A Plan for
Developing Tourism around Dantan

Submitted to

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On behalf of Bhatter College, Dantan, by

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Introduction

History of Dantan needs to be rewritten. Many scholars like Haraprasad Sastri, Nagendranath Basu, A. K. Banerjee, B. N. Mukherjee made a number of guesses on Dantan. Long ago Nihar Ranjan Ray clearly identified Dantan with the ancient and medieval province Dandabhukti, the capital of which must have been in a few places of Dantan. For, a number of provincial rulers—sometimes in the status of independent monarch, ruled here and built their settlements. The archaeological remains of those sites are still visible here and there. The entire region of Dantan has yielded large number of ancient artefacts which are still to be studied academically. In fact, Dantan remained a neglected place for a long period—culturally and economically. It is high time now that we reconsider the historical and academic importance of Dantan in a new era of information technology.

Black and Red Ware sites

The present explorer has found two big Black and Red Ware sites at Dantan, which are about 3000 years old. The findings of BRW pottery, buffers ware and pre-wheel pottery substantiates the fact that the human groups from the Chota Nagpur plateau and sub-plateau regions from the Neolithic Period started settling down the river banks and established the culture of Chalcolithic Early Farming, which later on developed as settled culture. The sites contain evidences of continuous settlement from the Post-Harappan through the Vedic to the medieval period. The authenticity of the artefacts were verified by Dr Rajat Sanyal, an archaeologist from the University of Calcutta.

Discovery of Moghalmari Buddhist Monastery

It was Prof. Asok Dutta who—through his intensive research for over a decade and scientific excavation—unearthed a Buddhist Monastery at Moghalmari. The monastery occupies a small area of an entire Buddhist settlement scattered at the Moghalmari village. Many structures are either unexplored or buried beneath the earth. Unearthing them will also open up a new chapter in the history of Bengal.

But Moghalmari is not the only archaeological site here. In fact, the entire region from Raibania (Orissa) through Dantan to Keshiary (even it can be extended to Daintikuri where still stands a pre-Muslim brick-temple) has a glorious history and is rich in archaeological artefacts.

Below are brief descriptions of the possible sites which need to be explored, conserved and developed for tourism.

Satdeulia

Satdeulia, a small village is situated on slightly elevated land at Ektarpur village of Dantan. The place derives its name probably from seven temples or 'Deul'. From the archaeological remains it is clear that the seven temples really existed. The temples are all gone and only seven small ditches exist around a big pond. However, we still could see foundations and debris of massive walls around the village in rectangular shape. It is found in Harrison's report that 2600000 bricks from this place were taken away from this place to make Rajghat Road. He wrote:

> On the occasion of excavating earth to get out bricks and stone for the use of Rajghat Road under construction several magnificent remains of the old buildings have been discovered at Satdeula and Moghalmari, and bricks, and stones, it is estimated have been dug out, numbering about 26 lakhs and some crores yet lie buried under the ground. From these it appears that the above place were once the residence of the ancient Rajas and exceedingly populous".

Some big stone statues have been recovered. One of them is a big life-size statue of some unidentified deity. May be this huge statue was left unfinished or it was deliberately defaced and damaged by some humans. The same is the case with a huge Bhairaba statue, the remains of which are found in parts. Definitely some destruction activity was there and one may relate this to the misdeeds of Kalapaharh. The pond still contains many statues and waits to be unearthed.

Dantan High School Ground

The school ground is situated in a vast elevated land. The present explorer has found huge amount of pottery sherds and stone tools around the ground covering a vast area. The artefacts range from crude Neolithic tools to the early medieval pottery. Like the BRW sites at Urishal and Satbahina Dhipi, it also seems to be a Chalcolithic mound. But so far no BRW evidence has been recovered. This place should be excavated by experts. Besides, this place has a beautiful location and surrounding. It can be developed into a full-fledged modern park and with this active night time of Dantan can also be extended.

Sharashanka

Sharashanka is the largest human-made lake of West Bengal covering an area of nearly 148 acres. Legend has it that it was dug up by King Shashanka and re-excavated by the Odissan King Mukundadeb. But the site has not been fully examined by archaeologists. As per Sri Lalit Mohan Samanta's (a local historian of 1950s) documentation some ancient artefacts were found from this area. The present explorer found pottery sherds dating back to the 8th century. It establishes that the lake was created during the reign of

Shashanka as a hydrological project for fishery and irrigation. Satellite images prove that there might have been a waterway stemming from the eastern bank of Subarnarekha River in the village Bora and passing through the successive villages like Tararui, Moghalmari, Bejda, Kakrajeet, Salikotha before it entered Sarasanka and then finally merges into the sea through the Nimpur waterway. Till the present day the rainy water flows likewise crossing the cultivating lands. But drastically this route has been changed as a result of a massive earthquake of April 1762 as seen in the case of Ganges which also changed its route near Nabadweep.

Sharashanka is significant as a holy place for the Hindus, Muslims and the tribal people. Along with its historical accounts and geographical facts this dighi has its own cultural records too. This enormous lake is sacred to its nearby inhabitants. A village fair, known as 'Pous-Sankranti Mela' is held annually on the auspicious occasion of 'Pous-Sankranti'. On that very day deceased village folk are being cremated on the banks of this lake. A number of Hindu Temples can be seen around the banks of this *dighi*. Interestingly, a

Majhar (shrine) of Peer Laskarganj Deewan is situated in the south-east bank of the lake. Peer sahab's ardent followers believe that he breathed his last on the day before the *Pous Sankranti* and on that particular day he had his solemn burial. There are legends that this 'Pous-Sankranti' mela has been annually held in commemoration of his glowing memory. On the very day of Pous Sankranti Mela this shrine is visited and the Peer is paid a glowing tribute by all of his followers irrespective of Hindus and Muslims.

Manoharpur Rajbari

Within 1 K.M. of the famous monastery an old place named as 'Manoharpur Rajbari' is situated. It is a matter of concern that the old structure will be dilapidated very soon if it is not renovated and preserved. It was established in 19th Century. The vast tanks, Natya Mandir and the palace itself draw the attention of the people. While visiting the site people travel in their mind's eye to the remote past. The place Rajbari is famous for its heritage architecture and it played a big role in the struggle for freedom during the British rule.

Kakrajit

Kakrajit may be called an ancient archaeological site following the old statues recovered from a big pond, Kundu Pukur, nearby. This place, not more than 5 km from the Moghalmari site, must have been culturally connected with the Moghalmari site. Prof. Asok Datta found trace of a Dharmachakra there. Remarkable is the fact that some statues of the Sun God Surya have been recovered from the pond. If we notice the emergence of the Surya cult in the 10-11 century in Orissa, we can understand that these statues were related to that cult and the chronology suggests that the cult came into existence when the Mogholmari Buddhist Monastery was in decline.

Uttarraibarh

The area around Urraraibarh has been suggested to have been the settlement of Shaiva *matha*. The discovery of a massive statue of a Shaivacharya (locally known as Jatadharibaba) attests to the assumption. More facts may come up if proper exploration work is taken up. The place also yielded some Jaina statues like that of Adinatha belonging to the 6th century AD,

Dantan Tower Station

This is a precious piece of heritage. Dantan Tower Station was built for trigonometric calculation before **1852** as part of the *Great Trigonometric Survey*. Now it stands in utter neglect on the southern part of the Vidhadhar tank. If conserved, it can be used for educational purposes for the school students and also for the researchers.

Kurumbera (Gaganeshwar)

"Built in the year 1438-1469 (written in Oriya inscription) during Kapileswar Deb's period, it also has structures built during the Aurangazeb's period by Mohammed Tahir (stone inscription). Despite being a protected monument, under the ASI, there is no data available about this fort. Folk legends believe that the fort was built in a single night, when Ram, Sita visited the place, during their Vanvas….The fort contains a three domed structure over a platform, along with a sacrificial altar. Though the most parts of this fort and its structures are in ruins, the ASI, has taken considerable effort to protect the structures from collapsing by using cement and lime mortar for holding the external pillars. The pillars hold a roofing which is shaped as a flower. The usage of circular pillar to the rear of the left-dome seems interesting. The presence of an inscription stating about its usage is present right behind of the domed structure. Though the script resembles Oriya, locals state that it is not decipherable." from Wikipedia.

Some Temples of Dantan

There are few temples which deserve to be preserved because of their architectural and cultural value. The most important of them Shyamaleshwar Temple (perhaps dating back to the 16th century) is a rare Pirha-Deul of Bengal. Other temples like Jagannath Temple and Chandaneshwar Temple—built in the 19th century in the Odissan Deul structure need equal attention.

Some places around Dantan in Odisha

Raibania

"Raibania fort is a group of ancient forts in Baleswar district, Orissa India. Though three forts have been recorded in the Ain-i-Akbari there are totally four forts found here, 2 of the larger ones are closer to the village Raibania and the other two are closer to the village Phulta (Phulahatta). According to The Balasore Gazetteer the forts were devastated after the Kalapahada invaded Utkala. Post invasion remnants of the forts except Raibania have been utilized for construction by the local Zamindars and villagers of the locality.

Raibania fort complex is located in Laxmannath which is 9 miles (14 km) from Jaleswar and 2 miles (3.2 km) from the river Subarnarekha." [Wikipedia]

The fort is built of laterite stone and in the shape of an irregular pentagon with walls of various dimensions ranging between 2,640ft and 4,950ft. Sir John Beams, the collector of Balasore, who conducted a study in 1872, presumed that the fort was built by Mukunda Dev (1559-68) to protect the north end to prevent constant aggression by the Afghan Sultans ruling in Bengal. However, disputing Beams's ideas several historians have proposed that the fort was built during the reign of Langula Narasingh Dev (1238-1264).

Lakshmannath Rajbari

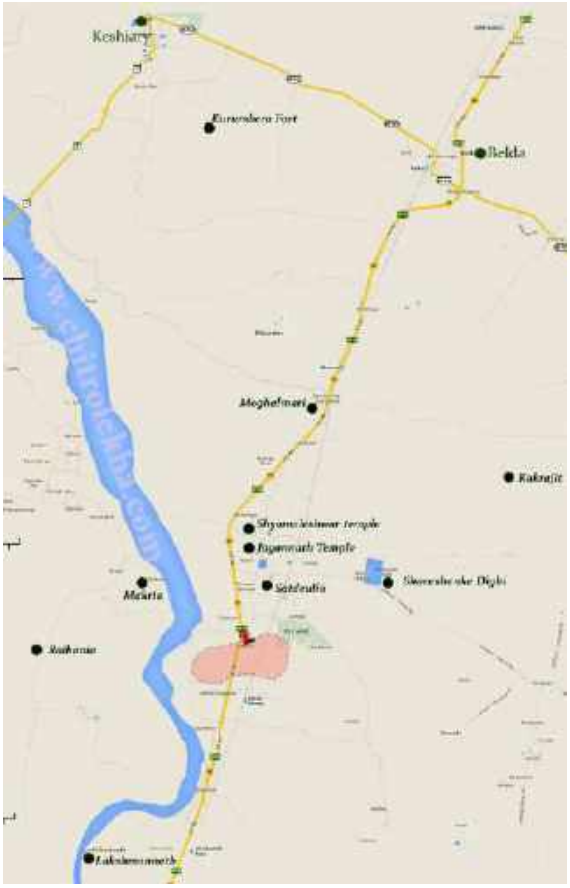
Lakshmannath Rajbari can also be attached to the tourist schedule of Dantan. The palace is unique in having British architecture mixed with the Muslim style.

Makria

Makria is a village situated on the other side of the river Subarnarekha. Its importance lies in its unique production of Tasser silk products. The village must have come into existence many centuries ago when the place around Dantan, including Raibonia Fort and Dantan Port, was in a very prosperous condition.

Steps to be taken for Developing Tourism

1. First of all, an advanced Tourist Lodge and Information Centre and a Museum and a Research Centre need to be built at Moghalmari. The entire building needs to be designed following the structure a Buddhist Stupa (for instance, the Stupa at Dhouli). The building needs to be built near the NH 60 and it will attract the attention of the people. A multi-cuisine restaurant needs to be there for providing food to the tourists.
2. Local youths may be trained for acting as paid guides.
3. The Club right on top of the Moghalmari mound needs to be taken down and shifted to some other place.
4. A well-calculated tourist route needs to be chalked out.
5. The roads leading to the sites need to be newly created or repaired for smooth journey of the tourists.
6. Advanced Nature Camps may be built at Borah or on the northern side of Mahabila near the river Subarnarekha and this would allow both eco-tourism and archaeological tourism.



The Tourist Map

Dandabhukti Museum and Research Centre

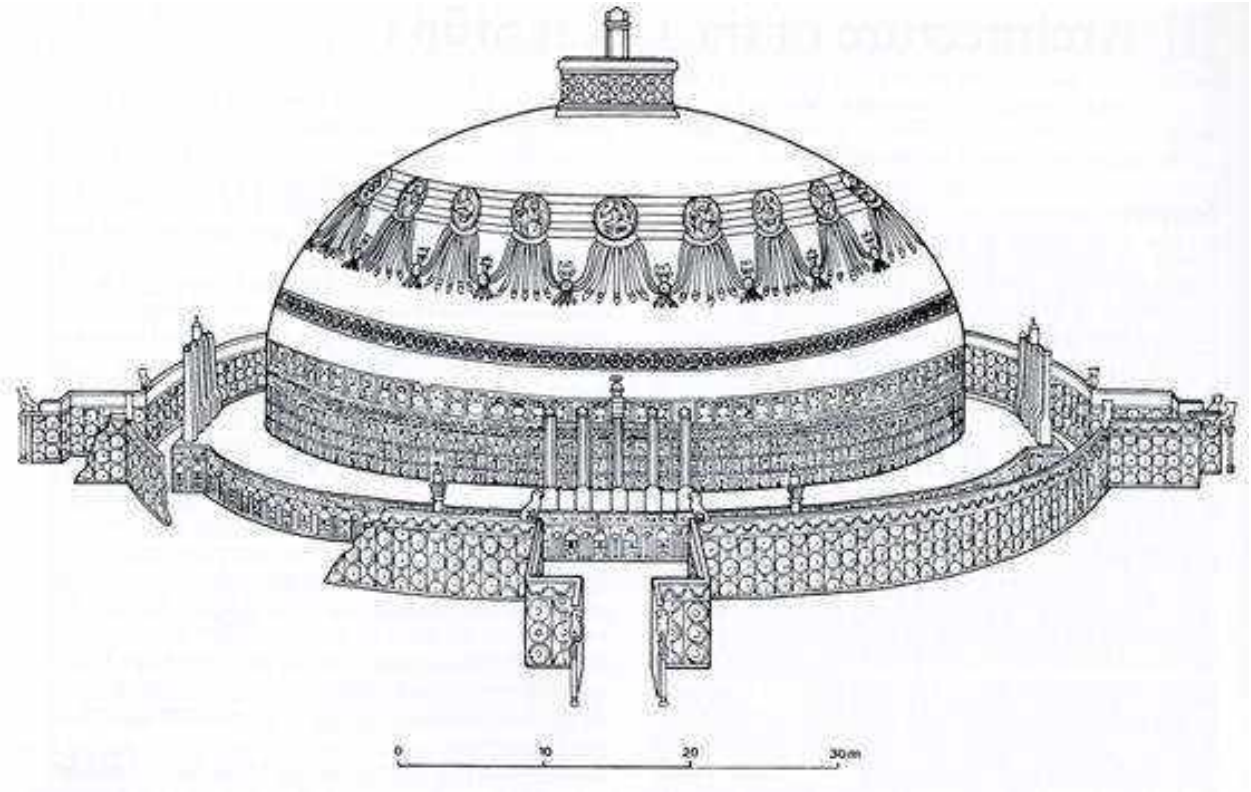
The Museum to be made should be named Dandabhukti Museum following the name of the ancient province of Bengal. This will serve three purposes:

(i) Vast number of artefacts--statues and

seals can be accommodated in one place for viewers and researchers and this will increase the size and variety of the museum;

(ii) The name Dandabhukti prefixed to the museum will add more value to an ancient entity and indirectly add more substance to the tourism possibilities of the place;

(iii) Dandabhukti Museum can serve as a model for other historical and archaeological sites of Bengal.



This picture is illustrative. The design of the Tourist Lodge/ Research Centre can be made in the model of the original design of the Monastery. The present explorer has got the design and can be shared.

Plan for a Historical and Archaeological Research Centre

Thrust Areas for Research:

1. The location of Dandabhukti and its capital has been a matter of long-time controversy. Whereas H.P. Shastri opined for its location in Bihar, Nihar Ranjan Ray located it right at present-day Dantan without any hesitation. Modern research works need to be initiated for determining conclusively whether Dantan was Dandabhukti once upon a time, though archaeological evidences strongly suggest its location at Dantan.
2. Kamboja Pala kings ruled from a capital named Priyangu. A copperplate inscription has been found in Baleshwar, Orissa; and from this some think that the capital might have been there. But the exact location of the place has not been found yet. Since they ruled in or around Dandabhukti, there is a strong possibility that they had their establishment at Dantan, probably at Angua (which got its name from long degeneration of the name 'Priyangu')
3. The vast area of Satdeulia of Dantan needs to be researched upon. The name itself suggests that once seven temples existed there. One can still find extensive brick walls running around the village in rectangular shape and many stone statues have been found from a big pond there.
4. Plans may be taken to re-excavate the pond first for cleaning it and for searching archaeological artefacts.
5. The village Kakrajit seems to be rich in archaeological artefacts. One can find a number of big statues found from the Kundu Pukur nearby. The collection includes a number of elaborate statues of Surya, and from this it may be assumed that once there was a Surya temple there. We know the cult of Surya worship started in Orissa, and so the statues and the lost temple might have been from the 11 to 12 century.

6. The location of Dantan port can be an important task involving multidisciplinary project.
7. The Kurumbera Fort at Gaganeshwar, Kukai, Keshairy has a simple history so far. But the architectural pattern suggests that some big temple might have been there (still some foundations are there) and the entire structure was either a Buddhist or Hindu temple complex.
8. The ground at Kierchand needs proper study.
9. The forts and temples at Nayagram need can be explored academically.
10. The Fort of Raibania needs to be studied as an important defence area of the region.

For all these, holistic multidisciplinary approaches need to be followed, and for this academic institutions, organizations, heritage trusts, government agencies and independent scholars need to come under umbrella projects. All these will contribute to the overall development of the area and enrich our knowledge of the heritage lying in neglect.

Finally, such an advanced multi-purpose research centre can be created at or in collaboration Bhatter College, Dantan.

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Why Tourism in Paschim Medinipur?

The land of Medinipur possesses unique cultural heritage, ethnic richness, eco-diversity and a number of glorious phases of history. All these make the land ideal for creating tourism circuits. Tourism in Paschim Medinipur can directly and indirectly help in utilizing the human, natural and historical resources for

i. Conservation of heritage sites in scientific manner.
ii. Promoting awareness about local history and heritage and thereby helping conservation.
iii. Developing local infrastructure
iv. Creating job opportunities and developing local economy.
v. Promoting advanced researches on the history and heritage of the areas.

What Kind of Tourism Paschim Medinipur Can Offer

Sl.	Type	Area/s	Target Groups
1	*Cultural Tourism*	i. Ghatal: Birsingh	Students
2	*Wild Life and Adventure Toursim*	i. Jungle Mahal: Various sites at Belpahari, Silda, Jhargram, Jambani, Nayagram	Young people, Students, photographers, wild-life lovers
		ii. Garbeta: Gangani	
3	*Eco-tourism*	i. Jungle Mahal: Various sites at Belpahari, Silda, Jhargram, Jambani, Nayagram	Family members, Young people,
		ii. Gopiballabpur: Forest Bungalows at Hatibari, Jhilli dam,	

		iii. Mindapore town: Gopegarh-Gurguripal, the bank of Kansai, Pathra	Students, photographers
		iv. Garbeta: Gangani	
		v. Dantan: Sarasanka lake	
4	*Religious Tourism*	i. Daspur: Temples	Family members, young people, old people, students, photographers, pilgrims
		ii. Chandrakona: Temples	
		iii. Garbeta: Sarbamangala Mandir, Bagri's Krishnarai Jiu Temple, Kameshwar Temple and Radhaballav Temple, Raghunathji Temple, Raghunath Bari, Uriyasaier Temple	
		iv. Midnapore: Temples of Karnagarh, Pathra, Well of the Peer and Akgambuj Masjid(for Muslim pilgrims)	
		v. Kharagpur: Temple of Khargeshwar, ancient Jain temple at Jisar, Manasatala at Jakpur	
		vi. Jhargram: Kanakdurga Temple	
		vii. Keshiary: Temples of Sarbamangala, Gaganeshwar, Kurumbera Fort,	

		viii. Nayagram: Tapoban, Sahasralinga Temple, the Than of Kalua Snarh (for tribal and semi-tribal people) etc	
		ix. Gopiballabpur: Temples famous for its association with Chaitanya-Vaishnavism, Rameswarnath Temple,	
		x. Dantan: Buddhist Monastery of Moghalmari, Shyamaleshwar temple, Chandaneswar Temple and others.	
		xi. Ghatal: Temples	
5	*Archaeological Tourism*	i. Neolithic and Chalcolithic sites in Jungle Mahal	Researchers, historians, archaeologists
		ii. Midnapore: Gopegarh, Pathra, Karnagrah	
		iii. Garhbeta: Gangani and other places (particularly for Jain artefacts)	
		iv. Keshiary: Kurumbera Fort	
		v. Nayagram: Chandrarekha Fort, Khelargarh Fort	
		vi. Dantan: Moghalmari and other sites	

6	*Craft Tourism*	vii. Pingla: Patachitra of Naya	Folk researchers, art collectors, business persons dealing in handicrafts, enthusiasts, general public
		viii. Ghatal: Handicrafts	
		ix. Sabang: Madur-craft	
		x. Dantan: Iron Craft	

What is the Present State of Affairs?

Tourism in West Bengal has always remained a neglected affair. Again, their conception of Kolkata-is-all did not allow them to look much beyond the state capital. Bengalis clang to certain colonial structures like the Victoria Memorial Hall and the Howrah Bridge as symbols of high culture. Ideologically the Left rulers ignored true Bengali heritage lying about everywhere in West Bengal and even suppressed researches and discussion of heritage sites, particularly the religious structure—be it a temple or a mosque. Only the act of producing silly self-destructive literature was promoted. As a result of their extreme myopia, tourism in Paschim Medinipur did not develop systematically and the heritage sites now demand urgent attention.

The fact is that developing tourism in the district will take time—much more time than one or two years.

Steps to be taken

In order to develop tourism there needs to be chalked out a long-term sustainable plan aiming at the future. The following steps may be taken:

- The district needs to be divided in **certain area-wise circles** keeping in view practical considerations of the demands and convenience of the tourists from inside and outside the district.

- After marking out the circles **basic infrastructure for transport, food and lodging** needs to be built or upgraded.
- At the same time, local **heritage sites and structures need to be conserved** locally with expert help from ASI or other agency.
- For preservation **local groups**, comprising members of local administration, elected people's representative and interest people, need to be created. The groups need to act following the guidelines fixed at the district or state level.
- After face-lifting of the sites, concerted efforts at **creating awareness** about the importance of heritage need to be taken up at the district level.
- At the same time, **publicity campaigns** can be taken up to **attract tourists** right from the Panchayet level to the State level.
- Some **new ideas and plans** need to be taken up in consultation with tourism experts from West Bengal and other states. For instance, the practice of 'Home-stay' with the slogan "Eso amar ghare" can be adopted in the case of eco-tourism.

Identifying the Tourism Circles and Circuits

It is clear from the table 1 that Paschim Medinipur offers mixed bag of attractions and interests to visitors. Depending on this some tourism circles and circuits can be identified for further action:

Sl.	Circles	Tourist Attractions
1	*Daspur*	❖ Gopinath Ekratna temple of the Singhas ❖ Radhagobinda Temple ❖ Brajaraj Kishore temple ❖ Nabaratna Rasmancha, Baliharpur ❖ Laxmi Janardan of the Pal Family

		❖ Temple of Radhakantapur ❖ Pancharatna Temple of Banka Roy, Laoda, ❖ Bhootnath Temple
2	*Ghatal*	❖ Birsing - Birthplace of Ishwar Chandra Vidyasagar ❖ Visalaxmi temple at Barada ❖ Khipteswari temple at Ghatal ❖ Bhasapool, Alamgunj Mosque ❖ Kushpata Satsanga Ashram of Anukul Thakur ❖ Eco park (picnic destination)
3	*Chandrakona*	❖ Ruins of many old temples ❖ Temple of Malleswar ❖ Navaratna temple of Mitrasenpur ❖ Raghunathgarh Rekha Deul ❖ Chandrakona Film City ❖ Chandrakona Forest
4	*Midnapore*	❖ Chapaleswar and Mahamaya temples at Karnagarh (place of Chuar Revolt and setting for Bankim Chandra's novel) ❖ Temples of Pathra, ❖ Gopegarh Heritage Park ❖ Gurguripal Forest, ❖ Hindu & Muslim religious structures in the town ❖ bank of the river Kansai

5	*Garhbeta*	❖ Sarbamangala mandir ❖ Gangani-danga ❖ Raikota Fort ❖ Bagri's Krishnarai Jiu Temple ❖ Kameshwar Temple and Radhaballav Temple ❖ Raghunathji Temple ❖ Raghunath Bari ❖ Uriyasaier Temple, ❖ Jhalda Fort ❖ Nayabasat
6	*Goaltore*	❖ Gohaldanga Forest ❖ Temple of Sanaka,
7	*Lalgarh*	❖ Forest life ❖ Radhamohan Jorh-Bangla Temple ❖ Dalan Temple ❖ Sarbamangala Temple
8	*Binpur*	❖ Forest life ❖ Pre-Muslim Temple at Daintikuri
9	*Jhargram*	❖ Jhargram Palace ❖ Deer Park ❖ Sabitri Temple ❖ Rabindra Park

		❖ Chilkigarh Raj Palace ❖ Kanak Durga Temple ❖ Jungle Mahal ❖ Medical Plants Garden (Kalaboni) ❖ Dherua (for the banks of Kansai river) ❖ Sevayatan, known for its beauty of Kechenda Bandh (lake) & surrounding forests. ❖ Tribal Museum ❖ Alampur ❖ Kendua (to see migrating birds) ❖ Kakrajhore Forest ❖ Ketki Falls ❖ Rohini: This is a historical village situated in the bank of Subarnarekha River. ❖ Birthplace of famous Vaishnav saint Rashikanandaji Maharaj. ❖ Gidhni Annukul Ashram ❖ Pukuria Bharat Sevashram Sangha
10	*Belpahari*	❖ Ghagra Water falls ❖ Gurrasini, Kakrajhor ❖ The Hills of Kanaisor ❖ The Spring at Ketki ❖ The Laljal Mountains, Orgnonda, Tarafeni
11	*Silda*	❖ Some temples

		❖ Forest ❖ some prehistoric archaeological sites
12	*Lodhasuli*	❖ Forest
13	*Gopiballabpur*	❖ Forest Bungalows at Hatibari ❖ Jhilli dam ❖ Rameswarnath Temple ❖ Temples famous for its association with Chaitanya-Vaishnavism
14	*Nayagram*	❖ Chandrarekha Fort ❖ Khelargarh Fort ❖ Tapoban ❖ Sahasralinga Temple ❖ Than of Kalua Snarh (for tribal and semi-tribal people) etc
15	*Keshiary*	❖ Kurumbera Fort and the Gaganeshwar Temple ❖ Sarbamangala Temple and others ❖ Ruins of Muslim structures
16	*Dantan*	❖ Buddhist Monastery of Moghalmari and the entire village ❖ Ruins at Uttarraibarh, Jatadhari Baba ❖ Shyamaleshwar temple ❖ Chandaneswar Temple ❖ Ruins of Fort ❖ Sarasanka lake ❖ Banks of Subarnareka

Considering the location and time needed for covering the areas in real-time tours, these 15 circles may be brought together under certain circuits:

<table>
<tr><th>Sl.</th><th>Circuits</th><th>Circles</th><th colspan="2">Time (Day/s)</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Ghatal</td><td>Daspur</td><td colspan="2" rowspan="3">One day (if a car is hired for the entire day)
Two days (if some want to spend a night in a forest bunglow)</td></tr>
<tr><td>Ghatal</td></tr>
<tr><td>Chandrakona</td></tr>
<tr><td rowspan="4">2</td><td rowspan="4">Midnapore</td><td>Midnapore</td><td rowspan="4">Two days (spend a night in a forest bunglow)</td><td rowspan="2">Midnapore & Garhbeta (One day if a car is hired for the entire day)</td></tr>
<tr><td>Garhbeta</td></tr>
<tr><td>Goaltore</td><td></td></tr>
<tr><td>Lalgarh</td><td></td></tr>
<tr><td rowspan="5">3</td><td rowspan="5">Jhargram</td><td>Binpur</td><td colspan="2" rowspan="5">Two days (spend a night in a forest bunglow)</td></tr>
<tr><td>Jhargram</td></tr>
<tr><td>Belpahari</td></tr>
<tr><td>Silda</td></tr>
<tr><td>Lodhasuli</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Nayagram</td><td>Gopiballabpur</td><td colspan="2" rowspan="2">One day (if a car is hired for the entire day)
Two days (spend a night in a forest bunglow)</td></tr>
<tr><td>Nayagram</td></tr>
<tr><td>5</td><td>Dantan</td><td>Keshiary</td><td colspan="2">One day (if a car is hired for the entire day)</td></tr>
</table>

		Dantan	

Some of these circuits can be interlinked with other circuits of other districts for attracting more tourists.

Paschim Medinipur Circuits	**Link with Circuits of Other districts**
Ghatal	*Jayrambati, Kamrpukur, Hooghly*
Midnapore	*Bishnupur, Bankura*
Dantan	*Digha, Purba Medinipur*

Creating Awareness and Publicity

Sri Tarapada Santra did stupendous work of surveying the heritage sites of the district and the documentation is available. So there is not much need for field-work for identifying the heritage sites. In our time it is necessary for the people of the district to be aware of our heritage and history and learn to respect and conserve them. At the same time people from outside the district need to be attracted to the richness and beauty of the state. For this strategies for effective publicity need to taken up.

Few suggested steps for generating awareness:

- Booklets be prepared on the tourist sites of Paschim Medinipur and be distributed among teachers of primary, secondary and HS schools and colleges, administrative officers and staff right from Panchayet levels, staff of all govt. and non-govt offices, clubs and other organizations for a charge.
- Special awareness campaigns be taken up at different administrative and educational levels.
- People directly involved in tourism like drivers, guides, hotel owners, cooks be trained and sensitized on the matters relating to the development of tourism.

Few suggested steps for publicity:

- Important roadways be marked and hoardings be put up with pictures and instructions to reach a nearby tourist place, thereby both informing about and inviting passerby to the local spot.
- A website dedicated only to tourism in Paschim Medinipur be created for providing information and displaying photographs of the places.
- Booklets on tourist spots of the entire district be made available for purchase to tourists from all the tourist spots.

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Multifunctional Use of the Sharashanka Lake in Dantan, India

Creating benefits for the ecosystem of the Sharashanka Lake and the local people

Multifunctional Use of the Sharashanka Lake in Dantan, India

Creating benefits for the ecosystem of the Sharashanka Lake and the local people

Master's thesis

Gottfried Wilhelm Leibniz University Hanover

Faculty for Architecture and Landscape

Institute of Environmental Planning

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Once upon a time, the King Shashanka and his mother were going on a long journey. As it was an exhausting travel, they needed to take rest on their way. In the small village they were passing, they sat under a large tree which afforded them cooling shade. The news of their arrival quickly spread and the village people came to welcome them. The mother, who was a warm-hearted person, noticed with regret that the people were very poor and had nothing to eat. "Why don't you have enough food growing on your fields?" she asked. The villagers replied: "There is no water to irrigate our crops. Everything dried out. Can't you help us?" The mother of the King understood that during rabi[1] season, water was a rare gift and she asked the King Shashanka for help: "Can't you build a basin to store the rainwater from kharif season?" The King knew that such a basin was of much work and denied his mothers request at first. But as she insisted and because he loved her, he gave in and agreed to excavate a lake for water storage. The King then took his bow and his biggest arrow and shot it as far as he could. "From here to where the arrow landed, the lake will be built!" With the help from all the villagers, it took the King three years to excavate the lake. But after that, the village people never had to suffer from water scarcity again.

(Oral tradition from the local people living around the Sharashanka Lake)

[1] *Rabi* season is the winter and dry season in India and *kharif* season means the summer and monsoon period.

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At this point, I want to thank all the people who supported me throughout my thesis and who contributed to the success of the study. First of all I want to thank my supervisors PD Dr. Sylvia Herrmann and Dr. Daniela Kempa for their informed advice. My special gratitude goes to all the people who agreed to get interviewed: the villagers around the Sharashanka Lake as well as the experts. I would also like to show my appreciation to the Bhatter College Dantan and the Indian Institute of Technology, Kharagpur, without whom the implementation and organisation of the interviews, the World Café and the lake visits would have hardly been possible. Last thanks go to the students who were with me in India and supported my work on the site and back in Europe.

Abstract

In West Bengal, India, agrarian reforms are crucial for many regions, as agriculture is often difficult through water scarcity in-between monsoon seasons. Near Dantan, the 48 ha big Sharashanka Lake was excavated to store rain water for dry seasons. Today, the lake has silted up and eutrophication deteriorates the water quality. The government of West Bengal has consequently developed a restoration plan. However, the plan does not foresee long-term solutions to prevent the lake from degradation and barely respects social and ecological aspects of sustainability. In response, this study aims at proposing a multifunctional use concept, considering an ecologically sustainable use and an integrated development approach. Through interviews with the local people first findings about the lake degradation, the working life of the people and their interest in the lake were depicted. In a next step important aspects were deepened in a World Café dialogue, before being commented by three experts. Different user groups/usage options were identified and the comparison of their respective demands led to the identification of possible conflicts. The different user groups/usage options were spatially allocated at the lake and their respective roles foresee balancing the demands. Farmers play a crucial role for the environmental stability of the lake, therefore changes in conventional rice farming practices, as well as landscape planning measures are proposed. Main obstacles for the concept could arise through politics, administrative proceedings and non-respect of the local people towards the concept. Furthermore, new conflicts could develop after the implementation of the concept. However, a high willingness of the people to participate in the development of the lake was perceived and with proper monitoring new conflicts could be treated early.

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1 Background

The subject of this study is the Sharashanka Lake, which lies in the Indian state of West Bengal. The background of the study and regional factors defining the background are described in this chapter.

1.1 Social, economic and ecological factors of West Bengal

In India, a country with a population of 1.3 billion (PLANNING COMMISSION, 2013: 1), about 30 % of the people live below the poverty line (MINISTRY OF RURAL DEVELOPMENT, n.y.: V). As 80 % of these people live in rural areas, the Ministry of Rural Development of India aims at decreasing social imbalances and improving the quality of life in rural areas by increasing livelihood opportunities and developing infrastructure for economic growth (ibid.).

Fig. 1-1: The state of West Bengal in India (ARUN GANESH, 2008: www)

The state of West Bengal lies in the north-east of India on the border to Bangladesh and extends from the Himalayan Mountains in the north to the Bay of Bengal in the south (cf. Fig. 1-1). Nowadays, with about 91,400,000 inhabitants on 88,752 km² (CENSUS OF INDIA, 2011: www) this state counts as the most densely populated one in the country (PLANNING COMMISSION, 2010: 25). In West Bengal, the southern districts are more densely populated than the northern ones, which is strongly related to the immigration from Bangladesh and neighbouring Indian states (PLANNING COMMISSION, 2010: 25). The state's rural population in 2011 was around 68 %, which was less than compared to India in general (CENSUS OF INDIA, 2011a: www). A positive development could be noticed as the number of people living below the poverty line in rural areas of the state decreased from 73.16 % in 1973/1974 to 28.6 % in 2004/05 (PLANNING COMMISSION, 2010: pp 94-95).

From an administrative point of view, the Department of Panchayats[2] and Rural Development is responsible for the needs of the rural population. A major function of the department is to facilitate economic and social development in rural areas through implementation of rural development programmes (DEPARTMENT OF PANCHAYATS AND RURAL DEVELOPMENT, 2013: www). For the period from 2013 to 2014, a sum of 8.8 billion Euros was outlaid for rural development in India (MINISTRY OF RURAL DEVELOPMENT, n.y.: XVI).

These development programmes are often related to agriculture as agriculture is using 60 % of the states' total land area (PLANNING COMMISSION, 2010: 26) and represents the primary occupation of the state's population (GOVERNMENT OF WEST BENGAL, n.d: 25). Since the 1980s, agriculture in West Bengal has experienced a growth in efficiency and production through agrarian reforms (green revolution), which mainly included the inputs of mineral fertilisers (hereinafter referred to as "fertilisers" only), pesticides, high yielding seeds and irrigation facilities (PLANNING COMMISSION, 2010: 39, 47). The most dominating food crop of the state is rice and in 2006/07 16 % of the Indian rice production came from West Bengal (PLANNING COMMISSION, 2010: 43). During the reforms the traditional rice seeds were replaced by high yielding kinds, for example, the seed *Boro*, leading to an expansion of irrigation and to an increased use of mineral fertilisers (PLANNING COMMISSION, 2010: 39, 41).

The green revolution in West Bengal boosted the food production and the economy but also had some negative consequences especially on the environment, above all the "[...] loss of indigenous varieties of seeds of food crops and vegetables, water pollution, groundwater contamination, pest resistance and erosion of biodiversity[...]" (PLANNING COMMISSION, 2010: 146). Water pollution and groundwater contamination can be caused by agricultural run-off when it contains pesticides and fertiliser residues. As fertilisers can increase the amount of nutrients in the water, organisms (like algae) can propagate. These can slow down the water flow, hence increasing the proliferation of organisms and sedimentation (MURTY & KUMAR, 2011: 288).

Negative effects on surface and groundwater get especially problematic in a region with extreme weather conditions, with water scarcity and where agriculture cannot only cause water pollution but also represents the main demander of fresh water (PLANNING COMMISSION, 2010: 148). In the south of West Bengal, life and especially agriculture is strongly influenced by the monsoon season and the climate. In the summer months extreme rainfall and heat dominate the conditions and in winter

[2] The Panchayats is a decentralised rural governance body to involve the local people in the socio-economic development process (WEST BENGAL STATE CENTRE, 2012: www) (cf. Chapter 4)

water scarcity complicates the cultivation. These extreme conditions make water management in agricultural areas a crucial topic.

One way to cope with water scarcity in dry regions is the use of ponds or tanks of various sizes. These can store the water from the monsoon season during the dry winter months. Such a tank is subject to this study and described in the following.

1.2 The degradation of the Sharashanka Lake and its consequences

Near the city of Dantan in southern West Bengal a tank was excavated around 600 AD by the King Shashanka (or Sasanka) to create better water access during periods of drought. The tank is called Sharashanka Lake (or Sarasanka Lake) and measures a surface of 48 ha (WRIDD, 2011: 3). Until today the lake has been of high religious value, due to the famous history of King Shashanka, the local Hindu temple and the myth about the god Krishna, who is said to have died near the lake (WRIDD, 2011: s.p.). For many decades, the lake represented a landmark for its religious value but also because it was a main water source for irrigation and fishing.

Today, the lake is silting up and has become almost dry and is full of slushy soil (cf. Fig. 1-2, Fig. 1-3). The eutrophication is at an advanced state. Like this the people around the lake suffer from water scarcity and the fishermen's livelihood is threatened as fishing is not possible anymore or brings no profit (cf. Fig. 1-4) (ibid.).

Fig. 1-2: Lake Sharashanka

Fig. 1-3: Slushy soil

The scenic beauty of the place has decreased as many migratory birds have not been sighted near the lake in the last years (ibid.). The decrease of birds and fish in number and in their species variety is affecting the overall value of the biodiversity created through the water body.

Fig. 1-4: Small fish

Following the demand of the local people, the government of West Bengal decided to start a project on the excavation and the development of the Sharashanka Lake. A detailed engineering study was made and a project report was presented in 2011-2012 (cf. WRIDD, 2011). While the project does not aim at investigating the causes of the degradation, it intends to excavate the lake and at restoring the three water inlets and the outlet to regain a recharge of water (WRIDD, 2011: 4). Together with a pisciculture plan including artificial hatcheries, this should improve the livelihood of the fishermen. After the excavation, tourism shall be developed and irrigation systems shall be installed supporting further measures for an increased crop production and horticultural diversification (ibid.). Measures will be accompanied by trainings for the local people in technical matters. The estimated final costs for the project are 8,000,000 Euros (WRIDD, 2011: s.p.).

Through the project, conditions for the local people should be improved and the economy should be enhanced in the future. Nevertheless, no measures for the long-term ecological state of Sharashanka Lake are defined in the project. For instance, (migratory) birds are not mentioned. No long-term solutions are proposed to maintain a good water quality and to prevent degradation. However, sustainability in development matters can mainly be achieved by considering environmental as well as economic and social aspects (RAT FÜR NACHHALTIGE ENTWICKLUNG, n.y.: www). The consideration of all three aspects is therefore essential for the further development of the Sharashanka Lake.

2 Objective

In consideration of a sustainable development of the Sharashanka Lake, this study takes a closer look at ecological and socio-economic development aspects. These aspects firstly consider the environmental stability of the lake in terms of a nutrients and a hydrological balance and secondly take into account the needs and the role of the local people for the future development of the lake. The goal of the study is to come up with recommendations for a multifunctional use concept for the Sharashanka Lake region considering an ecologically sustainable use. This should include giving proposals for an integrated development approach, regarding the capacity building of the local people and their involvement in the development of the Sharashanka Lake.

In order to achieve the goal set, the following questions will have to be answered:

1) *How can environmental stability of the lake be maintained, in order to establish a multifunctional use?*
    - *What are the influencing factors for the degradation of the lake?*
    - *How can these factors be treated to prevent a future degradation?*
2) *Which multifunctional use concept is feasible at the lake?*
    - *What are the different user groups of an intact lake system?*
    - *What are their (socio-economic) demands?*
3) *What is the role of the local people in an integrated development approach for the Sharashanka Lake region?*

3 Conceptual framework

To prepare for the investigations made in this study, a research about the **study area** was carried out. The gained information is described in the following **chapter** 4. This includes the geographic, climatic and social factors of the region, as well as information about agriculture and rural development, followed by a description of the Sharashanka Lake.

In order to answer the study questions (cf. Fig. 3-1), a set of **approaches** was applied, which is found in detail in **chapter** 5. The approaches include an initial preparatory research to lay down the basis before starting the research on site. Through personal interviews with the local people around the Sharashanka Lake, the basis information about the region shoul be reduced to specific information about the lake and the people living around. Some aspects collected during the interviews were than deepened with the interviewed people in group dialogues during a World Café. At last the collected information was commented by experts during expert interviews following an open discussion.

The used approaches led to data which give information about the reasons of the lake degradation as well as about the habits and future wishes of the people concerning lake and land use. Furthermore an insight of the administrative and political approaches to the lake problem was recorded. These **results** are listed and described in **chapter** 6.

Further processing of the results was then done by consulting literature, through which **recommendations** (cf. **chapter** 7) for a sustainable multifunctional use of the lake were deduced. The concept respects the demands of the different user groups/usage options and gives proposals about how the local people can be involved in the development of the lake.

Chapter 8 provides a **critical reflection** on the used approaches and in **chapter** 9 the limits of the proposed multifunctional use concept are **discussed**.

Finally a conclusion and an outlook about the study are made in **chapter 10**.

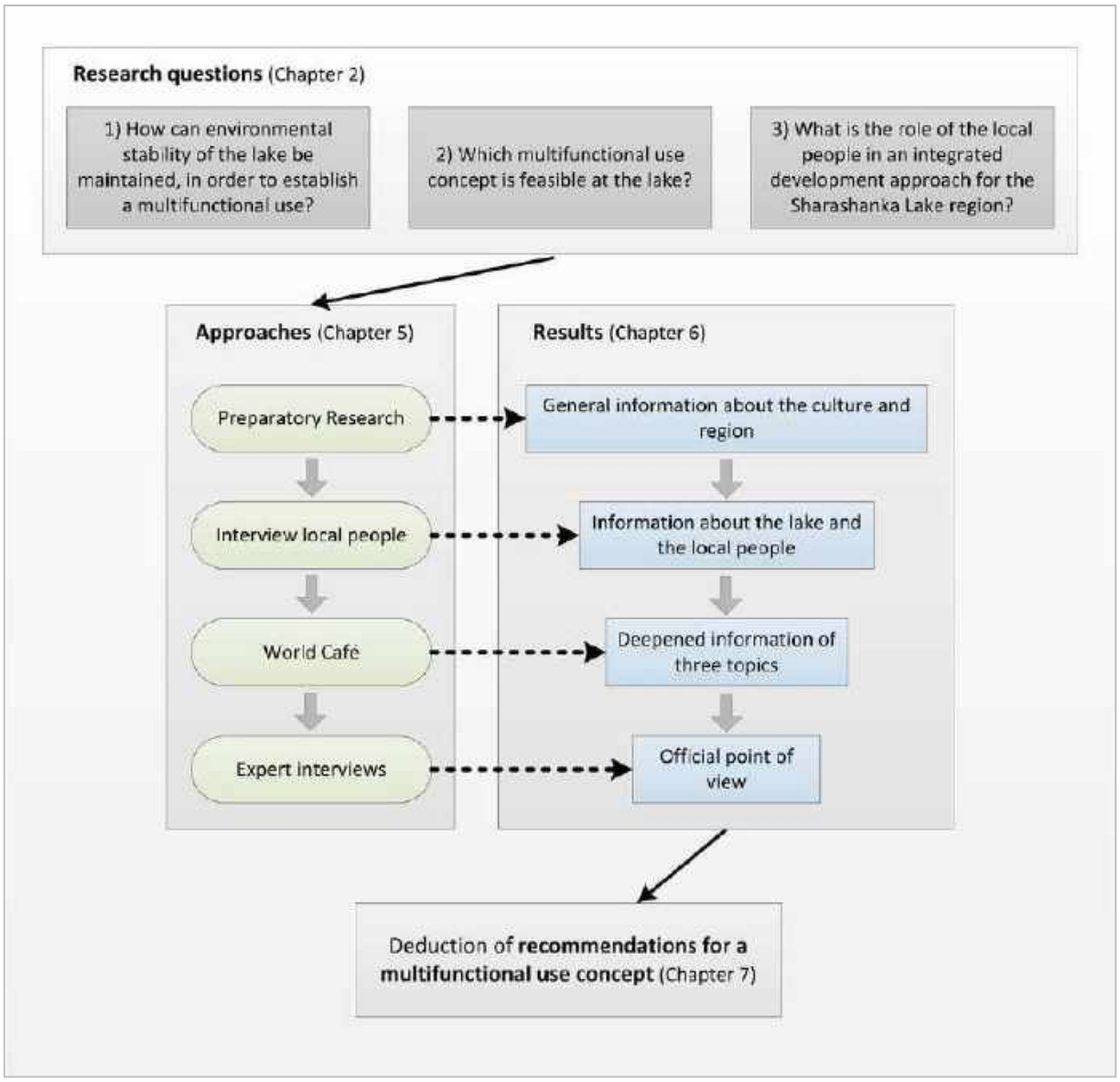

Fig. 3-1: Conceptual framework - Diagram

4 Study Area: Dantan and the Sharashanka Lake

As a preparation for the ongoing study and for the development of suitable approaches, a thorough research about the study area is necessary. Subjects treated include:

- Geographic and climatic factors of the region
- Social factors of the region
- Agriculture
- Rural Development
- The Sharashanka Lake

Fig. 4-1: Administration levels

Geographic and climatic factors of the region

The Sharashanka Lake lies in the administration unit called Dantan I block (hereinafter referred to as “Dantan” only), which is located in the district of Paschim Medinipur, West Bengal (cf. Fig. 4-1). Dantan has an area of about 252 km² (DANTAN-I, n.y.: 1) and the soil is to 100 % an alluvium soil (PMDC, 2012a: www). The slope of the ground falls down to the south-east, which is why all the rivers and the surface water flow are following this direction (PMDC, 2012b: www). There is no forest in Dantan (PMDC, 2012c: www), the area is mostly used by agriculture.

The region’s annual rainfall is about 1600 mm per year and varies from zero millimetres in the winter months (December, January) to about 400 mm during the main monsoon season (August, July) (PMDC, 2012d: www). These raining conditions are accompanied by a minimum temperature of 10 °C in winter and a maximum value of 42 °C in summer (PMDC, 2012e: www) (cf. Fig. 4-2).

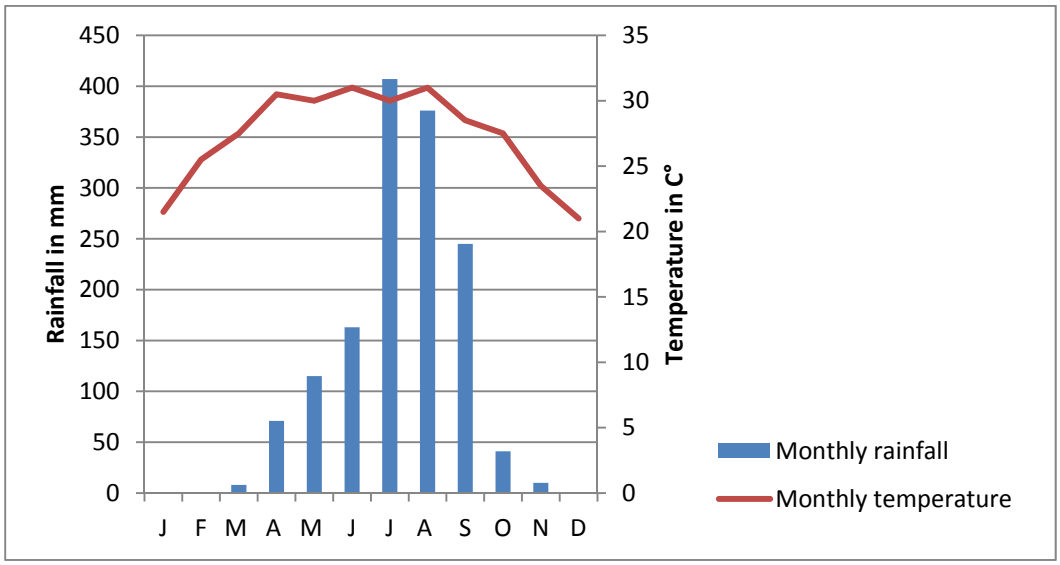

Fig. 4-2: Rainfall and temperature for the year 2006 in Paschim Medinipur
(adapted from: PMDC 2012d: www; PMDC 2012f: www)

Social factors of the region

Dantan's population counts about 172,000 people (2011 census), with males representing 51 %. Of these people around 94,000 are from tribes, minorities or other "backward classes" (DANTAN-I, n.y.: 1), people who still suffer from discrimination in India (MRGI, 2008: www). The literacy rate in Paschim Medinipur was 70.4 % in 2001 (PMDC, 2012e: www), exact values for Dantan are not available.

Agriculture

The main land use type is agriculture with a net cropped area of about 19,000 ha (DANTAN-I, n.y.: 3). The main crops are sugarcane, pulses and paddy rice (PMDC, 2012g: www).

Like in all of West Bengal, the green revolution had its effects on the region (cf. Chapter 1) and nowadays Paschim Medinipur is one of the major *Boro* rice producing districts in the state (PLANNING COMMISSION, 2010: 41).

Rural Development

As mentioned in chapter 1, the Panchayats and Rural Development Department is responsible for the rural development, but it also coordinates and supports the Panchayati Raj Institutions. The Panchayati Raj System aims at involving the local people in socio-economic development processes

and in the implementation of development and planning programmes (DEPARTMENT OF PANCHAYATS AND RURAL DEVELOPMENT, 2013a: www). A Panchayat institution is an elected decentralised rural governance body, consisting of members who can represent communities and who are often treating different thematic issues (PANCHAYATS AND RURAL DEVELOPMENT DEPARTMENT, 2009: 1). Panchayats exist at different administration levels: at district level, there is a *Zilla Parishad*, at block level there is one *Panchayat Samity* per block and the governance at village level is made by the *Gram Panchayats*. In the blocks of Dantan I and Dantan II there were, for example, 16 Gram Panchayats for ~53,000 households in the year 2009 (PMDC, 2012h: www). This system originally evolved from a group of elderly people from villages in ancient India, whose role it was to settle disputes and look after common interests (PANCHAYATS AND RURAL DEVELOPMENT DEPARTMENT, 2009: 6). Today, all poverty alleviation programmes of the Ministry of Rural Development of India and therefore of the Panchayats and Rural Development Department of West Bengal have been assigned to the Panchayat institutions, especially to the Gram Panchayats, because they have better knowledge of local conditions and needs (PANCHAYATS AND RURAL DEVELOPMENT DEPARTMENT, 2009: pp 7-8). The Panchayats and Rural Development Department gives administration support to the Panchayats and through them organises community actions for participatory planning and development (DEPARTMENT OF PANCHAYATS AND RURAL DEVELOPMENT, 2013a: www). They also provide the members with capacity building measures (ibid.).

The intervention of the Panchayats especially takes effect in the implementation of the development programmes. The major ones are, for instance, the *Mahatma Gandhi National Rural Employment Guarantee Programme* (MGNREGA) and the *Swarnjayanti Gram Swarozger Yojana* (SGSY). The MGNREGA is to provide 100 days of guaranteed employment to every household in rural areas in one financial year on condition that one adult member in the household does an unskilled manual work as employment (DEPARTMENT OF PANCHAYATS AND RURAL DEVELOPMENT, 2006: 1). The SGSY is the major self-employment programme of the department. The scheme aims at raising poor families above the poverty line within three years by supporting income generating advantages through bank credits and government subsidies (DEPARTMENT OF PANCHAYATS AND RURAL DEVELOPMENT, 2013b: www).

The Sharashanka Lake

Fig. 4-3: Location of the Sharashanka Lake in the Dantan I Block (adapted from: PMDC, n.y.)

The Sharashanka Lake is the property of the government and lies in the Gram Panchayat of Salikotha. This means that from an administrative point of view Salikotha is responsible for its use and theoretically 3,692 people depend on or are involved in the decisions made about the lake (CENSUS OF INDIA, 2011: www). The lake is well connected to a road system; a main road coming from the village of Dantan leads directly to it (cf. Fig. 4-3). The villages around the lake are not well connected to electricity and running water and most of the people live in houses made by clay and straw.

Fig. 4-4: Pond next to the lake

The lake itself has a total surface of 48 ha and holds a capacity of 1,900,000 m³ (WRIDD, 2011: 3). 37 smaller ponds of which the biggest one has a surface of 6855 m² and the smallest 121 m² (WRIDD, 2011: s.p.) surround the lake and are getting filled with rain water during the monsoon season (cf. Fig. 4-4).

Most of these ponds are still intact. This means that they are not degraded like the Sharashanka Lake and are used for washing, bathing and fishing. There are three inlets around the lake through which water can float in during monsoon season (cf. Fig. 4-6) and one outlet (cf. Fig. 4-5). Contrary to the inlets, the outlet is paved and should function like a weir. The catchment area of the lake covers around five square kilometres (WRIDD, 2011: 3).

Fig. 4-6: Water inlet during dry season

Fig. 4-5: Water outlet during dry season

On the east side of the lake, there is a bigger meadow on which a temple is built, designated to the Goddess Kali. Once a year in February people from all over the region, even from Kolkata and Orissa, come to visit the temple (cf. Fig. 4-7) and to take a holy bath (WRIDD, 2011: s.p.). On the actual number of visitors no information could be found.

Fig. 4-7: Meadow with temple

Figure Fig. 4-8 shows a schematic map of the Sharashanka Lake, in which the previous figures (Fig. 4-3 to 4-5) are located.

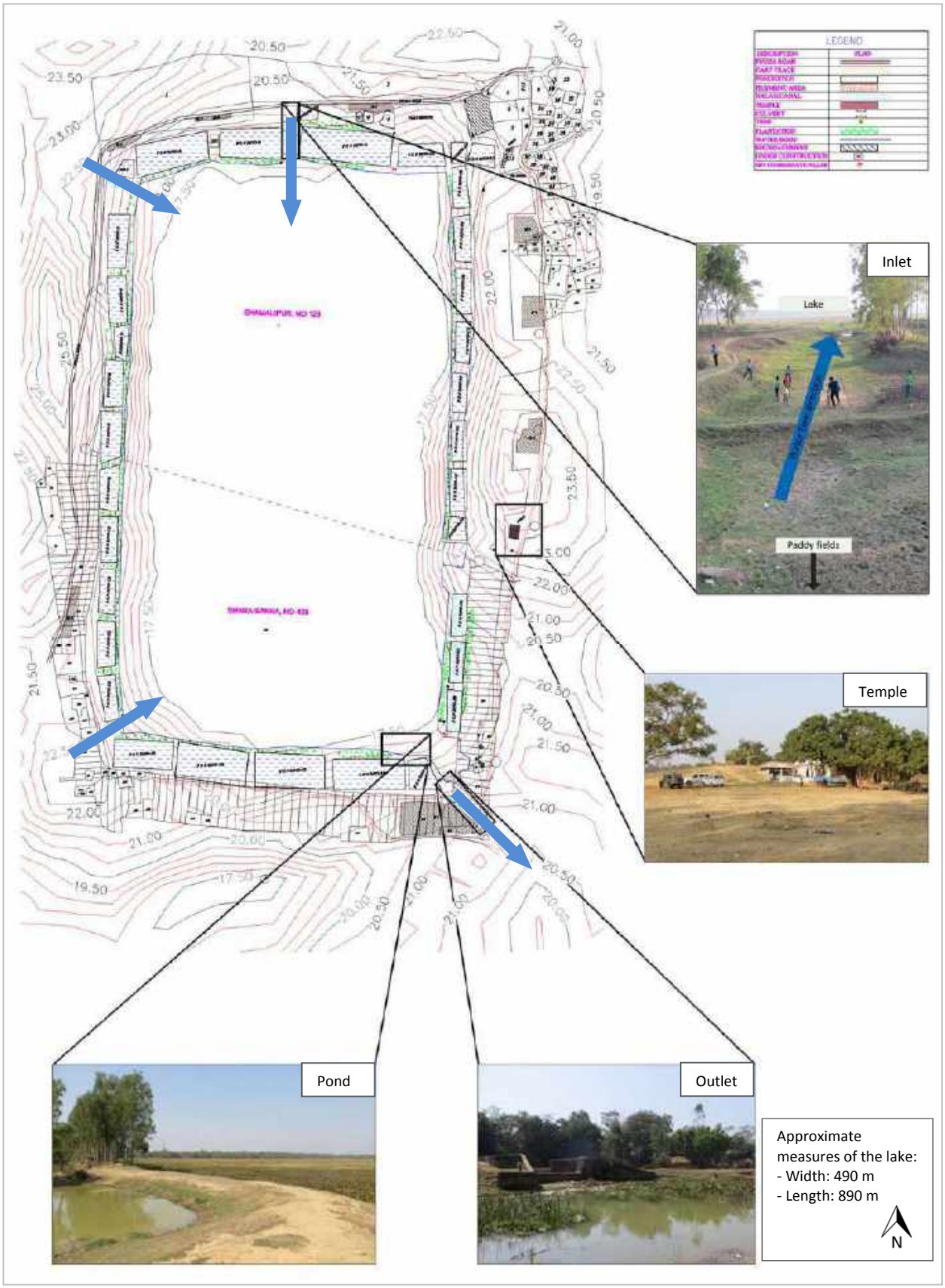

Fig. 4-8: Schematic map of the Sharashanka Lake, with the localisation of figures 4.4 – 4.7

The current state of the degradation mentioned in section 1.2 is shown in the satellite picture of the lake (cf. Fig. 4-9). The picture shows the region of the lake in December using infrared wavelengths. Hereby the vegetation cover is highlighted in red colour. In the picture, the water surface of the Sharashanka Lake appears in a vivid red colour, which consequently means that the lake is covered with vegetation. In comparison the ponds are visible in a dark blue colour, which means they are free of vegetation.

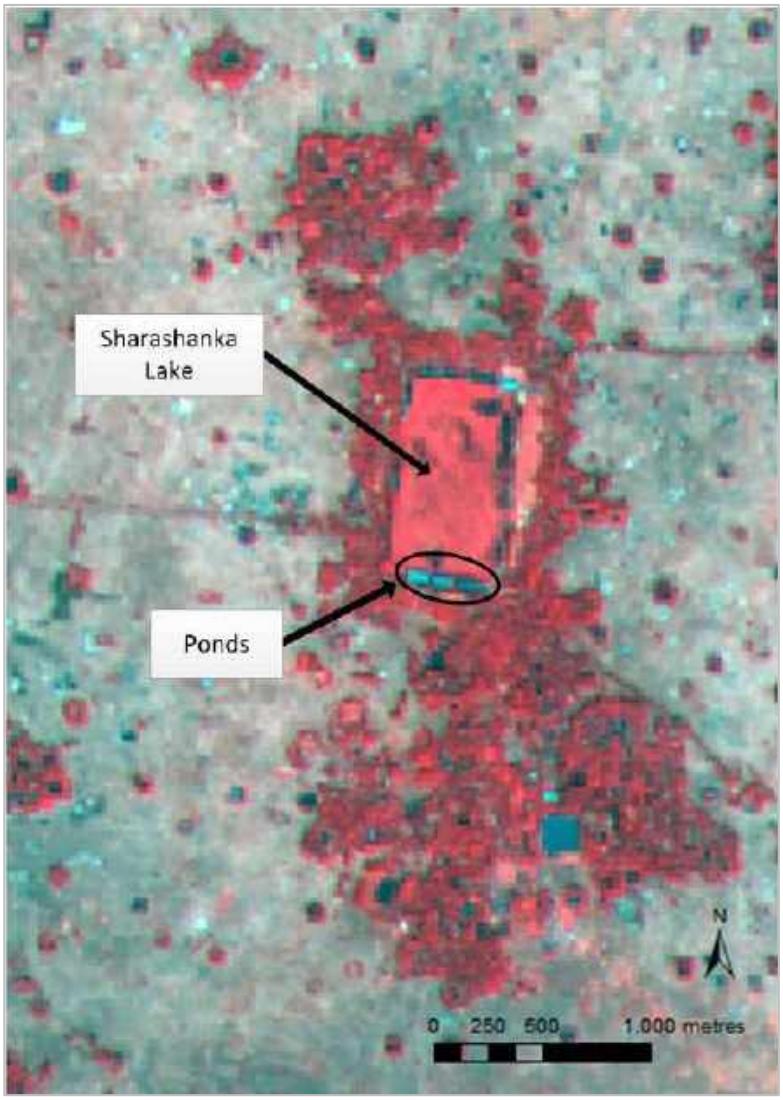

Fig. 4-9: Infrared picture of the Sharashanka Lake in December 2013

5 Approaches

To answer the research questions, a set of approaches was applied. First the approaches include a cross-cultural preparation and an on-site survey. Second, interviews and a World Café with the local people living around the Sharashanka Lake were carried out. Finally three expert interviews were held.

5.1 Cross-cultural preparation and on-site survey

Necessary for this study and for the field trip on site was a preparatory research concerning the Sharashanka Lake and the characteristics of the region of Dantan. The research was done by a group of students, from the Master studies of Environmental Planning from the Leibniz University Hanover. The group prepared a study trip to India for the duration of one week.

Not only did this preparatory research serve to have a well-founded knowledge about the site, which is necessary when talking to locals, but it was also preparing the German students for the Indian culture and the possibility of different planning approaches compared to Europe. Topics given for this research were:

- Methods of rural planning - Are European approaches appropriate for questions in West Bengal?
- Participation of players in rural development
- Restoration of water bodies
- Basic data and use of GIS- based methods in the study area
- Economic, ecological and social characteristics of rural areas in West Bengal
- Cultural characteristics of West Bengal
- Description of Paschim Medinipur und the Dantan Region
- Planning and development strategies and policies in India
- Planning and development strategies and politics in West Bengal and Dantan

(cf. BUENEMANN et al.: 2014)

This research also contributed towards providing information to determine which data should and which should not be collected on site in order to answer the research questions (cf. GLÄSER & LAUDEL, 2009: 76).

A next step in the preparation was an on-site survey and a first contact with the local people living directly around the Sharashanka Lake. With the help and hospitality of both Bhatter College in Dantan, and the Indian Institute of Technology (IIT) in Kharagpur, a visit to the lake was organised. During the visit a meeting with one of the local village leaders was arranged in order to gain an insight into the history of the lake and the relation between the villagers and the lake. In that way the group received a first impression on the local people's opinions and way of living. Additionally, the on-site survey served to build up some confidence towards the European students group (GLÄSER & LAUDEL, 2009: 115). The villagers could get accustomed to the participants and were informed about their objectives, namely the carrying out of research on the Sharashanka Lake. For some of the locals it was the first time to see European people and the meeting also intended to erase some reticence.

The on-site survey also aimed at getting an impression on the ecological state of the lake. Not only should the level of silting up of the lake be captured, but also a rough overview about flora and fauna should be made.

5.2 Interviews with the local people

As there is no scientifically documented form on the history of the Sharashanka Lake, interviews with the local villagers were carried out to get information on their working life as well as their wishes and opinions and both on the past and the present of the ecological state of the lake.

Interviewing method

As the Sharashanka Lake region is located in a remote rural area, the local people rarely if ever come encounter Europeans and might be nervous to get in touch with foreigners. Nevertheless, in order to get as authentic results as possible, the interviewed person has to feel as comfortable as possible, which is why the interview should be made in a natural conversational way (GLÄSER & LAUDEL, 2009: pp 114-115). Therefore a semi-structured interview method was chosen, more precisely, a guideline-based interviewing method with a narrative character (NOHL, 2009: 20; GLÄSER & LAUDEL, 2009: pp 41-42). Semi-structured in this case means that there are

defined questions during the interview, but a set of possible answers is not given; they can be chosen freely (GLÄSER & LAUDEL, 2009: 41). This allows a questioning for precise facts but also for some story telling about more complex matters, involving, for example, emotions, motivations, social relationships and decision-making (GLÄSER & LAUDEL, 2009: 130; BUBER et al., 2009: 362). Furthermore, additional questions can be added spontaneously according to the interest of the interviewer. The guideline-based method was used because different topics had to be treated in one interview (GLÄSER & LAUDEL, 2009: 111). This also meant that the interviewed person could not choose what to tell, but had to follow the guideline questions and take into account the interviewer's interests (NOHL, 2009: 19).

Choice of the interview partners

Chosen interview partners (respondents) should represent typical study cases of local people who are directly or indirectly concerned by the use of the lake. This means that the respondents should represent the study field, in terms of living conditions and life style, in a typical way (GLÄSER & LAUDEL, 2009: 98). The general types of respondents for this study were selected through job and occupation, which were defined by the preparatory research and the on-site survey. The respondents types are defined either as *farmer*, *fisherman* or *small householder*, in which *small householder* represents a person with a mixed occupation because of less land property and not only focussed on a single work activity. The specific people to be interviewed were selected by the village leaders who were in contact with the students and the staff of Bhatter College. The village leaders were asked to respect the three respondent types when choosing the people. The contacting by known people should increase the willingness of the villagers to get interviewed.

The number of people interviewed was not defined but adapted to the time available. Two days were used for the interviews, during which as many interviews as possible were made. Nonetheless a time limit for each interview was not set, but was spontaneously determined, depending on the information gathered.

Interview guideline questions

The guideline questions characterise the information to be raised to answer the research questions (GLÄSER & LAUDEL, 2009: 91) and make it possible to better compare the interviews (MEUSER & NAGEL, 2002: 269). For the different respondent types, two different sets of guideline questions were prepared, depending on the occupation: one for farmers and one for fishermen

(cf. GLÄSER & LAUDEL, 2009: 116). The respondent type small householder was either asked the questions of the farmers or the fishermen, depending on what occupation the person had. In this case the guideline questions were adapted to the occupation during the interview. The first questions of the guideline set should be easily answered by the interviewed person and serve as introductory questions (GLÄSER & LAUDEL, 2009: 147). The next questions have a narrative character and aim at stimulating story telling (ibid.: 116).

The questions asked were adapted to ecology and socio-economic related topics (guideline topics), which are the following:

- Work related questions: performing and processing
- Field inputs
- Past state of the Sharashanka Lake and its degradation
- Future of the lake and personal involvement

The **Work related questions** largely aim at stimulating a free and comfortable interview. Nevertheless, they are also important to get to know what practices are used in agriculture and in fishing. This might lead to conclusions about how practices could be adapted to a multifunctional use.

Under the topic **field inputs** mainly come questions about the use of fertilisers but also about irrigation and pesticides. This is an important topic as it aims at verifying the role of fertilisation in the degradation process of the Sharashanka Lake, because nutrient input, and hence eutrophication, into stretches of water particularly originates from agricultural sources (TMLNU, 2007: 6). Possible local alternatives to mineral fertilisers might be identified and knowledge about the treatment of water in the agricultural practices should lead to conclusions about the role of the lake for irrigation purposes.

As the interviewer was not familiar with the Sharashanka Lake region and its **past state** like the local people are, it is important to give the respondents the opportunity to tell their point of view about the past state and the degradation. The local people know their region best and could give insights to topics only they are acquainted with.

As this study aims at a future and sustainable concept of multifunctional use for the lake, it is necessary to find out about the willingness of the people to be part of such a concept. Their wishes about the **future and their involvement** define the success of the development concept for the lake.

Questions deriving from the guideline topics are the subsequent (cf. Tab. 5-1):

Tab. 5-1: Guideline questions according to the guideline topics

<table>
<tr><th colspan="3">Work related questions: performing and processing</th></tr>
<tr><td>Fishermen</td><td>Small householders</td><td>Farmers</td></tr>
<tr><td colspan="2">What are you working/producing for a living?
Do you have other income possibilities?
Where are you fishing?
How do you fish?
Which fish are you fishing?
Do you sell your products or is it for self-subsistence?
Where do you sell it?
How many people are working on the fields? Family or labourer?
What kind of cultivation do you have for self-subsistence?</td><td>What are you working/producing for a living?
Do you have other income possibilities?
What is the size of your land?
Do you sell your products or is it for self-subsistence?
Where do you sell it?
How many people are working on the fields? Family or labourer?
What kind of cultivation do you have for self-subsistence?
Are you doing a crop rotation on the fields?</td></tr>
<tr><th colspan="3">Field inputs</th></tr>
<tr><td colspan="3">Are you using fertilisers? How much? Which one? How often? How much does is cost?
Are there subsidies from the government for fertilisers?
Do you also use cow dung or straw or compost as fertilisers?
How do you irrigate?
Do you think the mud of the lake could be used as fertilisers?</td></tr>
<tr><th colspan="3">Past state of the Sharashanka Lake and its degradation</th></tr>
<tr><td colspan="3">What was the lake used for in the past and did you use it?
What are the reasons for the degradation (growing of the weed) of the lake?
Tell me about the fishing cooperative.
Which value has the lake today compared to the past?</td></tr>
</table>

Future of the lake and personal involvement
• Would you help cleaning up the lake or work in a government programme to get the original state of the lake back? • What could/should be the future use of the lake? • What do you think about tourism around the lake?

Interview conditions

To arrange the interviews with a natural conversation character and to reduce the expenditure for the interviewed people, all the interviews were made at the homes of the interviewed people. Two to three interviewers participated in the questioning. In general, the main interviewer led through the interview, asked the guideline questions and made further enquiries if necessary, whereas the other ones documented the answers and proposed additional questions to the first interviewer if necessary (GLÄSER & LAUDEL, 2009: pp 154-155).

The documentation of the interview results was made with the help of handwritten notes by all interviewers. This increased the quality of the results (ibid.: 155), as a comparison and combining of the notes was made after finishing the interviews. Handwritten notes were preferred to an audio record because recording could make the interviewed people feel uncomfortable and influence the authenticity of the results by making them hold back information (ibid.: 157). This is especially important when dealing with a different culture and when people are personally involved in the interview topics. Some filtration of the information could already be done during the interviews, which was justified by the interviewer experts' knowledge concerning the research questions.

The interviewed people only speak Bengali, the local language, therefore interpreters were needed. Because of financial reasons, these were people, speaking English, and no skilled interpreter. Interpretation was performed by students of the IIT and Bhatter College as well as teachers of the Bhatter College.

Analysis

To analyse the interview results, all of the information was categorised in the form of a table. Every piece of information (handwritten note) was allocated to one information category. This method of category building and allocation is adapted to the method of qualitative content analysis of GLÄSER & LAUDEL (2009). GLÄSER & LAUDEL (2009: 46) describe the method as a systematic extraction of

information from the raw results through grid analysis. The extracted information is then allocated to categories which define the grid analysis. Like this a basis of information is formed, which only contains information relevant to answer the research questions (ibid.: 200). The categories from this study were built up through the guideline questions which are previous theoretical considerations (GLÄSER & LAUDEL, 2009: 201). During the assignment different categories were added to the list due to the variety of answers. Finally, 25 information categories were defined (cf. Tab. 5-2).

Tab. 5-2: Information categories

	Guideline Topics				
	Work related questions: perfoming and processing	**Field inputs**	**Past state of the Sharashanka Lake and its degradation**	**Future of the lake and personal involvement**	**Others**
Information categories	Income possibilities	Mineral fertilisers	Use of the lake in the past	Future of the lake	Value of the lake
	Other work	Cost and amount of fertilisers	Past state of the lake	Help for restoration	Other facts about the lake
	Size of the land	Fertiliser subsidies	Fishing cooperative		Tourism
	Market or self-subsistence	Organic fertilisers	Reasons for the degradation		Education
	Labourer or family helping	Pesticides			
	Fishing/Farming method	Irrigation			
	Fish species	Mud as fertiliser			

Through this method, it is easy to check for all of the information concerning one specific topic (information category) and deduce an interpretation for further study steps and analysis. Furthermore the different respondents can be compared very exactly to one specific category.

5.3 The World Café

To verify the results from the interviews and to deepen those aspects which are the most important for the study, a World Café with all of the 22 respondents invited was organised. A World Café in

general is a method to host a large collaborative group dialogue (THE WORLD CAFÉ, n.y.: www). The dialogue is held in different groups where each group starts on a different table with a different dialogue topic. After a certain time, the groups change to another table and start discussing the next topic (THE WORLD CAFÉ, 2008: www).

For this study three dialogue topics were determined, each with some guideline questions (cf. Tab. 5-3):

Tab. 5-3: Guideline questions from the World Café

Dialogue 1: Reasons for the degradation of the lake and the growth of weed
• Has there been an investigation into the water and mud quality of the lake? Has there been a change in water quality? • Why is there so much weed in the lake? • Do you see a connection between the land use and the degradation? • How can the lake be kept clean? • Would it be possible to use fewer fertilisers?
Dialogue 2: Possibilities for local people to support the restoration of the lake (together with the Government)
• Under what condition would you help to restore the lake? • Which task could you perform during the restoration? • Would you support the restoration work for a longer period of time (e.g.: many years)? • What should be done with the grass/weed and the mud?
Dialogue 3: Multifunctional use of the lake in the future after the restoration (short- and long-term components)
• What do you expect from the lake in the future? • Which use is the most important one? • How much space should be kept for which use (if the lake would be divided in parts for different uses)?

Through the organisation of the Bhatter College and the village leaders, the World Café was held in the primary school of the village around the Sharashanka Lake. Considering time and distance it was easier for the invited respondents to attend it. The participants were assigned to a table where a

mediator, a German student, was leading the discussion. Each dialogue group had a more or less equal number of people and each group changed the topic together after the time was up. The time for each dialogue phase was set to 15 minutes and the documentation was made in handwritten notes.

The results from all three groups are summarised in clear statements in section 6.3 .

5.4 Expert interviews

To verify some of the results gained through the interviews with the villagers and to get an official point of view of the state of the lake, expert interviews were held. For privacy purposes these people will remain unnamed.

5.4.1 Interview with a local journalist

After the interviews with the local people, an interview with a journalist was made. This aimed at getting a chronological view on the development and the events of the Sharashanka Lake. He is a man who has witnessed the change of the lake for more than 20 years.

5.4.2 Discussion and interview with the administration of Dantan

An open discussion with an administrator of Dantan was carried out. The students and teachers of Bhatter College, official administration employees and some villagers attended the meeting. The meeting aimed at discussing very openly three specific topics:

- Administration units and organisation
- Development programmes and their implementation
- Nature conservation and the Sharashanka Lake

The discussion of the three topics intended to understand the political and administrative framework, making it possible to give recommendations for a multifunctional use concept.

In a next step a personal interview with the administrator took place to deepen previous gained information. The meeting's goal was to get clearer information about:

- A proposal of a **multifunctional use concept:** Is it possible to implement a zoning concept, concerning the opinion of the people and the administrative work? How could it be implemented? How do the departments (of specialist) of the administration of Dantan work together? Do they need incentives? Concerning Panchayats and administration: Who gets allocated to which tasks when the project is being implemented?
- **Tourism**: About the ideas in the official project: Who is responsible for tourism as there is no tourism department? During the fairs, how is the money distributed? Does it go to the Panchayats? What is the cost-benefit ratio for the project?
- **Nature conservation**: Is it possible to protect one part of the lake with legal instruments? (Considering that there are only conservation categories for large areas and not for the conservation of small areas in India); what can you tell about the Biodiversity Management Committee of Dantan?

The interview was guideline-based and held in an official office. The time was set to one and a half hour. Similar to the open meeting, only the most meaningful information is listed in this study report (cf. Sub-section 6.4.2).

5.4.3 Interview with a wildlife expert

Fulfilling the basic needs of the people by job creation and reduction of poverty is the main objective of the government of India (cf. Chapter 1). Therefore environmental issues do not play a major role for rural development matters. To get an expert opinion from an Indian perspective on the role of environmental protection on the site, an interview was made with a wildlife expert specialised in the Chilika Lake in Orissa but who also has some knowledge on the Sharashanka Lake.

Two guideline topics were the subject of the interview:

- The relation between the use of fertilisers and the degradation of the lake
- Multifunctional use respecting environmental protection

6 Results

The following results are structured according to the on-site survey, the interviews with the local people, the World-Café and the expert interviews. At the end the most important information is summarised.

6.1 On-site survey

On-site, observations about the degradation state of the Sharashanka Lake were made. The plant growth was at an advanced state, which confirms the previous analysed satellite picture. Almost no open water could be observed on the surface. Two main plants could be identified along the lake borders: a plant called “Sebla” by the villagers, which is an *Eichhornia* species, and a type of high-growing grass (cf. Fig. 6-1). It could be observed that the *Eichhornia* is eaten by the cows (cf. Fig. 6-2).

Fig. 6-1: Grass growing around the lake

Fig. 6-2: Grazed Sebla plants

Some birds could be identified on the surface of the lake and around. These are *Porphyrio porphyrio poliocephalus*, *Metopidius indicus*, *Ardeola grayii*, *Halcyon smyrnensis* or *fusca*, probably *Phalacrocorax fuscicollis* and some ducks.

On-site impressions about a precedent temple visit were gained. It could be observed that the visitors have picnics around the lake and the temple and simultaneously use the grounds as a toilet.

In the meeting with the local village leader essential information for the structure of the guideline questions for the interviews could be collected. Apparently, 20 years ago the fish in the lake were of a much bigger size and many villagers depended on the fish market. Then, gradually the silting up

started and the government decided to build the smaller ponds (as hatcheries) around the lake to start fish breeding together with a newly formed fishing cooperative. But after a few years the cooperative fell apart and has not been reinstalled since. The reason for the failure was unclear for the village leader but he suspected that it was due to governmental corruption and institutional failure, not due to a collective failure through the villagers, though. Since the failure of the cooperative and the strong degradation of the lake, most of the people have given up fishing. The leader also mentioned that the local people were very interested in the excavation of the lake and that they would help to get it back into its original state.

6.2 Interviews with the local people

In total, 22 people were interviewed. All of them are men, as in the families they are responsible for working matters. Among these 22, 11 are farmers, four are fishermen and six are of the respondent type small householder (cf. Fig. 6-3). One person (no. 3) cannot be identified by occupation, as the man joined the interview of number 2 to explain more about the fishing cooperative.

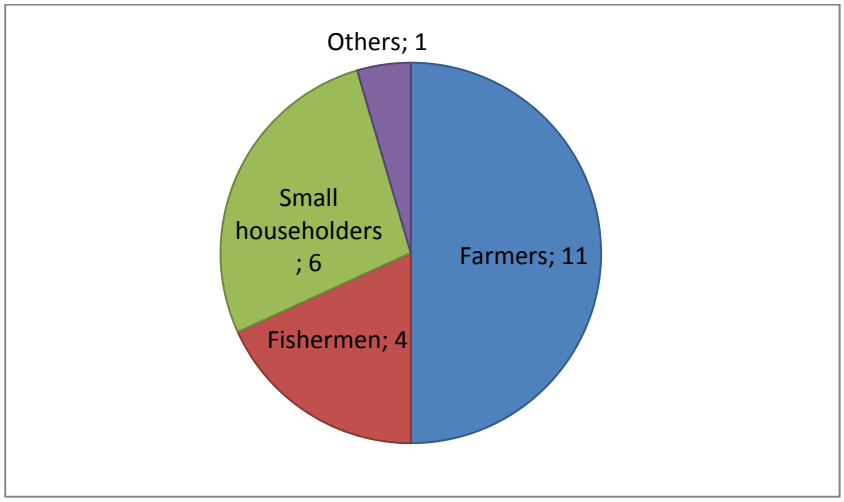

Fig. 6-3: Selection of interview partners

In the following section, the results are described according to the guideline topics and the information categories (cf. Tab. 6-1 to 6-5) built in section 5.2.

Work-related questions: performing and processing

The information categories for *work related questions* can be found in Tab. 6-1.

Tab. 6-1: Information categories built for *work-related questions: performing and processing*

Income possibilities	Other work	Size of the land	Market or self-subsistence	Labourer or family helping	Fishing/ Farming method	Fish species

All of the farmers except one, who is a chicken farmer, have paddy rice fields as a main cultivation. But similar to the other respondent types some also have a small area to grow vegetables or to keep some cows. Especially the farmers with less land property (surface varies from 0.2 ha to 2.5 ha) need additional income possibilities (cf. Fig. 6-4). This is often the sale of cow milk or fish. The fish is kept in small ponds; most of the interviewed people work with not more than one pond. Some farmers have additional jobs, like trader (of fertilisers) or teacher. In these cases and particularly when the farmers are small landowners, it is not quite clear which income possibility is their main one. Some of these farmers might keep a small rice field for self-subsistence and not for market sale.

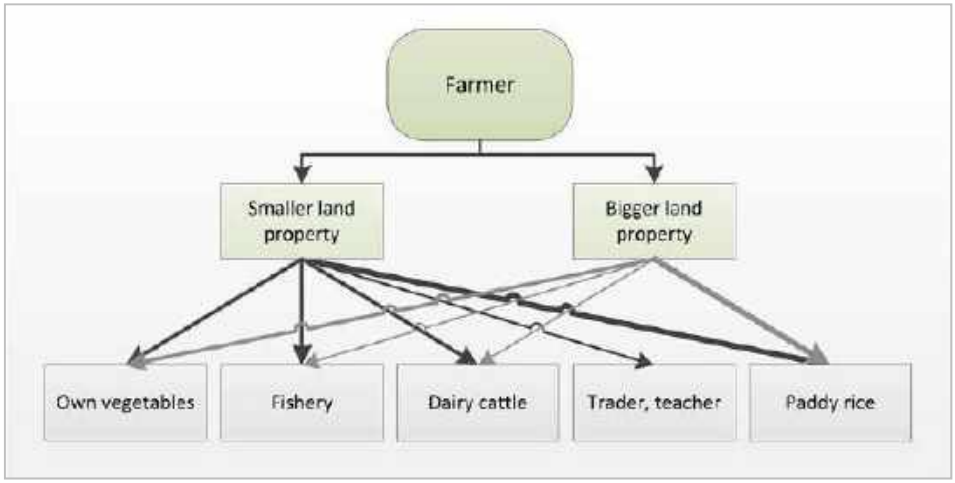

Fig. 6-4: Work of a farmer

All of the small householders have a small area of farming land for personal purposes and earn additional money by labouring on fields of somebody else's property or by labouring in the MGNREGA scheme (cf. Chapter 4). Other incomes are fishing, rickshaw-pulling or cow keeping (cf. Fig. 6-5). For the most part the small householders rely or have to rely on multiple income possibilities rather than one. This makes their standards of living appear worse than compared to farmers who have more land property and employ labourers.

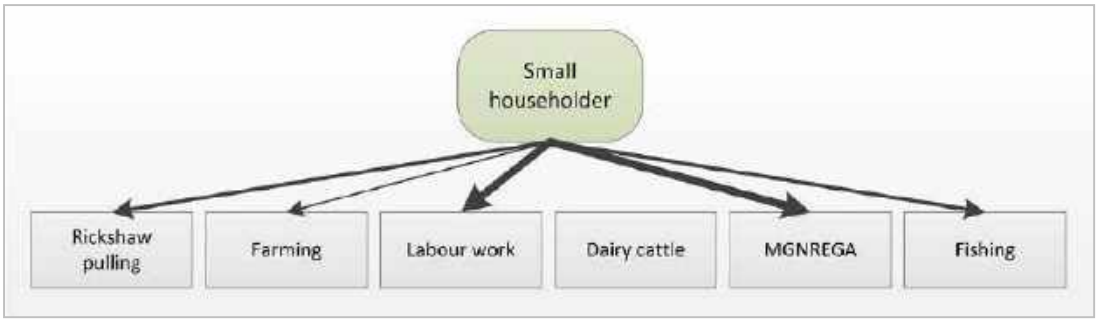

Fig. 6-5: Work of a small householder

It could be observed on-site that the fishponds are often close to the houses and in the villages. They might be laid out like this because, according to the interviews, they are also used for washing and bathing.

The interviews show that earlier, when the Sharashanka Lake was still intact, there were a lot of different and big species of fish in the lake. Unfortunately this vast variety can no longer be found. Today the fishermen rely on bred species, probably brought in through the fishing cooperative.

Field inputs

The information categories for *field inputs* can be found in Tab. 6-2.

Tab. 6-2: Information categories built for *field inputs*

Mineral Fertilisers	Cost and amount of fertilisers	Fertiliser subsidies	Organic fertilisers	Pesticides	Irrigation	Mud as fertiliser

All the people asked about the use of **mineral fertilisers** confirmed the following: even on the smallest size of land it is applied. Frequently the farmers explained that they started to use fertilisers about 20 years ago and have even had to increase the used amount since then. This correlates and is due to the start of the green revolution in India. Everybody uses the same two kinds of fertilisers which are UREA with 46 % of nitrogen and DAP (Di-ammonium phosphate) with 18 % of nitrogen and the rest phosphate (cf. Fig. 6-6). The details about **how much fertilisers** are put on the field strongly vary from person to person. For example,

Fig. 6-6: Fertilisers packaging

respondent number 20 puts 75 kg on 0.5 ha per year, whereas number 21 uses 100 kg for 0.4 ha and number 22 has a field of about 0.7 ha and said he used 750 kg. These amounts are probably not reliable because most of the respondents do not measure the used amount exactly and also said that they used as much fertilisers “as needed”. Anyway, the interviews clearly show that often fertilisers are put on the fields twice a year, as two harvests are possible per year. A controlled and restricted use of mineral fertilisers, which, for example, exists in the European Union, could not be identified.

Apparently fertilisers are **subsidised** by the government up to 75 % of the original price. However, some respondents had no idea that the price they pay for their fertilisers is reduced already.

When asked about **organic fertilisers,** the respondents confirmed that, in addition to mineral fertilisers, they also put cow dung or straw on the fields. Apparently, before the 1980s, this was the only way of fertilising their fields, but now they need the mineral fertilisers as the land is not so fertile anymore. Furthermore, there are not enough cows in the villages anymore to provide dung for all the fields. As observed on-site, the cow dung is dried and used as fuel to compensate for the lack of wood. In the past the quantity of cow dung was probably enough for self-subsistence but as the production of rice has increased due to the agrarian reforms, the cow dung that is produced is no longer sufficient for the many hectares, whose crops are mostly meant to be exported.

It turned out that some of the interviewed people understand that the **mud in the lake** is rich in nutrients. Two different opinions were expressed to the question if the mud could be used as fertiliser on the fields. On the one hand, the idea got approval as there would be good nutrients in the mud. On the other hand, the idea was rejected, as one person said he had tested the mud on his fields and that it was “over-fertilised”, so that there were too many nutrients for the rice fields. This is an issue which should be looked into more deeply by further mud-testing.

The people asked about **pesticides** confirmed the use of it. One person said he would use it “when needed”. For example, he puts it on his fields when the leaf-mining moth attacks the plants.

All of the asked respondents said that they use groundwater pumps for **irrigation**. This is probably true only for the dry season as in the rainy season the fields are filled with rainwater. The use of pumps could also be seen on the site. Many electric pumps are installed in between the rice fields.

Past state of the Sharashanka Lake and its degradation

The information categories for *past state of the lake* can be found in Tab. 6-3.

Tab. 6-3: Information categories built for *Past state of the Sharashanka Lake and its degradation*

Use of the lake in the past	Past state of the lake	Fishing cooperative	Reasons for the degradation

Most of the villagers remember the **past state of the lake**; they remember that there was still water in the lake. According to the villagers, this had an effect on the biodiversity, on the climate and on the use of the lake. It appears that the biodiversity in and around the lake was higher in the past. The information was collected that there were much more migratory birds as well as more and larger fish species than today in the ponds. This can be explained by the fact that the fauna needs an intact ecosystem for survival. Since animals depend on their environment, the faunistic biodiversity decreases with the deterioration of the living conditions. In the past the water body had a cooling effect on the climate in summer. The summers are said to be hotter today than before the degradation.

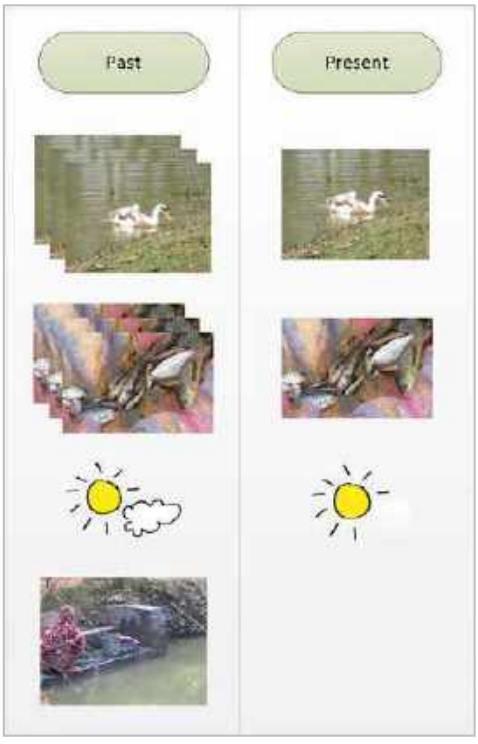

Fig. 6-7: Past and present use of the lake

As already presumed and confirmed by the village leader, the main **use of the Sharashanka Lake in the past** was fishing. According to the interviewed people the last fishing activities date back to around 10-20 years ago. This date correlates with the start of using mineral fertilisers. It appears that with the increase of fertilisation in the 1980s, the degradation of the lake started and consequently the fishing activities decreased. This would furthermore imply that already for a decade the possibility of an income through fishing has disappeared. Besides, it was confirmed by the villagers that the water from the lake was also used for washing, bathing and irrigation (cf. Fig. 6-7).

According to the interviews the already mentioned **fishing cooperative** was dissolved 10-15 years ago. The reasons for the failure are not clear among the villagers. Apparently the

government decided to disband it, but did not inform the members (mostly fishermen) or other villagers about the reasons. During the existence of the cooperative, communication was a big problem for the local people. No details about the cooperative itself reached them and even the members did not know where the money went and what the official decisions were. For example, there was the problem that all the official meetings and papers were written in English and not in the local language, Bengali. To sum up, the interviewed people call the cooperative useless and it failed because of a lack of communication and because of mismanagement. Nevertheless, some opinions express the wish to have a new cooperative with more local involvement. A new cooperative could also be responsible for the superficial cleaning of the lake, which according to one interviewed farmer (no. 21) had been carried out by the fishermen before. This shows first needs of participation by the villagers. They do not seem ready to accept governmental decisions without being informed or involved.

For the villagers it is not clear what the exact **reasons for the degradation** of the Sharashanka Lake are. Very few opinions could be collected. Respondent number 5 said that fertilisers were responsible for the plants in the lake and respondent number 18 said that it was the government's fault as it had not cleaned the water. A third explanation is scientifically more explicable. Respondent number 7 explained that, three years ago, the monsoon was to week and the lake had completely dried out. After it was dry the grass started growing and deposited on the lake area. This is completely natural as the soil contains nutrients and without the water layer offers good growth conditions. If this had happened more often in the last 20 years, it would have strongly supported the degradation of the lake.

Future of the lake and personal involvement

The information categories for *future of the lake* can be found in Tab. 6-4.

Tab. 6-4: Information categories built for *future of the lake and personal involvement*

Future of the lake	Help for restoration

The answers to the questions about the **future use of the Sharashanka Lake** are very homogenous. Of the 22 asked people, 13 openly supported a cleaning of the lake. They want to have the lake put back into its original state because they wish to start fishing again. They also want to have it back for

reasons of tourism, which in this case means for religious use. Next to fishing, tourism was the main idea mentioned by the villagers (cf. Fig. 6-8), but additionally, two respondents mentioned that they would like to have the birds back and that they could be protected in one part of the lake. Another wish expressed was the involvement of the government in the cleaning process and the involvement of the Panchayats in a long-term cleaning.

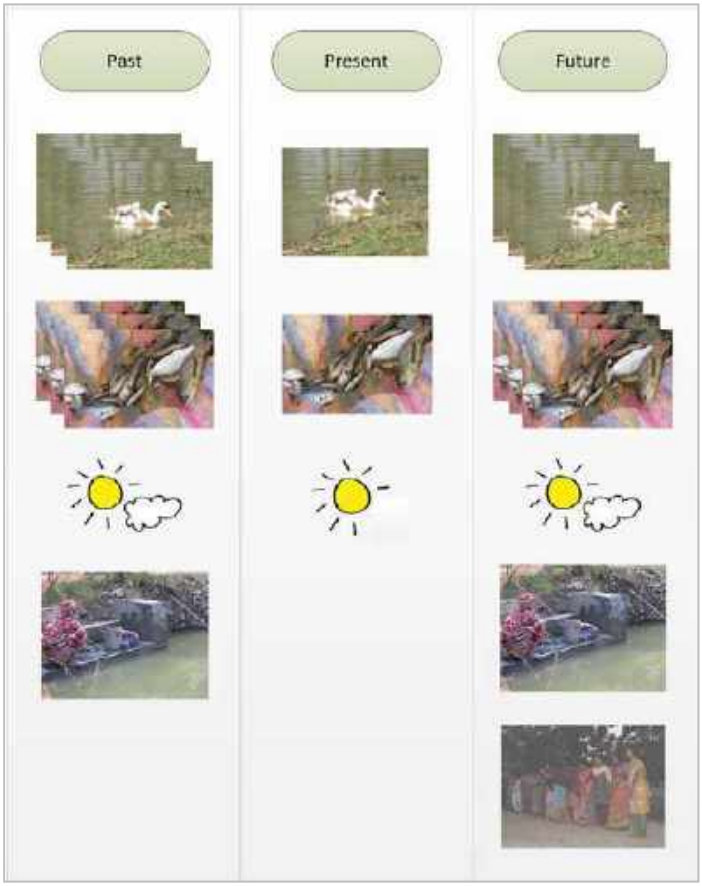

Fig. 6-8: Wishes about the future use of the lake

All of the asked people would **help** or even volunteer to get the lake back to its original state. However, their offer was subject to certain conditions. Firstly the government should provide money and machines because the villagers would not be able to clean the lake on their own. Secondly it was pointed out that the cleaning should be a common effort. Two of the respondents agreed to help only if the work was shared.

Overall, this part of the interviews shows a high wish for the restoration of the lake and a strong intention to help in doing so. This is a good basis for the further development as the villagers are eager to be involved in the initial implementation of the governmental project. They also feel the need for an intact environment, as they know about the benefits gained by the lake.

Tourism, education and the value of the lake

One interviewed person confirmed previous data about the organisation of **governmental training camps**. For example, the government apparently teaches how to use fertiliser. The interviewed person said that such training camps are organised two to three times a year. This results in a good communication between the government and the people and what's more, people are willing to participate in these governmental trainings. The use of skills trainings (hereinafter called capacity

building measures) for a sustainable development of the Sharashanka Lake seems to be a good instrument as it is accepted by the local people and supported by the government.

As mentioned above, when talking about **tourism** the villagers mainly think about religious fairs, because this is the time when many people also from afar come to visit the place of the Sharashanka Lake and the temple. For them the temple is very famous and of a high religious value. During the fair in February the villagers can sell food and other products to the visitors. It seems that this money is earned by the Gram Panchayat which can invest it in community needs. Yet one of the interviewed people mentioned that he does not know where this money is going. To get more (foreign) people visiting, some proposals to improve the tourism infrastructure were made. Two people suggested building more shops, stalls and restaurants as well as hotels. Additionally one proposal was made to offer bird-watching for the tourists. Three people would work in tourism if there were a profitable market.

The villagers made clear that the **value of the lake** is high for them as it represents a source of income and life quality. They said, that today these values had disappeared but they want to regain them. One person said that the degradation of the lake meant an intellectual harm for the people, as there was nothing left to pass on to the next generation, but the local people needed something to be proud of.

6.3 The World Café

In the following chapter, the answers to the questions asked during the dialogues in the World-Café are described separately.

Dialogue 1: Reasons for the degradation of the lake and the growth of weed

Has there been an investigation about the water and mud quality of the lake? Has there been there a change in water quality?

The participants of this dialogue are not aware of a test having been made (officially or unofficially) with the mud out of the Sharashanka Lake. Nevertheless they claimed that the mud was full of nutrients and very fertile. When the water level is low, the mud becomes visible and this soil is said to be very fertile as consequently many plants grow there.

The participants do not know about a test with the lake water either, but they admitted that the rice on their paddy fields grows better when using the water of the ponds instead of groundwater. This statement might imply that the nutrient level is higher in the pond water than in the groundwater.

All of the participants would agree to a test being made by the government about the water quality and the mud.

Why is there so much weed in the lake?

When asking about the weed in the lake, the aim was to find out about the degradation reasons. Several explanations were given by the groups. Repeatedly mentioned was the fact that the lake was not used, through fishing for instance, and that this was the reason for the degradation. Others said that it was the inactivity of the government, which had already been mentioned during the individual interviews. One person suggested that the weed growth was largely due to birds or cows. When they eat the plants and seeds, they excrete them somewhere else and thus favour the growth of weed and grass. Another part of the participants came up with the theory that there were too many nutrients in the mud of the lake, thus encouraging the plant growth. These nutrients would come from the agricultural fields. One group talked about how many substances entered the lake during the monsoon season. It said the entry would be huge and that not only weed was transported but also waste water. A last approach to the problem, which was already mentioned in the individual interview with number 7, addressed the succession of the plants when the lake falls dry. If there were not enough water in the lake, the plants would keep growing on the exposed soil. One participant suggested that when the plants die and stay in the lake, this again increased the nutrient content of the water and the soil.

Through the group dialogue similar reasons for the degradation as in the individual interviews could be detected. Nevertheless additional reasons were also mentioned. The problem of having too much nutrients in the lake was obvious for most of the participants. The majority was sure that the lake should be constantly used to prevent weed growth. Finally, the finding that the weed growth came through low water level, suggests that there might have been a higher water level and a stronger water level fluctuation of it in the past years.

Do you see a connection between the land use and the degradation?

As many villagers were aware of the high nutrient content in the lake (in the water or the mud), it was important to find out if they knew where the nutrients were coming from. This question was

already partly answered in the previous question as some participants suggested a nutrient input from outside sources, like waste water or the paddy fields.

Most of the people again discussed that during the monsoon, the water flow carries the water from the fields containing pesticides and fertilisers to the lake. Two groups admitted that fertilisers could be a reason and one group denied this.

How can the lake be kept clean?

As one reason why there is weed in the lake was the fact that the lake is not used like in the past, some participants suggested that the lake could be kept clean from weed by using it regularly (cf. Fig. 6-9).

The first group then strongly discussed the question about who is responsible for the lake. They think that if people take responsibility for the lake it can be kept clean. They suggested dividing the lake into squares and allocating these to different households. In this manner cleaning would be no problem anymore as every family would have a responsibility for its square. The group said that appointing special tasks to certain people would help the lake. These *certain* people could also be a committee of fishermen or a cooperative responsible for the lake which then would have to take care of the cleaning. Just as in the individual interviews, some participants wanted to join such a cooperative. Another proposed body to take responsibility was the Gram Panchayat. If something went wrong with the lake, the people could go and talk to them and they would have to find a solution. The second group expressed a different opinion: for them the cleaning could be done in self-organisation as soon as the government had restored the lake.

Fig. 6-9: How to keep the lake free from weed

A different approach against the weed was proposed by two groups. They knew some sort of pesticide which could be put into the water to kill the plants.

A more mechanical way of getting rid of the plants in the water was discussed in the last group. Coherent with the reasons for the weed growing is the possibility that the monsoon functions like a purifying process against the weed. The flood, which is coming through the inlet into the lake and then leaving through the outlet, would carry the weed along in several intervals. So if the monsoon is strong and the water level high enough, the lake is cleaned without further help of the local people.

Would it be possible to use fewer fertilisers?

As the nutrient input in the lake by fertilisation of the fields propagates plant growth, the villagers were asked if they could decrease their use of fertilisers. The answers were very homogenous in all the groups. No one wants to use fewer fertilisers as their crops are more important than the lake. Even if they have never thought about harming the lake, they cannot reduce fertilisation as the rice would not grow anymore. One comment was made that they were taught by the government how to increase their production and not how to save the lake.

Dialogue 2: Possibilities for local people to support the restoration of the lake (together with the Government)

Under what condition would you help to restore the lake?

In general, all the participants are willing to help; not one person said he would not help at all. Some would even agree without getting any payment. One of local village leaders is sure that no villager would have a different opinion and that they would cooperate with the government in every way, because they were the experts. Nevertheless, some conditions were mentioned during the dialogue (cf. Fig. 6-10). Thus one person wants all of the villagers to help, which gives the impression that he is not sure that everybody would help to restore the lake. One man recognised as a small householder voiced the condition that the poor people should have the right to fish in the lake. Several times the help of the government was demanded for the restoration, which could already be detected during the individual interviews. The participants want initial help by the government through funding

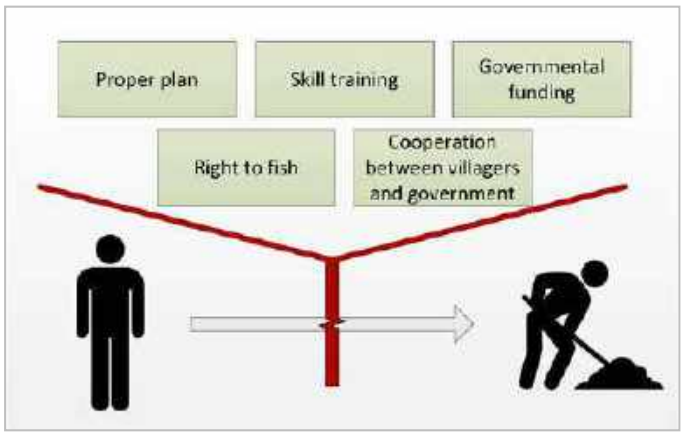

Fig. 6-10: Conditions set by the people in order to help with the restoration

and capacity building measures. Also there should be a proper plan for the restoration and a good cooperation between the government and the village communities.

Which task could you perform during the restoration?

All of the participants agreed to work physically during the restoration. They would participate in any task, apart from digging out the mud and weed for which machines are needed. They think that through the work on the lake, the unemployment problem could be solved.

Would you support the restoration work for a longer period of time (e.g.: many years)?

The participants stated that they knew that the restoration takes a lot of time but they would help until it was finished.

It appears through the previous questions of the dialogue that the willingness to support the restoration of the lake is high even if the villagers are not sure what exactly has to be done. They rely on instructions from a higher level as their strength is to fulfil tasks and physical work. Nevertheless, they do not only want to execute orders but also to cooperate with the government.

What should be done with the grass/weed and the mud?

The participants proposed to feed the grass and weed to the cows, although someone thought it would be too much for them. Some suggested cutting and drying the plants and using them for fertilisation or fuel for cooking. If it cannot be used at all, then maybe it should be removed along with the mud. A test could be made to find out.

The discussion about the mud led to the same conclusions as the interviews: either it is good fertilisers or it is not because it contains too “many” nutrients. One additional proposal was made to put the mud on the lower fields to increase the soil level. It seems that some of the fields have lost level.

Dialogue 3: Multifunctional use of the lake in the future, after the restoration (Short- and long-term components)

What do you expect from the lake in the future?

The same proposals as in the individual interviews for the future of the lake were made. The people want to use the lake for fishing and irrigation and want access for tourists, implying the religious value of the lake and the temple. One person proposed to create a nature conservation zone.

Which use is the most important one?

For all participants fishing remains the most important use of the lake.

How much space should be kept for which use (if the lake would be divided in parts for different uses)?

As fishing is the most important use, one half to one third of the lake should be available to do so. But again, a small part for conservation would be accepted.

6.4 Expert Interviews

6.4.1 Interview with a local journalist

This interview permitted to set the information gathered by the previous interviews in a more exact historical context (cf. Fig. 6-11). The journalist explained that in the 1960s the water body of the Sharashanka Lake was still intact. There were no plants growing on the surface as the strong rainwater flow from the monsoon took all the plant material away. The three inlets and the outlet already existed, but as an open river system as the weir of today had not been built yet. Until 1966/67 the water had still been clear, but then according to the journalist the first attempts of using fertilisers started. This information does not exactly match the official starting of the green revolution in India, which was in the 1980s.

In 1982 the weir at the outlet was built. This should guarantee a high water level in the Sharashanka Lake to improve fishery. The weir construction was probably done by the government to support the fishing cooperative as in the same year the ponds around the lake were dug out. Then in 1987 an excessive flood through a strong monsoon destroyed the weir at the outlet. The government did not want to repair the broken weir because it was not necessary for fishery anymore. According to the

journalist, it sad that there was a low demand for fish on the market and that the fishermen around the lake were not experienced enough. Moreover, it stopped providing money for the cooperative, which led to a gradual decrease in fishing. The collapse of the weir is an important piece of information as it confirms previously gathered data. As mentioned before, the water level was higher in former times and the flood was able to remove the weed growing on the lake surface. As the broken weir was not repaired, the water level got constantly lower and the water flowed out of the outlet more slowly, carrying fewer plants away. The increase of nutrient input into the lake through fertilisation intensified the plant growth and the weak water flow could not cope with the excessive growth anymore. That was most probably when the uncontrolled degradation of the Sharashanka Lake started.

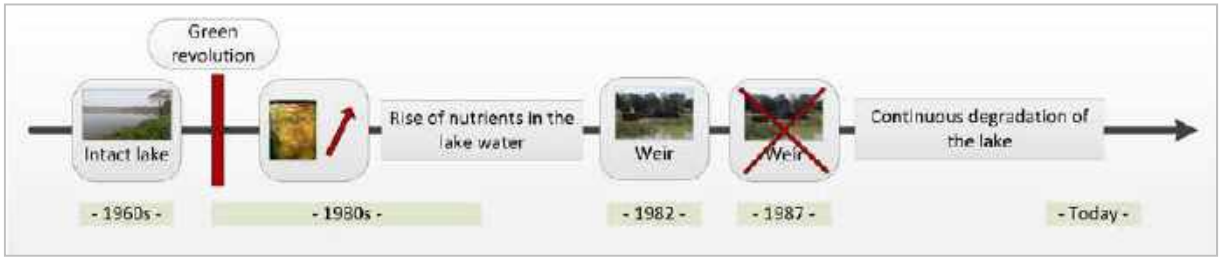

Fig. 6-11: Factors influencing the degradation process over time

Today the fish market is better because in 1990 a road to Kolkata was built. However, the fishing possibilities have decreased and not been improved since the outlet broke and the fishing cooperative got dissolved.

6.4.2 Discussion and interview with the administration of Dantan

During the open discussion with the administrator, the topic **administrations units** mainly focussed on the explanation of the Panchayat system. In Dantan there are 182 members in the Gram Panchayat which are elected independently from the members of the Panchayat Samity, even if the different bodies are interlinked in their functions. All project implementations are made at the lowest level of the Gram Panchayat. The Gram Panchayat is not only an instrument of the government to implement development schemes because it can independently start own projects. These can, for instance, be related to village infrastructure or road building. Own projects are possible through an own self-managed bank account. Each Gram Panchayat gets a fixed sum from the government but can also add money through personal activities. For example, the money gained through the fair held on Sharashanka Lake, if earned through the Gram Panchayat of Salikotha, is

added to its account. The Gram Panchayats can plan their own projects up to a certain extent. If, for instance, they build a road within their administration borders, they can do that without asking permission from a higher level, which is the Panchayat Samity. But if the road crosses the border to another Gram Panchayat, it is the Panchayat Samity which coordinates the project. When the Gram Panchayat builds a road and does not have enough money to do so (the maximum available is 200,000 Rs. or 2,400 € per project), it can ask additional financing from the Panchayat Samity. In the Panchayat Samity of Dantan there are 26 members. They are distributed on several technical departments, among those:

- Public work and transport
- Public health
- Land and forest
- Food supply
- Relief, women and children
- Animal husbandry and fishery
- Handicaps, small enterprises and power

For each department a head is nominated. This person has the function of a *block minister*. According to the administration the Panchayat System is very important for the self-development of the region.

This is an important statement for this study as it shows that the cooperation with the Salikotha Gram Panchayat is necessary for further development matters concerning the Sharashanka Lake. Only from the previous sources (cf. chapter 4), it was not clear in how far the integration of the Panchayat system in rural development really took place.

During the discussion about the **development programmes** it became clear that the most important and most applied scheme is the MGNREGA. This confirms the results collected by the preceding interviews with the villagers. In the past year, apparently 20,000 families were employed. Other schemes do not have a significant importance in the region. The MGREGA could therefore be a known and useful instrument to combine with the development of a multifunctional use on site.

As expected, the topics of **nature conservation** and environmental issues are not of first concerns for the administration. In the open discussion it appeared that in planning and decision making the basic needs of the people, like job creation and food security are more important. However, the information output was bigger in the individual interview than in the open discussion. For instance

the administrator informed the interviewer that one legal instrument to protect birds on the site is the Wildlife Act. Furthermore, according to the interview partner more plantations should be planned to attract birds. Nevertheless, he doubts if it is wise to attract them if they can't be protected from hunting. He thinks that before starting to protect anything, the local people have to be sensitised. They have to understand what protection is. As for the Biodiversity Management Committee of Dantan, the administrator knows that there is one since he is the head of it, but there are no meetings or activities. The focus of the administration does not lie on biodiversity management; there is no spare time for that.

The discussion at last revealed that the wish of the local people to restore the **Sharashanka Lake** was expressed a few years ago. In 2011 the official demand was taken to the Dantan administration, which forwarded it to the state government. They have not been able to put the project into practice yet, as several precautions will have to be taken. For example, the road construction has to be finished to allow heavy machines to access the lake. Also in order to begin with the excavation a week monsoon season, which will cause low water levels, is needed. Through the development project of the lake the administration of Dantan expects earnings to come, for example, from food production and tourism. A tourism department might be established for this purpose. Finally the administration declared that they want to involve the local people in the programme.

In the individual interview the administrator of Dantan favoured the idea of a **multifunctional use concept**. On the other hand however, he cannot support long-term projects as they need more money, expertise and involvement. The priority for the government is the fulfilment of people's basic needs, which can be done by short-term projects. The administrator wants to involve the local people, but this is only possible insofar of contributing to the excavation project and the maintenance of the lake.

In contrast to other technical departments **tourism** is centralised at state level. Even at district level there is no tourist office. This decreases the administrator's authority in this field. Nevertheless, he has some ideas for the Sharashanka Lake which he wants to implement. He wants the villagers to be involved in the reception of tourists, but no overnight stay concept should be set up. They should rather provide food and drinking. Tourism should be improved so that there is a benefit for Dantan, for example, a boat tour service could be set up. This creates job opportunities and running revenue. Also more festivals could be held through the improvement of infrastructure.

Some **other** interesting issues were discussed during the interview. For example, the administrator talked about another tank in Dantan, the Bidyadhar tank. This tank is smaller than the Sharashanka Lake, but nevertheless it is clean and perfectly usable. The administrator thinks the reason for this is the different responsibility as Bidyadhar is owned by 40 people and Sharashanka by the government. This confirms the ideas discussed during dialogue 1 of the World Café (cf. section 6.3). If no one has been designated to do, for instance, cleaning work, no one feels responsible for the lake. A clear distribution of tasks and responsibilities seems indispensible for the future development of the Sharashanka Lake.

6.4.3 Interview with a wildlife expert

The wildlife expert confirmed the relation between the degradation or eutrophication of the Sharashanka Lake and the nutrient input through fertilisation of the surrounding fields. In his opinion the best way to deal with the use of fertilisers is a use-adapted method. He therefore suggested fixing a time when it is allowed to use fertiliser, for example, with respect to the monsoon season so that fewer nutrients are washed away.

Also in terms of a multifunctional use of the lake, he proposed a time-adapted approach. Each use should have a main period of time for application. This means that a period would be fixed when fishing is allowed and one when tourism is allowed. The expert does not think that on such a small scale it is possible to guarantee the protection of one part of the lake while also allowing fishing.

6.5 Abstract of the previous results

The following information and statements collected during the interviews and the World Café are the most significant for the ongoing study (cf. Tab. 5-2). Therefore they are processed by further literature research and represent the basis for a multifunctional use concept for the Sharashanka Lake, which are described in chapter 7.

Tab. 6-5: Summarised results for further processing

	Topic			
	Lake degradation	**Lake use**	**Agricultural practices**	**Involvement of the local people**
Answers	Succession of the plants without sufficient water in the lake	Ponds for washing and bathing	Application of as many fertilisers and pesticides “as needed” and 2 times (because 2 crops) a year	Small householders: additional earning through labouring in the MGNREGA scheme thus reduction of the unemployment rate
	Clean lake if the local people or the Panchayat take responsibility or special tasks	In the past: washing, bathing, fishing, irrigation, better climate, more biodiversity (fish, birds)	Not enough cows in the villages to provide enough dung (organic fertilisers) for all the fields	Panchayats: very important for the self-development of the region; Involvement in a long-term cleaning
	Fixing a time when it is allowed to use fertilisers	Wanted use: Mostly fishing (at least 1/3 to 1/2), also tourism, washing, bathing, a bit of nature conservation	Fertilisers are subsidised up to 75 % by the government	Conditions to help with the restoration: capacity building measures, right to fish, cooperation with the government, funding
	Each use should have a main period of time for application	Nature conservation and environmental issues are not of first concerns for the administration	Nutrients from the agricultural fields increase the plant growth in the lake	All of the asked people would help to get the lake back to its the original state
	Mud as fertiliser: Some people say "yes" some say "no"	There is a Biodiversity Management Committee of Dantan, but inactiv		There is a willingness to participate in governmental trainings
	Maybe drying the plants and using them for fertilisation or fuel for cooking			

6.6 Demands of and conflicts between user groups/usage options

Through the findings from the previous results six different user groups/usage options could be determined. Four user groups were determined right from the start through the on-site survey: **tourism**, **farmers**, **fishermen** and **small householders**. Even if small householders are similar to farmers and fishermen in their kind of uses (farming or fishing), they are distinguished in a separate

group because their social and economic status differs from the others and therefore they have different demands on the lake region. Through the interviews with the local people it got clear that **housekeeping** is not to be neglected. Most of the housekeeping activities are done in the ponds, but the people want to use the lake again as well. From a professional point of view, the enhancement of biodiversity is desirable for an intact and divers lake ecosystem. However, nature conservation, which is in this case necessary for the support of biodiversity, is a difficult issue in the region. Nevertheless, the research showed that the local people and the administration are not completely opposed. Therefore, **nature conservation/biodiversity** was set as a sixth user group or in this case usage option of the lake.

Each of the above user groups/usage options makes different socio-economic **demands** on the lake (cf. Tab. 6-6). As well as the summarised interview results, these demands are taken into consideration and should be fulfilled when coming up with proposals for a multifunctional use concept for the lake.

The demands of the fishermen, the farmers, the small householders and the housekeeping result from the interviews and their work habits. As a reaction to the on-site observations, sanitation facilities and a meadow for picnicking and resting are important for the numerous tourists visiting the lake. As for nature conservation, the demands are an outcome of the needs of the fauna. The bird species seen on the Sharashanka Lake all depend on water biotopes like a lake or pond. Some species show preferences for still or slow-flowing extensive wetlands with muddy shorelines and dense vegetation (BIRDLIFE INTERNATIONAL, 2014: www; SALIM, 1941: 372), other require tall trees for nesting and observation and open water to dive for hunting (LEBOFF & LEBOFF, 2013: www; RIA TAN, 2001: www; SALIM, 1941: 214).

Tab. 6-6: User groups/Usage options and respective demands criteria

User groups/usage options	Demands Criteria					
Farmers	Irrigation		Capacity building	Income security	No loss in yield and revenue	
Tourism	Sanitation facilities		Meadow for picknicking and resting			Easy access to water for bathing (flat borders/ghats)
Nature conservation/ Biodiversity	Birds: Shallow area for resting and breeding on the lake border	Birds: Rest and hunting area on the open water of the lake	Reduced human activity			Well structured riparian landscape
Fishermen	Enough water to breed big fish species	Fish hatcheries	Capacity building	Income security	Right to fish	Easy access to the lake (flat borders or boat)
Housekeeping	Washing	Bathing				Easy access to water (flat borders, ghats)
Small householders	Working opportunities and additional income		Capacity building	Income security	Right to fish	

The demands of each use differ from each other, nevertheless there also appear similarities: for example, capacity building measures, income security and the direct use of the lake are the same criteria for fishermen, small householders and farmers. The easy access to the lake is important for housekeeping, fishermen and tourists, whereas for nature conservation and biodiversity a well structured riparian landscape is preferred.

Due to similarities and differences in the demands, conflicts can arise between user groups/usage options. The following table gives a synopsis of the conflict situation (cf. Tab. 6-7).

Tab. 6-7: Possibility of conflicts between the different uses

	Tourism	Nature conservation/ Biodiversity	Fishermen	Housekeeping	Small householders
Farmers	no	possible (1)	possible (2)	no	possible (2)
Tourism		yes	no	no	no
Nature conservation/ Biodiversity			yes	yes	yes
Fishermen				possible (4)	possible (3)
Housekeeping					possible (4)

The biodiversity demands for less human activity and a well structured riparian landscape contrast with the demands of almost all the other user groups/usage options. Tourism, housekeeping and fishery need an easy and flat access to the lake and will increase the activity around and on the lake. This could hamper the riparian habitats and breeding grounds of birds. Furthermore, excessive nutrient input through agriculture plays an important role for water quality and could likely change the living conditions for aquatic habitats[3] (1). On the other hand, a different agricultural practice, in favour of biodiversity, could reduce yield and revenue of the farmers and therefore endanger their income security. The same applies for fishery.

If the living conditions for aquatic creatures, like fish, were affected by nutrient inputs, another conflict could arise between the farmers and the fishermen as well as small householders (2). A reduction in fish species and number of fish through eutrophication would affect the income security of the fishermen.

The interviews with the local villagers showed that the small householders expressed the wish for having the right to fish. If big fishermen with fishery as the main income reserved the lake or

[3] Through the accumulation of nitrogen in the water, more plants can grow and consume more oxygen. The reduced availability of O_2 can thus harm the aquatic biocoenosis (KONOLD & SCHREINER, 1996: 132) and the N-accumulation can induce a decline in species avoiding living conditions with a high nutrient availability (FRANKE & BAYER, 1995: 93).

overfished it, it would be difficult, or even impossible, to meet this expressed wish and another conflict arises (3).

In today's situation, where the lake is not yet restored, housekeeping activities are mainly taking place in the ponds around the lake. If this continued after the restoration, there could arise a conflict with fishery, however, only if the fishermen and small householders needed the ponds to raise the fish species (4).

As tourism concentrates on the temple in the east of the lake and is not in continuous use throughout the year, it does not crucially affect other user groups except nature conservation.

The conflict possibilities show the necessity of an integrated approach for the Sharashanka Lake. All of the user groups/usage options have to be considered in a long-term and sustainable development of the lake. Their demands have to be met in a multifunctional use concept by balancing the demands.

7 Recommendations for a multifunctional use concept in the Sharashanka Lake region

Considering the diversity of rural regions and its stakeholders, an **integrated approach** for rural development aims at creating partnerships between politics, administration, economy and the local population of the region (BMEL, 2014: pp 5-6). Hereby, the focus lies on using the know-how of the local population to create a dynamic, cross-sectoral and sustainable common development strategy instead of using a sectoral planning approach (ibid.).

For the development of the Sharashanka Lake region, an integrated approach should be envisaged as many stakeholders (politicians, administration on different levels and different user groups/usage options around the lake) are involved in and affected by the development of the Sharashanka Lake. By working together in a development plan, their strengths could be used more efficiently and benefits for everyone could be created.

For all of the stakeholders, the land use of the Sharashanka Lake region includes different possibilities. These lie in the, often heterogeneous, functions the landscape of the lake can offer simultaneously. In the case of the Sharashanka Lake region they are of a habitat, economic, social and religious nature. The landscape of the lake is hereby called a multifunctional landscape (MANDER et al.: 1). Using many functions and not only one, means having a **multifunctional use**.

Through the restoration of the lake, the possibilities of functions increase and the desired uses (Farming, fishing, tourism, nature conservation and housekeeping) can be established. Hence a **multifunctional use concept** is possible. The concept should envisage that the functions of the landscape can be used simultaneously without creating excessive disadvantages for other uses. Each user group/usage option should use the lake in respect of a long-term environmental stability, while the consideration of the respective demands is balanced.

In the following sections, the requirements for a multifunctional use concept in the Sharashanka Lake region are initially depicted. Afterwards, the role of each user group/usage option in a multifunctional use concept is described, considering an integrated development approach and an ecologically sustainable use. At last a spatial allocation of the different uses at the lake is presented.

7.1 Requirements for a multifunctional use concept

To establish a multifunctional use concept at the lake, some basic steps have to precede the implementation. First of all, it is indispensable to excavate the lake and take out all the mud and the weed so that the basin can be refilled with water again. Secondly the weir has to be repaired and a long-term maintenance has to be set up. The repaired weir should be used to control the lake's water level by regulating the outlet flow. The implementation of these measures is foreseen in the project led by the government (WRIDD, 2011) and is supposed to follow in the next years.

In addition to the weir repair, there should be a regulating plan for the opening of the weir. This aims at a better control of water withdrawal for irrigation and at having a relatively high water level and therefore preventing the lake from drying out. People from the village could perform this work against payment, if the weir had to be adjusted manually.

As there is the possibility of a good nutrient content in the lake mud, tests should be carried out about the suitability of the mud as fertiliser and soil formation on the paddy fields. This should be the role of the government as they have the capacities (funds, know-how) to perform a research and furthermore are responsible for the disposal of the lake contents. If the mud turns out to be of use as fertiliser and for soil formation, it could be processed nearby the lake and put on the paddy fields for nutrient input. This would reduce shipping and disposal costs. A similar approach is possible for the plants growing around and on the surface of the lake. Tests can show the suitability of the plants as animal fodder or organic manure.

To create a consciousness among the village people about the lakes problematic, which includes the eutrophication, the silting up, the nutrient input through agriculture and the role of the broken weir, awareness building measures are necessary. This information work should be carried out simultaneously with or before the excavation work. The local people need to learn what caused the degradation and hereby understand the necessity for a long-term maintenance of the Sharashanka Lake. Education should take place in the schools because reaching the children means creating an aware generation who could take responsibility in the future of the lake and the region.

After fulfilling the requirements for a multifunctional use concept, the objectives of further measures and approaches are:

- respecting the demand criteria of the user groups/usage options while balancing the conflicts, and
- reducing and regulating the nutrient and sediment input in the lake to prevent it from future degradation.

7.2 Role of the farmers

Agriculture plays a crucial role in the degradation process of the Sharashanka Lake as most of the nutrients and sediments flushed into the lake water issue from the paddy fields of the lake's catchment area. Two rice crops are produced per year and fertilisers are generally applied two to three times during one growth period (BECKER, 2014). DAP (Di-Ammonium-Phosphate) is applied directly on the soil when ploughed. This procedure normally does not influence water eutrophication (ibid.). But at the time of tillering and panicle initiation, nitrogen fertilisers (like UREA) are directly applied on the water of the continuous flooded rice field (ibid.). This can cause problems, as the floating nitrogen is only partly absorbed by the rice plants and the run-off of nutrients is high when the fields are drained before harvest (RICE KNOWLEDGE BANK, n.y., a: www).

During monsoon season the nutrient loss is even higher as uncontrolled flooding of the rice fields can occur and the nitrogen is transported into the landscape and into the lake (BECKER, 2014; FAO, 2002: 1). In addition, sediments are flushed out of the fields during field drainage, but mostly during flooding events in the monsoon season due to high flow pressure (FAO, 2002: 1). These sediments settle in the lake basin and are additionally causing the silting up.

The monsoon season starts in Paschim Medinipur around June and ends in September. Depending on the weather situation, the summer crop (rabi) grows from November/February to March/June and the winter crop (kharif) from June to December (ADHIKARI et al., n.y.: 22-23).

Measures treating the nutrient input into the lake should aim at:

- refraining from using fertilisers or reducing the amount applied,
- reducing the run-off of sediments and nutrients, especially nitrogen, and
- intercepting sediments and nutrients, before they can reach the Sharashanka Lake water.

7.2.1 Refraining from using fertilisers or reducing the amount applied

Through omitting the use of fertilisers, there can be no massive nutrient run-off from the paddy fields and no input in the lake. However, with the today's agricultural practices and demands, fertilisers are necessary for the farmers to fulfil the market needs of rice and to secure a high yield. Therefore, omitting or reducing the applied amount of fertilisers shall not destabilise the farmers' income (cf. Tab. 7-1).

Tab. 7-1: Demands of the farmers

Farmers	Irrigation	capacity building measures	Income security	No loss in yield and revenue

One effective method to avoid or reduce the use of fertilisers is the "System of Rice Intensification" (SRI) method. In general, SRI foresees to reduce the amount of used irrigation water up to 50 % (UPHOFF & RANDRIAMIHARISOA, 2002: 71). This aims at keeping the soil moist but well drained, which means that the soil is not saturated with standing water, at least during the vegetative growth period (UPHOFF & RANDRIAMIHARISOA, 2002: 72, 76; MCHUGH et al., 2002: 90). Thus, the nutrient take-up by the plants can be increased significantly compared to conventionally grown rice. A study in Madagascar showed, that through SRI, yields were even higher as in conventionally methods (cf. MCHUGH et al.: 2002). This should compensate farmers for extra expenditures, as the SRI method only works in combination with better water control, more labour for weed management (as flooded fields make weed control easier) and capacity building measures (UPHOFF & RANDRIAMIHARISOA, 2002: 84). SRI can offer benefits, provided that plant, soil and nutrient management changes as well. For example RABENANDRASANA (1999) suggests to apply compost, preferably leguminous plants, on the crop preceding the rice crop, to weed often and early, to plant single seedlings rather than several seedlings together in a hill and to irrigate by using small amounts of water daily or by using the alternate wetting and drying[4] (AWD) method. In the SRI method, fertilisers can be used, but in the most cases this is not necessary as the method can provide enough or even better yield output without the use of mineral fertilisers

[4] AWD is a water saving technology, in which the field is alternately flooded and non-flooded (RICE KNOWLEDGE BANK, n.y., b: www)

(UPHOFF & RANDRIAMIHARISOA, 2002: 78). As an alternative, fertilisation and nutrient accumulation in the soil should occur through organic fertilisers and organic manure.

For the catchment area of the Sharashanka Lake, the SRI method might be a suitable alternative, as fewer nutrients are suspended in the water of the rice fields and less field water is flushed into the lake. Nevertheless, the method should be elaborated and tested by the government on regional fields to make sure that there is no yield loss for the farmers, especially because the method requires **organic manure for fertilisation**, which is rare in the form of straw and cow dung (cf. Tab. 6-5).

A special attention should therefore be put on practices like the planting of nitrogen-fixing legume plants (like *Vigna aconitifolia*, *Cicer arietinum*, etc.) as **rotation crops** (AGRIINFO.IN, 2011: www). These can be incorporated as organic manure into the soil after harvest to maintain fertility and supply additional nutrients for the following rice crop. The irrigation of the rotation crop should not decrease the amount of water usable for the rice crops, if water is saved by the AWD and SRI methods. With two rice crops a year and as one rice crop growing period takes between 100 to 160 days (RICE KNOWLEDGE BANK, n.y., d: www), there are around 165 to 45 days per year where the paddy fields lie fallow. This time is used for paddy field preparation (ploughing) and could give enough time to grow and harvest a rotational crop. A condition of planting rotation crops is the need to be profitable. Their yield should always lead to an additional income for the farmer or be used for self-subsistence, as they need additional work and resources.

If the **plants growing on the lake** are being useful for fertilisation, they can be used as well as organic manure on the fields. As it takes time to install a system of rotation crops and to teach the people how it works to manage new techniques, the incorporation of the plant material in the soil during the first years after the excavation is appropriate. The **mud** from the lake could fulfil a similar intention: adding nutrients and increasing the amount of fertile soil.

Fig. 7-1: Leaf colour chart with rice plants (BRKB, 2014: www)

Another option to avoid excessive use of fertilisers is by using a **Leaf Colour Chart** (cf. Fig. 7-1). The chart indicates different green colours to determine the greenness of a plant leaf, which indicates the nitrogen content of the plant (RICE KNOWLEDGE BANK, n.y., c: www). Like this the addition of N-fertilisers can be adapted to the actual needs of the plants.

Another option to refrain from using fertilisers is **organic agriculture**, as in this practice the use of mineral fertilisers is prohibited. It is replaced by the use of organic fertilisers accompanied by further nutrient accumulation in the soil through nitrogen-fixing legume plants as rotation crops and through incorporating green manure into the soil (PRATA NEVES et al., 2007: pp 2-3). The nutrient accumulation hereby takes place in the soil and not on the flooded water and the absorption through plants is therefore more effective. Although organic agriculture is potentially an option to refrain from using fertilisers, there is no information if it would be realistic in the Dantan region. During the study no analysis was possible to invest the market situation on organic rice. Therefore no information could be collected about the effectiveness and costs on organic agriculture and if there would be customers.

7.2.2 Reducing the run-off of sediments and nutrients

As explained before, the **SRI** method could be a good alternative to refrain from using fertilisers without having yield losses. Although even if fertilisers are used, the method results in a reduced run-off of nutrients and sediments, especially during dry seasons, as a constant water level is being avoided. In the monsoon season the method is less effective as a controlled irrigation is more difficult.

If agricultural fields lie fallow during the rainy season, nutrients and especially sediments can easily be flushed out by the heavy rain. To reduce these run-offs, the previously described **rotation crops** are useful. The used crops cover the soil and reduce erosion (AGRIINFO.IN, 2011: www), hereby keeping sediments and nutrients on the fields.

Rotation crops or other plants can also be used for **mulching**, which is a layer of plants residues covering the fallow field. The layer reduces run-off, prevents the soil from eroding and facilitates weed control (AGRIINFO.IN, 2011: www). Like this the soil is kept on the field and the plant residues can be ploughed into the soil before the next crop, hereby serving as organic fertilisers.

Nevertheless, in the case of having flooded paddy fields during the monsoon season, it is extremely difficult to keep sediments and dissolved nutrients (especially nitrogen) on the fields. With respect to this, measures should rather aim at refraining from using fertilisers and at reducing the used amount or at intercepting nutrients and sediments before they can reach the Sharashanka Lake water.

7.2.3 Intercepting sediments and nutrients

Particularly during rainy seasons the run-off of sediments and nutrients from agricultural fields can hardly be prevented. Hence, measures keeping the sediments and nutrients from leaking into the lake are more effective. Interventions possible for the Sharashanka Lake are:

- Strip cropping
- Sewage farms
- Restraining basins for sediments and nutrients

Strip cropping

One technique to retain sediments on a field, is the so called strip cropping. In strip cropping erosion permitting crops (filterstrips) and erosion resisting crops are grown in alternate rows. The erosion permitting crops, growing with the contour line, cover the soil and do not allow runoff water to carry much soil with it, hence retaining the sediments (AGRIINFO.IN, 2011: www). Plants used should have developed their maximum root and canopy growth when the rainy season starts.

On paddy fields, other crops can hardly grow in strips as the soil for rice plants is saturated. Nevertheless, for the Sharashanka Lake the filterstrips can be grown outside of the paddy fields in the channels where water is drained before rice harvest. These might be in between fields or after the agricultural land and before the lake. Plants possible for filterstrips are for example *Phaseolus aconitiolius*, *Dolichos biflorus* and *Glycine max* (AGRIINFO.IN, 2011: www). These can also be used for food or fodder. Like with rotation crops, the cultivation of filterstrips should be cost effective. Species used should nevertheless be adapted to regional characteristics.

Sewage farms

Sewage farms have been developed in the 19th century to treat waste water problem in cities. The water was seeped away on a large area, for example a meadow, so that the soil could absorb the contained substances which would consequently be decomposed by micro-organisms in the soil (WIKIPEDIA.DE, 2013: www; BIOLOGISCHE STATION RIESELFELDER MÜNSTER E.V., 2014).

Between the agricultural fields and the Sharashanka Lake, such sewage farms or rather sewage fields could function like a buffer (FRANKE & BAYER, 1995: 114) or a clarification biotope. If the drained water from the paddy fields or the water from monsoon floods would have to flow over sewage fields, part of the nutrients and sediments could be detained before reaching the lake. The area should be

planted at least as a meadow but also shrubs and some trees are helpful. In the governmental project orchards plantings are foreseen. If these were to be combined with sewage fields, the area would offer different functions for the villagers. In the dry season, livestock can also graze the area. Depending on where sewage fields would be working, the planting of trees and shrubs could be tested. However, these probably retain more water in the soil than grass, thus accumulating water on the area. This can get crucial if the sewage field neighbours a housing area which could be flooded in consequence.

Restraining basins for sediments

Restraining basins have a greater impact on sediment flows as sewage fields. They have an oval-like form and are a widened and depressed part of a river bed where sediments can deposit (cf. Fig. 7-2). Like the sewage fields, the basins aim at intercepting the sediments from the fields being carried away by the water flow (LANGE & LECHER, 1986: 157). For the Sharashanka Lake it would be suitable to built basins in between the rice fields, before the inlets or in the inlets' river-beds, the last two options being probably more effective. During monsoon seasons and during field drainage, they can prevent the sediments from leaching into the lake.

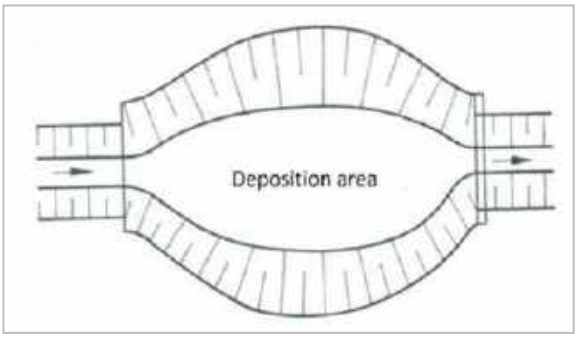

Fig. 7-2: Top view of a restraining basin (adapted from: LANGE & LECHER, 1986: 185)

A bigger and more effective concept could foresee to expand the restraining basins by **connection channels to the neighbouring** one to two **ponds** (cf. Fig. 7-3 and Fig. 7-4). The ponds can hereby work

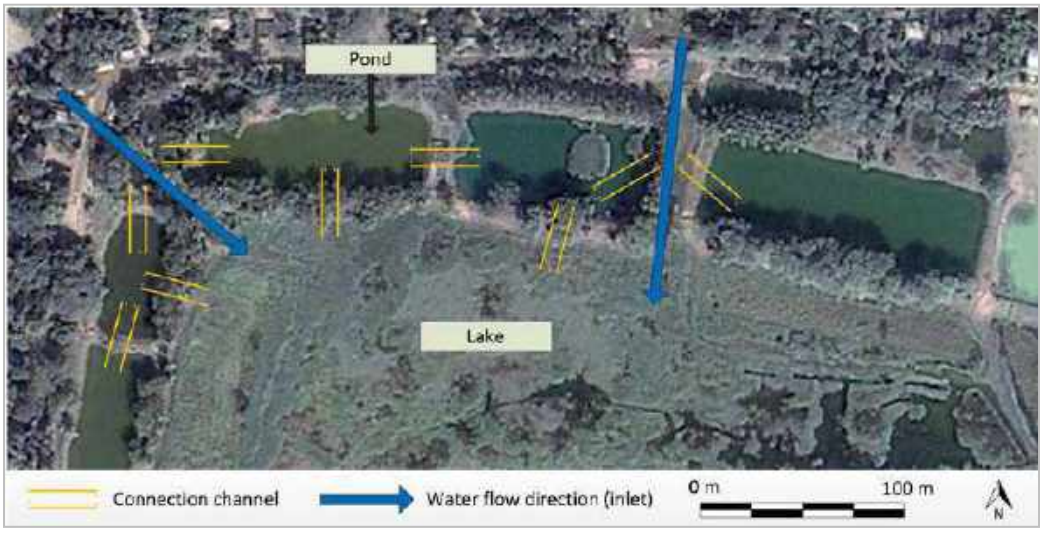

Fig. 7-3: Connection channels - Top view (adapted from: DIGITALGLOBE, 2014)

as restraining basins as well. They needed to be taken out of use, as fishing and washing would probably not be possible anymore. But, if the restraining concept is being worthwhile and reduces the sediment and nutrient input, this could be acceptable.

The channels would join the riverbeds with the ponds, making it possible to divert one part of the water so that more sediment can settle in the ponds before floating back into the lake. If the concept works well, no restraining basins in the river beds might be necessary, only the ponds might be needed.

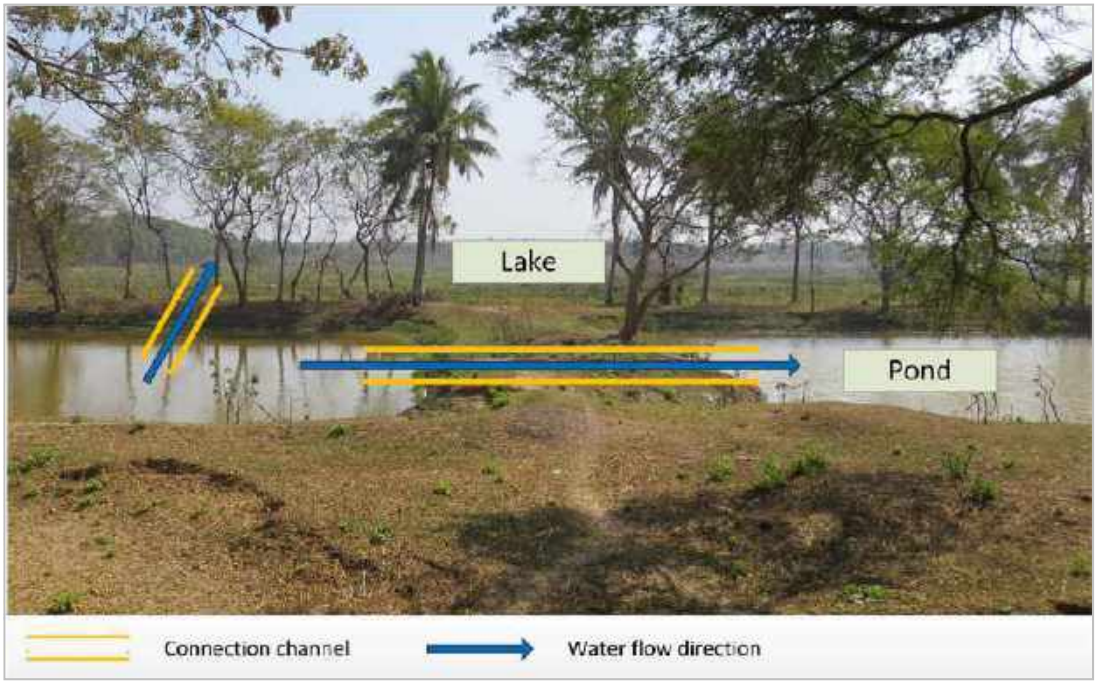

Fig. 7-4: Connection between ponds and lake

A possible method of effectively diverting the water flowing through the inlets is a construction of **geotextile joists** or similar bioengineering installations. Geotextile joists consist of geotextile mats formed to cylindrical or tube-like bodies and filled with a gravel-sand mixture (SCHIECHTL & STERN, 1994: 108). Combined with living building material capable of coppice, the joists are set into the soil and the river banks where the living material starts growing. They have to be set up diagonally to the direction of flow, so that they conduct the rainwater into the ponds. Simultaneously they stabilise the ground and the banks and intercept already one part of the nutrients and sediments. Geotextile joists could be a suitable possibility for the Sharashanka Lake, because they persist through changing water levels and bedload transport (SCHIECHTL & STERN, 1994: 108).

The connection channels should be well planted, so that nutrients floating by can be absorbed by the roots or accumulate in the soil through water infiltration (cf. Fig. 7-5). Sediments will probably also deposit in the channels. If in a few years, the channels risk to be obstructed, the mud can be taken out and put back on the fields.

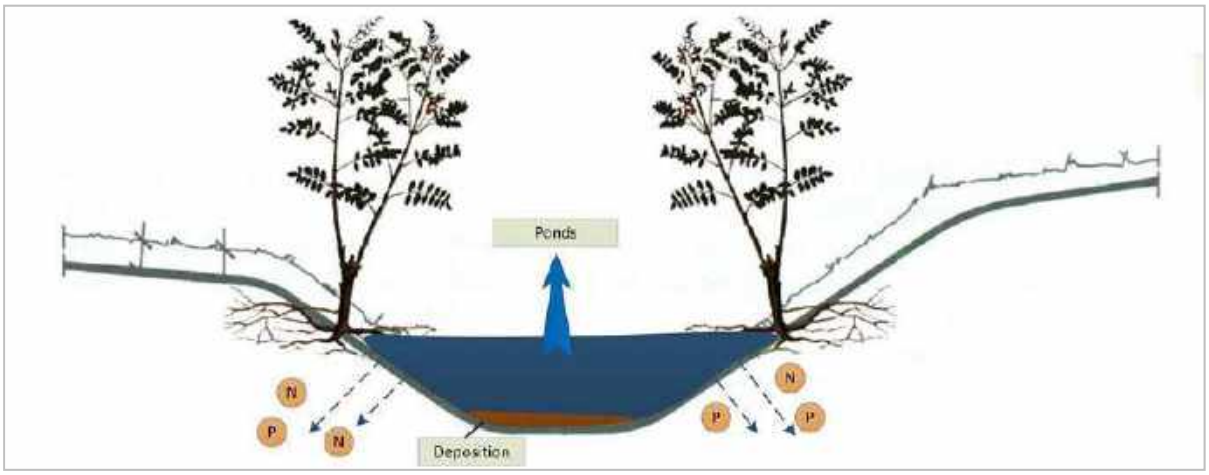

Fig. 7-5: Section of a connection channel (adapted from: LANGE & LECHER, 1986: 208)

The **expansion of the vegetation** along the borders of the inlets, and especially along the connection channels and the ponds is important for the nutrient regulation in the water. The plants should work like filtration organs (HACKER & JOHANNSEN, 2012: 159, 164), taking up nitrogen and other nutrients from the water and the soil. Plantings at the connection channels and inlets should be initiated by the government, using local species with strong roots (HACKER & JOHANNSEN, 2012: 45, 163). The vegetation around the ponds can develop naturally which is less costly and allows natural habitats to develop.

For the exact planning and construction work, a team of hydrologists and engineers should be consulted. Especially to calculate water flow forces and directions in combination with the geotextile joists.

7.2.4 Capacity building and involvement of the local people

To implement the proposed measures in agriculture, training for the new techniques and awareness building measures are necessary. Without educational input, the new techniques cannot be implemented correctly and the people will not properly understand why they are essential and soon go back to old techniques. Capacity building measures for agricultural practices like SRI, rotation

crops, AWD, or the LCC are essential and should be well prepared by governmental experts and can be held after the excavation work is done. This will allow the farmers to understand the necessity of the measures in relation to the lake and increase the willingness to participate as they can see that the government has done its most important part on the development of the lake, namely the excavation. Along with the excavation work or after it, strip cropping, sewage fields and restraining basins should be prepared. Their implementation will have a rapid effect, which allows the farmers to settle with the new agricultural techniques. Especially the basins should buffer the nutrient and sediments input from the fields.

The government should also help the farmers with the work adjustments by providing incentives. For example planting materials could be supplied for free as well as the leaf colour chart and the measuring cup for AWD method.

Regular information days about the sense of new techniques should be held, not only in an initial phase. Some techniques can be taught in school with teenagers as many of them probably work with their parents on the fields. Through an agricultural class, many important issues can be spread into the families.

7.3 Role of tourism

The demands of the tourists (cf. Tab. 7-2) coming to the lake are well respected in the governmental project report. As the temple and the surrounding large meadow are on the east side of the lake, tourism concentrates on that side of the lake. The project report does not change anything about this, but ghats will be built on all the banks of the lake and toilets and drinking water facilities will be available in the future (WRIDD, 2011: 6). As a nature conservation zone is desirable on the north-west side of the lake (cf. section 7.4), it should be desisted to built ghats in that area to minimise human activities. Access should then be denied.

Tab. 7-2: Demands of tourism

Tourism	Sanitation facilities	Open meadow	Easy access to water for bathing (flat borders/ghats)

Fig. 7-6: Meadow next to the lake after tourism event

During the temple visit in February, a lot of waste is left behind (cf. Fig. 7-6). For environmental purposes measures should be taken to decrease the pollution. Plastic and other waste will pollute the water of the lake and threaten animals. To avoid pollution, an information sign about the importance of an intact lake system and what waste can cause should be installed. Also signs prohibiting littering are necessary. In combination with dustbins, this should make it possible for the visitors to dispose their waste. After large tourism events, an employed cleaning troop should tidy up the area and an official removal should take place.

The project report of the government describes making a touristic attractive site out of the Sharashanka Lake. This aim can correlate with the people's wish to regain the scenic beauty of the lake by having more birds, because for (Indian) tourist birds will also improve the view at the lake. Furthermore, boat rides for bird watching can be established, which provides an additional income for the local people who can offer the tours. Boats are foreseen in the pisciculture scheme of the project report and could be available for a shared use.

7.4 Role of nature conservation/biodiversity

The issue of nature conservation does not seem to be so much treated by the government and also by the local people (cf. Chapter 6). Nevertheless, some awareness could be recognised from the villagers, especially because they want the birds' and fish's abundance to increase again; Mostly in relation to fishery and the scenic beauty of the lake, but probably also for bird hunting reasons (cf. Sub-section 6.4.2).

To increase the number and species of the fauna, the nature around the lake has to be protected and developed in such a way to provide habitats, nesting grounds and food for the animals, especially the birds (cf. Tab. 7-3).

Tab. 7-3: Demands of nature conservation and biodiversity

Nature conservation/ Biodiversity	Birds: Shallow area for resting and breeding on the lake border	Birds: Rest and hunting area on the open water of the lake	Reduced human activity	Well structured riparian landscape

As the demands of the nature conservation stand in contrast to the demands of other user groups, they cannot be fulfilled on the whole lake area. Nevertheless, it might be possible to enclose a **nature conservation zone** in one part of the lake where the demands for the development of biodiversity can be respected. This zone can be established in the north-west corner of the lake near the two inlets. The east border is excluded from nature conservation because of the tourism zone and the south border should be excluded as there is a larger settlement area, both borders increasing the human activity at the lake, either for tourism or for fishing. The west border shows the smallest housing area, but it might still be more occupied through the road coming from Dantan.

The **north-west border** of the lake with the two inlets would develop differently than the other borders, through the implementation of the retraining basin concept. If sediments deposit in the ponds, these will get muddier and develop marsh parts. Through the natural vegetation development at the ponds there woul be well structured and diverse riparian habitats. These would be ideal conditions for birds and other organisms (cf. Tab. 7-3). The use of the ponds neighbouring the inlets should therefore be restricted and a nature conservation zone can be put in place. Like this a new function can be allocated to the ponds as they are anyway less usable by the local people for fishing and washing because of the restraining basin concept.

For a well functioning of the nature conservation zone, some **rules** have to be followed by the population:

- The access to the zone should be reduced.
- During the breeding season of birds, often in the monsoon season (SALIM, 1941), the access should be restricted.
- On the borders of the lake and on the open water bordering the zone, fishing should not be allowed at breeding times.
- All year, fishing, washing and bathing should not be allowed in the ponds being part of the nature conservation zone.

- Birds should not be hunted during breeding seasons.
- To prevent the riparian habitats from being damaged, the vegetation should not be removed. Only maintenance in favour of the nature conservation zone by governmental experts should be allowed.

These rules - when followed - will guarantee reduced human activity and allow an undisturbed reproduction of the species. To assure that the rules are followed, they should be controlled by the Biodiversity Management Committee of Dantan. Therefore the committee should be reactivated and have clear tasks to fulfil for the region.

The committee or the State Biodiversity Board should organise together with the Panchayats an **information day** about nature conservation and biodiversity in general and at the lake. This should be done for the whole Gram Panchayat of Salikotha and other people using the lake. Furthermore, regular classes on environmental topics should be held in the schools as from the first school year on, implying that teachers would have to get special training about the subjects.

The **Panchayats** could also be trained and work as a control organ, having an eye on the nature conservation zone and report any rule braking to the Biodiversity Management Committee or give verbal cautions themselves.

7.5 Role of the fishermen

The department of fishery from the government of West Bengal has proposed a detailed pisciculture plan in the **project report** for the Sharashanka Lake (WRIDD, 2011: s.p.). Demands like fish hatcheries, capacity building measures and an easy access to lake are considered in the plan and as the lake will be excavated there will be enough water to grow fish species of a larger size (cf. Tab. 7-4).

Tab. 7-4: Demands of the fishermen

Fishermen	Enough water to breed big fish species	Fish hatcheries	Capacity building	Income security	Right to fish	Easy access to the lake (flat borders or boat)

In respect to a multifunctional use concept, the plan should foresee to restrict fishery in the nature conservation zone as described in section 7.4 . The fishermen can work together with tourism as they have boats on their service which can also be used for little boat rides and bird watching. This could allow an additional income.

The government should furthermore consider in the project plan that all the villagers can have the **right to use the lake**. This does however not imply that everyone can fish how, when and as much he wants to, because soon the lake could be overused and the fish populations would decrease again. Nevertheless, no one should be excluded from the use. Clear rules would have to be followed so that everyone can profit from fishing and have a secure income, especially small fishermen or people listed in this study as small householders.

7.6 Role of housekeeping

Today, **housekeeping activities** are held in the ponds, but wishes have been expressed to reintroduce them in the lake. However, since washing powder and other soaps affect the water quality, the input should be reduced as much as possible. A good solution would therefore be to keep washing and bathing (cf. Tab. 7-5) in the ponds. The access to the ponds is still easy and the use pressure on the lake can be reduced. Furthermore, the water of the lake is kept free from soap residues, which improves the water quality for fishing and irrigation.

Tab. 7-5: Demands of housekeeping

Housekeeping	Washing	Bathing	Easy access to water (flat borders, ghats)

To reinforce this approach, an **information day** for women should be organised to treat the affects of soaps on water quality and to propagate the use of biodegradable soap if available on the market. Furthermore, it should be highlighted that also the women play their role in the protection of the lake. By giving them this special responsibility, the acceptance of protecting the lake will grow and hopefully be passed on to the children, who spend a lot of time with their mother and sisters.

7.7 Role of the small householders

Since the small householders either work in agriculture or in fishery or in both, they should respect the proposals made in the previous sections (cf. section 7.2 & 7.5). Nevertheless, this user group should be more strongly integrated in the work to be done for the development of the Sharashanka Lake, for example planting work or construction work. The interviews showed that the people from this group are poorer and often rely on the MGNREGA scheme to secure a minimal income (cf. Tab. 7-6). Using the scheme, the small householders should be employed for the above mentioned work.

Tab. 7-6: Demands of the small householders

Small householders	Working opportunities and additional income	Capacity building	Income security	Right to fish

7.8 Lake maintenance

By fulfilling the described roles of each user group/usage option the lake degradation can be significantly reduced. Nevertheless, the risk of degradation might not be totally excluded. Maybe the proposed measures, especially in agriculture, are not sufficient to cope with the eutrophication and sedimentation of the lake. Furthermore, future economic developments might influence the agriculture and fish market so that practices will change again. A possible consequence would therefore be a repeated plant growth making maintenance measures necessary every few years. To inhibit further spreading, excessive plants can be manually removed and then maybe dried and used as fodder or organic manure. During the World Café, several proposals were made about who should take care of the plant growth (cf. section 6.3). It was suggested giving a responsibility to a group, like the fishermen or the Panchayat, who should take care of the cleaning. But, as everyone plays its role in the lake degradation and uses it in any way, everyone has the responsibility to care about it. Either, a group of designed people should be employed to do the work, or the cleaning should be a community effort based on free participation. The later one would allow strengthening the social cohesion of the villagers and no one would feel less responsible as someone else, but the risk that many people would not help is larger. The cleaning events, either employed or not, could be organised by the Panchayats.

7.9 Abstract of the roles of the user groups/usage options

In the following table (cf. Tab. 7-7), the roles of the user groups/usage options are summarised. The spatial allocation at the lake and the time of use of the lake is listed as well as restrictions and change in habits coming along with the multifunctional use concept. Necessary capacity building measures and education are named in the columns of *involvement* and *capacity building*.

Tab. 7-7: User groups/usage options and their role in a multifunctional use concept

User groups/ Usage options	Spatial allocation lake	Time of use	Restrictions	Change in habits	Involvement	Capacity building
farmers	/	/	reduced or no use of mineral fertilisers	adopt new agricultural practices	lake cleaning; construction work and plantings	capacity building measures for agricultural practices; Education about the degradation problematic of the lake
tourism	eastern border at the temple	all year	no access to nature conservation zone	use sanitation facilities; No pollution through waste	/	signs at the lake
nature conservation/ biodiversity	north-western ponds and border	all year	no access and fishing in the ponds; Respect breeding season of birds	/	for villagers: construction work and plantings	for villagers: Education about the importance and meaning of the zone
fishermen	lake	all year	in the north-west not during birds breeding seasons	respect conservation zone, adopt rules for a sustainable fishing	lake cleaning; construction work and plantings	training for sustainable fishing; Education about the degradation problematic of the lake
housekeeping	ponds	all year	not in the lake	use biodegradable soap and washing powder	lake cleaning	information day for women and children; Education about the degradation problematic of the lake
small householders	cf. fishermen and farmers	cf. fishermen and farmers	cf. fishermen and farmers	cf. fishermen and farmers	lake cleaning; Improved involvement in the work to be done for the development of the lake	cf. fishermen and farmers

7.10 Spatial allocation of the different uses at the Sharashanka Lake

The following map shows the proposed spatial allocation of the previously described uses at the Sharashanka Lake. In the north-west, the nature conservation zone covers less than a third of the lake surface and the ponds necessary as restraining basins. The frontier on the north and east side of the ponds of the zone is limited by the road passing by. Six ponds are taken out of use in favour of the nature conservation zone. The rest of the lake surface is available for fishing and the rest of the ponds for housekeeping. In the east tourism covers most of the meadow, but it might expand or shrink depending on how much people visit the temple. The agricultural area is not allocated in the map however it takes place in the catchment area around the lake which is mostly located in south and north-east of the water body.

8 Reflection on the approaches

In this chapter a critical review of some of the applied approaches, namely the interviews with the local people and the experts, as well as the World Café is undertaken.

Interviews with the local people

The circumstances to conduct the interviews were influenced by the cultural conditions on-site. For the interviewer it was a new situation to interview Indians, and what is more, who came from a remote rural area. The local people probably never had experienced a personal interview before. The interviewer had to be very careful not to make them feel uneasy, allowing authentic answers to the questions. As the time to organise the interviews was short, the total time allocated to the interviewing on-site was fixed to two days, there was less time for the interviewer to get prepared for the interview situation. For a better understanding of the answers from the respondents, it would had been helpful to have invested more time on-site to get to know the culture and the daily life of the local people and hereby better understand and react to given answers.

The translation of the interviews further increased the loss of information. As the time on-site was short and the preparation partly spontaneous, the interpreters were no professionals. This had two disadvantages. First, the interpreters probably did not always translate the questions exactly but added additional explanations, thinking this might help the respondent to understand the questions. This, in return, could have influenced the given answer because the respondent got a sense of what he thought the interviewer wanted to hear. For example, when asked about what the respondents understood about tourism, some interpreters added examples, like bird watching, which made the respondent answer with a simple *yes* or *no* instead of a personal answer. Second, a disadvantage appeared as the interpreters could not translate every sentence simultaneously and literally, either due to problems with the English language or because the respondents simply explained so much that not everything could be remembered by the interpreter. Like this some information was not translated at all, but it might have been interesting for the study. This unsaid information might have given a better perception about the nuances of opinions of the people and of the meanings of some answers. If a similar study were to be repeated, more time should be invested in choosing the interpreters and in explaining to them what is expected of them.

A circumstance which highly influenced the respondents' answers was that the interview was never held alone with the respondent. But family members and neighbours always joined the interview and participated in the answering and hereby created discussions (cf. Fig. 8-1). When interviewing someone who was less outgoing, this person might have withheld information or changed answers by having been influenced or set under pressure by others. This circumstance is nevertheless a common occurrence when working with such a culture and can hardly be prevented. It is hereby more important that the interviewer keeps focused on the respondent and not on surrounding participants and tries to directly address the respondent.

Fig. 8-1: Typical interviewing situation

The interview partners were only chosen by their occupation and not by gender, therefore only men could be interviewed. The man is the head and represents the family so it is probably his role to talk to foreigners. He is also mostly responsible for work-related topics. The women mostly did not even witness the interviews. They were either shy or they were not supposed to interfere in "man-matters". Nevertheless, the interviewing of women would have been helpful for the following reasons: firstly, they depend on the lake in terms of housekeeping activities, opinions concerning this topic would have been helpful for the recommendations in the multifunctional use concept, secondly, the women make part of the village communities and still have strong roles in the daily life of the rural people in terms of child care and nutrition. For a successful development of the lake considering an integrated approach their demands should have been more carefully investigated.

The use of handwritten notes for documentation is criticised in GLÄSER & LAUDEL 2009 (157), nevertheless even after the interviews, this method seems as the right one. All the information translated got captured by trying to avoid personal interpretation for the most part. Therefore the results can be seen as authentic. Positively for the interviews was that the note-taking even seemed to encourage the respondents to tell more, because they could witness that all the information they told seemed interesting to the interviewer as it was written down. Sometimes the respondents even encouraged the interviewer to note down specific information, as for them it was very important.

This eagerness for participation in the interviews was perceived throughout the work on-site. One might have presumed that the respondents were critical towards foreigners questioning them but this was not the case. Instead, all the respondents gave answers without hesitating. A high wish of communication was noticed and not a certain reserve, making it appear that the method of interviewing was in general well chosen and for the most part well implemented.

World Café

The respondents willingly participated in the World Café without questioning the method, but the problem of translation was the same as during the personal interviews. Unfortunately during this part of the approaches the group influence on answers of some respondents got worse. As it was an open dialogue in which everyone of the table group had a say, very outgoing people soon led the discussion and shyer people got even more reserved, expressing their opinions less and less. As there were three different mediators and some of them were inexperienced, they might have had overlooked this. Therefore they might not have addressed the shy people directly to get an opinion. If a World Café was to be repeated, the mediators should be better instructed what their role is supposed to be.

Expert interviews

The open discussion with the **administrator of Dantan** was scheduled during the research on-site anyway, but luckily he agreed to do a second and personal interview later on. The discussion allowed the interviewer to prepare some topics for the personal interview, thus enabling to address some critical topics. The preparation through the open discussion, during which unknown information came up, made a more exact analysis through the second interview possible. Again, because of cultural issues and differences in politics and administration it was not clear from the beginning what information to look for. Only after the first encounter with the local people and the administrator the set of interview questions could be formulated.

The other two expert interviews had not been planned before the trip to the region, but resulted spontaneously on-site due to the relation with the Bhatter College. They provided valuable input for the study. The interview with the **journalist** confirmed the degradation process assumptions and the information received by the **wildlife expert** gave suggestions for the multifunctional use concept.

9 Discussion

The following discussion takes a look at the recommendations for a multifunctional use concept of the Sharashanka Lake in an overall context. Limits of the recommendations and an appraisal of the implementation are presented.

In the concept the underlying demands of the different user groups/usage options (cf. Tab. 6-6) could possibly be expanded but the research output of this study only identified the mentioned demands criteria. Nevertheless, they are sufficient to make viable proposals for a multifunctional use concept, as they represent the most important demands to influence it. The recommendations respect a balance of the demands, not giving serious disadvantages to any of the user groups/usage options. Therefore, the **multifunctional use concept** as such can be deemed as feasible.

Looking at it from a bigger scale however, the implementation of the recommended concept could meet some **obstacles**. These could either come from the local people or **politics and administration**. Without the consent of the government of West Bengal the proposed multifunctional use concept and especially the changes in agricultural practices would not be possible. Funds as well as know-how and experts for capacity building measures are indispensable. But the state government might not necessarily want to promote new agricultural practices or develop nature conservation measures, as one of their main aims, food security, is mostly reached by the current approaches. Also the newly proposed practices in agriculture oppose the governmental fertilisers policy, which offers subsidies on fertilisers. Then the concept should be put into practice by the administration of Paschim Medinipur and especially Dantan for a better consideration of the local people and their demands and their involvement. This requires a close cooperation between the concerned administrative responsibilities. During the study it could be detected that this integrated procedure is not easy in India. Already on a national level there are 51 ministries (NATIONAL INFORMATICS CENTRE, n.y.: www) (compared to 14 in Germany), complicating the cooperation between different disciplines. How the technical departments on district or block level cooperate among themselves could not be found out during the interviews. However, the main organisational and planning work is likely to be done on state level as the current project report for the development of the Sharashanka Lake was done by the government of West Bengal. The importance and influence of the local administration on state decisions could not be clearly detected during this study.

Further **obstacles** to the recommended concept could occur through the **local people**. They are the main element in the success of the multifunctional use concept since they are the users of the lake region. The environmental stability of the lake, which should allow a multifunctional use, can only be maintained if the local people correctly implement the proposed agricultural practices. Furthermore, they would have to respect the nature conservation zone and the accompanying rules. This might be very difficult for them as they would have to change some of their habits and would be exposed to restrictions concerning their freedom to move.

The adoption of the recommended concept is probably the most difficult for the farmers, as they would have to change their habits the most. The changes might be not adopted either due to fear of economic losses or out of distrust. Economic losses leading to destabilisation of income may occur during the period of transition to new agricultural practices. Especially for small farmers or small householders this could pose a problem. A correct application of the techniques and a success of them might only take place a few years after the adoption. Farmers might need the time of a few crop seasons to fully learn how to handle new techniques and to adapt them to their fields. Therefore they could experience the same or a higher income only after start-up failures. In many rural areas, measures on water quality are only adopted if they affect the wealth of the people (KEHRIG, 2002: 3), making this one factor of success of the concept.

Most people living in rural areas have had the same habits for generations. The change of these is often unwanted. This was also observed in a development project in Andhra Pradesh, India, which aimed at reducing the use of pesticides (GTZ SUSTAINET, 2006: pp 40-49). In this region it took the farmers two years to fully adopt the newly proposed practices. Only after seeing the benefits of the changes they agreed to resort to them as well. The project used test fields to show the people how the new practices work. This is an important issue for the farmers of the Sharashanka Lake as well. Test fields are necessary to demonstrate for instance rotational cropping and the SRI method because the learning effect and the acceptance are much higher when seeing and trying out for yourself.

Other habits or traditions, which can cause a failure of the project, are the social structures of the Indian society. This is highlighted in the Indo-German Bilateral Project about watershed management (GTZ SUSTAINET, 2006: pp 100-107). The project stated that “it is beyond [...] [the] scope [of watershed programmes] to overcome traditional social barriers between land owners and the landless”, especially regarding social structures of power and caste affiliation (ibid.: 106). The range

of such a problem cannot be fully discussed in this study because the lack of understanding of the Indian society is too big. The research time on-site was too short to identify all the social structures within the population. However, statements made by small householders result in the assumption that these social structures should not be neglected. For instance, they noticed that they, as poor people, need the right to fish in the lake and that this could not be a privilege of wealthier people, meaning also land owners.

Although the **local people** can pose obstacles for the implementation of the multifunctional use concept, they are also the crucial **factor for a success** of the recommendations. The interview results show that the willingness to participate in any work necessary for the development of the lake is high. The people want to be integrated in the work. This is the most important premise for a successful implementation of the recommended concept. The above-mentioned Indo-German Bilateral Project confirms this. It points out that factors contributing to success are the local people's openness to new ideas and the acceptance of new practices and measures, provided they are beneficial (GTZ SUSTAINET, 2006: 106). As long as the local people agree with the recommendations for a multifunctional use concept, success should be possible. Agreement again fully depends on the capacity building measures and the long-term education. Without these, the concept will neither be implemented nor sustainable.

GTZ SUSTAINET (2006) also demonstrates the success of the **involvement of the local people** in the problem and solution-finding of their listed watershed development projects. In Orissa, India, discussions took place with villagers in the context of an irrigation project (GTZ SUSTAINET, 2006: 75-80). Problems and opportunities of the region were identified but the highlight of the findings was the local knowledge about alternative irrigation methods. The recommendations of the present study arose in the context of both personal interviews and discussions with the local people. Nevertheless parts of the recommendations, especially concerning agricultural practices, rely on literature and not on local knowledge, since this was not investigated. This might be a disadvantage for the multifunctional use concept since measures proposed by the people could be more successful as they might be more accepted. Also the local people are more familiar with the working and living conditions of their region and might therefore point out more practicable measures.

Furthermore, the involvement of the **Panchayats** in the decision-making and in the implementation of the concept is a crucial factor for a successful implementation. In most of the development

projects described by GTZ SUSTAINET (2006), the role of the Panchayats is emphasised. In the Andhra Pradesh project, it was responsible for the organisation of community investments, like, for instance, buying a seed-crushing machine used by the community (GTZ SUSTAINET 2006: 45). Panchayats, especially Gram Panchayats, are useful to build local strength (ibid.: 116) and to establish a better collaboration with the local people. The involvement of the Panchayats in the proposed multifunctional use concept was only touched on in this study. How exactly this body can support the concept, especially in the long run, and if it really wants to, should be investigated in the future.

If the recommendations for a multifunctional use concept of this study were to be implemented, there is the possibility that **new conflicts** would arise among the user groups/usage options. For instance, if the avifauna increased due to successful nature conservation, their consumption of fish would increase as well. The fish consumption through birds would thus lead to a conflict with the fishermen, which would reflect negatively on nature conservation/biodiversity. This again could deteriorate the concept's success. Moreover, tourism could grow if the attractiveness of the lake improves. This could mean that pollution increases and that more area is needed around the lake. Consequently, conflicts could arise between tourism and fishing as well as nature conservation/biodiversity. Both need clean water and the conservation zone should be a restricted area where no tourists are allowed. Another possible conflict could arise between down-stream farmers and fishermen. In dry periods, both groups rely on the water of the lake to irrigate or to fish. However, if too much water is used for irrigation, there might be not enough water left in the lake for a successful fishing and vice versa. Therefore, an early identification and prevention of further conflicts is important.

There might be changes concerning markets, economy, ecology and sociology, which are influencing a correct and successful implementation of the recommended concept. The short research time on-site and the type and scope of this study could not have respected all of the influencing factors and the testing of the measures. Therefore a monitoring study of the multifunctional use concept accompanying the implementation would be helpful to verify success or failures.

10 Conclusion and Outlook

This study is a response to the current degraded state of the Sharashanka Lake and the proposed project report of the government of West Bengal. The goal was to propose a multifunctional use concept for the lake region. This should consider an ecologically sustainable use and proposals for an integrated development approach. In order to achieve the goal set, three research questions were formulated.

The **first research question** asked about how environmental stability of the lake can be maintained in order to establish a multifunctional use. Environmental stability hereby implies that the hydrological and nutrient balance is intact, so that the water quality allows a complex and diverse ecosystem permitting different uses of the lake. The main step to regain an intact hydrological and nutrient balance is to excavate the lake so that an open water surface is created. But to maintain environmental stability, and hereby allowing a long-term multifunctional use, the causes of the degradation (eutrophication) have to be treated.

Through this study different factors influencing the degradation of the lake could be identified. First, the broken weir at the water outlet inhibits a strong water flow necessary to flush plants and nutrients out of the lake. As the government intends to repair the weir, this problem should be considered as solved. Second and above all, the input of agricultural fertilisers in the lake strongly influence the nutrient content, and therefore the eutrophication. The interviews with the local people showed that they do not have rules about how much fertilisers are used on the fields and research about rice farming showed that the amount applied is generally put on the standing water of the paddy field. These circumstances are becoming problematic for the Sharashanka Lake when water from the fields flows into the lake through drainage and monsoon floods. The contained nutrients increase plant growth in the lake and cause eutrophication. To decrease the nutrient input into the lake, this study suggests a set of approaches. These mainly intervene in the conventional agricultural practices applied by the Indian farmers and have three goals:

- refraining from using fertilisers or reducing the amount applied,
- reducing the run-off of sediments and nutrients, especially nitrogen, and
- intercepting sediments and nutrients, before they can reach the Sharashanka Lake water.

To respect the three goals, changes in agriculture or treatments of its effects are recommended in this study. These include small proposals from the introduction of rotational crops or leaf colour charts to complete conversions of agricultural practices to the method of “System of rice intensification” and proposals of landscape planning measures including bioengineering interventions. The landscape planning measure addresses the creation of restraining basins to intercept sediments and water rich in nutrients. The proposed measures should be implemented in combination to be the most effective and as well be tested and discussed by further experts, especially hydrologists and agronomists.

Any recommended measure will neither be successful nor sustainable without the capacity building and the involvement of the local people living at and profiting of the Sharashanka Lake. To effectively maintain the environmental stability the people have to be informed and educated from the beginning of the governmental project and through all of the development measures to come. This is the task of the Indian government, or more specifically of the administration of Paschim Medinipur and Dantan.

The **second research question** inquired about which multifunctional use concept is feasible at the lake. First, the different user groups/usage options of an intact lake system had to be identified. In a next step the uses were compared by depicting their demands and conflict potentials. The recommended concept includes possible solutions to balance the analysed demands.

Five user groups/usage options were identified during the on-site survey and the interviews with the local people: farmers, tourism, fishermen, housekeeping and small householders. Furthermore, nature conservation/biodiversity was set as sixth user group/usage option. The demands of fishermen, farmers and small householders primarily focus on income security or additional income possibilities. Most of the user groups/usage options would like to or need to continue with their use at the lake. They furthermore want to participate in capacity building measures. In contrast to the other uses, nature conservation/biodiversity requires a reduced human activity including areas for resting and bird nesting and a well structured riparian landscape. This conflicts with the other demands.

The recommended multifunctional use concept therefore separates the different uses spatially and partly in time. Housekeeping should only take place in the ponds while tourism should be concentrated at the eastern border around the temple. At the north-western border, around the inlets and the respective ponds, a nature conservation zone should be allocated. Through landscape

planning measures this area will develop in favour of biodiversity. Access and other uses should be restricted in this area, especially during breeding season of birds. Fishing should take place at the rest of the lake and farmers should continue agriculture on their fields but in respect of the proposed new practices to maintain environmental stability of the lake.

In the **third research question**, the role of the local people in an integrated development approach was addressed. This role mainly lies in the application and implementation of the proposed multifunctional use concept. The local people should help with the technical work on-site, like plantings and construction work. In a long term, the maintenance of, for instance, the weir and the restraining basins should be their area of responsibility. Furthermore, the education and capacity building of the involved people is essential for an integrated approach. They should know and understand what new techniques and practices aim at and this knowledge should be transferred to the following generations. It is furthermore important to strengthen the role of the Gram Panchayat in the development concept of the lake. The Gram Panchayat is represented by the local people and should enhance the communication towards the government. It functions like a connection to the government, aiming at solving problems and at stating demands. This is essential for a future development of the lake and for a long-term success of the multifunctional use concept.

Although the **recommendations for a multifunctional use concept** respect the on-site situation, concerning economy, ecology and sociology, there still might be missed factors which are influencing the correct and successful implementation of the concept, making for example new conflicts arise between user groups/usage options. Politics, administrative proceedings and non-respect of the local people towards the concept represent the main obstacles for success. Nevertheless, the willingness to participate in the development of the lake is high among the villagers and this is the main factor of success for a multifunctional use concept at the Sharashanka Lake.

In **further researches** the recommended concept should be discussed on-site with the respective politicians, further experts and especially the local people. This should aim at identifying the acceptance and at revising the feasibility of the concept and thus making necessary amendments. It should also allow formulating an implementation strategy. Furthermore, test fields should be arranged to carry out surveys on the proposed agricultural practices. At last, a monitoring study should be carried out during implementation and application.

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Attachment

To examine the detailed results of the interviews with the local people and the present thesis in digital form, please view the attached CD.

Affirmation in lieu of an oath

I hereby declare in lieu of an oath that I wrote the available Master thesis myself only by using the indicated references and assistant data and that all passages of the thesis which derive from other sources, either word-for-word or in general sense, are being marked as such. The thesis has not been presented to any other examination authority in the same or a similar form.

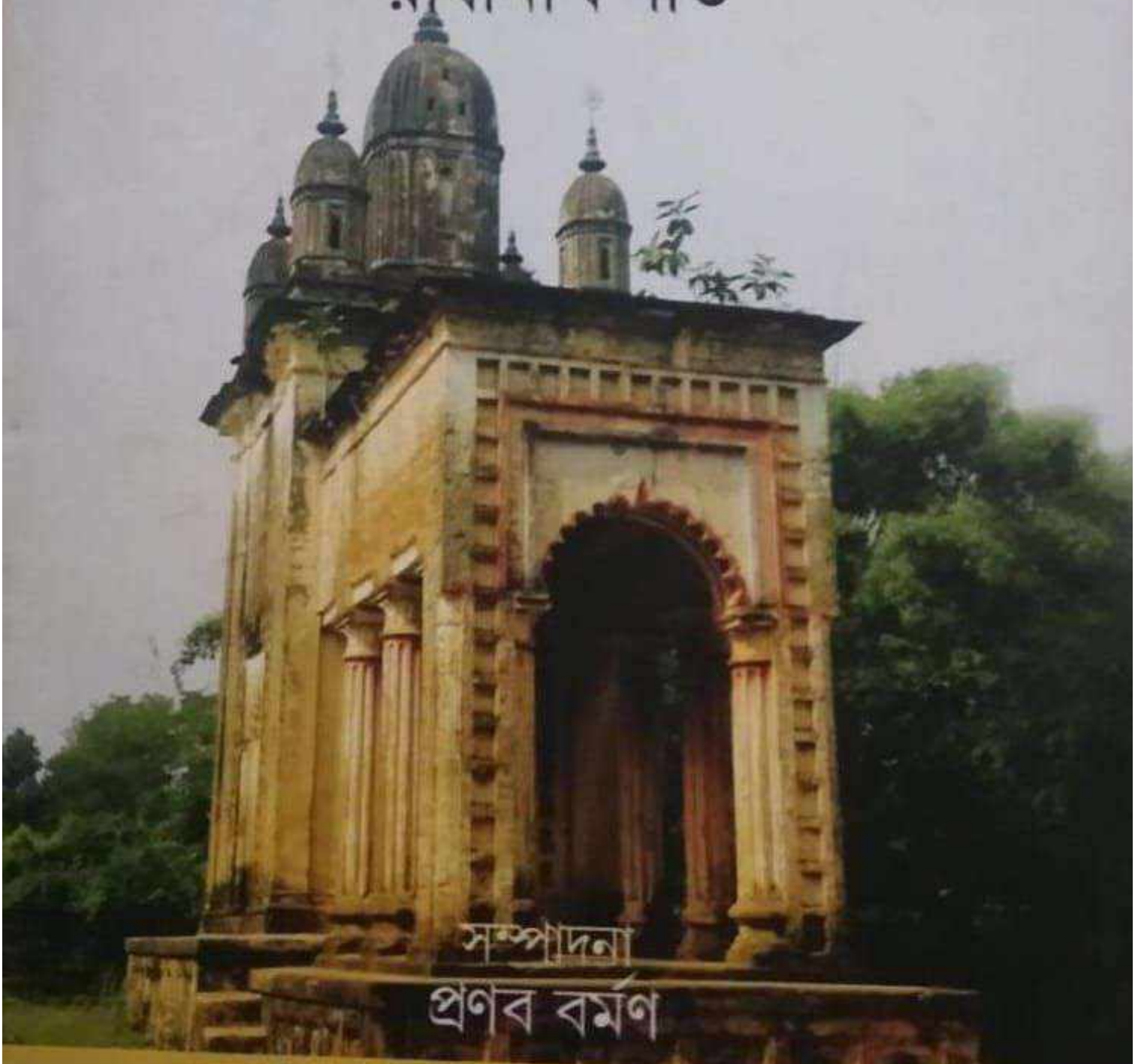
Hanover, 15.08.2014,

Julie Even

ভট্টর কলেজ, দাঁতন | প্রকাশনা ১

কেশিয়াড়ি

রাধানাথ পতি



সম্পাদনা
প্রণব বর্মণ

ভট্টর কলেজ, দাঁতন

সূচী

প্রাক্‌কথন

ভারতের ইতিহাস নেই — কথাটি ইংরেজদের দ্বারা বহুলভাবে ব্যবহৃত। এই মতকে দৃঢ় ভিত্তির উপর স্থাপন করেন সংস্কৃত পন্ডিত ম্যাকডোনেল সাহেব, যার বক্তব্য ছিল 'History is the one weak spot in Indian literature'।[১] একই সুরে কথা বলেন হান্টার সাহেব। ইতিহাসচর্চায় ভারতীয়দের অনীহাকে তুলে ধরে ইংলন্ডের সঙ্গে তুলনা করে একদা লিখেছিলেন :

> Every country, almost every parish in England, has its annals, but in India, vast provinces, greater in extent than the British Islands has no individual history whatever[২]

শুধুমাত্র ইউরোপীয় সাহেবরা নন এই মতের অনুসারি ছিলেন স্বয়ং রবীন্দ্রনাথ। ভারতের অন্যান্য ক্ষেত্রে অসামান্যতা আছে বলে স্বীকার করলেও ইতিহাসের ক্ষেত্রে ইংরেজদের কথাটি যে সত্য তা অকপটে স্বীকার করেন। ভারতীয় সমাজ ইতিহাসের প্রতি বিমুখ হবার অন্যতম কারণ ছিল, ধর্মের প্রভাব ও পরজীবনের প্রতি আকর্ষণ। তবে ব্যতিক্রম যে নেই, সেটা বলা বাহুল্য। অতীতের সব প্রতিকূলতাকে অতিক্রম করে রাজপুত বা শিখরা নিজেদের কথা বিক্ষিপ্তভাবে লিপিবদ্ধ করেছেন। আবার 'বখর' এর মধ্য দিয়ে মারাঠাবাসী তাঁদের ইতিহাসচেতন মনকে জাগরুক রেখেছেন। এই গোত্রের মধ্যে দক্ষিণ ভারতের 'কারনাম'দের লেখা নানা গ্রন্থ বা অসমের 'বুরুঞ্জী'র কথা উল্লেখ করা যায়। শোনা যায় ইতিহাস লিপিবদ্ধ না করা জাতিগুলির অন্যতম ছিল বাঙালি। মঙ্গলকাব্য এবং বৈষ্ণব গ্রন্থগুলি বাদ দিলে বাংলায় অতীতচর্চার কোন ঐতিহ্য নেই। ঐতিহাসিক গ্রন্থের যথেষ্ট অভাব রয়েছে। এই অভাব দূর করার জন্য মহেন্দ্রনাথ করণ লিখেছিলেন :

> *বাঙ্গালার ইতিহাস নাই; কীটদষ্ট জীর্ণ পুথি, ভগ্ন প্রস্তরখন্ড, উৎকীর্ণ শিলালিপি, -শিল্প, স্থাপত্য ও ভাস্কর্য্যের নিদর্শন,-প্রাচীন মুদ্রা, জীর্ণ মন্দির, পঙ্কপূর্ণ জলাশয় এবং ইষ্টকের জঞ্জালস্তূপের মধ্যে দেশের যে অজ্ঞাত ইতিবৃত্ত প্রচ্ছন্ন রহিয়াছে... বাঙ্গালীকে তাহার উদ্ধার সাধন করিতে হইবে।*[৩]

বিশেষ করে ঔপনিবেশিক ভারতে বাঙালির এই 'ইতিহাসচেতনাহীন' মনকে নাড়া দিতে এগিয়ে এগিয়েছিলেন বঙ্কিমচন্দ্র চট্টোপাধ্যায়, রাজকৃষ্ণ মুখোপাধ্যায়ের মত মানুষজন। বঙ্কিমবাবু মনে করিয়ে দেন :

> *যে দেশে গৌড়, তাম্রলিপ্তি, সপ্তগ্রামাদি নগর ছিল, যেখানে নৈষধ চরিত ও গীতগোবিন্দ লিখিত হইয়াছে, যে দেশ উদয়নাচার্য, রঘুনাথ শিরোমনি ও চৈতন্যদেবের জন্মভূমি, সে দেশের ইতিহাস নাই। মার্শম্যান, স্টুয়ার্ট প্রভৃতি প্রণীত পুস্তকগুলিকে আমরা সাধ করিয়া ইতিহাস বলি, সে কেবল সাধ পুরাণ মাত্র।*[৪]

হয়ত এই অভাব পূরণের জন্য রাজকৃষ্ণবাবুর হাত ধরে প্রকাশ পেয়েছিল, *প্রথম শিক্ষা বাঙ্গালার ইতিহাস* এর (১৮৭৪) মত বই। বিদ্যালয়ে ছাত্র-ছাত্রীদের ইতিহাস পাঠের ওপর জোর দেওয়া হয়। স্কুলের পাঠ্য বিষয়ে ইতিহাসের অন্তর্ভুক্তির প্রশ্নে ও ছাত্র-ছাত্রীদের কাছে বাংলার ইতিহাসের প্রয়োজনীয়তা সম্পর্কে রবীন্দ্রনাথ জোর দেন বাংলার ভাষা, সাহিত্য, ইতিহাস, সমাজতত্ত্ব প্রভৃতি সম্পর্কে জানার পাশাপাশি নিজের দেশকে ভালো করে জানার ওপর। তিনি ইতিহাসচর্চার সঙ্গে মিলিয়ে দিলেন দেশপ্রেম ও জাতীয়তাবাদী উন্মাদনাকে। ঊনবিংশ শতকের দ্বিতীয়ার্ধ থেকে বাংলার ইতিহাসচর্চা প্রবল আকার ধারণ করে। যেন এই মনোভাব প্রবল হয়—'আমাদের ইতিহাসকে আমরা পরের হাত হইতে উদ্ধার করিব, আমাদের ভারতবর্ষকে আমরা স্বাধীন দৃষ্টিতে দেখিব, সেই আনন্দের দিন যেন আসিয়াছে।'[৫] বিভিন্ন সাময়িক পত্র-পত্রিকায় নানা ঐতিহাসিক প্রবন্ধ প্রকাশিত হতে থাকে। হেমেন্দ্রপ্রসাদ ঘোষ বাঙালির ইতিহাসপ্রীতির এই কালকে শুভলক্ষণ বলে মনে করেন। অক্ষয়কুমার মৈত্রেয়, রজনীকান্ত গুপ্ত, কালীপ্রসন্ন বন্দোপাধ্যায় ও রাজেন্দ্রলাল মিত্রদের উদ্যোগে বাংলা ও বাঙালির ইতিহাসচর্চায় নতুন দিগন্ত উন্মোচিত হয়। এই উদ্যোগ দেখে অনেকে 'আমরা ইতিহাসকে আদর করতে শিখে গেছি বলে গর্ববোধ করতেন।'[৬] দেশীয় পন্ডিতদের মাধ্যমে বাংলার ইতিহাসচর্চা ধীরে ধীরে সমৃদ্ধ হয়ে ওঠে। তার সাক্ষ্য দিয়েছেন রাজেন্দ্রলাল মিত্র উড়িষ্যার গুহা'র বিস্তারিত বিবরণ দিয়ে। যে গবেষণার কাজ দেখে হান্টার সাহেব

যথেষ্ট প্রশংসা করে মন্তব্য করেছিলেন যে তিনি আর উড়িষ্যা-গুহার বিস্তৃত বিবরণ লিপিবদ্ধ করার চেষ্টা করবেন না। কারণ তাঁর সুহৃদ রাজেন্দ্রলাল মিত্রই তা করছেন।

অতীত উদ্ধারের কর্মকান্ড শুধুমাত্র ইংরেজী শিক্ষিত শহুরে (পড়ুন কলকাতা) মানুষদের মধ্যেই সীমাবদ্ধ ছিল তেমনটা নয়। ঊনবিংশ শতকের দ্বিতীয়ার্ধে কলকাতা থেকে দূরে মফস্বলেও ইতিহাসচর্চার সূচনা হয়েছিল। প্রকাশিত হয় *হিজলী বৃত্তান্ত* বা *মুর্শিদাবাদ কাহিনী*-র মত পুস্তিকা। মফস্বলের এই উদ্যমী মানুষদের লক্ষ্য সম্পর্কে কালীনাথ চৌধুরীর মতো মানুষদের বক্তব্যে কিছুটা আন্দাজ করা যায়। তিনি বলেন, 'সমগ্র ভারতভূমির চিন্তা করা অস্মাদৃশ ক্ষুদ্র ব্যক্তির ক্ষমতায়ত্ত নহে, তাই ক্ষমতায় যতদূর কুলায়, আপনি জিলার কাহিনী সংগ্রহ নিমিত্ত বাসন করিয়াছি...'।[৭] এই বাসনা পূরণ করার জন্য তিনি প্রকাশ করলেন *রাজসাহীর সংক্ষিপ্ত ইতিহাস* (১৯০১)। বহুপূর্বেই পথ দেখিয়েছিলেন কালীকমল সার্ব্বভৌম তাঁর *সেতিহাস বগুড়ার বৃত্তান্ত* (১৮৬১) প্রকাশের মধ্য দিয়ে। যে পথের অনুসারি ছিলেন যোগেন্দ্রনাথ গুপ্ত (*বিক্রমপুরের ইতিহাস*, ১৩১৬) অচ্যুতচরণ চৌধুরী (*শ্রীহট্টের ইতিবৃত্ত*, ১৩১৯) ও কুমুদনাথ মল্লিকের (*নদীয়া কাহিনী*, ১৩১৭)-র মত ব্যক্তিত্বরা। সকলেই ইতিহাস লেখার চেষ্টা করেছেন তেমনটা নয়। কুমুদবাবু এই কথা স্বীকার করেছেন তাঁর *নদীয়া কাহিনী* গ্রন্থে লিখেছেন :

> *নদীয়া কাহিনীকে নদীয়ার ইতিহাস বলা যায় না। তবে যে সকল উপাদানে ইতিহাস বিরচিত হয়, তাহার অধিকাংশ ইহাতে সন্নিবেশিত হইয়াছে। আমাদের দেশে অন্যান্য বিষয়ের যতই উন্নতি হউক না কেন, ইতিহাসের চর্চা যে কখনও বহুল পরিমাণে হইয়াছে বলিয়া, অনুমিত হয় না। যাহা কিছু ইতিহাস বলিয়া সাধারণত প্রচলিত আছে তাহা এতই অদ্ভুত অলৌকিক কাহিনীতে সমাচ্ছন্ন যে, তাহার মধ্য হইতে খাঁটি সত্যটুকু বাছিয়া লওয়া সুকঠিন। আর তাহা বাছিয়া লইতে গেলেও ইতিহাসের অঙ্গে অনেক ক্ষত*

হইয়া পড়ে; তাই এই পুস্তক রচনায় বহু কৌতুহলোদ্দীপক কাহিনীর অবতারণা করিতে হইয়াছে আর সেই জন্যই ইহার নাম নদীয়ার ইতিহাস না দিয়া নদীয়া কাহিনী দিয়াছি।[৮]

একই সুর শোনা গেল *মেদিনীপুরের ইতিহাস*-এর লেখক যোগেশচন্দ্র বসুর গলায়। মেদিনীপুরের অতীত বা বর্ত্তমান যে অসার বা গৌরবশূন্য নয়, তা দেখানোই যে এই গ্রন্থের উদ্দেশ্য, সেটা মেদিনীপুর জেলার ইতিহাস লেখার সময় বলতে বিস্মৃত হননি। বাংলায় বিভিন্ন অঞ্চলের গৌরবময় দিকগুলি সর্বসমক্ষে তুলে আনার যে তাগিদ দেখা গিয়েছিল তার প্রভাব অনুভূত হয় মেদিনীপুর জেলাতেও। ইতিহাসচর্চাকে উৎসাহ দেওয়ার জন্য *হিজলীর* বৃত্তান্ত-য় লেখা হয়েছিলো '...যাহা হউক যত দিন আমাদিগের দেশে অন্যান্য প্রদেশের বৃত্তান্ত বিষয়ে বিশেষ অনুসন্ধান না জন্মিবে, তত দিন বিশেষ উন্নতির সম্ভাবনা নাই'।[৯] এ যেন ম্যাক্সমুলারের বক্তব্যের প্রতিধ্বনি, যে জাতি নিজের অতীত সম্পর্কে ও নিজেদের সাহিত্য নিয়ে গৌরব অনুভব করে না, সে জাতি জাতীয় জীবনের প্রধান অবলম্বন থেকে বিচ্যুত হয়। আর এই গৌরব উদ্ধারের প্রবণতা থেকে কোনো জেলাই মুক্ত রইল না। বাংলা ভাষায় ইতিহাসচর্চা বাংলা প্রদেশেও সীমাবদ্ধ রইল না। উড়িষ্যাবাসী প্রবাসী বাঙালিরাও অনেকে এগিয়ে এলেন। বাঙালি শিবচন্দ্র সোম লিখে ফেললেন, *উড়িষ্যার ইতিহাস : প্রাচীনকাল হইতে বর্ত্তমান সময় পর্যন্ত (১৮৬৬)*। এখানে উড়িষ্যার ইতিহাসের সঙ্গে বিক্ষিপ্তভাবে উঠে এসেছিল মেদিনীপুরের কথা। এর দীর্ঘদিন পর প্রকাশিত হয় মেদিনীপুরের অধিবাসী ত্রৈলোক্যনাথ পাল'এর 'Annals of Midnapur' (*মেদিনীপুরের ইতিহাস*, প্রথমভাগ, ১৮৮৮)। এখানে কোন নির্দিষ্ট অঞ্চল নয়, স্থান পায় মেদিনীপুরের কয়েকটি বিশেষ রাজবংশের কথা। বংশচরিত লেখার কারণ সম্পর্কে গ্রন্থের 'বিজ্ঞপ্তিতে লেখা হয়েছিল,... 'অতি প্রাচীন বংশের ইতিবৃত্তের সহিত জেলার অনেক মনোহর প্রাচীন কীর্ত্তির ধ্বংসাবশেষের বিবরণ সম্পৃক্ত আছে'।[১০] বিশ শতকের প্রথমার্ধে মেদিনীপুর জেলা নিয়ে বড় ধরনের কাজ না হলেও অন্যান্য

উল্লেখযোগ্য কাজ হল নগেন্দ্রনাথ বোস' এর *The Archaeological Survey of Mayurbhanja, Vol-I, (1911)*। এখানে অবিভক্ত মেদিনীপুরের মোগলমারি ও কেশিয়াড়ি'র মত স্থানের কথা উল্লেখ করা হয়েছে। দীর্ঘ দুই দশক পরে আবার মেদিনীপুরের প্রাচীন কীর্তিগুলিকে নিয়ে যথার্থ ইতিহাস লেখার চেষ্টা করে ছিলেন মহেন্দ্রনাথ করণ। তাঁর মধ্যে উল্লেখযোগ্য হল হিজলীর *মসনদ্-ই-আলা (১৯২৬)*। এই গ্রন্থে লেখক নিছক গৌরবের কাহিনীকে তুলে ধরেননি, সত্যকে তুলে ধরাই ছিল তাঁর অন্যতম লক্ষ্য। প্রভাবিত হননি আবেগের দ্বারা।

মেদিনীপুরের ইতিহাস লেখার এই উদ্যোগে সামিল হয়েছিলেন আরেক অপেশাদার মানুষও। তিনি ছিলেন পেশায় আইন ব্যবসায়ী রাধানাথ পতি। লেখকের নিজের জন্মস্থানের কথা তুলে ধরার তাগিদ থেকে এই বই'এর অবতারণা। এর বাইরে আরো একটা উদ্দেশ্যের কথা ভূমিকাতে তিনি স্বীকার করেছিলেন, —'এই প্রাচীন ভু-ভাগের সহিত যে ভারতের ইতিহাসের খুব ঘনিষ্ঠ সম্বন্ধ আছে সে কথা অনেকেই হয়তঃ অবগত নহেন। ইতিহাসপ্রিয় পাঠককে সেই সমস্তের সহিত কিঞ্চিৎ পরিচিত করিবার উদ্দেশ্যেই এই ক্ষুদ্র প্রয়াস'। উপাদান হিসাবে ব্যবহার করেছেন সরকারী নথিপত্র, মনোমোহন চক্রবর্ত্তী'র 'উড়িষ্যার শেষ রাজা' (বইটির কোনো সন্ধান পাওয়া যায় নি), ও' ম্যালি'র ডিষ্ট্রিক গেজেটিয়ার' বা উইলিয়াম হান্টার-এর উড়িষ্যার সংক্রান্ত নথিপত্র। ব্যবহার করেছেন 'মুখে বলা' ইতিহাসের উপাদান। অল্প পরিসরের মধ্যে সমগ্র কেশিয়াড়িকে পরিবেশন করার চেষ্টা করেছেন। তবে নিজের জন্মভূমি বলে মনের মাধুরী মিশিয়ে তাকে গৌরবান্বিত করার প্রবণতা দেখাননি বলে উল্লেখ করেছেন। লেখক কেশিয়াড়ির প্রাচীনকাল থেকে নিজের সময়কাল পর্যন্ত একটা রূপরেখা দিয়েছেন। কেশিয়াড়ির অতীতকে পাঠকদের কাছে সহজবোধ্য করে তোলার জন্য রাজনৈতিক ইতিহাসকে প্রাচীন কাল, মুসলমান অধিকার ও ইংরেজ অধিকার

প্রভৃতি অধ্যায়ে বিভক্ত করেছেন। বিভাজনের মধ্য দিয়ে লেখক কেশিয়াড়ির মত ছোট অঞ্চলকে, দেশের মূলস্রোতের ইতিহাসের সঙ্গে মেলানোর চেষ্টা করেছেন।[১১]

'বিদ্যাধর', 'নায়কা' ও 'কাশীমাইতি'র মত পুরনো দীঘির বিবরণও ছোট এই বইটিতে স্থান পেয়েছে। এই অঞ্চলের অন্যতম নিদর্শন গগনেশ্বরের 'কুরুমবেড়ার দুর্গ'-এর বিস্তর বর্ণনা দিয়েছেন। এড়িয়ে যাননি মন্দির, মসজিদ বা স্থাপত্যের কথা। বিবরণের ক্ষেত্রে সমীক্ষার যথেষ্ট ছাপ পাওয়া যায়। এখানে তিনি অনেকটা সতীশচন্দ্র মিত্রদের পথে হেটেছেন। অর্থনৈতিক ইতিহাসকে প্রাঞ্জলভাবে বর্ণনা করেছেন। কেশিয়াড়ির মানুষের অর্থনৈতিক ভিত ছিল তাঁত বোনা। তসরের জন্য কেশিয়াড়ি হয়ে ওঠে ইউরোপীয় কোম্পানীগুলির ব্যবসায়িক কেন্দ্র। এই কথার উল্লেখ পাই, ইষ্ট ইন্ডিয়া কোম্পানীর কর্মচারী স্ট্রীনশ্যান মাষ্টারের ডায়েরিতে।[১২] বইতে জীবিকার কথার পাশাপাশি সামাজিক অবস্থানের কথাও পাওয়া যায়। বিস্তারিতভাবে বর্ণনা দেন সর্বমঙ্গলার মন্দিরের। যা কেশিয়াড়ি অঞ্চলের প্রত্নতত্ত্বের অন্যতম নিদর্শন। স্থাপত্যশৈলীর কথা সাবলীলভাবে উপস্থাপন করেছেন। মন্দিরের সঙ্গে এই অঞ্চলের মানুষের জীবন বিশেষভাবে জড়িয়ে রয়েছে, হয়ত তাই জন্যই নগেন্দ্রনাথ বসু লিখেছিলেন :

> The Sarvamangala Devi of Kasiari is celebrated as being one of the principal goddesses of Orissa and Mednapur।[১০]

এই অঞ্চলে মন্দির-মসজিদ ও বৈষ্ণবদের আশ্রমের উপস্থিতি জানান দেয় রাজনৈতিক পালা-বদলের প্রভাব ধর্মের ওপর পড়েছিল। সর্ব্বমঙ্গলা ছাড়া এখানে গড়ে উঠেছে কাশীশ্বর মন্দির (শৈবধর্মের), জগন্নাথের মন্দির, পতিদের রাম-সীতার মন্দির, কিশোরদেব গোস্বামীর আশ্রম (বৈষ্ণবধর্ম) ও ইদ্‌গা (মুসলিম আমল) প্রভৃতি। লেখক অল্প পরিসরে কেশিয়াড়ির অতীতকে তুলে ধরার চেষ্টা করেছেন, পরবর্তী প্রজন্মের জন্য রেখে গিয়েছেন তাঁর স্বপ্নের কথা। লিখেছেন, তাঁর চেষ্টা সার্থক হবে, যদি তা কোন ঐতিহাসিককে এই অঞ্চলের প্রাচীন ইতিহাস সংগ্রহ বিষয়ে প্ররোচিত করতে সমর্থ হয়।

মূল বানান ও লিখনরীতি অপরিবর্তিত রাখা হয়েছে। আখ্যাপত্রে কেশিয়াড়ি শব্দটি ঊর্দ্ধকমা'র মধ্যে ছিল। বর্তমান সংস্করণে তা তুলে দেওয়া হয়েছে। নগেন্দ্রনাথ বসু'র *The Archaeological Survey of Mayurbhanja* (Vol-I) থেকে কেশিয়াড়ি বিষয়ক অংশটি পরিশিষ্টে সংযোজিত হয়েছে। এই বই থেকে দু'টি ছবিও বর্তমান সংস্করণে গৃহীত হয়েছে। বলা যায়, অপটু হাতে সম্পাদনার কাজ করা হল। কাজ করতে গিয়ে নানা পরামর্শ (পড়ুন উপদেশ) দিয়ে ঋদ্ধ করেছেন শ্রীঅশোক উপাধ্যায় ও শ্রীশেখর ভৌমিক। বই-পত্রের সন্ধান দিয়ে কাজকে সহজ করে দিয়েছেন শ্রীইন্দ্রজিৎ চৌধুরি। নানা ভাবে উৎসাহিত করেছেন শ্রীদেবাশিস বসু। বিশেষভাবে সাহায্য করেছেন সহকর্মী শ্রীতরুণতাপস মুখার্জী। বিভিন্ন সময়ে নানা তথ্য দিয়ে আব্দার মিটিয়েছেন রাধানাথ পতি'র প্রপৌত্র শ্রীস্বপন পতি। গ্রন্থ প্রকাশের কাজকে সহজ করে দিয়েছেন শ্রীঅরিন্দম চক্রবর্তী ও শ্রীপ্রিয়রঞ্জন পাত্র। এঁদের প্রতি আমার কৃতজ্ঞতার শেষ নেই। দুষ্প্রাপ্য বই ও অন্যান্য আনুষঙ্গিক প্রবন্ধগুলি পাওয়ার জন্য ধন্যবাদ জানাই জাতীয় গ্রন্থাগার, বঙ্গীয় সাহিত্য পরিষৎ ও এশিয়াটিক সোসাইটি'র কর্মীদের। আর্থিক সহায়তার জন্য কলেজ কর্তৃপক্ষকে জানাই ধন্যবাদ। ভুল-ত্রুটি যা রইল তার দায় সম্পাদকের।

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