natural extreme events can still be highly threatening. Particularly the livelihoods of the poor come under pressure in these cases and it is those people who have to rely on meager resources and relatively simple local responses towards these threats. As traditionally people live in villages and indigenous responses have been developed in rural contexts, urban dwellers are facing new challenges and have to come up with innovative strategies.

Global warming is affecting regional climates. Significantly changing weather patterns have to be expected in the future and the magnitude of natural extreme events are likely to increase. Based on the results of previous research (for Bangladesh, see e.g., [Abheuer, Thiele-Eich, & Braun, 2013](#); [Azam & Falk, 2013](#); [Braun & Abheuer, 2011](#); for parallel results for India, see [Chatterjee, 2010](#)), we can assume that there is an extensive need and potential for revised local responses. Lacking background knowledge and low levels of self-organization are the main obstacles to local responses by the urban poor. Thus, our project aims at knowledge sharing and community-based initiatives. Consequently, we developed workshops for and with slum dwellers in Dhaka that not only communicate possible climate change impact on livelihoods but also create relevance for the individuals and options for action. 21 workshops involving men, women, and children were conducted and analysed. The final workshop design incorporates a mix of participatory and input-oriented elements in order to overcome the problem of psychological distance.

DHAKA AS A HAZARD-PRONE AREA

Bangladesh's geography comprises a number of generally favorable conditions. It is characterized by an auspicious tropical climate – its morphology is shaped by many rivers and streams running towards the Bay of Bengal. As a result, Bangladesh's soil is mostly fertile. But at the same time, Bangladesh is one of the world's countries most prone to natural hazards (Beck, 2005). These include cyclones, droughts, earthquakes, floods, and river bank erosion (Agrawala, Ota, Ahmed, Smith, & van Aalst, 2003; Beck 2005; Braun & Shoeb, 2008; Edris & Collins, 2010; Hofer & Messerli, 2006; Novak, 1994; Reliefweb, 2007; Sen, 1981). According to Edris and Collins (2010), 97 percent of the country and 98 percent of the population are hazard-prone.

The extent of affectedness coupled with the variety and number of natural disasters leads to high numbers of fatalities (Paul & Routray, 2011). The most regularly occurring disaster is flooding which mainly includes rain floods and river floods as well as urban water logging. The frequency and magnitude of flood events in Bangladesh is based on its deltaic morphology with more than 60 percent of the land area below 6 m above sea level as well as the huge and rain-laden catchment areas of mighty rivers. As a result, floods are frequently experienced by the people of Bangladesh (Ahmed & Falk, 2008; Braun & Shoeb, 2008; Hofer & Messerli, 2006; Rashid, 1991).

Forecasts on regional effects of global warming are difficult to make and remain relatively vague due to the variety of influencing factors. Analyses of the data of the Bangladesh Water Development Board show that in the past 60 years the annual flooded area has not increased significantly in the long term (see Fig. 1). Due to the increased variability of rainfall and precipitation patterns, the variability of floods from year to year has however risen considerably (Islam & Neelim, 2010). A crucial factor for this development is the increasing global average temperature (Palmer & Räisänen, 2002). Further consequences of increasing temperatures are decreasing precipitation in winter, increasing precipitation during other seasons increasing likelihoods of extreme rainfall events, and flooding as well as the potential rise in sea level which may add to flooding by decreasing the gradients of the rivers (Ali, 1999; Christensen et al., 2007; Cruz et al., 2007; Hofer & Messerli, 2006; IPCC, 2012). While these natural conditions are becoming more and more critical, migration to urban agglomerations, especially Dhaka, continues to lead to growing population concentrations in disaster-prone locations (Walsham, 2010; UN, 2012).

The future effects of global warming will add further to the already high frequency and magnitude of natural disasters in Bangladesh and, thus, impose new threats on the country and its population. The capital Dhaka is a megacity of roughly 15 million inhabitants (UN, 2012) with about 40 percent of the population living in slum settlements which are spread all over the city. In these areas, the majority of Dhaka's growth and the highest numbers of urban poor are recorded (CUS et al., 2006). Most of them work in the informal sector. The average monthly income of these households is below TK 5,000 (approx. /US\$ 59; see CUS et al., 2006). Thus, most of the slum dwellers face severe difficulty concerning their livelihoods and everyday survival. The environmental and infrastructural situation in slums is hazardous in many cases, creating a large number of social, hygiene, and health-related problems. As only very few public services and means of support are available for the slum dwellers, they manage their problems independently and have developed various coping and adaptation strategies. People apparently live "from hand to mouth" and somehow manage to survive. The advancing local effects of global warming will cause increased pressure on the livelihoods and adaptation capacity of the people as well as increased hazard-proneness. This affects people's ability to work, leads to cutbacks in nutrition and an aggravated health situation for the urban poor. Thus, vulnerability increases (Abheuer et al., 2013). Accordingly, early information on climate change and improved knowledge on preparation is indispensable.

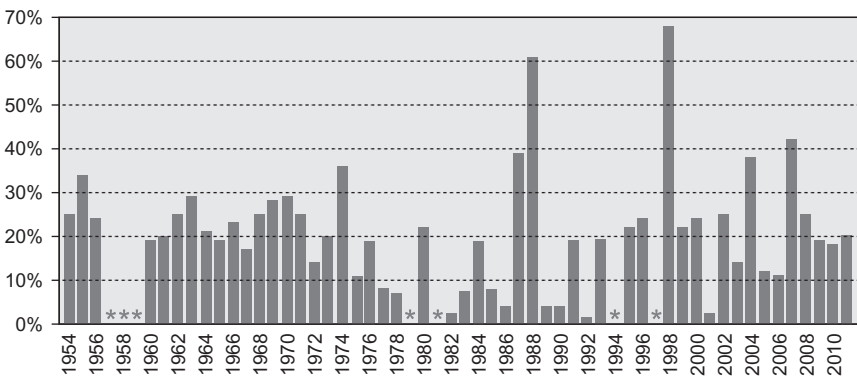


Fig. 1. Maximum Flooded Area in Bangladesh from 1954 to 2011 (as %).
*: Missing Value. Source: Bangladesh Water Development Board, 2011.

Each of the more recent floods in Bangladesh also had severe effects on Dhaka (Alam & Rabbani, 2007; Islam, 2005; Stalenberg & Vrijling, 2009). Previous research on the one hand reveals that most households in slums are highly vulnerable due to poor financial, physical, and human resources but, on the other hand, also show a surprising capacity to cope with floods due to informal social networks (Abheuer, Salingré, Thiele-Eich, Braun, & Simmer, 2012; Braun & Abheuer, 2011). Even though social capital helps the slum dwellers to cope with, and to a certain extent, proactively adapt to floods, coping does not automatically mean long-term socioeconomic development or increasing resilience (Abheuer et al., 2013; Braun & Abheuer, 2011). Accordingly, improvements in options for action through knowledge and community organization are required to build up resilience. Based on the knowledge on current coping strategies, their capacity and limitations, as well as regional climate change scenarios, we aimed at the communication of scientific findings on floods, climate, and climate change to Dhaka's slum dwellers. The capacity to adapt and learn is relatively low, resulting in the poor getting by but rarely getting ahead. Building on this, we aimed at strategies, tools, and principles for the communication of climate change-related disaster risks and possible impacts on the livelihoods of the slum dwellers and to empower them to initiate a revision of current strategies and community-based adaptation with regard to natural hazards.

CHARACTERISTICS OF THE URBAN POOR IN DHAKA

In order to develop a suitable methodology, the target group and local conditions need to be analysed in detail. Our project focused on various informal and formal marginal settlements in Dhaka. Our study sites were chosen from the entity of settlements fulfilling the slum criteria by the local Centre for Urban Studies (CUS) (Table 1).

Despite the heterogeneity of slum settlements (e.g., with respect to legal status, size, and location) and differences between individual households, the slum dwellers generally share a number of characteristics which are relevant in risk communication: the adults are usually familiar with natural hazards in general, but due to the fact that most families are migrants from rural areas, many of them do not have any experience at their current place of residence. Hence, the use of previous experience and existing knowledge are limited when targeting new challenges. Furthermore, the migratory background also affects the long-term perspectives of many households.

Table 1. Essential Characteristics of Urban Slums in Bangladesh According to CUS.

| |
|---|
| More than 50% of the dwellings are in very poor conditions, e.g. shacks made of temporary materials. |
| High population density and/or crowding of rooms, e.g. average densities above 75,000 inhabitants per km ² and/or less than 4m ² living space per person. |
| Poor supply and sanitation, especially with regard to hygienic conditions and water. |
| Low socioeconomic status of population, accordingly at least 50% of households with monthly incomes of TK 5,000 or less. |
| Insecurity of tenure. |

Source: CUS et al. (2006).

Since the people originally came to Dhaka for economic reasons, they still hold strong ties with their families back in the villages. Thus, intentions for remigration are widespread. In many cases, people may finally stay in Dhaka, but as long as they plan to leave again in the foreseeable future, long-term strategies for development and improvement at the individual level are hampered. General education is widely missing as especially adults lack formal schooling (literacy levels are below 50 percent amongst household heads according to Braun & Abheuer, 2011). In contrast, however, the slum dwellers have valuable indigenous local knowledge of relevance regarding rural lifestyles and environments. Finally, the precarious living conditions of the people call for a prioritization of daily survival. Accordingly, it is often difficult for them to allocate time and resources to attend the workshops and to continue to deal with the respective issues afterwards. These problems are even reinforced by the powerlessness of the slum dwellers who often find themselves at the mercy of other, more influential people (local politicians, bureaucrats, NGOs, etc.).

Despite and particularly because of the limited options and resources for community-based actions, our workshops for empowerment had to consider and address the special conditions and challenges described.

DIDACTIC PRINCIPLES

In order to address the aforementioned challenges in risk communication, several didactic principles proved to be crucial and were incorporated into the workshop design. Knowledge is always a combination of learning and experience. This means that linking functional knowledge, life experience,

and emotional experience can lead to a better understanding of complex issues (Bonifacio, Takeuchi, & Shaw, 2010; Gropengießer, 2008; Schübler, 2004). Accordingly, it is crucial to embed new information into a network of already known information and indigenous knowledge. This phenomenon is called *networked knowledge* and has been one of our core principles.

Another crucial factor for leaning is *motivation*. The more eager the participants are to learn, the more energy, enthusiasm, and concentration will be put into the situation from their side. Thus, participants need to know why they are supposed to learn about a specific issue, know about the relevance of and the benefit from learning, and should actively be motivated to participate by the trainers or workshop leaders.

Climate change is an abstract and psychologically distant issue as it goes beyond normal sensual perception. The more distant a topic is, the less people think about it and, thus, it appears to be less relevant (Beyerl, 2010). By application of the *relevance* principle “distance [can] be reduced by making climate change more real, local, relevant and immediate to the people which might promote action on climate change” (Spence, Poortinga, & Pidgeon, 2011, p. 1). The incorporation of local examples and incidents from everyday life which happen in the participants’ surroundings allows for increased emotional and cognitive engagement. Therefore, it is important to focus on specific aspects in order to address abstract and psychologically distant topics and ease understanding (O’Kane, 2008; Schübler, 2004). This approach is based on the finding that clearly defined and detailed goals as well as the psychological proximity of a topic significantly increase the likelihood of action (Spence et al., 2011).

Even though relevance often goes along with personal interest or concern, it does not automatically imply the *need and options for action*. In order to ensure that people memorize the information delivered in the workshop and even more to initiate potential activities, the relevance of action for the participants had to be clarified. This aspect was realized by discussing currently applied strategies on the basis of potential changes. At many points, the participants discovered that the strategies might not be functional in the future and thus revised and innovative strategies are needed. Still, this has to be illustrated considerably. It is essential not to create an impression of current strategies becoming malfunctional. Instead, the relevance for action has to be a starting point for discussing, rethinking, and developing (new) strategies. It is important to create realistic options for actions in the workshop, provide the participants with the means to work on these, and give them the motivation and strength to enter this process.

Finally, a *mix of methods and media* is helpful to keep the workshops interesting and enable the participants to pay attention more easily. The methods used have to comprise input-oriented as well as participatory elements, they should help to highlight the main information, and address cognitive and affective dimensions of learning. Media should be used in order to illustrate the issues discussed but not lead to a visual, auditory, or any other overload of information and impressions or distract the participants. Furthermore, the media need to be adequate. In the context of our workshops that meant bearing in mind the participants' age, gender, and life experience; the widespread illiteracy; as well as potential cross-cultural differences especially with regard to symbols and metaphors used.

METHODOLOGY: WORKSHOP DEVELOPMENT, EVALUATION, AND ANALYSIS

In preparation for the workshops, an extensive literature review was carried out in order to learn about other projects' methods and results in conveying expert information to the local population and awareness-creation workshops. All the approaches that have been developed so far were rooted in various forms of participatory appraisals, such as participatory rural appraisal (PRA) (see e.g., Absalom et al., 1994; Chambers, 1996) and participatory learning and action (PLA) (see e.g., Pretty, Guijt, Thompson, & Scoones, 1995; Schönhuth, 1996; Thomas, 2002). However, it was essential for our project to adapt these methods and principles to the given topic of weather extremes and climate change and also to the specific social, cultural, and natural environment of slums in Dhaka. In order to root our methods in local communities, we cooperated with international and local partner NGOs. The local NGO *Glory Friendship Social Welfare* (GFSW), in collaboration with *Ärzte für die Dritte Welt* (German Doctors), runs health services as well as schools for slum dwellers. Additionally, scholars from the *University of Rajshahi* as well as Bangladeshi education experts from the Dhaka-based NGO *Interaction Bangladesh* cooperated in the project.

All the workshops were run by a German–Bengali team, in which the German team members played the role of experts whereas the Bengali team members played the role of facilitators and interpreters, according to a fixed workshop guideline based on the aforementioned didactic principles. The language of the workshops was Bangla and the phases held by the

German team members were simultaneously translated to the participants. The workshops took place in schools, public places, and shacks in six different informal settlements (Hazaribag, Mirpur, Box Culvert, Manda, Genderia, and Korail) throughout Dhaka (see Fig. 2). At each place, separate sessions with men, women, and children were held. The workshop concepts for men and women were almost similar, whereas the workshop layout for children differed significantly (see Table 2). The majority of our workshops for children were carried out with classes from GFSW slum schools. In all adjacent slum communities (Manda, Genderia, Korail), workshops with adults took place and were organized with the help of GFSW. Furthermore, the GFSW staff served as consultants and took part in teacher training on the scientific foundations of climate change. Consequently, this cooperation was a means of embedding the issue in educational institutions as well as in the communities.

In two field phases in 2011 and 2012 a total number of 21 workshops were conducted. All the workshops were videotaped, translated, and transcribed. After each workshop, feedback sessions and discussions among the project team members were held in order to analyze and improve the workshop concept. Additionally, the taped workshops were analysed after the completion of each field phase and systematic evaluation was carried out. In this way, subsequent revisions and improvements were possible.

Our evaluation aimed at analyzing the positive and negative aspects of each workshop as well as their dynamics in order to improve the concept as well as the facilitation. While it was possible to draw inferences about the immediate understanding and learning of the participants, long-term evaluation of the success of the workshops, that is, the performance of the participants in a given future situation, was not feasible within the scope of the project. The audiovisual data of the workshops allowed for reflection on action and illustrative proofs. Still, even though audiovisual analysis has been used in social research for several years integrative methods for analysis are still lacking (Rosenstein, 2000; Schnettler & Raab, 2008; Schubert, 2002). The audiovisual data was analysed together with the translated workshop transcripts. The essential steps of qualitative content analysis according to Mayring et al. (Mayring, 2000; Mayring, Gläser-Zikuda, & Ziegelbauer, 2005) were carried out with help of the software atlas.ti. Codes used for analysis were clustered in two groups: The first one was *motivation/interest* which included *active participation*, *topic-related enquiries*, *attention*, and *addressing other topics*. The second group was *training success* which included *previous knowledge*, *link to personal environment (of participants)*, *realisation of relevance of climate change*, *comprehension of*

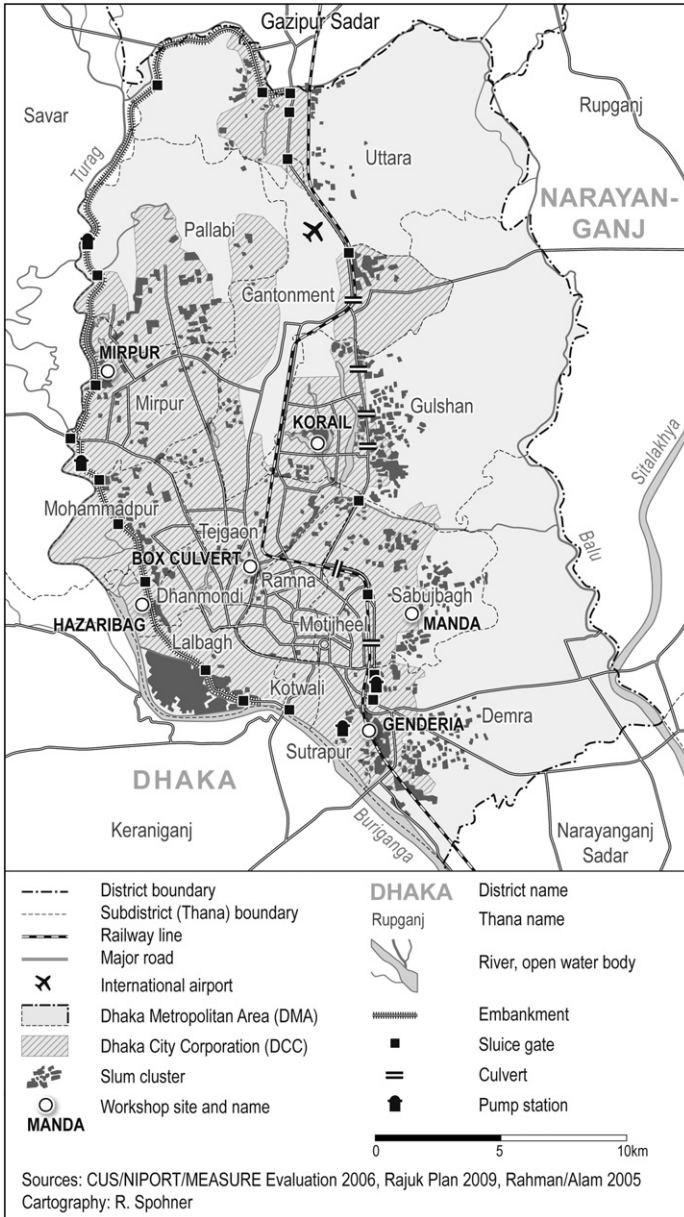


Fig. 2. Map of Dhaka Indicating Slum Locations and Workshop Sites.
Sources: CUS et al., 2006; Rajuk Plan, 2009; Rahman & Alam, 2005.

Table 2. Framework for Workshops.

| Children | Adults |
|--|--|
| Approx. 2hrs during teaching time | Approx. 1 hr in the afternoon or early evening |
| Retrospective focus on flooding | Retrospective focus on climate-related hazards |
| Discussion of possible future strategies | Discussion of possible future strategies |

contents, and problem solving. Additionally, *further influences* on the workshop situation were analysed. Amongst them *mistakes* (as compared to the guideline) by the workshop team, *external disturbances, persons leaving/entering the workshop, group dynamics, controlled/uncontrolled situations,* and *scepticism towards the workshop/workshop team* were taken into account

THE WORKSHOP CONCEPT

The didactic aspects illustrated above are crucial for the conceptual background of our work. Our workshops, thus, integrated the existing knowledge of the participants and included an introduction building on the people's experience of the different seasons and discussing their perceptions of changing weather patterns in the last few decades. The presentation of climate change and its effects focused on the local level and on noticeable changes. It was followed by a discussion of the impact of climate change on people's lives and their adaptation and coping strategies to illustrate the relevance for them and to reduce psychological distance.

As the understanding of the concept of climate change requires a comprehension of the concept of the climate as opposed to other phenomena, the logical sequence of our workshops started out as a very basic one and proceeded in small steps. First, the term and the concept of weather had to be clarified. This was illustrated with help of the local range of weather phenomena generally observed by the participants. Then, different kinds of weather phenomena were allocated to the different seasons and these were revised with the help of season cards depicting typical images such as the harvesting of certain crops or children playing in a heavy downpour. In Bangladesh, the course of the year is traditionally divided into six seasons: summer "grishshokal" which is very hot, with a lot of sunshine and many thunderstorms as well as some rain (March–May); the rainy season "borshakal" which has a lot of rain and many clouds in the sky (June–August);

autumn “shorotkal” which does not have much rain and sometimes the nights may be cool (September–October); late autumn “hemontokal” which is dry with generally cold nights (October–November); winter “shitkal” which is cold and foggy, especially in the mornings (November–January); and finally spring “boshontokal” which is when it starts to become hot again and the flowers blossom (January–February).

Taking up these seasons, we discussed the annual cycle of typical weather patterns during the course of the year which has been following the same pattern for a very long time. It was crucial to clarify that changing weather during the year is due to the seasons and is very typical and normal. So this does not require the term “change” and does not get our special attention as it is a natural and balanced process. Thus, we defined climate as a long-term “normal” repetitive cycle of weather phenomena including some extreme events occurring every now and then. By contrast, climate change means significant noticeable long-term changes to the climate.

Adults' Workshop

After a general introduction to the workshop situation, the team, the procedures of translation and videotaping, the benefits of participation, and the opportunity to ask questions to the team, a personal introduction took place. All the team members and workshop participants introduced themselves, stating their names and occupations. On the one hand, this introduction served as an icebreaker and helped to familiarize the participants with talking in front of the group and listening to each other. On the other hand, the occupations of the participants and their self-presentations also allowed some assumptions about the social setting of the slums and possible hierarchies within the group. First of all, after the warm-up phase, the assessment of previous knowledge took place. It included a very open question about associations to climate change and, subsequently, the question whether the participants thought it is something positive or negative. The first phase of the workshop was related to the normal climatic situation in Bangladesh. In this phase, the six seasons of Bangladesh were repeated or introduced with the help of visualizations and descriptions of typical weather patterns, depending on the participants' previous knowledge. In the course of this phase, the typical challenges and problems during the rainy season and winter were discussed in the group. Until this point, the workshops were held in a participatory manner by a Bangladeshi team

member. To highlight the importance of the core information, only then was the topic of climate change taken up and explained with the help of specific inputs by the German team member who fulfilled the role of a climate change expert (the second phase). Climate change was then contrasted with seasonal weather change. Moreover, it was explained based on long-term trends which started in the past. The input only briefly covered the causes of climate change and also omitted effects which are not of local relevance in order to keep things simple and relevant to the given setting. After this input, the participants were given time to ask questions on climate change. In some cases, they took the opportunity and asked for repeated explanations or had in-depth questions. In order to assess whether the participants understood the term “climate change” and to enhance learning by repetition, the participants were encouraged to explain the term in their own words. The third phase of the workshop focused on the impact on adaptation and coping strategies and the revision and development of possible strategies. Based on the memories of the participants, a chart of floods between the 1980s and 2005 was drawn (cf. Fig. 3) and compared to the “official” chart of flooding in Bangladesh as depicted in Fig. 1. It was noticeable that the charts in all the workshops depicted the same extreme events (Fig. 3).

Based on the expected increase in floods, group work and discussions on the suitability of current strategies and possible new strategies took place (Fig. 4). The closing phase served to wrap up the workshop content as well as to highlight the relevance for action and the communities’ potential once again (Table 3).

Children’s Workshops

As today’s youth will be more affected by climate change than the generation of adults and pupils are more used to learning new content through teaching situations, we decided not only to address adults but also children. At each study site, at least one group of pupils was chosen to attend a workshop which was conducted in their classroom during regular class time. The children usually were the first slum dwellers to be addressed as they were supposed to tell their parents about what they had experienced at school and, thus, raise their parents’ interest in our work. Furthermore, the cooperation with slum schools offered an institutional link to the communities and enabled us to introduce the topic and new methods of instruction

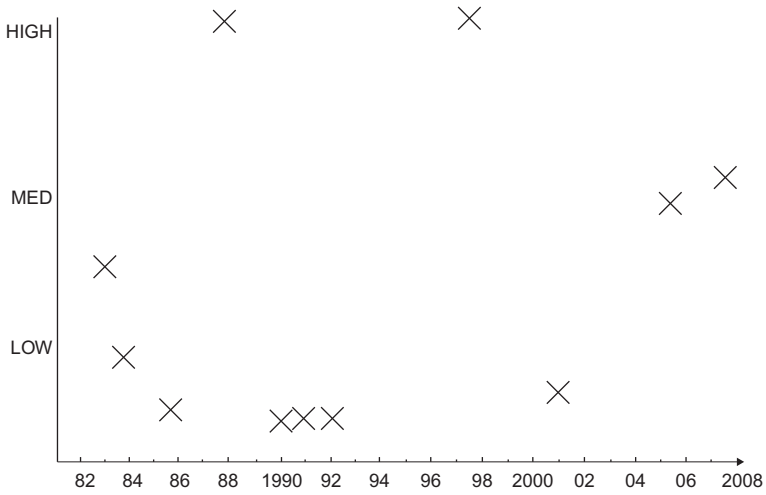


Fig. 3. Sketch of a Flood Magnitude Diagram as Drawn by Participants in the Workshops.

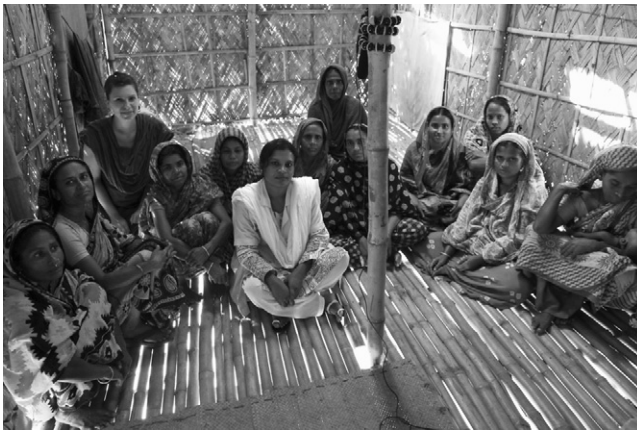


Fig. 4. Scene from the Women's Workshop in Hazaribag. (Photograph: Nils Jahn, 2011).

within the schools. Most workshops were conducted with students aged 8 to 11 as children in slums often drop out of school after class four.

The children's workshops were based on the same theoretical background and didactic principles as the workshops for adults (Fig. 5).

Table 3. Guideline for Adults' Workshops (Simplified and Shortened Version).

| | | |
|----|---|-------------|
| 1 | Getting started: welcome, workshop introduction by Bangladeshi team member | BTM |
| 2 | Getting to know each other, breaking the ice | BTM |
| 3 | Overview of previous knowledge: asking about knowledge and associations regarding the term "climate change" | BTM |
| 4 | Examples and life experience of rainy and dry seasons with references to the study site and home villages of the participants with the help of illustrative photographs | BTM |
| 5 | Participatory introduction of six seasons with the help of season cards | GTM/ BTM |
| 6 | Explanation of the term "climate" with reference to the seasons | BTM |
| 7 | Input on climate change: explanation of the term "climate change" and its causes with help of pictograms | GTM/ BTM |
| 8 | Review: explaining climate change in the participants' own words | BTM |
| 9 | Group work finding solutions | BTM |
| 10 | Thanks and farewell | GTM/ BTM |

However, as the target group and workshop setting differed significantly from the workshops with men and women, the guideline was adjusted in many ways. Due to the availability of a blackboard and the literacy of the children, blackboard charts, reading, and writing exercises were included (Fig. 6). As the children were familiar with different forms of teaching and learning, we also made use of group work, small presentations, games, and creative tasks (Table 4).

Implementation of Didactic Principles

To establish *networked knowledge*, a lot of emphasis was laid on the linkages between previous and newly gained knowledge. In the first part of the workshops, an assessment of previous knowledge was carried out. In some cases, participants had more or less clear ideas about climate change and its impact, others had incorrect knowledge. Most of the participants had no knowledge about the topic at all. Based on the assessment, the seasons of Bangladesh were introduced or repeated, the terms "weather change" and "climate" were introduced and demarcated. Only after these steps, was the term climate change introduced and explained. Past long-term trends and expected future changes were mirrored with people's personal perception.



Fig. 5. Scene from the Children's Workshop in Hazaribag (Photograph: Nils Jahn, 2011).

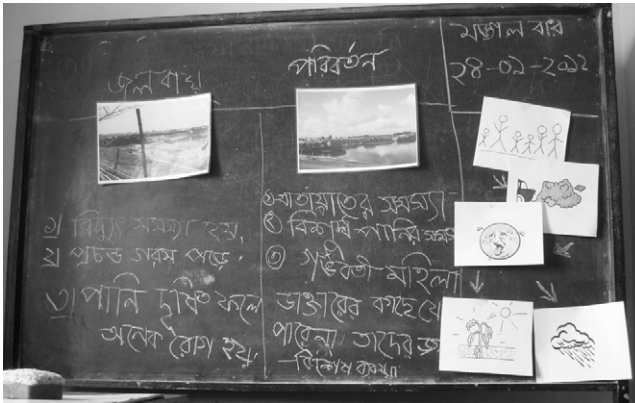


Fig. 6. Exemplary Blackboard Image Used During a Children's Workshop in Manda. (Photograph: Annika Salingré, 2012).

In order to *create relevance* for the slum dwellers, all the information was directly and explicitly applied to their living situation. Discussions focused on their problems in everyday life during times of natural disasters and in relation to prospective future developments.

As the workshop team could not provide distinct strategies in response to the local effects of climate change, the goal was to initiate a problem-solving

Table 4. Guideline for Children's Workshops (Simplified and Shortened Version).

| | | |
|----|---|-------------|
| 1 | Getting started: welcome, introduction of guests by the teacher, workshop introduction | BTM |
| 2 | Getting to know each other, breaking the ice | BTM |
| 3 | Dream Journey | BTM |
| 4 | Overview of previous knowledge: asking about knowledge and associations regarding the term "climate change" | BTM |
| 5 | Input on and participation in the term "climate": introduction of six seasons with the help of season cards, explanation of the term "climate" with reference to the seasons | GTM/ BTM |
| 6 | Example of the climate change at the study site: comparison of personal experience of local weather conditions and natural extreme events and future scenarios with the help of photographs | BTM |
| 7 | Input on climate change: explanation of the term "climate change" and its causes with the help of pictograms | GTM/ BTM |
| 8 | Review: writing exercise explaining climate change in the pupils' own words | BTM |
| 9 | Group work finding solutions | BTM |
| 10 | Drawing exercise: changing situation during climate change | BTM |
| 11 | Thanks and farewell | GTM/ BTM |

process and to empower the communities. In order to encourage independent community processes, the workshops included participatory elements and initiated exchange amongst the slum dwellers themselves. Participation also strengthened their self-esteem and helped to keep their concentration high throughout the whole workshop duration.

Motivation, in general, was an important issue to take into consideration for the design and conduct of the workshops. On the one hand, the urban poor are very busy with income generation and household work and cannot afford a lot of time for participation in workshops. On the other hand, based on their previous experience, they expect foreigners to deliver direct help and are somewhat surprised if they are not directly given material assistance or explicit advice. The goals of knowledge sharing and exchange, therefore, had to be transparent from the beginning of the workshops and the participants needed to be encouraged to stay for the whole duration of the sessions as well as to be actively motivated by the workshop team with the help of several activities.

The *need for action* was illustrated by discussing current strategies in the context of potential future weather patterns and natural hazards. It became obvious to the participants that the potential future situation will very likely challenge their current coping and adaptation strategies and that a

revision of the latter will be needed. However, this insight might leave people desperate as they are facing an increasingly problematic situation and are barely getting by even at the moment. Thus, the identification of *options for action* was crucial. In plenary and small group discussions, the current strategies were tested and the potential for adjustments was thought through. As it is, of course, impossible to thoroughly review the actions of the communities in no longer than an hour, we focused on initiating the process of exchanging and discussion of strategies within the communities, resulting in closely assessing and carefully improving these. Ideally, the participants left the workshops with an awareness of the need for the development of sustainable local responses as well as trust in their communities as capable drivers for this process.

The methodology of the workshops was shaped by a mix of input-oriented and participatory *methods*. Especially the linking of new and existent knowledge as well as the development of options for action, the overview of local weather patterns, and the discussion on local seasons and climate were carried out in plenary discussions moderated and visually supported by the team. Actually, the only real input was the presentation of the concepts of climate and climate change and, furthermore, the potential local developments in the middle of the workshop. The *media* used mainly consisted of color-printed large photographs of typical scenes from the six seasons and from incidents of severe floods. For the adults' workshops, we additionally used the chart of a flooded area (Fig. 1) and a blank diagram in order to get an overview of the perceived and actual extent of floods (Fig. 3). In the children's workshops, icons for the illustration of the causes and effects of climate change were used in a blackboard image (Fig. 6) and in the course of some exercises the children wrote keywords and short texts and drew images on the blackboard.

LESSONS LEARNED

When working with the urban poor, one has to bear in mind that the target group is under multiple pressures. The adult slum dwellers are concerned about their livelihoods nearly all of the time. Men work in various occupations for many hours per day to generate an income, women also partly work outside their homes and, in addition, have to do the household chores and take care of the children. Thus, these people can scarcely allocate the time and energy to attend a workshop. Consequently, and also because

the adults are not used to sitting, talking, and staying focused on a topic for a long time, the workshop has to be kept short. Breaks can be helpful under these conditions but, at the same time, cause a lot of disturbance and fluctuation. So finally, we ended up with nonstop workshops of approximately one hour (two hours for children). Still, this was too much time for many participants. Some left early, opted out, or fell asleep. However, we could not shorten the workshops any further as the concepts had to be introduced carefully, repetition was needed, and it was crucial to initiate certain processes.

Not only did time constraints force us to keep things simple, but the amount of new information for the participants was huge and it was important to avoid an overload. This would potentially have led to confusion and hampered the intended workshop outcomes. Thus, we decided to narrow things down and focus on crucial aspects. Our selected content included aspects from the participants' previous knowledge in order to build up links. Beyond this, the potential local effects of climate change were presented. Global-level effects and for the adults' workshops also the causes of global warming were purposely omitted as they are of minor relevance for the target group. With the children, we discussed the causes of climate change as some of them had already heard about these in school or from the media and it was important to embed as much previous knowledge as possible. They were also more familiar with classroom situations and focusing on a topic and, in many cases, had relevant basic knowledge in science and there were less time constraints as the workshops went on for about two hours. Simplification also played a role in the choice of terminology and presentation of causalities. In line with Moser and Stein (2011) we used the increasing frequency and magnitude of natural extreme events as proof of climate change as these are tangible manifestations of the vulnerability of the urban poor.

In general, participation in the workshops was easier for children than for adults. In the same way, it was less challenging to design and run the children's than the adults' workshops. This was due to a number of reasons: first of all, the children's workshops took place in schools during general teaching time. The pupils did not only prove to be generally enthusiastic but they were also happy about some alternation in their school routines. The foreigners coming to their class, the interesting topic, the uncommon methods used, the presence of a camera and a microphone, etc. made our workshop an exciting experience. Furthermore, the children were in their usual class settings and used to interacting in their groups and with teaching personnel. Thus, they had no difficulty in asking questions,

expressing ideas, and discussing within their groups. The longer timeframe also allowed for a slower and rather playful progression in the workshops as well as some fun activities. Finally, it was helpful to have meetings with teachers and headmasters/headmistresses at the schools in order to make preparatory arrangements, adapt our concept to the given situation, and establish links to the communities of adjacent slum settlements.

The establishment of links to local communities was essential at all sites. Prior to the first workshops, we went to each site to meet key people from the community, to enable the dwellers to get to know us in advance, to decide whether workshops are feasible, and to decide and announce the time and place. In addition to schools, we tried to establish links to NGOs, community institutions, health centers, social workers, and local landlords. These organizations and individuals were able to provide basic information about the communities, their general problems, past incidents of floods, suitable workshop times and venues, and often offered to inform the members of the community. For us, it was crucial to have them onside and involve them in order to embed the new topic and initiated processes in the communities.

Generally, the concepts of climate and climate change as long-term phenomena are not easy to understand. The distinction between weather change in the course of a year and long-term changes in climate (global warming and its effects) were, thus, not easy to distinguish. In order to illustrate the timeframe for long-term changes, we referred to the seasons and to the climate one or two generations back. Adults were asked about their memories of seasonal change during their childhoods and whether they had ever heard accounts of elders talking about the weather in the past. In most cases, people were able to recount the same patterns of seasons as nowadays but soon started to list abnormalities they had noticed recently:

“Oh! These six seasons [normal seasons of Bangladesh as discussed and presented in the workshop] are outdated.”

“The six seasons are increasingly changing.”

(Participants from the men’s workshop in Mirpur)

These discussions were used to illustrate long-term patterns that are stable despite sporadic divergent and extreme events. However, after thorough and stepwise explanations, repetition and answering of questions, the participants were well able to understand about climate change, its potential local effects, and impact on their lives.

“We understood the issue of climate. That means, for example, that during the month of Kartika [October/November] it rains a little and nights are a little cold. Ok? Then it feels hot during the months of Boishakha [April/May] and Joishtho [May/June]. Again it feels very cold in winter.”

“He is right, different types of weather in different seasons. From those, we get rains in rainy season, cold in winter.”

“More heat during summer and more cold during winter. More winter and more warm. That is called climate change.”

“Because of climate change, we might be facing more floods? That means less in some years and more in some years, but we have to face these.”

(Participants from the men’s workshop in Box Culvert)

Again and again, the workshop situations were shaped by the everyday problems of the slum communities. The people are constantly concerned with their current and apparently urgent problems and, therefore, do not have or do not allocate resources for dealing with climate change. That topic is psychologically distant while the more urgent problems of slum dwellers appear to be closer.

“Now the main problem is that if we get the electricity facilities, the owner of these houses will demand more rent for their house. It will be very difficult to stay here if we fulfill their demand. We don’t have enough financial abilities to fulfill their demand.”

“I am talking about the environment. I invested 17 lakh Taka. The place we live here is not hygienic for our health. The dust, the dirt, and stains are everywhere. That’s why different kinds of diseases are increasing.”

(Participants from the women’s workshop in Hazaribag)

Spence et al. (2011) have analysed the subjective distance of climate change and its impact on the concern and actions of individuals which is highly relevant for risk communication and information on climate change effects in various contexts. Their analysis incorporates various dimensions such as spatial, temporal, and social distance as well as uncertainty. They found that the risks related to climate change are generally perceived to be far away in all four dimensions. High psychological distance correlates with low levels of concern, while low levels of concern correlate with little readiness for individual action. Consequently, in order to inform and empower the affected population so that they can revise their strategies, psychological distance has to be reduced as much as possible. Furthermore,

Spence et al. stress the fact that highly abstract and de-contextualized events tend to be psychologically distant. This leads to the suggestion to decrease the psychological distance by presenting climate change in a tangible manner, linking its effects to the context of the target group, and framing it with the previous knowledge of the participants.

Furthermore, the workshops can only be successful if they are run by a well-attuned team which consists of experienced, knowledgeable, and highly committed members. It proved to be very useful to inform all the team members extensively. We not only explained and discussed the background and aim of our project in general and the workshops in specific but carried out preliminary exercises as well as training workshops which were evaluated. Bangladeshi team members were much more than just interpreters. Their local and cultural knowledge as well as their evaluation of the workshops were highly beneficial for the whole research process. The more they got involved, the more committed they became. However, one cannot overemphasize the cross-cultural component of working in an international team. Things might apparently go smoothly but actually not be that way. This needs to be borne in mind throughout the cooperation, especially in the initial and training phases. In our cooperation, we had the experience that asking questions and making critical remarks was difficult for all team members for a certain time and we had to go through a couple of training and preparation loops until everything relevant was asked, expressed, and understood. In this stage, team leaders should include being open to learning in their role.

Finally, data analysis revealed and validated a range of insights which are of relevance for conducting workshops and employing other communication techniques: a thorough workshop introduction proved to pay off. Even though we discussed with community members whether they were interested in learning about climate change and discussing community-based strategies amongst themselves as well as explicitly announced information and discussion without financial or material support, there were many false expectations. At the same time, some community members remained sceptical about whether to trust us. Thus, the workshop introduction was revised and extended stepwise and presented to the participants including every detail. This was of special importance as participants did not usually ask questions about the workshop and the team in the beginning. These had to be anticipated and answered in advance. Analysis showed that unspoken and unanswered questions impacted the workshop atmosphere and participants' attention negatively. Consistent and well-structured workshop moderation/facilitation significantly coincides with

the distinct active participation, motivation, and focus of participants whereas in cases of unsystematic workshop conduct, the workshops could not be carried out successfully with regard to the aspects mentioned.

Due to the language barrier, workshop moderation was very much in the hands of facilitators, and so was the consistency of leadership. However, local facilitators could be supported with regard to workshop flow and structure by the German experts. This led to the extended involvement of the experts in the moderation of some parts of the workshop and in providing assistance to the facilitators for some other parts and giving inputs. The time required for translation did not have any negative effects on the workshops. The participants were curious to listen to the strangers and behaved very patiently while waiting for translations. The translation process also slowed down the workshops which allowed time to think about the information provided, digest it, and phrase questions. However, retranslation and coordination within the workshops remained challenging even for the well-practised team. For well-facilitated workshops, the data clearly showed that external disturbances, such as people asking for items from the shacks, children crying, outsiders looking on, were disregarded by the participants or could easily be absorbed by the team. The same applied to people leaving or entering the workshop site and side discussions. It is clear from the audiovisual material that independent of the workshop quality, at each workshop there were participants who were highly enthusiastic, interested in the topic, and committed to participation. In the same way, we came across a few people who did not seem to be motivated and willing to take part at all, even though participation was supposed to be voluntary. At the end of the day, practical experience and data analysis reinforced the assertion that the quality and success of a method, in our case the workshops, is not only about concept, content, and preparation but a lot depends on adequate facilitation and translation. Team training and attunement proved to be essential.

CONCLUSIONS

Even though falling back on a well-established set of tools from participatory appraisals, methods for the assessment of local perceptions and strategies towards severe weather events as well as the initiation of community-based adaptation processes are still in their early stages (Moser & Stein, 2011). As the core of participatory methods were developed in a very

hands-on manner in the 1990s (Absalom et al., 1994; Chambers, 1996), recent projects have mostly been concerned with questions on the situation and environment of their subjects of research. In contrast, we were concerned with methodological questions regarding result communication. Experience in this field is still very limited and each project is of an exploratory character. Moser and Stein (2011) have pointed at the unique potential of participatory methods such as the capability of the urban poor to identify the impact of global warming on their immediate environment and their daily lives. At the same time, results from Spence et al. (2011) highlight a core challenge in climate change communication: in various contexts, climate change and related issues were of lower priority compared to other different topics and perceived as temporally and spatially distant. Thus, this psychological distance had to be anticipated and overcome.

The integration and active involvement of the objects of research in the scientific process turns them into subjects as it is the core principle of participatory appraisals. This is not only a first step to acknowledge and integrate indigenous knowledge and local expertise but can also serve as a means to empower the local people and civic institutions and to make them agents of change (Fig. 7).

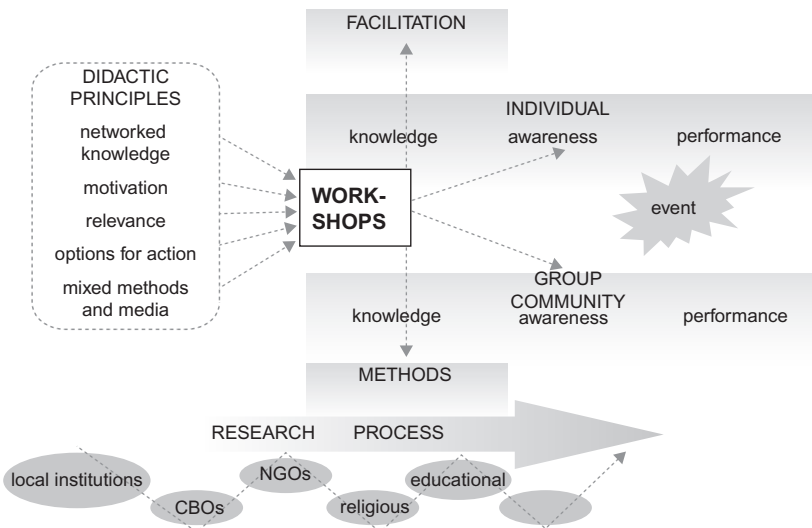


Fig. 7. Conceptual Diagram: Different Levels of Evaluation. Source: Author.

Despite the encouraging results and the positive progression of workshops, some general concerns and challenges remain. These might well apply to the communication of scientific results in other settings as well. A major concern is systematically testing and evaluating the effectiveness of the workshops. Success can be measured on different levels: (1) on the level of facilitation, (2) on the methodological level, (3) on the individual level, (4) on the group or community level or (5) with regard to the research process (see Fig. 7). First insights regarding levels 1 to 4 could be gained during and right after the workshops and could be wrapped up in immediate evaluation. Testing the knowledge gained was implemented in the workshop concept by assessing the participants' previous knowledge and comparing it to their own explanations of climate change at a later stage of the workshop. This was mainly carried out in order to find out whether further explanations and repetitions were needed or whether the concepts presented were understood by the participants. However, a systematic assessment of the knowledge gained generally also needs to be carried out with a certain time lag. The same holds true for evaluating the change in awareness.

The aim of initiating the acquisition of new competences and improving the performance in the case of a natural extreme event could not be tested in the scope of the project, as it required a relevant incident and the incorporation of a reference group. As the knowledge, awareness, and competence gained can hardly be measured directly after the workshop, it is even more desirable to cooperate with local partners and institutions that can facilitate an ongoing community process. For example, training local teachers can have a sustainable impact on teaching content and quality and, thus, lead to the improved knowledge and awareness of pupils. Furthermore, community-based organizations and local NGOs can carry on work on potential future strategies and moderate local discussion processes, while researchers usually quit the field after completion of their project. It is, thus, desirable to anchor recommendations and strategies from the workshops locally, both at the administrative level and in local and community-based organizations (Moser & Stein, 2011).

The participatory approach focuses on peoples' skills and capabilities and intends to sensitize and to trigger processes early on so that small-scale, modest, and incremental activities can be developed within communities to build up resilience against and to respond to recurrent patterns of severe weather impact. Since there is often limited access to municipal agencies for the urban poor, local NGOs might be the preferred local partners.

ACKNOWLEDGEMENTS

The authors thank the German Research Foundation for the financial support received for our research project “Natural hazards and climate change in Dhaka: future trends, social adaptation and informal dynamics” within the Priority Programme 1233 “Megacities – Megachallenge: Informal Dynamics of Global Change”. Furthermore, the authors are grateful to Tibor Aßheuer who carried out the first stage of empirical research in the project. The authors also thank Clemens Simmer and Insa Thiele-Eich (University of Bonn) and AZM Shoeb and Raquib Ahmed (University of Rajshahi) for their kind cooperation. Finally, the fieldwork would not have been possible without the deep commitment of the interpreters, Nishat Jahan Jyoti, Anita Shafiq, and Laila Nur Shemonto, German students Magdalena Oppitz and Nils Jahn, and the kind support of Glory Future Social Friendship (Dhaka), Ärzte für die Dritte Welt (Frankfurt), Psychologen über Grenzen (Potsdam), and essentially the patience, hospitality, trust, and knowledge of Dhaka’s slum dwellers.

REFERENCES

- Absalom, E., Chambers, R., Francis, S., Gueye, B., Guijt, I., Joseph, S., ... Welbourn, A. (1994). Sharing our concerns and looking to the future. *PLA Notes*, 5, 5–10.
- Agrawala, S., Ota, T., Ahmed, A. U., Smith, J., & van Aalst, M. (2003). *Development and climate change in Bangladesh: Focus on coastal flooding and the Sundarbans*. Paris: OECD.
- Ahmed, R., & Falk, G. (2008). Bangladesh: Environment under pressure. *Geographische Rundschau International Edition*, 4(1), 12–18.
- Alam, M., & Rabbani, G. (2007). Vulnerabilities and responses to climate change for Dhaka. *Environment and Urbanization*, 19(1), 81–97.
- Ali, A. (1999). Climate change impacts and adaptation assessment in Bangladesh. *Climate Research*, 12, 109–116.
- Aßheuer, T., Salingré, A., Thiele-Eich, I., Braun, B., & Simmer, C. (2012). Natural hazards and climate change in Dhaka: Future trends, social adaptation and informal dynamics. In M. M. Islam & W.-P. Zingel (Eds.), *Climate change effects and energy development* (pp. 132–136). Germany, Bonn: Bangladesh Environment Network (BEN).
- Aßheuer, T., Thiele-Eich, I., & Braun, B. (2013). Coping with the impacts of severe flood events in Dhaka’s slums – the role of social capital. *Erdkunde*, 67(1), 21–35.
- Azam, M., & Falk, G. (2013). *Governance of climate induced migration in the coastal regions of Bangladesh: New transformation required?* Earth System Governance Tokyo Conference. 28–31 January, 2013, Tokyo, Japan.
- Bangladesh Water Development Board. (2011). *Annual Flood Report 2010*. Flood Forecasting and Warning Centre, Dhaka.

- Beck, T. (2005). *Learning lessons from disaster recovery: The case of Bangladesh*. Disaster Risk Management Working Paper Series 11. World Bank, Washington, DC.
- Beyerl, K. (2010). Der Klimawandel in der psychologischen Forschung. In M. Voss (Ed.), *Der Klimawandel. Sozialwissenschaftliche Perspektiven* (pp. 247–262). Wiesbaden: VS Verlag.
- Bonifacio, A. C., Takeuchi, Y., & Shaw, R. (2010). Mainstreaming climate change adaptation and disaster risk reduction through school education: Perspectives and challenges. In R. Shaw (Ed.), *Climate change adaptation and disaster risk reduction: Issues and challenges*. Community, Environment and Disaster Risk Management 4, 143–169.
- Braun, B., & Abheuer, T. (2011). Floods in megacity environments: Vulnerability and coping strategies of slum dwellers in Dhaka/Bangladesh. *Natural Hazards*, 58(2), 771–787.
- Braun, B., & Shoeb, A. (2008). Naturrisiken und Sozialkatastrophen in Bangladesh - Wirbelstürme und Überschwemmungen. In C. Felgentreff & T. Glade (Eds.), *Naturrisiken und Sozialkatastrophen* (p. 381–393). Berlin: Spektrum.
- Chambers, R. (1996). Participatory rural appraisal and the reversal of power. *Cambridge Anthropology*, 19, 5–23.
- Chatterjee, M. (2010). Slum dwellers response to flooding events in the megacities of India. *Mitigation and Adaptation Strategies for Global Change*, 15(4), 337–353.
- Christensen, J. H., Hewitson, B., Busuioc, A., Chen, A., Gao, X., Held, I., ... & Whetton, P. (2007). Regional climate projections. In S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor & H. L. Miller (Eds.), *Climate Change 2007: The physical science basis* (pp. 847–940). Contribution of working group I to the fourth assessment report of the intergovernmental panel on climate change, Cambridge University Press, Cambridge.
- Centre for Urban Studies (CUS), National Institute of Population and Training, Measure Evaluation. (2006). *Slums of urban Bangladesh: Mapping and census, 2005*, Dhaka and Chapel Hill.
- Cruz, R. V., Harasawa, H., Lal, M., Wu, S., Anokhin, Y., Punsalmaa, B., ... & Ninh, N. H. (2007). Asia. In M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden, & C. E. Hanson (Eds.), *Climate change 2007: Impacts, adaptation and vulnerability* (pp. 469–506). Contribution of working group II to the fourth assessment report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge.
- Edris, A., & Collins, A. E. (2010). Cyclone disaster vulnerability and response experiences in coastal Bangladesh. *Disasters*, 34(4), 931–954.
- Gropengießer, H. (2008). Qualitative Inhaltsanalyse in der fachdidaktischen Lehr-Lernforschung. In P. Mayring & M. Gläser-Zikuda (Eds.), *Die Praxis der Qualitativen Inhaltsanalyse* (pp. 172–189). Weinheim: Beltz.
- Hofer, T., & Messerli, B. (2006). *Floods in Bangladesh: History, dynamics and rethinking the role of the Himalayas*. Tokyo: United Nations University Press.
- Intergovernmental Panel on Climate Change. (2012). *Managing the risks of extreme events and disasters to advance climate change adaptation*. A special report of working groups I and II of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge.
- Islam, N. (2005). *Dhaka now – contemporary urban development*. Dhaka: Bangladesh Geographical Society.
- Islam, T., & Neelim, A. (2010). *Climate change in Bangladesh: A closer look into temperature and rainfall data*. Dhaka: The University Press Limited.
- Mayring, P. (2000). Qualitative content analysis. *Forum: Qualitative Social Research*, 1(2), article 20. Retrieved from <http://qualitative-research.net/fqs/fqs-d/2-00inhalt-d.htm>

- Mayring, P., Gläser-Zikuda, M., & Ziegelbauer, S. (2005). Auswertung von Videoaufnahmen mit Hilfe der Qualitativen Inhaltsanalyse – ein Beispiel aus der Unterrichtsforschung. In: MedienPadagogik. Retrieved from <http://wl3www486.webland.ch/04-1/mayring04-1.pdf>, May 27, 2013.
- Moser, C., & Stein, A. (2011). Implementing urban participatory climate change adaptation appraisals: A methodological guideline. *Environment & Urbanization*, 23(2), 463–485.
- Novak, J. (1994). *Bangladesh – reflections on the water*. Dhaka: University Press Limited.
- O’Kane, C. (2008). The development of participatory techniques. Facilitating children’s views about decisions which affect them. In P. Christensen & A. James (Eds.), *Research with children: Perspectives and practices* (pp. 125–155). London: Routledge.
- Palmer, T. N., & Räisänen, J. (2002). Quantifying the risk of extreme seasonal precipitation events in a changing climate. *Nature*, 31, 512–514.
- Paul, S. K., & Routray, J. K. (2011). Household response to cyclone and induced surge in coastal Bangladesh: Coping strategies and explanatory variables. *Natural Hazards*, 57, 477–499.
- Pretty, J., Guijt, I., Thompson, J., & Scoones, I. (1995). *Participatory learning and action: A trainer’s guide*. London: IIED.
- Rahman, A. A., & Alam, M. (2005). *Dhaka City state of environment: 2005*. Dhaka: UNEP.
- Rajuk Plan. (2009). Dhaka City and Rajuk Plan (Future Dhaka City). 1:20.000. Dhaka: The Mappa Ltd.
- Rashid, H. E. (1991). *Geography of Bangladesh*. Dhaka: The University Press.
- Reliefweb. (2007). *Bangladesh: Flood migrants pour into Dhaka*. Retrieved from <http://reliefweb.int/node/246418>. Accessed on Feb 22, 2013.
- Rosenstein, B. (2000). Video use for program evaluation, a conceptual perspective. *Studies in Educational Evaluation*, 26, 373–394.
- Sen, A. (1981). *Poverty and famines: An essay on entitlements and deprivation*. New Delhi: Oxford University Press.
- Schnettler, B., & Raab, J. (2008). Interpretative visual analysis – Developments, state of the art and pending problems. *Forum: Qualitative Social Research*, 9(3), article 31.
- Schönhuth, M. (1996). PRA (Participatory Rural Appraisal) im Diskurs. *Entwicklungsethnologie*, 5(2), 11–33.
- Schubert, C. (2002). Making interaction and interactivity visible – On the practical and analytical uses of audiovisual recordings in high-tech and high-risk work situations. Technische Universität Berlin, Berlin.
- Schübler, I. (2004). *Nachhaltiges Lernen – Einblicke in eine Langschnittuntersuchung unter der Kategorie “Emotionalität in Lernprozessen”*. Report 1/2004 Literatur- und Forschungsreport Weiterbildung, 27, Bielefeld, 150–163.
- Spence, A., Poortinga, W., & Pidgeon, N. (2011). The psychological distance of climate change. In *Society for risk analysis*. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1539-6924.2011.01695.x/pdf>. Accessed on May 22, 2013.
- Stalenberg, B., & Vrijling, H. (2009). The battle of Tokyo and Dhaka against floods. *Built Environment*, 35(4), 471–491.
- Thomas, S. (2002). What is participatory learning and action (PLA): an introduction. In *UNHCR*. Retrieved from <http://idp-key-resources.org/documents/0000/d04267/000.pdf>. Accessed on May 27, 2013.
- United Nations. (2012). *World Urbanization Prospects: The 2011 Revision*, United Nations Population Division, New York.
- Walsham, B. (2010). *Assessing the evidence: Environment, climate change and migration on Bangladesh*. Dhaka: IOM.