

# **Arsenic Mitigation in Bangladesh from the Recipients' Perspective: Evaluation of a local non-governmental initiative**

*Štěpánka Pecháčková // pech.stepanka@gmail.com  
Palacký University Olomouc, Czech Republic*

## **Abstract**

Arsenic contamination of groundwater in Bangladesh is one of the largest examples of poisoning in the world. It affects millions of people because groundwater is the main source of potable water in the country. This paper qualitatively evaluates an arsenic mitigation initiative in Bangladesh from the perspective of the recipients. The initiative was implemented by a local non-government organization, the Thanapara Swallows Development Society (TSDS). The objective of the evaluation is to influence the decision-making of the aid-providers through empirically driven feedback. The paper uses the Sustainable Livelihoods Framework to assess TSDS's activities in arsenic mitigation from the perspective of the recipients. It then translates the evaluation's findings into recommendations in terms of community development.

**Key words:** Arsenic mitigation, Bangladesh, community development, groundwater

## **Introduction**

Arsenic contamination of groundwater in Bangladesh is one of the largest examples of poisoning in the world, and it was first discovered in 1993 (United Nations International Children's Fund [UNICEF], 2008, p. 1; Ahmed, 2005, p. 283). Groundwater is the main source of potable water in the country<sup>1</sup>. Estimates of the number of Bangladeshi people exposed to arsenic vary from 20 to 77 million (Ahmed, 2005, p. 283; Hossain, Islam, Gani, & Karim, 2005, p. 163; Jiang et al., 2013, p. 20) out of a total population of about 150 million (Government of Bangladesh [GoB], 2011).

Arsenic is found throughout the environment due to both natural and man-made processes (Gilbert, 2012, p. 128-129; British Geological Survey and Department of Public Health Engineering [BGS & DPHE], 2001, p. 4). Most environmental problems related to arsenic have natural causes. However, humans have considerably influenced the occurrence of arsenic in the environment through activities such as burning fossil fuels, using arsenic in pesticides and herbicides (BGS & DPHE, 2001, p. 2), and smelting for copper, lead, and zinc (Gilbert, 2012, p. 128).

It has been found that groundwater resources in the north of the country contain smaller concentrations of arsenic than in the south (Ahmed, 2005, p. 285).

Islam and Uddin (2002) claim that the distribution of arsenic in groundwater relates to the geological structure of the country. The number of Bangladesh's 64 districts where arsenic was detected varies, depending on the source from 61 (Moinuddin, 2004, p. 8), to 60 (Jiang et al., 2013, p. 22), to 59 (Hossain et al., 2005, p. 164). There are also extreme variations in the extent of arsenic occurrence from the district to the village level (Ahmed, 2005, p. 284–287). Arsenic pollution is mainly a problem of rural areas<sup>2</sup>. The extent of pollution affecting people is altered when different guideline values for arsenic in drinking water are used (see Figure 1). The World Health Organization (WHO) recommends a limit of 10µg/litre, while Bangladesh has 50µg/litre (Department of Public Health Engineering [DPHE], n.d., Health effect section, para. 2). Most developing countries have the same limit as Bangladesh (Moinuddin, 2004, p. 8).

**Figure 1. People affected by arsenic as a % when the Bangladesh Drinking Water Standard is used (left), people affected by arsenic as a % when the WHO guideline value is used (right)**



Chronic exposure to arsenic causes serious health conditions such as skin lesions and hyperkeratosis (World Health Organization [WHO], 2012, Health effects section, para. 1; Food Agriculture Organization [FAO] et al., 2010, p. 8), cancer, hypertension and cardiovascular diseases, anaemia, diabetes and neurological effects (Smith, Lingas, & Rahman, M. (2000), p. 1096; WHO, 2012, Health effects section, para. 2-3; Gilbert, 2012, p. 132; UNICEF, 2008, p. 2). These health issues have socioeconomic consequences for individuals as well as the whole society. Arsenic contamination is interlinked with poverty and its deprivation trap.

Water management is at the core of arsenic mitigation, along with awareness raising and the identification and treatment of those affected. Provision of safe water requires the use of existing water resources or the construction of new alternative resources. The technical options are various: well switching, chemical water treatment or pond sand filters, or alternative water sources such as hand-dug wells, deep tube wells and rainwater harvesters.

In 1996, the Government of Bangladesh (GoB) implemented arsenic mitigation programmes. The government has been supported by a number of donor countries' and UN agencies, and international and national non-governmental organizations (NGOs) (Milton, Hore, Hossain, & Rahman, 2012, p. 2). Only a few of the initiatives were actually implemented in terms of community development.

Community development is, however, a basic tool for achieving social development (Stoesz, Guzzetta, & Lusk, 1999) and a key strategy in poverty alleviation and other areas (Cox & Pawar, 2006). Arsenic mitigation cannot be done without the cooperation of the people it is supposed to help. That is why this paper examines the local arsenic mitigation initiative from the perspective of its recipients.

## Methods

The study described is a qualitative evaluation. Its *general objective* was to influence the decision-making of TSDS through the provision of empirically driven feedback concerning its arsenic mitigation work. The *specific objectives* were; 1) assess the activities of TSDS in arsenic mitigation from the perspectives of the recipients and 2) translate the evaluation findings into recommendations for TSDS in terms of community development.

The evaluation questions were:

1. What are the recipients' perceptions and experiences of TSDS's arsenic mitigation work in the community of Miapur, Bangladesh?
2. How can the work of TSDS in Miapur be transformed into community development?

Qualitative methods were used because through them a project's story can be told by capturing and communicating the views of the participants and the details of the project overall (Patton, 2003). The study combines two seemingly contradictory, and up to now rarely connected, approaches: the Sustainable Livelihoods Framework (SLF) and community development. These approaches can become complementary, further developing and easing each other's strengths and weaknesses, respectively.

The categories of the SLF were used to frame the perspective in data collection and analysis. The Framework is a tool that helps us to understand the peoples' livelihoods, especially those of the poor (Department for International Development [DFID], 1999). The SLF is a widely-used approach (GLOPP, 2008) that has rarely been connected to the concept of community development. The transformative features and principles of community development can enhance the approach and the SLF can compensate for the weaknesses in community development. That is why the evaluation findings were translated into the recommendations based on the community development concept by de Boer and Swanepoel (2011).

To ensure the quality and reliability of the evaluation study, the different strategies suggested by Guba (1981) and Patton (2003) were followed. The triangulation of methods and sources was used. As much information as possible was collected in order to enable a comparison of this research context with other possible contexts. Also, the referential adequacy materials were collected and tested against the findings. The sampling was not intended to be representative or typical but to provide the maximum amount of information available. Different data collection methods were used to complement each other, and to strengthen stability. Other researchers and experts were consulted during the inquiry.

Potential underlying epistemological assumptions were reflected on through the use of an ongoing journal and by establishing peer debriefings.

### **Research Implementation**

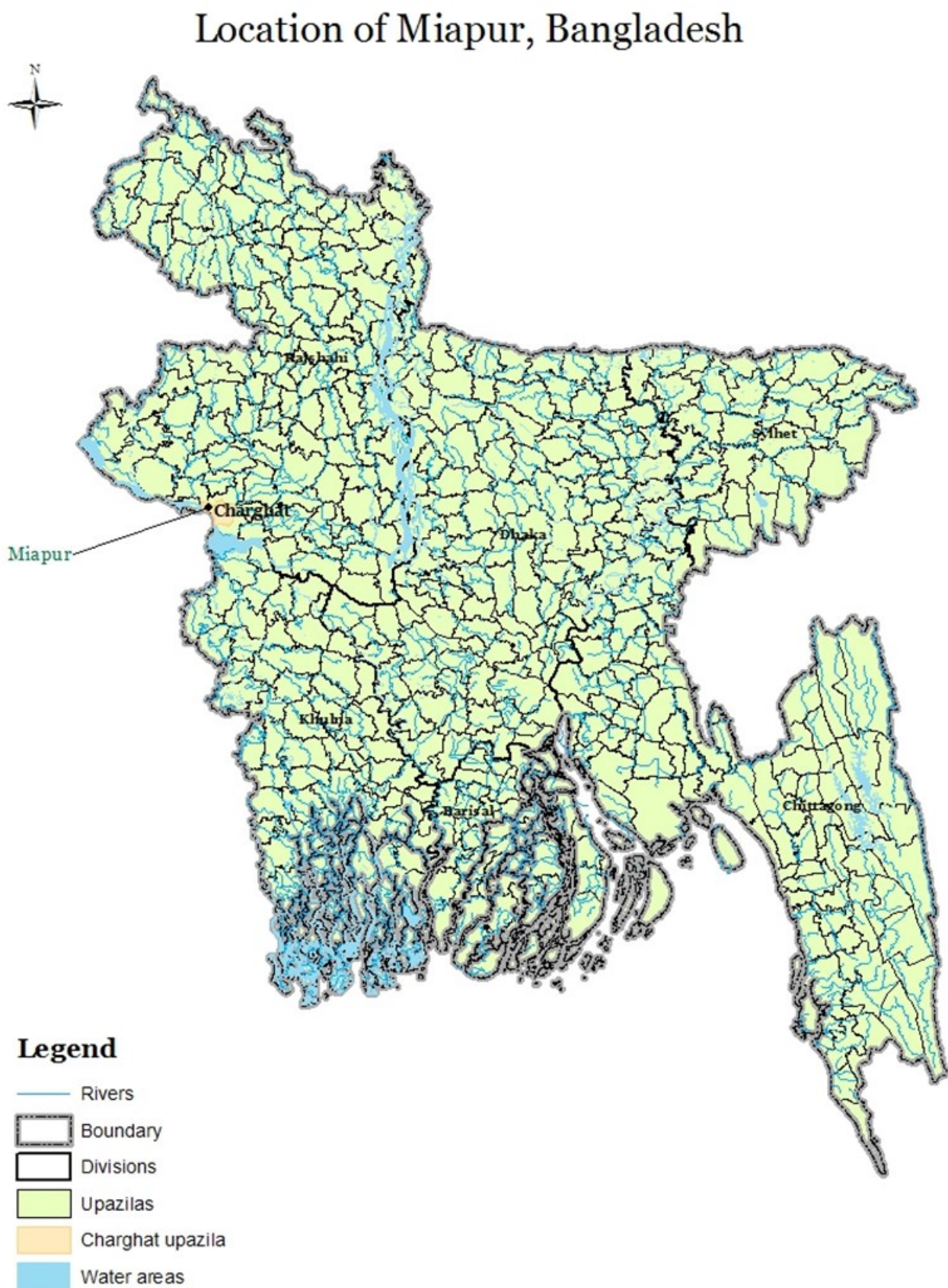
The evaluation was initiated by the author, as a part of an internship at TSDS, and built on direct field experience. No such evaluation regarding the organisation had been done before. The respondents in the research were the arsenic-affected community of Miapur. This particular community was chosen from the two locations where TSDS arsenic mitigation work has taken place. It was selected because of its accessibility and the richness of information it could offer.

Data were collected through reviews of secondary sources and personal documents, observation, participatory mapping, and semi-structured group and expert interviews. Valuable information was provided via the informal communication with the staff of TSDS and the inhabitants of Miapur. Most of the data collection took place in one location in the centre of the village, or at TSDS headquarters during the period June – August 2013.

Non-probability sampling was used in the data collection, more specifically purposive sampling and snowball sampling. The population was accessed with the help of TSDS staff<sup>3</sup>. In order to have as much variability as possible, it was ensured that all parts of the population were represented in the sample: arsenic patients, the users of alternative mitigation options and the participants of awareness campaigns. The members of these groups intermingle. There were a total of 16 interview respondents aged from 15 to 60 and 22 participants in the mapping, with men and women equally represented. The two experts selected for the interviews were Bangladeshi nationals; one was a project manager (Expert 1) and the other was one of the top-managers of the organization (Expert 2).



**Figure 2. Location of Miapur**



The method of ‘observer as a participant’ (Disman, 2002) was followed—the observer is in social interaction with the community members but does not belong to the community or participate in community affairs. The influence of the observer on the community was reduced by them behaving as ‘normally’ as possible, for instance by travelling to Miapur using public transport and avoiding extra attention.

Hands-on mapping was selected for this qualitative evaluation study, specifically sketch/paper mapping. Sketch/paper maps show the community-identified land features from a bird’s eye view. The participatory mapping sessions enabled us to get a broader picture of the locals’ indigenous knowledge concerning the area, particularly in terms of arsenic contaminated and safe water resources. It also helped to establish trust between the author as an evaluator and the residents of the village.

### **Situational Analysis**

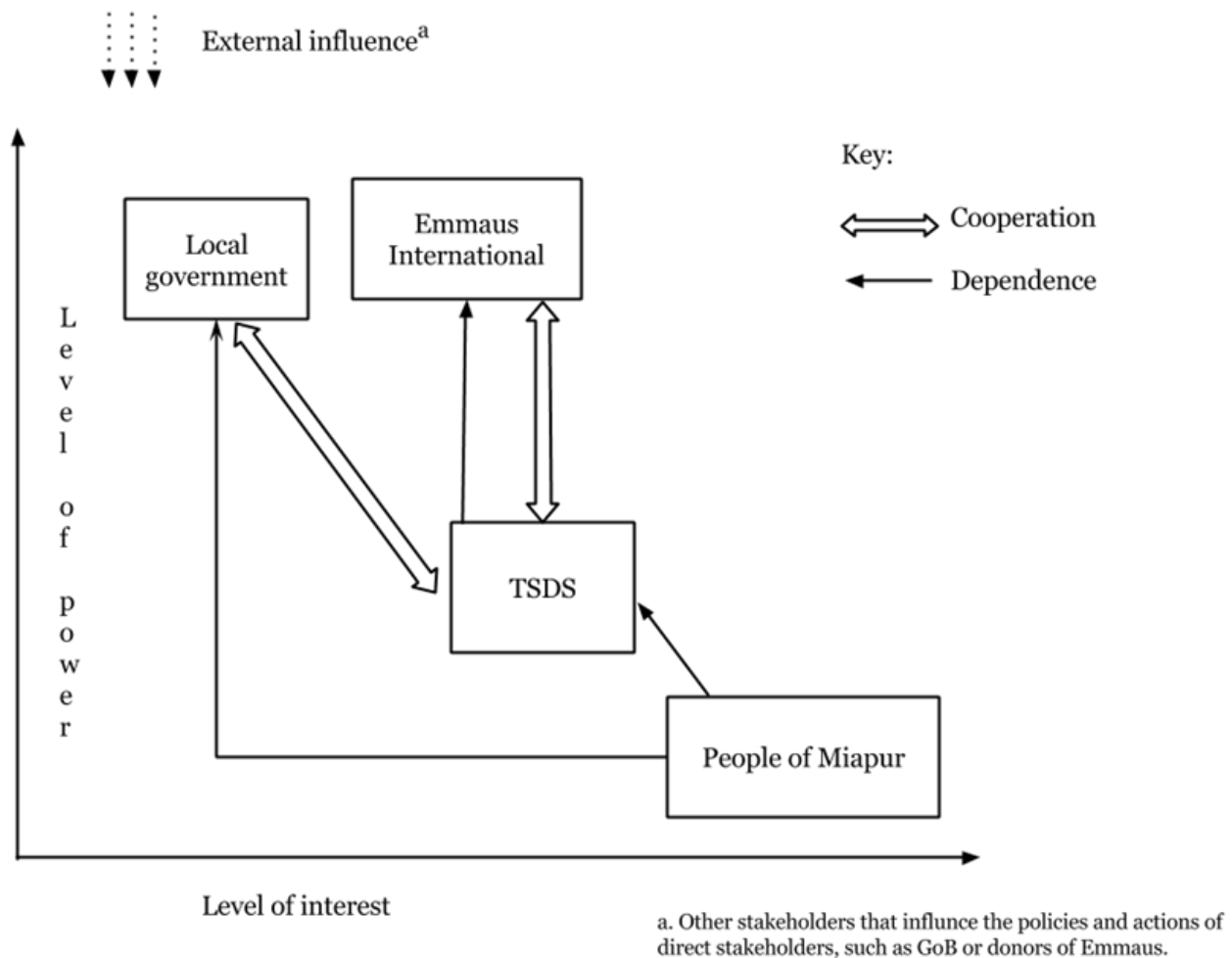
Miapur is located in Charghat upazila, in the Rajshahi District of northwestern Bangladesh, next to the Padma (Ganges) River. It is a village of 2.08 km<sup>2</sup> with around 2,000 inhabitants<sup>4</sup>. Almost all the villagers are Muslims, except for a small Hindu minority. Most of the people work in agriculture.

Arsenic was first discovered in the water sources of Miapur in 1998. Since then, various arsenic mitigation initiatives have taken place in the village under different donors. All the initiatives were implemented by TSDS. TSD was always the provider of assistance, whereas the inhabitants of Miapur were the recipients. The role of the local government bodies in the mitigation was limited. They neither interfered in the mitigation activities, nor did they have much interest in being involved (Expert Interview [EI] 2, Group Interview [GI] 1).

The donors – Development Association for Self-reliance, Communication and Health, Swiss Development Cooperation, and NGO Forum – gradually phased out their activities in Majpur, for different reasons. For one, it was simply the time frame of the projects. Another reason was the ‘low’ rate of arsenic contamination in local tube wells, which had dropped below 30% (EI 1, 2). At the time of the evaluation in 2013, the active phase of arsenic mitigation work in Miapur was over. The existing activities involved arsenic patients’ treatment and maintenance of established alternative safe water resources

The relationships among stakeholders can be seen in the stakeholder map (see Figure 3.). The map is based on the Power versus Interest grid stakeholder analysis, as described in Bryson (2004, p. 30). Two types of relationships were identified: cooperation and dependence.

Figure 3. Stakeholder Analysis



## Evaluation

### The recipients' perspective

#### *Sustainable Livelihoods Framework*

The SLF illustrates the main components of and influences on the livelihoods of the recipients and the typical relationships between the components and the influences. It defines five core asset categories or types of capital upon which livelihoods are built: *Human*, *Natural*, *Financial*, *Physical*, and *Social*. People require and draw on these *Livelihood Assets* in order to achieve their objectives or *Livelihood Outcomes*, using chosen *Livelihood Strategies*. Both (Livelihood Assets and Livelihood Strategies) are shaped by the *Transforming Structures and Processes*, which also influence the assets. All are operated within and interlinked with the *Vulnerability Context*. Livelihood Assets are understood to be the people's strengths, their capital, but not in an economic sense.

### *Natural and physical capital*

Natural capital and Physical capital are more interrelated than usual in cases of arsenic contamination of water. Adequate infrastructure and access to safe water resources are necessary in order to deal with arsenic contamination. In accordance with common practice, TSDS focused on screening and marking the contaminated tube wells and providing arsenic-safe water sources. The situation regarding arsenic contamination in Miapur improved over time. The respondents in all group interviews emphasized the difference between before and after TSDS began to work in the village. They suggested expanding the current activities because some new arsenic contaminated water sources had been found. The quality of the alternative mitigation options provided by TSDS and the quality of their water were seen as good. The respondents themselves performed the maintenance. However, when the need for repairs or other issues occurs, the respondents “come to get [Expert 1’s name]” (GI 3).

### *Human capital*

Efforts to improve the recipients’ Human capital centred around patient identification and treatment and awareness-raising activities. The activities began with the screening of arsenic contamination and included workshops in schools, courtyard meetings and Village Development Committee (VDC) activities. The caretaker training and briefings provided the recipients with some degree of skill so they could maintain the alternative water sources, but the sessions did not lead to the people’s complete independence from TSDS’s support. After TSDS started their awareness activities, “a lot of development” (GI 2) could be seen. The quality of awareness activities did not overly concern the recipients. Their answers were mostly short, not exhaustive: “I attended a few meetings with this program. It was nice” (GI 3).

There was a widespread awareness of the arsenic contamination and the mitigation initiatives in the village. The participatory map drawn by the respondents supports the evidence. The respondents also showed their knowledge of arsenicosis, of how the disease occurs and is treated. The respondents stated that the medical treatment of arsenic patients had improved compared to the past, but they missed the previous regular patient checks<sup>5</sup>.

The communication channel through which most of the respondents learned about arsenic was the awareness-raising activities of the local organizations and institutions, particularly TSDS (GI 1, 2). Another communication channel that cannot be overlooked is word of mouth: “We live in the village and we know everything about all families, and that’s how we know about it [about the people that cannot afford the arsenic treatment]” (GI 3).

The recipients’ view corroborated the findings that children can act as family or community change agents by spreading awareness and thus reducing the exposure to arsenic (see Hanchett, Nahar, Agthoven, Geers, & Rezvi, 2002). “It’s really good if someone discusses in the school because if they tell their mother...children don’t follow their mother but



they obey their teacher and they are little bit afraid of the teacher so if they discuss the issue in the school and the teacher also tells them about this, then they realize yes, we should use” (GI2). Also, Human and Social capital can increase if arsenic mitigation activities are linked with water quality and sanitation. “In Bangladesh many people suffer from diarrhoea and cholera and that is why the government has taken some steps and that’s why the Swallows also believe we should do something about this and people can be safe, that’s why Swallows organized a few meeting and they concerning people about this” (GI 2).

### *Social capital*

Social capital is developed through networks and connections, including membership of more formalized groups with rules and norms, and relationships of trust, reciprocity and exchange (DFID, 1999). Arsenic mitigation activities in this category are particularly represented by the VDC . The committee was autonomous and aimed to address arsenic contamination in the village. Regular meetings served as an opportunity for discussion, exchange of information and solving problems. However, when the committee was disbanded the recipients did not continue such activities by themselves.

The vertical, i.e. patron/client, rather than horizontal networks, were observed. There is a strong relationship between Expert 1, who is the representative of TSDS and the specific person who provides aid, and the recipients. Expert 1 knew the recipients personally and communicated with them on a daily basis (Observation). The representatives of TSDS are the first people the recipients turn to for help. When “...they face some problems...they ask Swallows” (GI 2) and “come to get [Expert 1’s name]” (GI 3)<sup>6</sup>. On the other hand, the recipients felt that the VDC enabled them to be self-dependent and they stated the need to remain as such: “We should become independent, not dependent on someone” (GI 2).

Sympathy and a sense of mutuality could be seen within the community. The respondents pointed out that there were some people in the village who could not afford the treatment, even though they did not experience this problem themselves. “Someone who is really poor, he is not able to pay 20%, so she suggests if we can provide fully free it’ll be great.” “...and he has one suggestion, if Swallows give all medicine fully free it will be really helpful for them because someone really poor and they can’t bear this 20%” (GI 3).

The social stigma around arsenicosis that is rife elsewhere in Bangladesh did not seem to be an issue in Miapur. None of the interviewees mentioned any kind of negative feelings towards arsenic patients, nor did the author observe any kind of stigmatization. The arsenic patients, including those with visible skin lesions, moved freely and openly around the village, without any signs of fear. They were treated equally within the group during the mapping session, the group interviews and in the arsenic medicine distribution camp. We can definitely attribute this state of affairs to TSDS’s awareness activities in the village<sup>7</sup>.

### *Financial capital*

Human capital, especially health and the ability to work, influenced the Financial capital of the recipients. They “don’t took work properly and they can’t work in days or they can’t walk in two days” which “...is bad for their income” (GI 1). The negative effects on the recipients’ incomes were reduced due to the support of TSDS. The arsenic patients paid 20% of the cost of their treatment, which was considered helpful by the recipients. However, the recipients identified the group of arsenic-affected people in the village who were excluded from the provision of treatment due to financial constraints (see Social capital section). The recipients share the cost not only in the treatment, but also when building the alternative arsenic free water sources. Interestingly, the recipients found the cost-sharing necessary in order to create a sense of ownership and commitment: “Yes, we have to pay something, if we pay something, we will take care it more, like otherwise if it would free, we didn’t care.” (GI 2)

### *Transformation Structures, Policies, and Processes*

The transformation structures and processes within the SLF are the institutions, organizations, companies, policies and legislations that shape livelihoods, in this case, in the context of arsenic contamination. The recipients are directly influenced by the non-governmental organization TSDS, and by the local government and their policies and actions. The relationship between themselves and these structures was reflected in the respondents’ answers and behaviour. On one hand, the recipients trust and rely on TSDS. They did not complain about the organization’s work, but only suggested changes. On the other hand, no trust was expressed towards the local government. It was said that the local government provided little or no help in terms of arsenic mitigation. All questions about the local government brought about heated discussions, which suggests responsiveness to the topic.

### *Vulnerability context*

The Vulnerability context is important because it directly impacts on people’s asset status and their access to assets. The Vulnerability context is manifest through trends, shocks and seasonality (DFID, 1999). The recipients did not identify any major problems regarding their vulnerability. Only seasonality in relation to the availability of water in the village was a minor concern (G1, G2, G3).

### **The providers’ perspective**

The comparison of the recipients’ perspectives with those of TSDS shows the chain of aid-providers that exists in the area. Both perspectives describe the issues of participation, power distribution and dependence arising within the chain. The level of participation in arsenic mitigation in Miapur ranged from extractive to consultative; the middle of the participation ladder. The recipients’ roles were as informants, workers and collaborators, and the level of their ownership was low to moderate.

Participation did not reach the transformative or mobilization level which occurs when the recipients initiate and own the actions (see Chambers, 2006).

However, TSDS's arsenic mitigation was actually based on the recipients' needs and was as flexible as possible within the chain of existing aid-providers. The organization's ability to stand up for the recipients' needs when communicating the conditions of cooperation with big international donors suggests that the organization is inclined towards the recipients rather than the donors, and that it is aware of its own power.

It was TSDS that "took responsibility" (EI 2) for taking action in Miapur. There may be a few reasons for that. It could be a question of both reputation and feelings of empathy and caritas, as TSDS is one of the biggest, longest-working, and thus very well-known, NGOs in the area (Observation; Review of Secondary Sources). Another reason might lie in the relationship between the providers and the recipients of aid. The locals expect the outsiders to help them and the outsiders accept this order of things. Also, the insufficient local government services would not have provided the needed mitigation services. It is the aid-provider in this situation that holds the power in the sense of having the ability to take action and make decisions that influence the whole community. "...Otherwise, when taking permission [from the local government], we are free, we just have money and we do everything we want" (EI 2).

There is an important issue of dependence emerging. As TSDS depends on its donors, the people of Miapur depend on TSDS. The providers' ability to implement arsenic mitigation activities is derived primarily from their donors. Empowerment of the recipients was achieved partly through VDC but the Committee stopped its activities due to a lack of funding. Aid is impersonated in TSDS's representatives. Even though the recipients experienced power through VDC and expressed their desire to become independent, they still relied on TSDS when dealing with arsenic contamination. At no time were the arsenic mitigation activities initiated and managed by the people themselves (see Human capital section).

A lack of empowerment in the affected people of Miapur is also demonstrated in their access to information. This is not only in terms of their education and access to the communication infrastructure, but also in terms of the information TSDS provides them with. After research conducted in Miapur found high levels of arsenic in the local food chain, the information was initially deliberately kept from the inhabitants of the village. This was done in order to save the affected farmers' incomes. Even though TSDS eventually informed the locals, the contaminated crops were still sold. (Expert 1, personal communication, July 15, 2013).

## **Recommendations**

The recommendations for future work of TSDS in Miapur arise from the evaluation findings presented in the previous chapter. The recommendations are framed by de Boer and Swanepoel's (2011) concept of community development.

This features an integrated approach, collective action, needs orientation and objective orientation. It happens at the grassroots level, is asset-based and is democratic. If successful, it leads to awareness, further development, the demonstration effect, learning and community building. The ethical principles behind community development are human orientation, participation, empowerment, ownership, sustainability and release. These ethical principles are achieved in a practical way through learning, compassion, adaptability, and simplicity.

The concept does not necessarily have to refer just to the community of Miapur. Community development principles and practices can be applied to all the activities TSDS implements. That would enable the development of local sustainable communities and their release from the deprivation trap.

## **Features**

### *Integrated approach*

TSDS implemented all the usual actions taken to mitigate arsenic contamination of drinking water, including screening, awareness-raising and patient treatment. However, other factors can worsen the effects of arsenic contamination, such as the socio-economic situation of the affected people. Ideally these factors should be identified and addressed, along with arsenic contamination. For example, TSDS could involve the people affected by arsenic in the microcredit program that is running in the village (Expert 1, personal communication, June 10, 2013). Also, the efforts of different stakeholders in the area need to be more coordinated. A joint plan of action with the local government bodies and other relevant stakeholders should be developed and implemented.

### *Collective action*

The arsenic mitigation implemented by TSDS involved collective action, particularly in the form of VDCs. But these actions ceased due to a lack of funding. The recipients did not attempt to continue their collective actions, nor were they encouraged to do so by the providers. TSDS needs to involve the recipients more in the management of arsenic mitigation projects.

### *Needs orientation*

In terms of orientation of needs, TSDS's arsenic mitigation work is very good. TSDS addressed the needs identified by the affected people and flexibly changed its activities accordingly. These needs were communicated clearly so the community understood them. It is desirable that such an approach continues. The only aspect that can change is the level of people's participation in the needs assessments.

### *Objective orientation*

As well as the needs, the objectives in arsenic mitigation were clearly stated. People dealt with specific tasks, such as how many new water resources needed to be built.

This focus helped the people take action. Future projects should also state their objectives as clearly as possible.

#### *Grassroots level*

Arsenic mitigation in Miapur did not have a grassroots orientation. No activity was led by the community members themselves. Rather than facilitators, outsiders such as TSDS were initiators and provided change and action towards development. TSDS and the community of Miapur need to reconsider this vertical relationship of provider and recipient. The relationship should become a partnership. In order for that to occur, there must be an actor of change to facilitate action at the grassroots level. Ideally, TSDS should become such a facilitator since it has been working in the community for a long time.

#### *Assets-based*

The reason TSDS did not facilitate a grassroots level of arsenic mitigation actions could be that they were not fully aware of the assets that were at their disposal; the people. Such assets ought to be identified as well as the needs. Since they were neither identified nor used, they could not improve. TSDS should start building their activities around the arsenic affected people's assets, not just their needs. Thus, the people can become more self-aware, confident, and ultimately, independent.

#### *Democratic*

Arsenic mitigation in Miapur was not very democratic. The local government only played a marginal role. It did not give those affected by the arsenic; people from the poor rural population of Bangladesh, an active sense that they could use their democratic rights. In order to ensure an integrated approach, local government needs to be more involved than it has been so far. TSDS, local government bodies, and the community of Miapur should work jointly and in a coordinated fashion on arsenic mitigation in the village. The community members need to be aware of and encouraged to use their rights as citizens and to participate in democratic processes.

Successful community development activities lead to:

#### *Awareness*

Community development generates a form of awareness when people become aware of themselves, of their needs and their assets. TSDS successfully generated awareness of arsenic contamination in Miapur. However, the organization failed to support the self-awareness of the local people. To develop this kind of awareness, TSDS should apply an assets-based and democratic approach, facilitating the full use of the people's potential.

#### *Further development*

Community development projects often trigger further activities which in turn lead to further development. Yet this was not the case with the arsenic mitigation in Miapur.



However, if TSDS follows the role of a facilitator, builds on the locals' assets and shares leadership, such development will be achieved.

### *Demonstration effect*

If TSDS applies the features and principles of community development, their arsenic mitigation projects can achieve success and broadcast their effects over a wide area. The projects will not only have physical results, but also psychological benefits. The locals will be able to see what they are capable of as well as the value of cooperation. Such projects may spark other activities and initiatives elsewhere and serve as examples of good practice.

### *Learning*

Learning was part of the arsenic mitigation projects. The people of Miapur gained a certain degree of skill regarding the maintenance of safe water resources. They had the opportunity to develop their management skills through VDC. They also gained knowledge about arsenic contamination and water and sanitation. Yet the learning part lacked multidimensionality, conceptuality, and the active role of the people. In the next project it is important that the local people's learning is facilitated in a strategic manner, with their active involvement.

### *Community building*

On one hand, the arsenic mitigation work strengthened the Miapur community, particularly on a practical level. It provided the locals with the safe water and sanitation infrastructure which are essential for their lives, as well as for their dignity. On the other hand, to build the community fully, TSDS needs to enhance leadership and institution building in the community through capacity building, collaboration and the sharing of leadership responsibilities. Thus, the community will become truly self-reliant and sustainable.

## **Ethical principles**

### *Human orientation*

TSDS focused more on basic needs, such as the lack of safe water, rather than on abstract needs such as self-reliance. Although the latter are equally as important as the former. Therefore the organization should pay more attention to these abstract needs, even though they might not be formulated directly. However, the lack of awareness of people's abstract needs was compensated for by the human approach TSDS has towards the Miapur community. It is an example of good practice which should be followed further.

### *Participation and empowerment*

People should participate in all aspects of community development projects. TSDS only partially involved the local people in the project's management. To bring about community development, the capacities of TSDS's members and the whole community need to be built. For that to occur, participation and community engagement at the highest levels are necessary.

One of the primary roles of community development is to empower people;□□to give them the power and the right to make decisions while supporting them with the necessary knowledge and skills to make good decision-making possible. TSDS partly managed this in the Miapur community through the VDC activities. But the committee did not reach its full potential. TSDS needs to facilitate a process of self-awareness and capacity building, leading to a sustainable and self-reliant community. In a radical view, participation leads to equity. It gives the community members the power to fulfil their rights as democratic citizens. It is a question of how much this can be achieved in a local context.

### *Ownership*

The lack of ownership may have been one reason the community members did not initiate or self-manage any actions. A sense of ownership and commitment are essential for successful community development. To ensure these, TSDS needs to apply the principle of participation.

### *Sustainability*

In the environmental sense, the existing activities in Miapur were as sustainable as possible in the local context. It was a small project, using local sources and technologies. In the sense of self-dependence, the community did not achieve sustainability. The initiatives such as VDC and the amendments to alternative water sources did not happen without TSDS's direct intervention.

The quality of the environment and its protection is very low in Bangladesh. There are no waste and wastewater treatment systems available. There is a great lack of awareness; no legal provisions exist and there is no progress in this area.

### *Release*

Arsenic mitigation in the Miapur community did not release the local people from the deprivation trap of poverty because that was not its goal. TSDS alleviated the effects of arsenic contamination but did not aspire for more. It is up to TSDS whether or not they pursue a more integrated approach in the future, which would lead to the community's sustainability, and possibly even its release from the deprivation trap.

### **Practical principles**

One remarkable aspect of TSDS's work is that at all times its staff behaved as humanely as possible. The people affected by arsenic did not just become numbers or items in a prescribed framework. Naturally, using common sense and a sympathetic approach, TSDS applied the practical principles of community development: learning, compassion, adaptability and simplicity. 72

Since the principles were followed naturally, they lacked conceptuality. In order to achieve the best results, the principles should become part of the organization's strategic planning, guiding their activities in the field. TSDS should particularly focus on develop-

ing the learning part of their projects, not just for its staff but also for the community members. TSDS works flexibly according to the changing needs of a community, yet developing adaptability in the sense of creativity and innovation would enhance its work. Finally, the NGO can serve as an example for other organizations and institutions in the way they practise compassion and simplicity in their field work.

Community development initiatives include certain features that lead to the development of sustainable communities and release those communities from the deprivation trap. Ideally, TSDS should identify all the features of arsenic mitigation and address them in an *integrated approach*<sup>8</sup>, such as involving the people affected by arsenic in the microcredit program that was running in the village (Expert 1, personal communication, June 10, 2013). Also, a joint plan of action with local government bodies and other relevant stakeholders should be developed and implemented. Arsenic mitigation carried out by TSDS involved *collective action*, particularly in the form of VDCs. These actions ceased and the recipients did not try to continue with them, nor were they encouraged to do so by the providers. TSDS needs to involve the recipients more in the management of arsenic mitigation projects.

## Discussion

This study is one of the first evaluations of TSDS's projects. It is the first study to evaluate the arsenic mitigation work of TSDS from the perspective of the recipients. The only other study concerning arsenic mitigation in the village of Miapur was done by Nahar et al. (2008). Their research was aimed at the health and socio-economic effects of arsenic contamination of groundwater. The authors reached similar conclusions to this study: "All respondents were aware of the arsenic problem in the groundwater. Nearly all the respondents enjoyed the facility of having a water source (tube well) within their home arena". Moreover, their survey "identified a marked absence of discrimination and neglect in behaviour toward arsenic victims", which is contradictory to the usual norms in Bangladesh.

This study has its limitations. First, the evaluation was conducted at an unfavourable time, which prevented the maximum level of participation<sup>9</sup>. Second, there were significant cultural and language barriers. Finally, the interviews were limited because of bias and assumptions on both sides; on the author's side as an evaluator and on the local people's side as the respondents. Since this is the first evaluation that has dealt with the arsenic mitigation activities of TSDS, there is a great deal more to study. The next evaluations could be done on a larger scale with long-term engagement on the site and a wider sample. The inquiries could be carried out in collaboration with the community members at the highest level of the participation ladder and thus contribute to the development of the community. There is also room for the use of quantitative research methods. Thematically, it would be interesting to further examine the differences between the providers' and the recipients' perspectives, especially in terms of their values and principles.

## Summary

Arsenic contamination of groundwater in Bangladesh has vast socioeconomic effects that are interlinked, and can easily be overlooked because they have occurred over a long-time period. There have been plenty of arsenic mitigation initiatives in Bangladesh, and they have involved a number of different stakeholders. Arsenic mitigation usually consists of screening, patient identification and treatment, awareness-raising, and the provision of alternative safe water sources. Few of the initiatives used community development practices.

This evaluation study qualitatively assessed the arsenic mitigation work of the Thanapara Swallows Development Society, a local non-government organization, from the perspective of the recipients, using the Sustainable Livelihoods Framework. The evaluation findings were transformed into recommendations in terms of community development. The study aims to influence the decision-making processes of the TSDS organisation.

The arsenic mitigation projects implemented by the Thanapara Swallows in the community of Miapur were successful in terms of mitigating arsenic contamination to a minimum level. The recipients perceived the organization's work as satisfactory, helpful and an improvement on the past. The organization is an example of good practice in following the practical principles of community development: learning, compassion, adaptability, and simplicity. However, there is a lot to be done in terms of community development. The distribution of power in the existing chain of aid-providers should be balanced towards the members of the community. It is necessary to build the capacities and self-awareness of the community members, while supporting and involving them in all stages of aid. The whole process needs to be done conceptually, within the strategic planning of the organization. Thus, the community can become empowered, sustainable and self-reliant.

## References

- Ahmed, K. M. (2005). Management of the groundwater arsenic disaster in Bangladesh. In Chandrasekharam, D., Bundschuh, J., & Bhattacharya, B. (Eds.), *Natural Arsenic in Groundwater: Occurrence, Remediation and Management: Proceedings of the Pre-Congress Workshop Natural Arsenic in Groundwater* (pp. 283-296). London: Taylor & Francis Group.
- British Geological Survey and Department of Public Health Engineering. (2001). *Arsenic Contamination of Groundwater in Bangladesh*. (Kinniburgh, D. G. & Smedley, P. L., Eds.) (British Geological Survey Technical Report WC/00/19.). Keyworth: British Geological Survey. Retrieved from <http://www.bgs.ac.uk/research/groundwater/health/arsenic/Bangladesh/reports.html>
- Bryson, J. M. (2004). What to do when stakeholders matter: Stakeholders Identification and Analysis Techniques. *Public Management Review*, 6(1), 21–53. Retrieved from <http://www.landf.co.uk/journals>
- Chambers, R. (2006). Participatory Mapping and Geographical Information Systems: Whose Map? Who is empowered and disempowered? Who gains and who loses? *The Electronic Journal on Information Systems in Developing Countries*, 25(2), 1–11.
- Cox, D., & Pawar, M. S. (2006). *International Social Work: Issues, Strategies, and Programs*. SAGE.
- de Boer, F. & Swanepoel, H. (2011). *Community Development: Breaking the cycle of poverty*. South Africa: Juta.

- Department for International Development (DFID). (1999). Sustainable Livelihoods Guidance Sheets. Retrieved from <http://www.eldis.org/vfile/upload/1/document/0901/section2.pdf>
- Disman, M. (2002). *Jak se vyrábí sociologická znalost*. Praha: Karolinum.
- Department of Public Health Engineering. (n.d.). Arsenic Contamination and Mitigation in Bangladesh. Department of Public Health Engineering. Retrieved February 28, 2014 from [http://www.dphe.gov.bd/index.php?option=com\\_content&view=article&id=96&Itemid=104](http://www.dphe.gov.bd/index.php?option=com_content&view=article&id=96&Itemid=104)
- Food Agriculture Organization, United Nations International Children's Emergency Fund, World Health Organization, & Water Sanitation Program. (2010). Towards an Arsenic Safe Environment in Bangladesh. Retrieved from [http://www.unicef.org/bangladesh/Towards\\_an\\_arsenic\\_safe\\_enviro\\_summary\(english\)\\_22Mar2010.pdf](http://www.unicef.org/bangladesh/Towards_an_arsenic_safe_enviro_summary(english)_22Mar2010.pdf)
- Gilbert, S. G. (2012). *A Small Dose of Toxicology. The Health Effects of Common Chemicals* (2nd ed.). Healthy World Press. Retrieved from <http://www.toxipedia.org/display/hwt/A+Small+Dose+of+Toxicology%2C+2nd+Edition>
- GLOPP. (2008). DFID's Sustainable Livelihoods Approach and its Framework. Retrieved from [http://www.glopp.ch/B7/en/multimedia/B7\\_1\\_pdf2.pdf](http://www.glopp.ch/B7/en/multimedia/B7_1_pdf2.pdf)
- Government of Bangladesh. Ministry of Planning. Statistics and Informatics Division (2011). Population and Housing Census 2011: Bangladesh at a glance. Retrieved from <http://www.sid.gov.bd/wp-content/uploads/2013/01/BANGLADESH-at-a-glance-Census-2011.pdf>
- Guba, E. G. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. *ECTJ*, 29(2), 75–91. doi:10.1007/BF02766777
- Hanchett, S., Nahar, Q., van Agthoven, A., Geers, C., & Rezvi, Md. F. J. (2002). Increasing awareness of arsenic in Bangladesh: lessons from a public education programme. *Health Policy and Planning*, 17(4), 393–401. Retrieved from <http://heapol.oxfordjournals.org/content/17/4/393.full.pdf>
- Hossain, M., Islam, M. A., Gani, M. O., & Karim, M. A. (2005). Arsenic contamination in drinking water of tube wells in Bangladesh: statistical analysis and associated factors. In *Natural Arsenic in Groundwater: Occurrence, Remediation and Management* (pp. 163–172). Taylor & Francis Group.
- Islam, M. N., & Uddin, Md. N. (2002). Hydrogeology and Arsenic Contamination in Bangladesh. In *International Workshop on Arsenic Mitigation in Bangladesh* (pp. 1–67). Dhaka: Government of Bangladesh. The Local Government Division, Ministry of Local Government, Rural Development & Cooperatives.
- Jiang, J.-Q., Ashekuzzaman, S. M., Jiang, A., Sharifuzzaman, S. M., & Chowdhury, S. R. (2013). Arsenic Contaminated Groundwater and Its Treatment Options in Bangladesh. *International Journal of Environmental Research and Public Health*, 2013(10), 18–46. doi:10.3390/ijerph10010018
- Milton, A. H., Hore, S. K., Hossain, M. Z., & Rahman, M. (2012). Bangladesh arsenic mitigation programs: lessons from the past. *Emerging Health Threats*, 5(7269). Retrieved from <http://dx.doi.org/10.3402/ehth.v5i0.7269>
- Moinuddin, M. (2004). *Drinking Death in Groundwater: Arsenic Contamination as a Threat to Water Security for Bangladesh*. Retrieved from Arms Control, Disarmament, and International Security at the University of Illinois at Urbana-Champaign website <http://acdis.illinois.edu/assets/documents/251/DrinkingDeathinGroundwaterArsenicContaminationasaThreattoWaterSecurityforBangladesh>.
- Nahar, N., Hossain, F., & Hossain, M. D. (2008). Health and Socioeconomic Effects of Groundwater Arsenic Contamination in Rural Bangladesh: New Evidence from Field Surveys. *Journal of Environmental Health*, 70(9), 42–47.
- Patton, M. Q. (2003). Qualitative Evaluation Checklist. Evaluation Checklist Project. Retrieved from [www.wmich.edu/evalctr/checklists](http://www.wmich.edu/evalctr/checklists)
- Smith, A. H., Lingas, E. O., & Rahman, M. (2000). Contamination of drinking-water by arsenic in Bangladesh: a public health emergency. *Bulletin of the World Health Organization*, 78(9).
- Stoesz, D., Guzzetta, C., & Lusk, M. W. (1999). *International Development*. Boston: Allyn and Bacon.



United Nations International Children's Emergency Fund. (2008). Arsenic Mitigation in Bangladesh. Retrieved from <http://www.unicef.org/bangladesh/Arsenic.pdf>

World Health Organization. (2012). Arsenic (Fact sheet No. 372). Retrieved from <http://www.who.int/mediacentre/factsheets/fs372/en/>

## Notes

<sup>1</sup> One of the big development successes in Bangladesh achieved mainly due to Western donor driven activities since the 1970s.

<sup>2</sup> The capital city of Dhaka, although almost entirely dependent on groundwater (Ahmed, 2005, p. 286), has a more or less arsenic-free water supply (Moinuddin, 2004, p. 8).

<sup>3</sup> The language and cultural barrier could not be overcome without local translators and facilitators. All aid recipients in Miapur were approached. Taking part in the evaluation was voluntary.

<sup>4</sup> In 2005, according to Nahar, Hossain, and Hossain (2008) Miapur had 1,733 inhabitants. Given the annual population growth of 1.5% in Bangladesh, the population should have been around 2,000 in 2013.

<sup>5</sup> The relationship between income and arsenicosis and the costs of treatment that were often mentioned in the interviews are discussed in the Financial capital section.

<sup>6</sup> The transcribed statements from the group interviews are stated as they were translated from Bangla to English by an interpreter, including the mistakes in English grammar. The third person "they" indicates the respondents.

<sup>7</sup> However, the local girls and women might have problems getting married if they suffer from arsenicosis (F. Hoque, personal communication, August 18, 2013).

<sup>8</sup> Italics indicates a term used in the community development concept by de Beer and Swanepoel (2011).

<sup>9</sup> It was the monsoon season and the holy, fasting months of Ramadan. The monsoon season is characterized by large amounts of rain, high temperatures and humidity. Ramadan is a holy month in Islam when fasting and spiritual contemplation takes place. Muslims do not eat and drink from sunrise to sunset during this month which affects their physical and psychological states.