

**A STUDY ON THE ROLE OF THE LOCAL LEVEL
INSTITUTIONS IN THE DEVELOPMENT OF RAJSHAHI
CITY**

Submitted By

MST. ILME FARIDATUL

MASTER OF URBAN AND REGIONAL PLANNING



**DEPARTMENT OF URBAN AND REGIONAL PLANNING
BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY
DHAKA**

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Thesis Submitted to the Department of Urban and Regional Planning
Bangladesh University of Engineering and Technology in partial fulfillment of the
requirements for the Degree of Master of Urban and Regional Planning
(MURP)

**DEPARTMENT OF URBAN AND REGIONAL PLANNING
BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY
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THESIS ACCEPTANCE FORM

**A STUDY ON THE ROLE OF THE LOCAL LEVEL
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**DEPARTMENT OF URBAN AND REGIONAL PLANNING
BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY
DHAKA**

CANDIDATES DECLARATION

It is hereby declared that this thesis or any part of it has not been submitted elsewhere for the award of any degree or diploma.

Signature of the Candidate

.....
Mst. Ilme Faridatul

Appendix-A

Department of Urban and Regional Planning
Bangladesh University of Engineering and Technology, Dhaka
 (All the information collected will be used for research purpose only)

Questionnaire on

Level of Satisfaction and Perception Regarding Physical Development of Rajshahi

Questionnaire No:

Date:

.....

01. Name, **Address:**

..... **Ward No.**.....

02. Drainage

- Do you face any type of drainage problem in this locality? Yes No
- If yes, what type of drainage problem exists in this locality?
 Absence of drain Narrow Broken Blocked Overflow other
 (indicate)
- Are you satisfied with the present drainage condition? Indicate the level of satisfaction on a 5 point scale.
 Highly Satisfied (1) Satisfied (0.5) Neutral (0) Dissatisfied (-0.5) Highly
 Dissatisfied (-1)

- The drainage condition of your locality has been improved or not, indicate your level of perception on a 7 point scale.

| Improved | | | Neutral | Deteriorated | | |
|------------|----------------|--------------|---------------|---------------|-----------------|-------------|
| Highly (3) | Moderately (2) | Slightly (1) | No Change (0) | Slightly (-1) | Moderately (-2) | Highly (-3) |

- At present do you face the water logging problem in your locality? Yes No
- Did you face the water logging problem in the past? Yes No
- If yes, what was the intensity?
 Very high High Moderate Slight
- What do you think about the increment/reduction of the number of water bodies (pond/khal/river etc.) in your locality? Indicate the level of perception on a 7 point scale.

| Increased | | | Neutral | Reduced | | |
|------------|----------------|--------------|---------------|---------------|-----------------|-------------|
| Highly (3) | Moderately (2) | Slightly (1) | No Change (0) | Slightly (-1) | Moderately (-2) | Highly (-3) |

03. Waste Management System

- Where do you dump the generated household waste?
 Municipal collection van alongside the road Dustbin Drain other
 (indicate)
- Are the wastes collected regularly from the dumping site? Yes No
- Are you satisfied with the present waste management system? Indicate the level of satisfaction on a 5 point scale.
 Highly Satisfied (1) Satisfied (0.5) Neutral (0) Dissatisfied (-0.5) Highly
 Dissatisfied (-1)

- The waste management system have been improved or not, indicate the level of perception on a 7 point scale.

| Improved | | | Neutral | Deteriorated | | |
|------------|----------------|--------------|---------------|---------------|-----------------|-------------|
| Highly (3) | Moderately (2) | Slightly (1) | No Change (0) | Slightly (-1) | Moderately (-2) | Highly (-3) |

04. Road Network

- What is the existing condition of the roads in your locality?
 Very good Good Poor Very poor
- Are you satisfied/dissatisfied with the present condition of road network of your locality? Indicate the level of satisfaction on a 5 point scale.
 Highly Satisfied (1) Satisfied (0.5) Neutral (0) Dissatisfied (-0.5) Highly Dissatisfied (-1)
- What do you think about the improvement of the road networks of this locality? Indicate your level of perception on a 7 point scale.

| Improved | | | Neutral | Deteriorated | | |
|------------|----------------|--------------|---------------|---------------|-----------------|-------------|
| Highly (3) | Moderately (2) | Slightly (1) | No Change (0) | Slightly (-1) | Moderately (-2) | Highly (-3) |

05. Water Supply

- What is the source of water of your house?
 Tub-well Pond River Street hydrant Tap other (indicate)
- The water which you use is provided by whom?
 Municipal NGO Private other (indicate)
- If municipal, are you satisfied with the present water supply? Indicate the level of satisfaction on a 5 point scale.
 Highly Satisfied (1) Satisfied (0.5) Neutral (0) Dissatisfied (-0.5) Highly Dissatisfied (-1)
- Do you face any type of problem with the municipal water? If yes what type of problem do you face?
 Bad Odor Intermittent Supply Impure other (indicate)
- What do you think about the improvement of the water supply? Indicate your level of perception on a 7 point scale.

| Improved | | | Neutral | Deteriorated | | |
|------------|----------------|--------------|---------------|---------------|-----------------|-------------|
| Highly (3) | Moderately (2) | Slightly (1) | No Change (0) | Slightly (-1) | Moderately (-2) | Highly (-3) |

06. Electricity

- Do you have electricity connection? Yes No
- If yes, are you satisfied with the present electricity supply? Indicate the level of satisfaction on a 5 point scale.
 Highly Satisfied (1) Satisfied (0.5) Neutral (0) Dissatisfied (-0.5) Highly Dissatisfied (-1)
- Do you face load shedding problem? Yes No
- What do you think about the intensity of the load shedding? Indicate the level of perception on a 7 point scale.

| Increased | | | Neutral | Reduced | | |
|------------|----------------|--------------|---------------|---------------|-----------------|-------------|
| Highly (3) | Moderately (2) | Slightly (1) | No Change (0) | Slightly (-1) | Moderately (-2) | Highly (-3) |

07. Open space (Park/playfield/any other recreational facilities)

- What types of recreational facilities are available in your locality?
 Park Play field both neither park nor play field other (indicate)

For Park

- The numbers of parks has been increased or not, indicate the level of perception on a 7 point scale.

| Increased | | | Neutral | Reduced | | |
|------------|----------------|--------------|---------------|---------------|-----------------|-------------|
| Highly (3) | Moderately (2) | Slightly (1) | No Change (0) | Slightly (-1) | Moderately (-2) | Highly (-3) |

- Indicate the level of satisfaction on a 5 point scale.

Neutral (0) Satisfied (0.5) Highly Satisfied (1) Dissatisfied (-0.5) Highly

Dissatisfied (-1)

For Playfield

- The number of playfield has been increased or not, indicate the level of perception on a 7 point scale.

| Increased | | | Neutral | Reduced | | |
|------------|----------------|--------------|---------------|---------------|-----------------|-------------|
| Highly (3) | Moderately (2) | Slightly (1) | No Change (0) | Slightly (-1) | Moderately (-2) | Highly (-3) |

- Are you satisfied with the playfield? Indicate the level of satisfaction on a 5 point scale.

Neutral (0) Satisfied (0.5) Highly Satisfied (1) Dissatisfied (-0.5) Highly

Dissatisfied (-1)

08. Katcha Bazar

- What type of katcha bazaar is available in this ward?

Permanent Temporary No bazaar

- Do you face any type of problem related to the katcha bazaar?

Yes No

- If yes, what type of problem do you face?

Absence of nearest bazaar Absence of permanent bazar Long distance other

(indicate)

- Are you satisfied with the available katcha bazar facilities in your locality? Indicate the level of satisfaction on a 5 point scale.

Highly Satisfied (1) Satisfied (0.5) Neutral (0) Dissatisfied (-0.5) Highly

Dissatisfied (-1)

- What do you think about the number of the katcha bazar? Indicate the level of perception on a 7 point scale.

| Increased | | | Neutral | Reduced | | |
|------------|----------------|--------------|---------------|---------------|-----------------|-------------|
| Highly (3) | Moderately (2) | Slightly (1) | No Change (0) | Slightly (-1) | Moderately (-2) | Highly (-3) |

09. Health Facilities

- Is there any municipal provided primary healthcare centre (community clinic) in this locality? Yes

No

- From where you take the healthcare facilities?

Community clinic Private hospital Public hospital other

(indicate)

- If community/public, are you satisfied with the present healthcare facilities?

Highly Satisfied (1) Satisfied (0.5) Neutral (0) Dissatisfied (-0.5) Highly

Dissatisfied (-1)

- What do you think about the improvement of the municipal provided healthcare facilities? Indicate the level of perception on a 7 point scale.

| Improved | | | Neutral | Deteriorated | | |
|------------|----------------|--------------|---------------|---------------|-----------------|-------------|
| Highly (3) | Moderately (2) | Slightly (1) | No Change (0) | Slightly (-1) | Moderately (-2) | Highly (-3) |

10. Community Centre

- Is there any municipal community centre in your locality? Yes No
- If yes are you satisfied with the Community Centre? Yes No
- If no, why? Small size Poor maintenance required facilities are not available other (indicate)
- Indicate your level of satisfaction with the centre on a 5 point scale.
 Highly Satisfied (1) Satisfied (0.5) Neutral (0) Dissatisfied (-0.5) Highly Dissatisfied (-1)

11. What is your perception regarding the overall development of Rajshahi? Indicate the level of perception on a 5 point scale.

| Scale (Level of perception) | | 2008-2012 | 2003-2007 |
|-----------------------------|-----------------------|-----------|-----------|
| 0 | No development | | |
| 1 | Very slow | | |
| 2 | Medium | | |
| 3 | High | | |
| 4 | Very high development | | |

Thank you for your kind co-operation.

.....

Name and Signature of the Surveyor

Date:

Department of Urban and Regional Planning
Bangladesh University of Engineering and Technology, Dhaka
(All the information collected will be used for research purpose only)

Official Opinion (RDA)

Regarding the Implementation of the Functional Master Plan (2004-2014)

Date:

Name:

Designation:

1. It was a plan to review the plan in 2009. Was it possible to review the plan in 2009? If no, please point out the reasons of failure.

2. Is it possible to complete the Functional Master Plan by 2014? If no, please specify the reasons of delay.

Yes/No

3. Is it possible to implement the Master Plan individually? If no, please specify.

4. RDA only implements the land use plan but to implement other plan proposals (education, health, recreation, industry and social) what steps should be taken?

5. What types of problems are faced by the institutions to implement the Master Plan? Related to.....

- **Institutional:**
- **Management:**
- **Technical:**
- **Financial:**
- **Political:**
- **Others:**

6. Is there any monitoring cell?

8. What should be done to ensure coordination among the local level institutions?

9. Do you think that the planning proposals are realistic for the implementation? If no, how a realistic plan could be prepared?

10. Does the plans are being implemented according to the guideline of the DAPs? If no, please specify the reasons.

11. Please Mark the Implementation Status of the Planning Proposals

| Planning proposals | Implementation Status | | |
|---|-----------------------|---|---|
| | F | P | X |
| Drainage development | | | |
| Sewerage system development | | | |
| Water supply system development | | | |
| Increase waste disposal site | | | |
| Development of town centre | | | |
| Development of housing areas | | | |
| Construction of new roads | | | |
| Widening of roads | | | |
| Improvements of pedestrian facilities | | | |
| Improvements of major Intersections | | | |
| Creation of parallel roads along Major Thoroughfare | | | |
| Build Truck Terminal alongside Bypass road | | | |
| Relocate wholesale rice market from Kadirganj | | | |
| Development of ICT village at Budhpara, Meherchandi | | | |
| Establishment of EPZ at Mallikpur-Ranhat | | | |
| Development of industrial area with necessary infrastructure and services | | | |
| Development of Education Facilities <ul style="list-style-type: none"> • Primary school-24 • Secondary school-38 • College-6 | | | |
| Development of a specialized hospital at Katakhal | | | |
| Development of two community park at Budhpara and Bariapara | | | |
| Development of 5 play field within the urban area | | | |
| Development of a Botanical garden at Uzirpukur | | | |
| Development of Padma River bank as a recreation area | | | |
| Development of Social Services <ul style="list-style-type: none"> • Katcha Bazar-20 • Post office-6 • Graveyard • Community centre cum ward commissioner's office-30 | | | |

***F=fully; P=partially/ongoing; X=not implemented

12. What do you think about the achievement (approximate %) of the authority in the implementation of the planning proposals.

13. Please provide some recommendations to be successful in the implementation of the planning proposals.

Thank you for your kind co-operation.

Department of Urban and Regional Planning
Bangladesh University of Engineering and Technology, Dhaka
(All the information collected will be used for research purpose only)

Official Opinion (RCC)
Regarding the Implementation of Drainage Master Plan (1994-2020)

Date:

Name.....

Designation.....

1. What do you think about the implementation of the plan? Is it possible to implement the plan according to the guidelines? Yes/No

If no, please specify the reasons of deviation from the guidelines.

2. Was it possible to achieve the target phased of development? Yes/No

| Phases | Target Year | Year of Achievement |
|-----------------------|-------------|---------------------|
| 1 st phase | 2000 | |
| 2 nd phase | 2010 | |

If no, please specify the reasons.

3. Is it possible to achieve of all the work components within 2020? Yes/No

4. Did you face any type of problems in the implementation of the Drainage Master Plan?

Yes/No

If yes, please specify the problems in terms of

- **Financial**

- **Institutional**

- **Management**

- **Technical**

- **Political**

5. Please point out the achievements of the target work components.

| Proposals for Drainage | 1 st Phase (up to 2000) | |
|--|---|--------------|
| | Targets | Achievements |
| Primary Drain - Resection - Rehabilitation - New Pucca - New Katcha | 18 km 15 km 1 km 4 km | |
| Secondary Drain - Rehabilitation - New | 9.3 km 7.6 km | |
| Tertiary Drain - Rehabilitation - New - Pipe (500mm) | 8 km 6 km 4.5 km | |
| Plot Drain - Rehabilitation - New | 7.5 km 5 km | |
| Culverts - Rehabilitation - New | 30 nos 20 nos | |
| Road Crossings - Rehabilitation - New | 70 nos 46 nos | |
| Cleaning & removal of blockage of existing khals & drains. | 90 km | |
| Proposals | 1 st Phase (upto 2000) | |
| | Targets | Achievements |
| Sanitation | - Single pit latrine 2000 nos - Twin pit latrine 4000 nos - Conversion of surface latrine into twin pit latrines 40 nos. - Construction of public toilets 6 nos. | |
| Solid Waste Management | - Disposal land: 0.5 hectares - Push cart/Hand Trolley: 50 nos - Richshaw Van: 40 nos - Garbage Truck: 2 nos - Rubbish bin: 150 nos | |

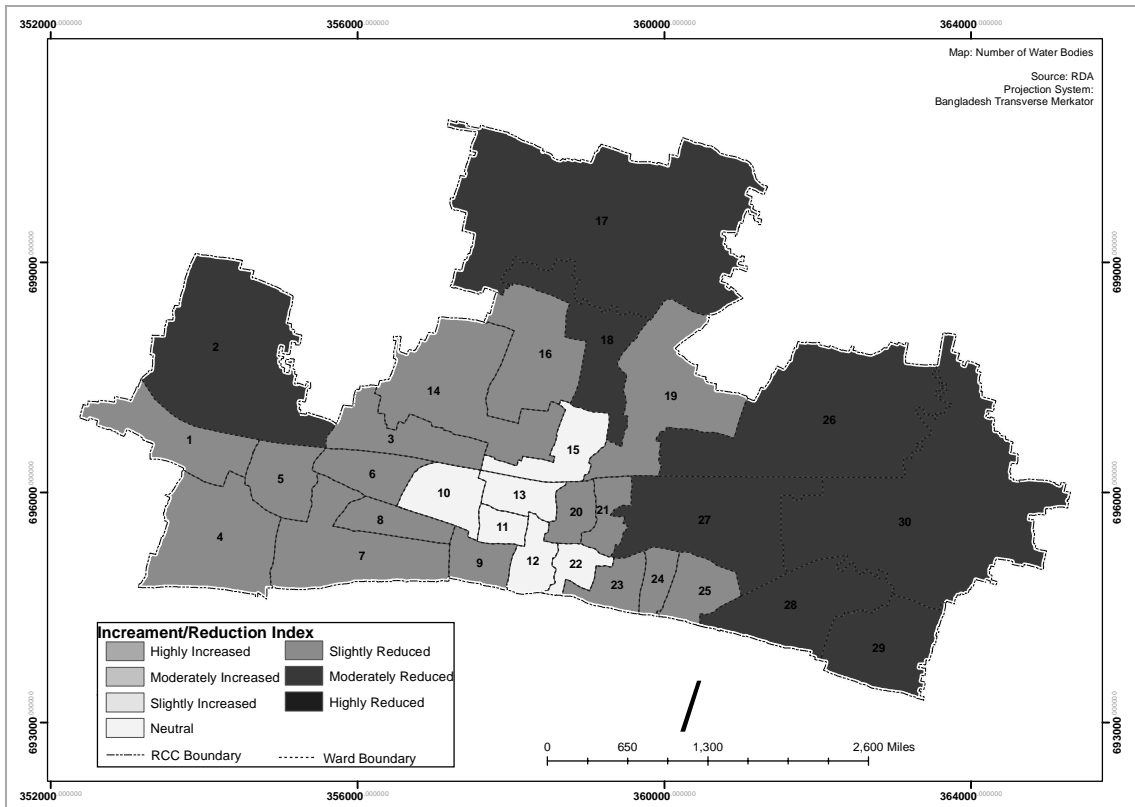
6. What do you think about the achievement (approximate %) of RCC in the implementation of the proposed work components?

7. Please provide some recommendations to be successful in the implementation of the plan.

Thank you for your kind co-operation.

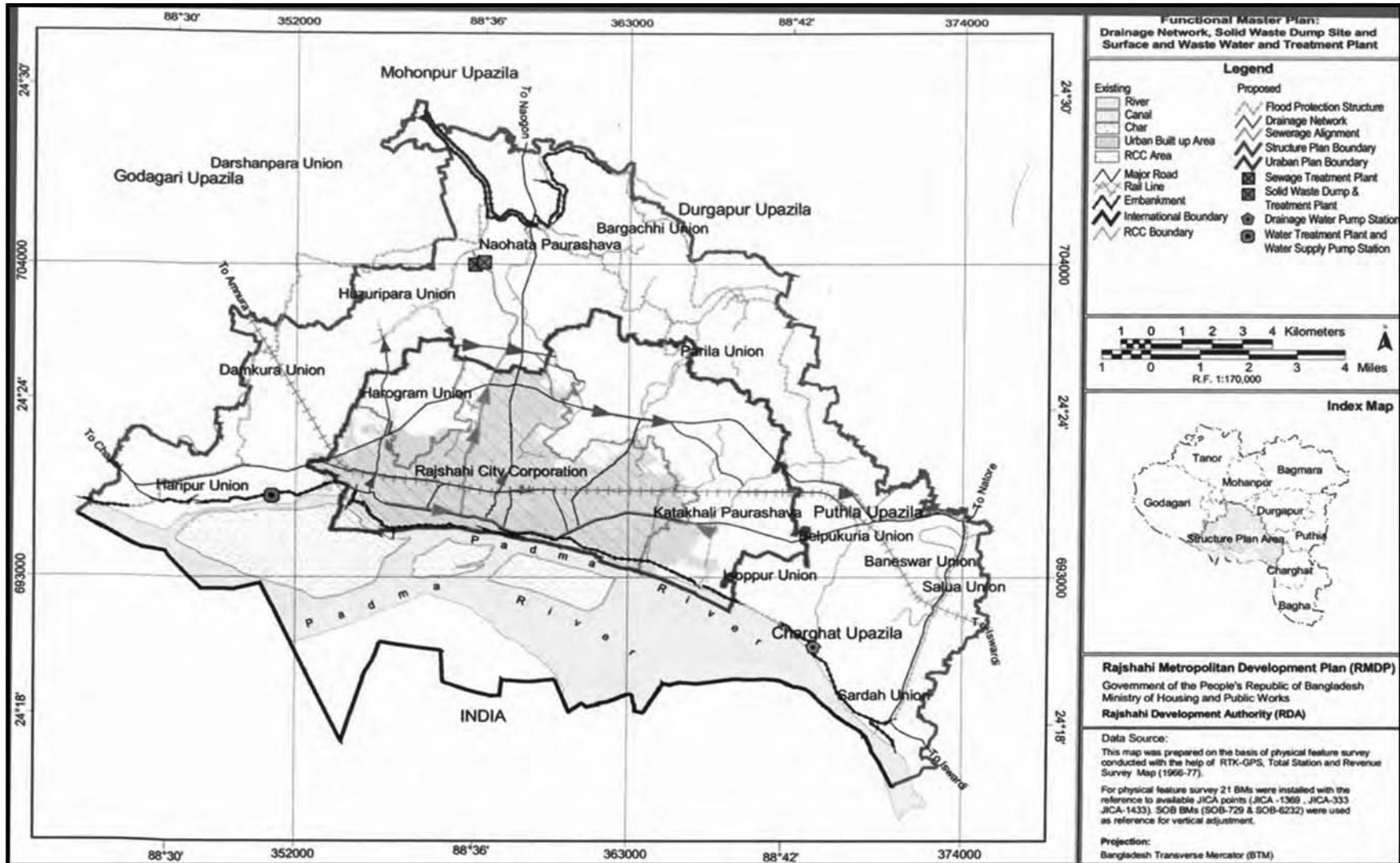
Appendix-B

Map B-2: Condition of Water Bodies within RCC Area by Ward



Source: RDA & Questionnaire Survey, 2013

Map B-3: Proposed Drainage and Swerage Network of the Functional Master Plan



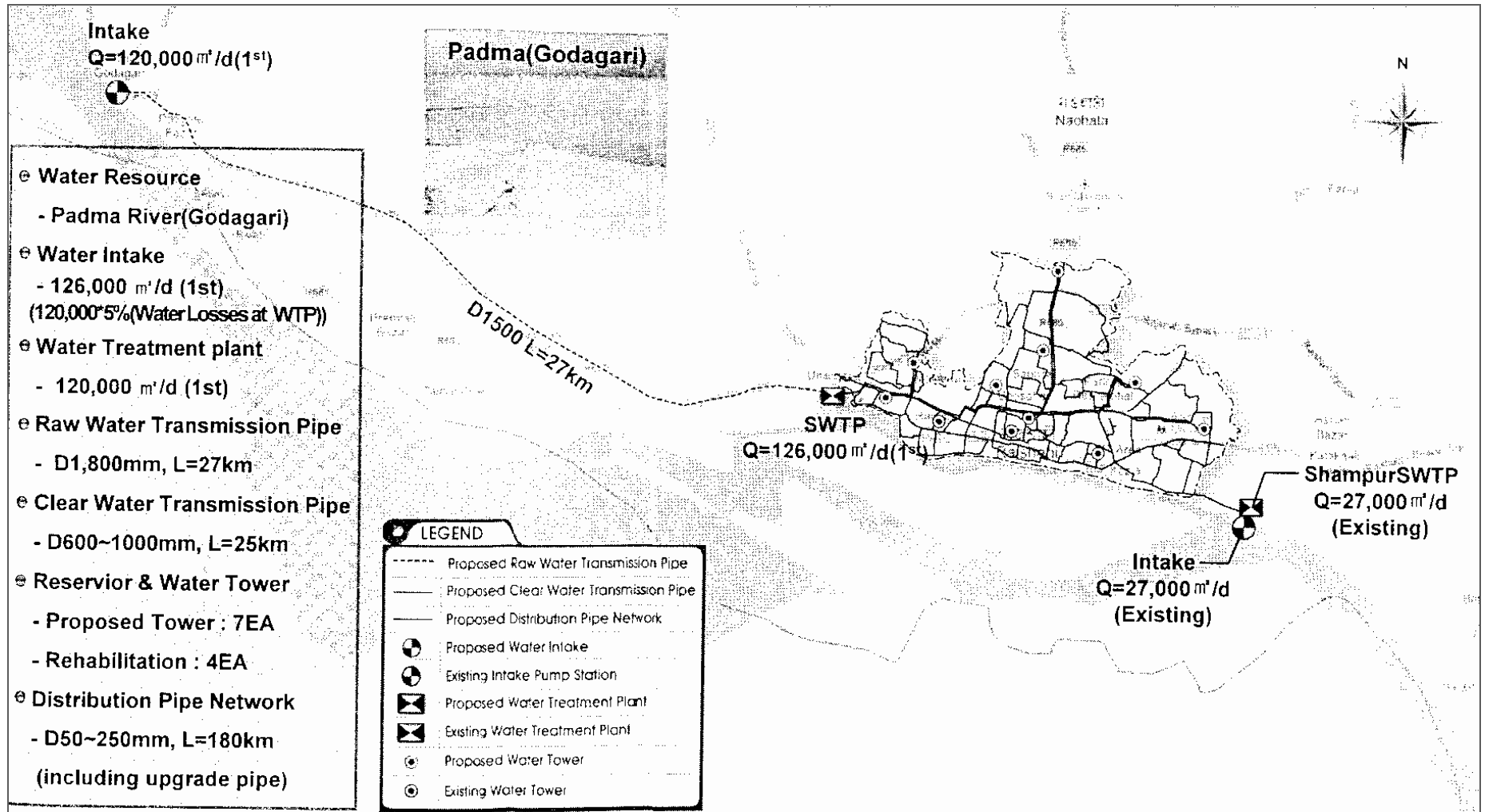
Source: RMDP, V-I

Map B-4: Swerage Network Plan



Source: RWASA, 2012

Map B-5: Plan of Water Supply Facilities by RWASA



Source: RWASA, 2012

Appendix-C

Table C-1: Improvement Index Values by Ward for the Community Facilities

| Ward No. | Drainage | Waste Management | Road Network | Water Supply | Health Facilities | Recreation Facilities | Community center |
|--------------------|-------------|------------------|--------------|--------------|-------------------|-----------------------|------------------|
| 1 | 1.1 | 1.8 | 2.1 | 1.8 | 1.1 | 0 | 0 |
| 2 | 0.5 | 0.9 | 2.1 | 1.56 | 1.4 | 0 | 0 |
| 3 | 1.4 | 1.7 | 1.6 | 1.9 | 0 | 0 | 0 |
| 4 | 1.1 | 1.4 | 1.8 | 1.8 | 0.4 | 0 | 0 |
| 5 | 2 | 2 | 1.9 | 1.7 | 0 | 0 | 0 |
| 6 | 1.3 | 1.7 | 1.6 | 1.6 | 0 | 0 | 0 |
| 7 | 1.3 | 2 | 2 | 1.9 | 1.5 | 0 | 0 |
| 8 | 1.5 | 1.7 | 1.6 | 1.8 | 0.1 | 0 | 0 |
| 9 | 1.2 | 2.3 | 1.9 | 1.5 | 0 | 0 | 0 |
| 10 | 0.7 | 1.5 | 1.9 | 1.2 | 0.6 | 0 | 0 |
| 11 | 0.9 | 1.7 | 1.6 | 1.5 | 0 | 0 | 0 |
| 12 | 0.9 | 1.6 | 1.6 | 1.78 | 0 | 0 | 0 |
| 13 | 0.8 | 1.7 | 1.8 | 1.4 | 1 | 0 | 0 |
| 14 | 1.2 | 2 | 1.8 | 1.6 | 0.1 | 0 | 0 |
| 15 | 0.7 | 1.9 | 2 | 1 | 1 | 0 | 0 |
| 16 | 1.2 | 1.6 | 1.8 | 1.9 | 1 | 0 | 0 |
| 17 | 0.5 | 1 | 2 | 1.8 | 1.56 | 0 | 0 |
| 18 | 1 | 1.8 | 2 | 1.9 | 0.5 | 0 | 0 |
| 19 | 1.8 | 2.2 | 2 | 1.7 | 2 | 0 | 0 |
| 20 | 1.2 | 2 | 1.8 | 2 | 0 | 0 | 0 |
| 21 | 1.5 | 1.9 | 1.8 | 1.67 | 0 | 0 | 0 |
| 22 | 0.9 | 1.6 | 1.8 | 1.4 | 0 | 0 | 0 |
| 23 | -0.1 | 1.7 | 1.5 | 1.4 | 0.9 | 0 | 0 |
| 24 | -0.4 | 1.6 | 1.8 | 1.4 | 0 | 0 | 0 |
| 25 | 2 | 2.1 | 2.2 | 1.4 | 0 | 0 | 0 |
| 26 | 1.2 | 1.7 | 2 | 1.9 | 1.6 | 0 | 0 |
| 27 | 1.1 | 2 | 1.3 | 2 | 0 | 0 | 0 |
| 28 | 1.9 | 2 | 1.7 | 1.44 | 1.7 | 0 | 0 |
| 29 | 1.2 | 1.5 | 1.3 | 1.67 | 1.2 | 0 | 0 |
| 30 | 1 | 2 | 1.9 | 1.4 | 0 | 0 | 0 |
| Grand Total | 1.08 | 1.75 | 1.81 | 1.63 | 0.59 | 0 | 0 |

Source: Calculated from the Questionnaire Survey Data, 2013

Table C-2: Satisfaction Index Values by Ward for the Community Facilities

| Ward No. | Drainage | Road | Waste Management | Electricity | Water Supply | Katcha Bazar | Recreation | Health Facilities | Community Center |
|----------|----------|------|------------------|-------------|--------------|--------------|------------|-------------------|------------------|
| 1 | -0.9 | 0.5 | 0.05 | 0.5 | -0.1 | -0.35 | -1 | 0 | -1 |
| 2 | -0.75 | 0.45 | -0.25 | 0.35 | 0.33 | -0.85 | -1 | 0.4 | -0.95 |
| 3 | -0.6 | 0.4 | 0.2 | 0.2 | -0.2 | 0.35 | -1 | -0.75 | -0.95 |
| 4 | -0.35 | 0.55 | 0 | -0.1 | 0.3 | 0.5 | -1 | 0.167 | -0.9 |
| 5 | 0.4 | 0.35 | 0.5 | -0.3 | -0.1 | 0.75 | -1 | -0.72 | -1 |

| Ward No. | Drainage | Road | Waste Management | Electricity | Water Supply | Katcha Bazar | Recreation | Health Facilities | Community Center |
|--------------------|-------------|--------------|------------------|--------------|---------------|---------------|------------|-------------------|------------------|
| 6 | -0.55 | 0.35 | 0.2 | -0.4 | 0 | 0.1 | -1 | -0.7 | -0.95 |
| 7 | -0.6 | 0.5 | 0.3 | 0.4 | 0.3 | -1 | -1 | 0.5 | -0.7 |
| 8 | 0 | 0.15 | 0.5 | -0.2 | 0.2 | 0.6 | -1 | -0.37 | -0.9 |
| 9 | -0.6 | 0.2 | 0.65 | 0.1 | 0.1 | -0.6 | -1 | -0.78 | -0.95 |
| 10 | -0.4 | 0.5 | 0.5 | 0.4 | -0.05 | -1 | -1 | -0.11 | -0.95 |
| 11 | -0.6 | 0.35 | 0.5 | 0.25 | 0 | -0.9 | -1 | -0.89 | -0.65 |
| 12 | -0.35 | 0.45 | 0.5 | 0.35 | 0.39 | -0.95 | -1 | -0.95 | -0.65 |
| 13 | -0.65 | 0.4 | 0.5 | 0.3 | 0.1 | -0.95 | -1 | 0.25 | -0.7 |
| 14 | -0.7 | 0.3 | 0.55 | -0.2 | -0.1 | 0.28 | -1 | -0.33 | -0.95 |
| 15 | -0.7 | 0.5 | 0.5 | 0.45 | 0 | 0.25 | -1 | 0.4 | -0.75 |
| 16 | -0.2 | 0.4 | 0.05 | 0.2 | 0 | 0.6 | -1 | 0.3 | -0.9 |
| 17 | -0.95 | 0.5 | -0.4 | 0.5 | -0.45 | 0.85 | -1 | 0.44 | -0.7 |
| 18 | -0.7 | 0.6 | 0.55 | 0.2 | 0 | -0.4 | -1 | -0.18 | -0.9 |
| 19 | -0.05 | 0.55 | 0.6 | 0.5 | -0.2 | -1 | -1 | 0.5 | -1 |
| 20 | 0.15 | 0.3 | 0.55 | 0.5 | 0.5 | 0.15 | -1 | -0.61 | -0.95 |
| 21 | -0.15 | 0.5 | 0.6 | 0.4 | 0.167 | 0.55 | -1 | -1 | -1 |
| 22 | -0.45 | 0.5 | 0.5 | 0.4 | 0.2 | 0.35 | -1 | -0.8 | -0.95 |
| 23 | -0.8 | 0.4 | 0.4 | 0.35 | 0.1 | -1 | -1 | 0.15 | -1 |
| 24 | -0.9 | 0.5 | 0.25 | 0.5 | 0 | 0.5 | -1 | -0.8 | -0.95 |
| 25 | 0.4 | 0.7 | 0.5 | 0.5 | -0.4 | 0.05 | -1 | 0.5 | -1 |
| 26 | -0.2 | 0.5 | 0.3 | 0.55 | 0.05 | 0.1 | -1 | 0.4 | -1 |
| 27 | -0.4 | -0.05 | 0.55 | 0.5 | 0.3 | 0.2 | -1 | -0.5 | -0.95 |
| 28 | 0.2 | 0.2 | 0.6 | 0.45 | -0.056 | 0.55 | -1 | 0.4 | -1 |
| 29 | -0.05 | 0.15 | 0.25 | 0.5 | 0.5 | 0.5 | -1 | 0.4 | -1 |
| 30 | -0.6 | 0.55 | 0.5 | 0.5 | -0.35 | 0.5 | -1 | -0.5 | -0.95 |
| Grand Total | 0.50 | 0.367 | 0.288 | 0.047 | -0.045 | -0.157 | -1 | -0.41 | -0.91 |

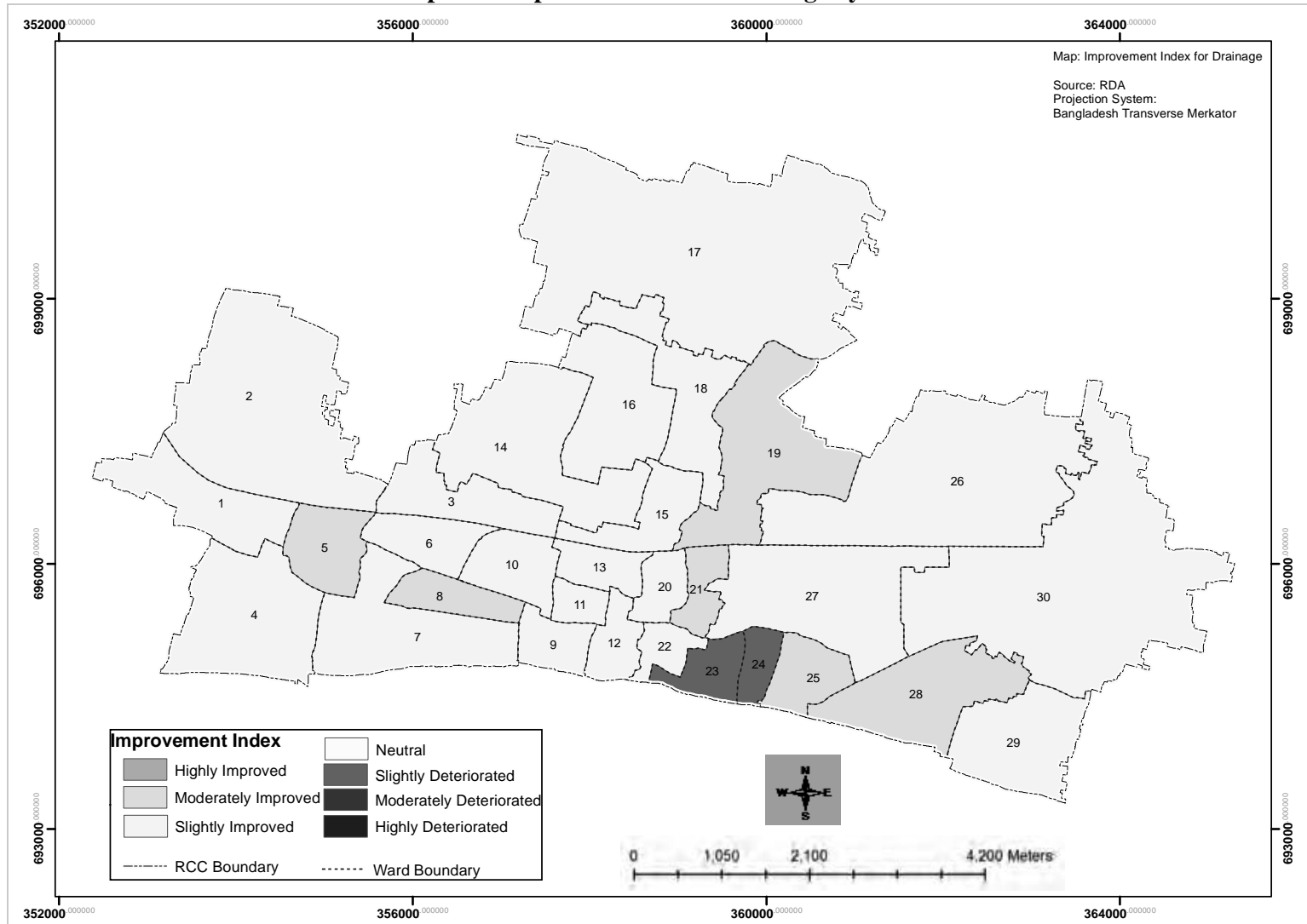
Source: Calculated form Questionnaire Survey Data, 2013

Table C-3: Development Index of RCC by Ward

| Ward No | Year | |
|---------|-----------|-----------|
| | 2003-2004 | 2005-2012 |
| 1 | 1.5 | 2.7 |
| 2 | 1.2 | 2.1 |
| 3 | 1.1 | 2.7 |
| 4 | 1.2 | 2.4 |
| 5 | 1.4 | 2.6 |
| 6 | 1.5 | 2.5 |
| 7 | 1.8 | 2.3 |
| 8 | 1.5 | 2.6 |

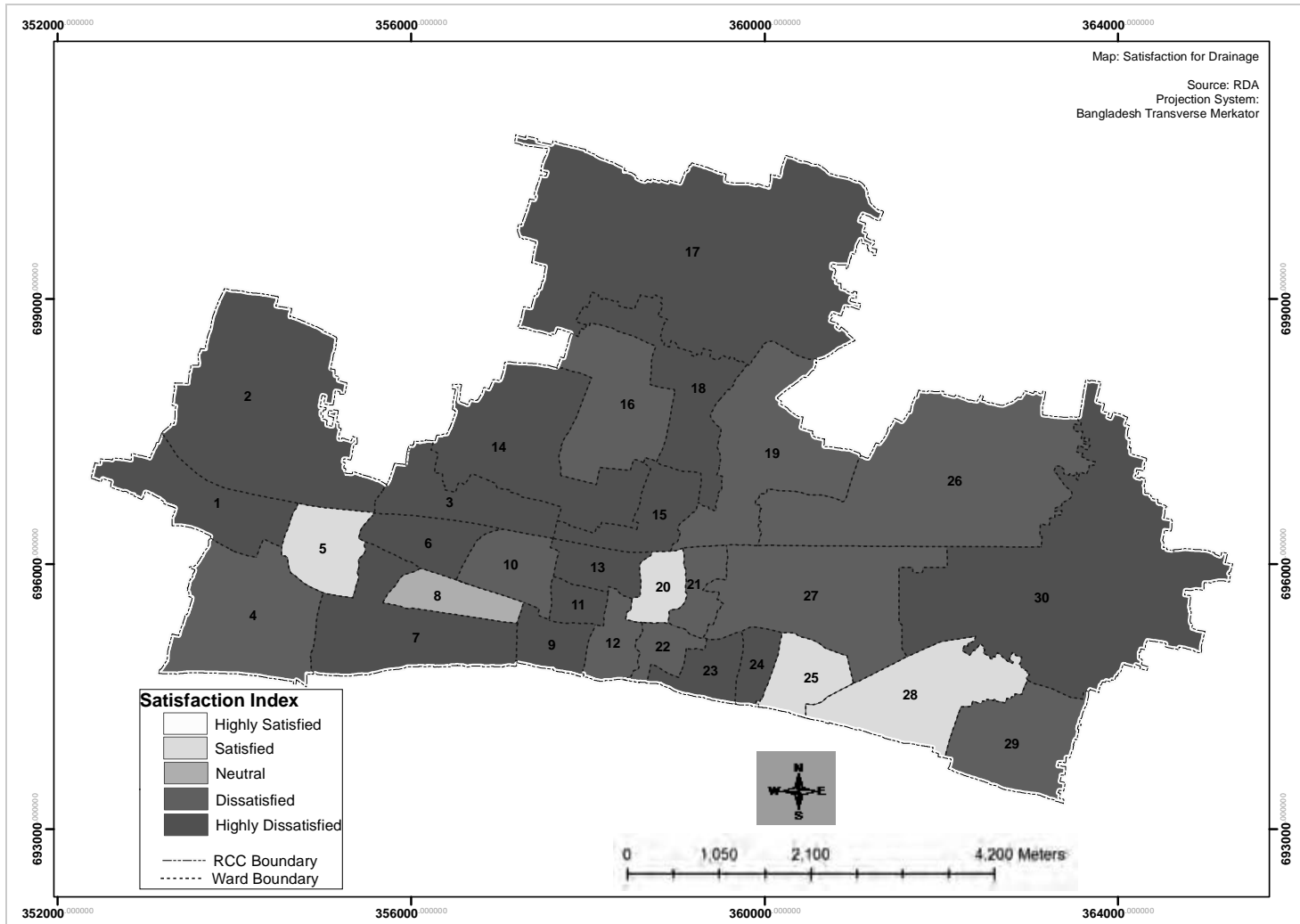
| Year | | |
|--------------------|------------------|------------------|
| Ward No | 2003-2004 | 2005-2012 |
| 9 | 1.5 | 2.2 |
| 10 | 2 | 2.6 |
| 11 | 1.8 | 2.2 |
| 12 | 1.8 | 2.4 |
| 13 | 1.8 | 2.4 |
| 14 | 1.4 | 2.5 |
| 15 | 2 | 2.4 |
| 16 | 1.3 | 2.6 |
| 17 | 1.6 | 2 |
| 18 | 1.7 | 2.7 |
| 19 | 1 | 2.2 |
| 20 | 2.1 | 2.6 |
| 21 | 1.6 | 2.8 |
| 22 | 1.7 | 2.1 |
| 23 | 1.7 | 2.3 |
| 24 | 1.4 | 2.4 |
| 25 | 1 | 2.8 |
| 26 | 1.1 | 2.5 |
| 27 | 1 | 1.8 |
| 28 | 1 | 2.2 |
| 29 | 1.1 | 2.1 |
| 30 | 0.9 | 2.3 |
| Grand Total | 1.46 | 2.4 |

Map C-1: Improvement of the Drainage by Ward



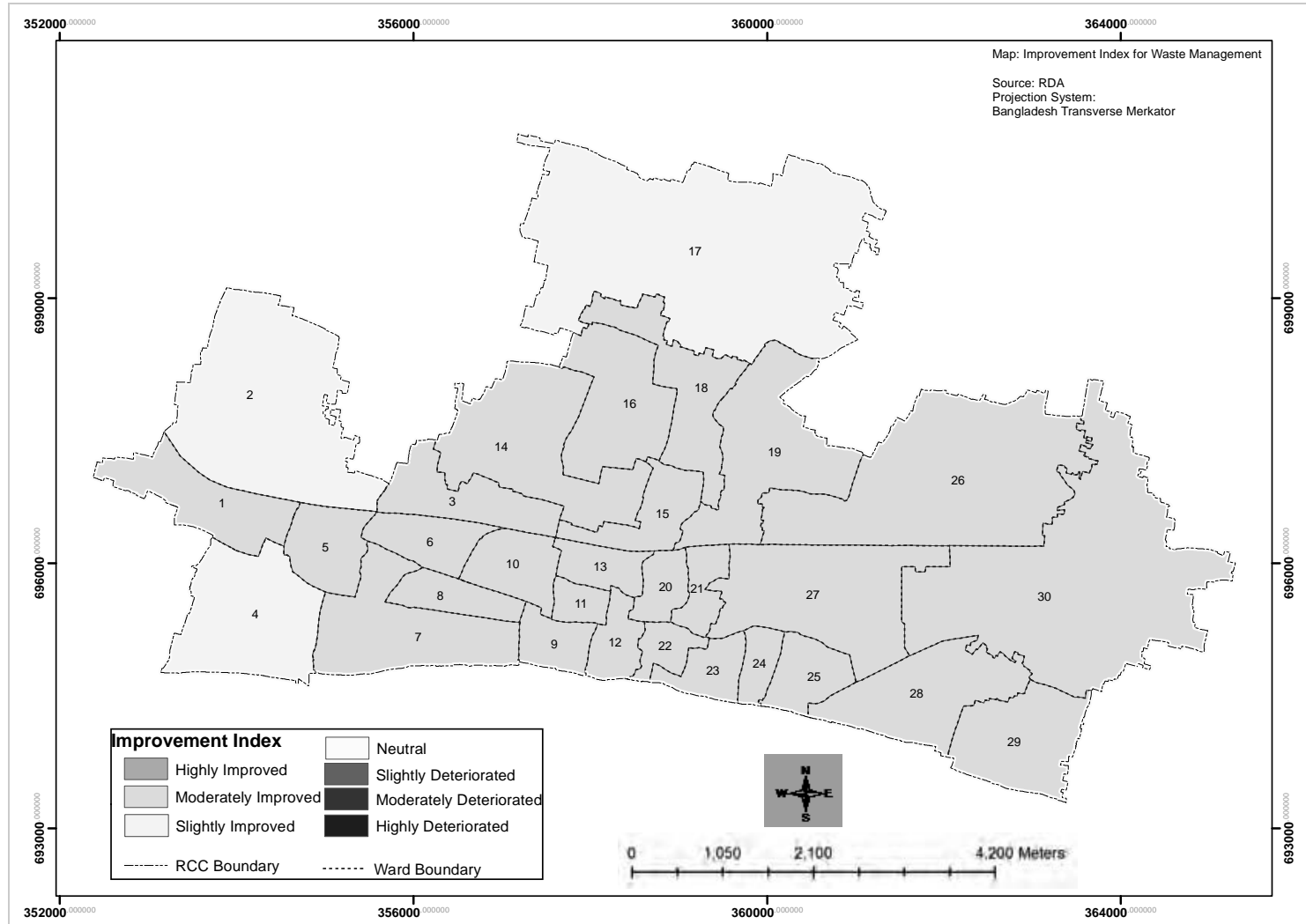
Source: RDA & Questionnaire Survey, 2013

Map C-2: Satisfaction for the Drainage by Ward



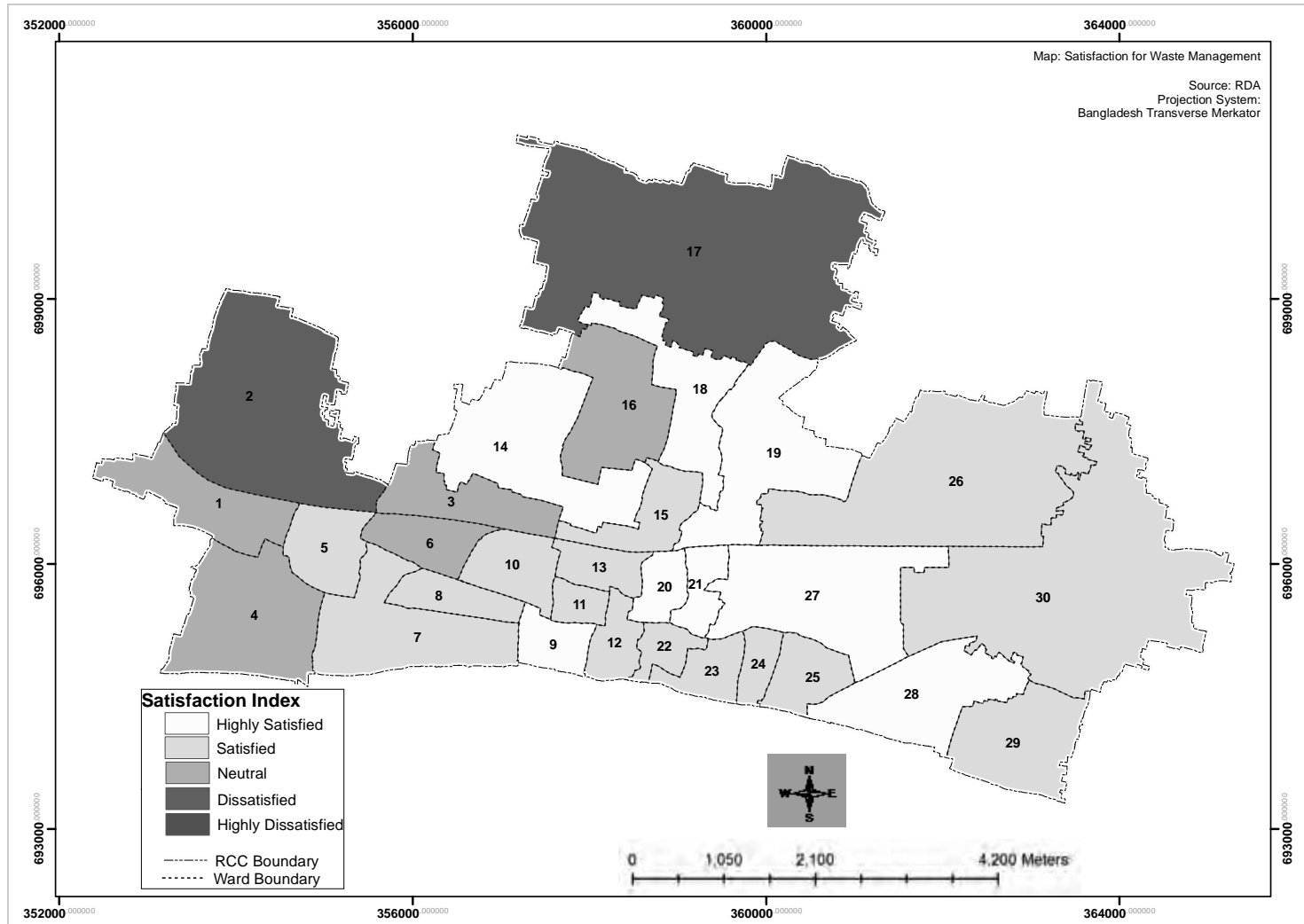
Source: RDA & Questionnaire Survey, 2013

Map C-3: Improvement of the Waste Management System by Ward in RCC Area



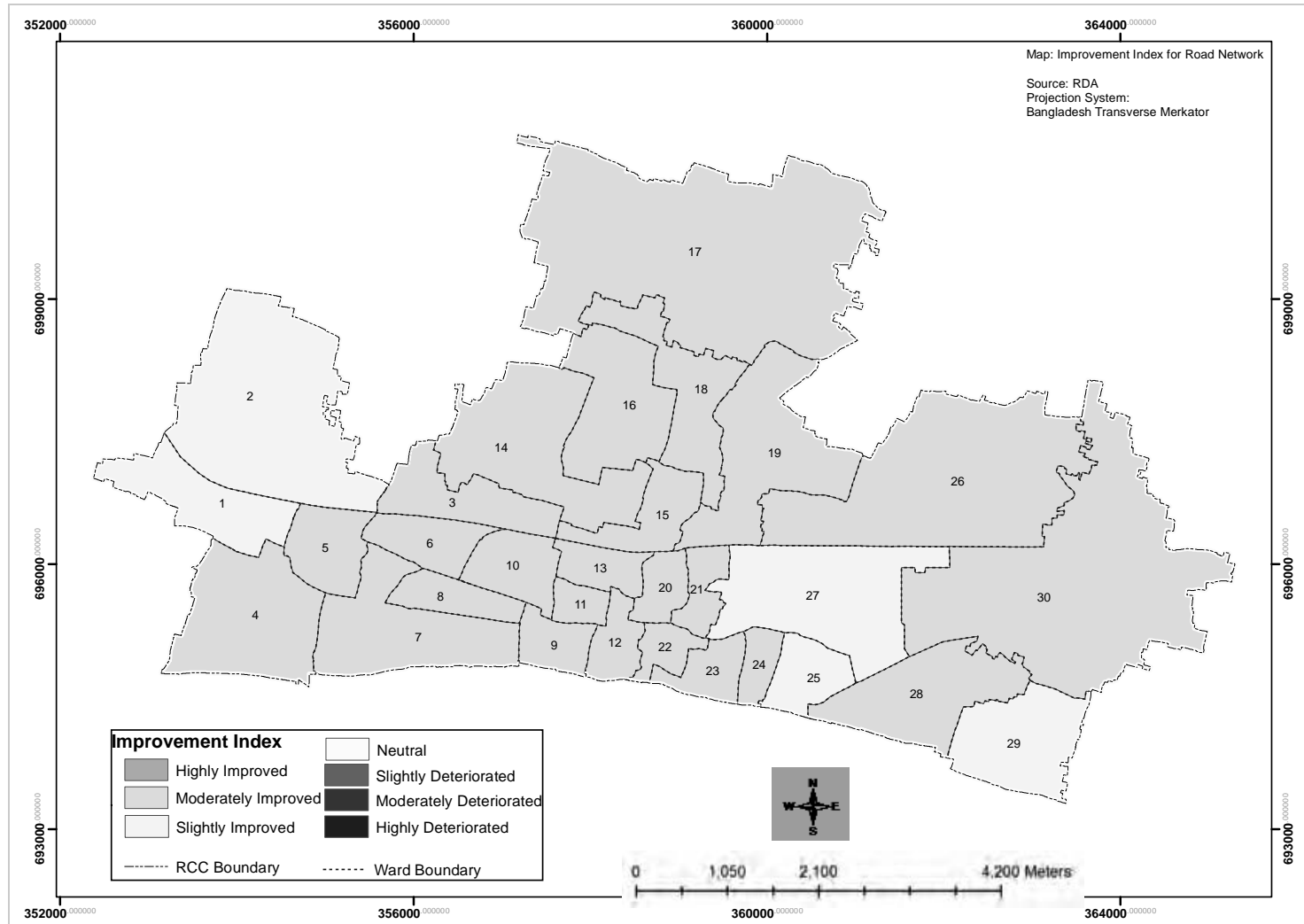
Source: RDA & Questionnaire Survey, 2013

Map C-4: Satisfaction for the Waste Management System by Ward in RCC Area



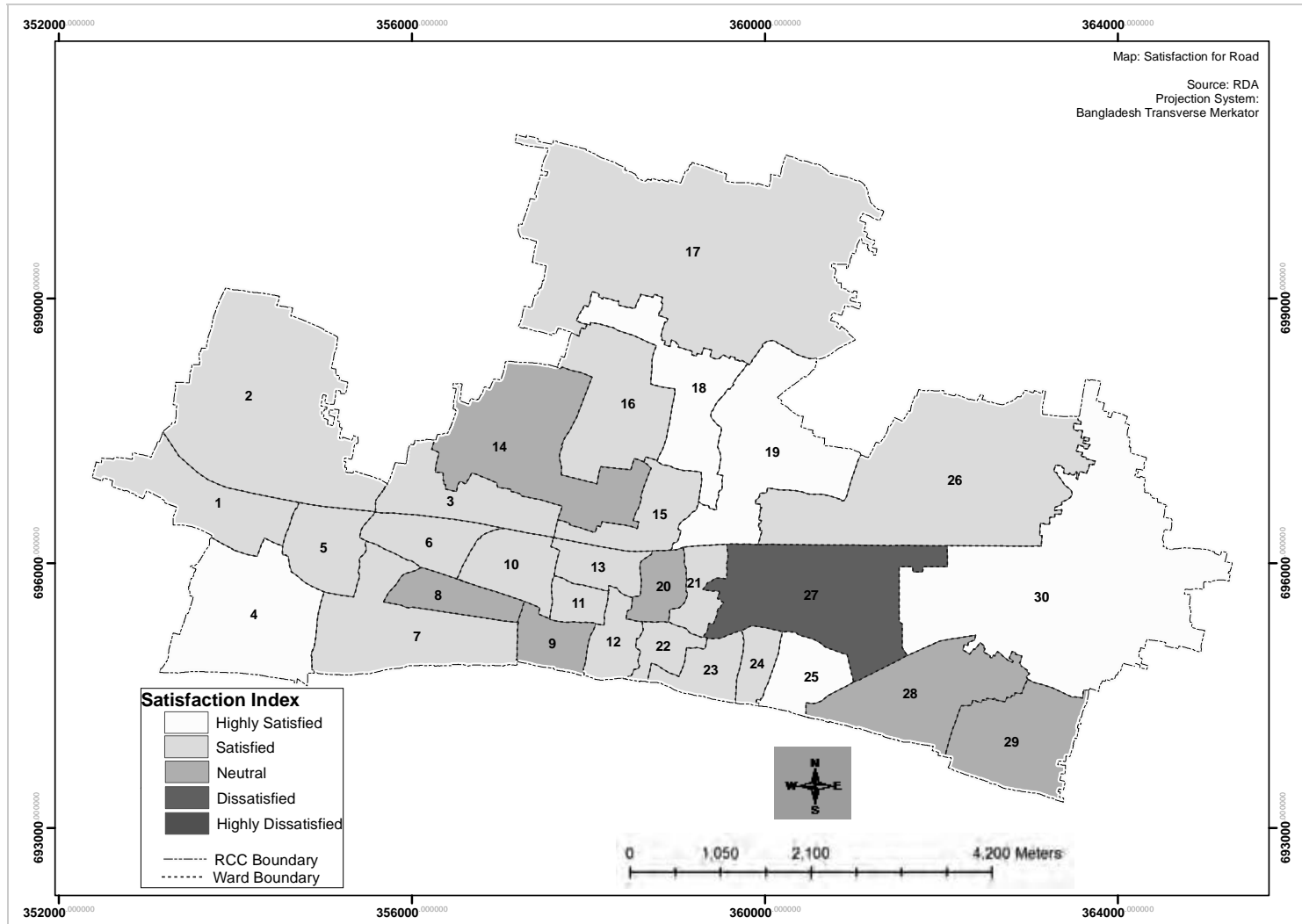
Source: RDA & Questionnaire Survey, 2013

Map C-5: Improvement of the Road Networks by Ward in RCC area



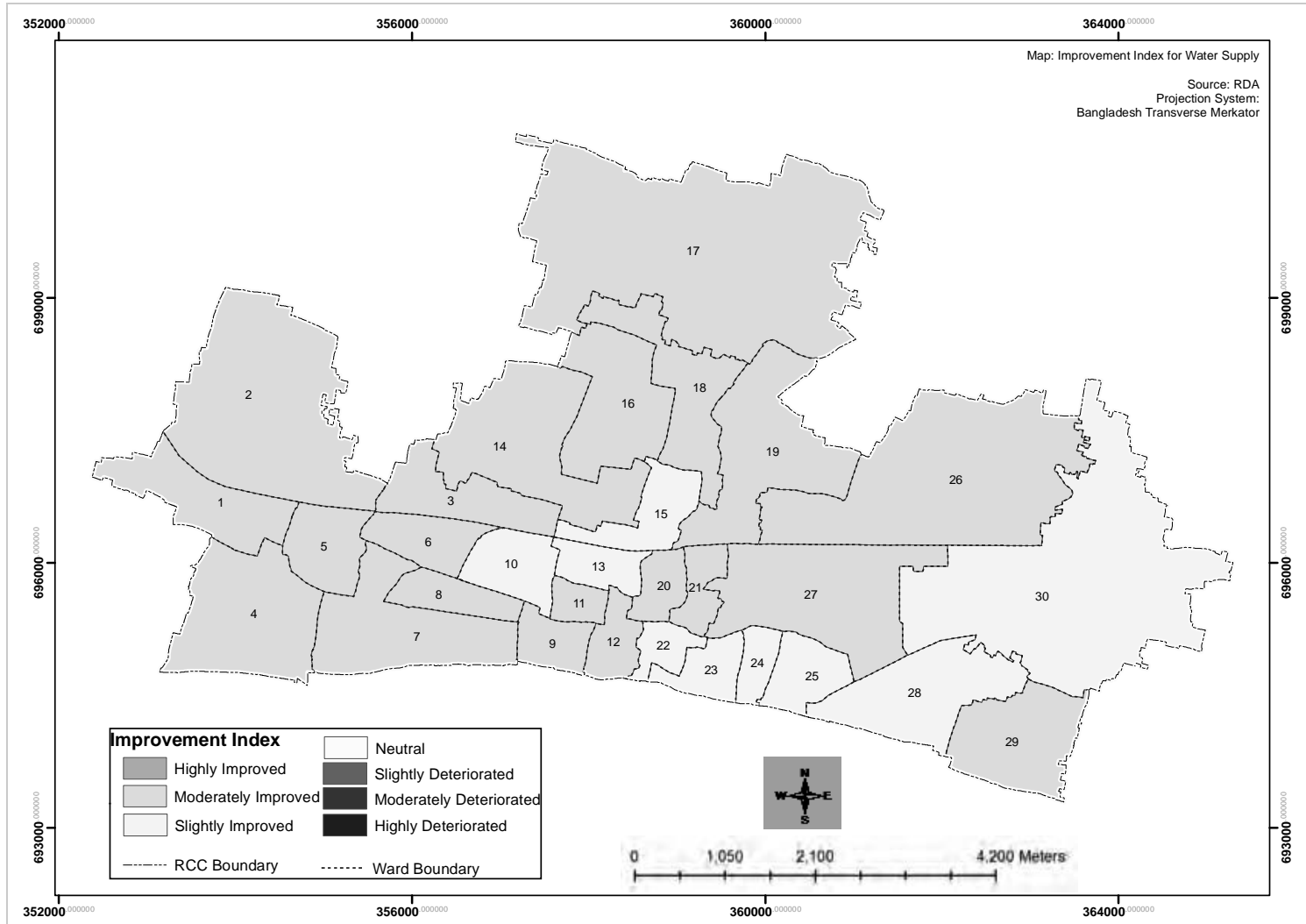
Source: RDA & Questionnaire Survey, 2013

Map C-6: Satisfaction for the Road Networks by Ward in RCC area



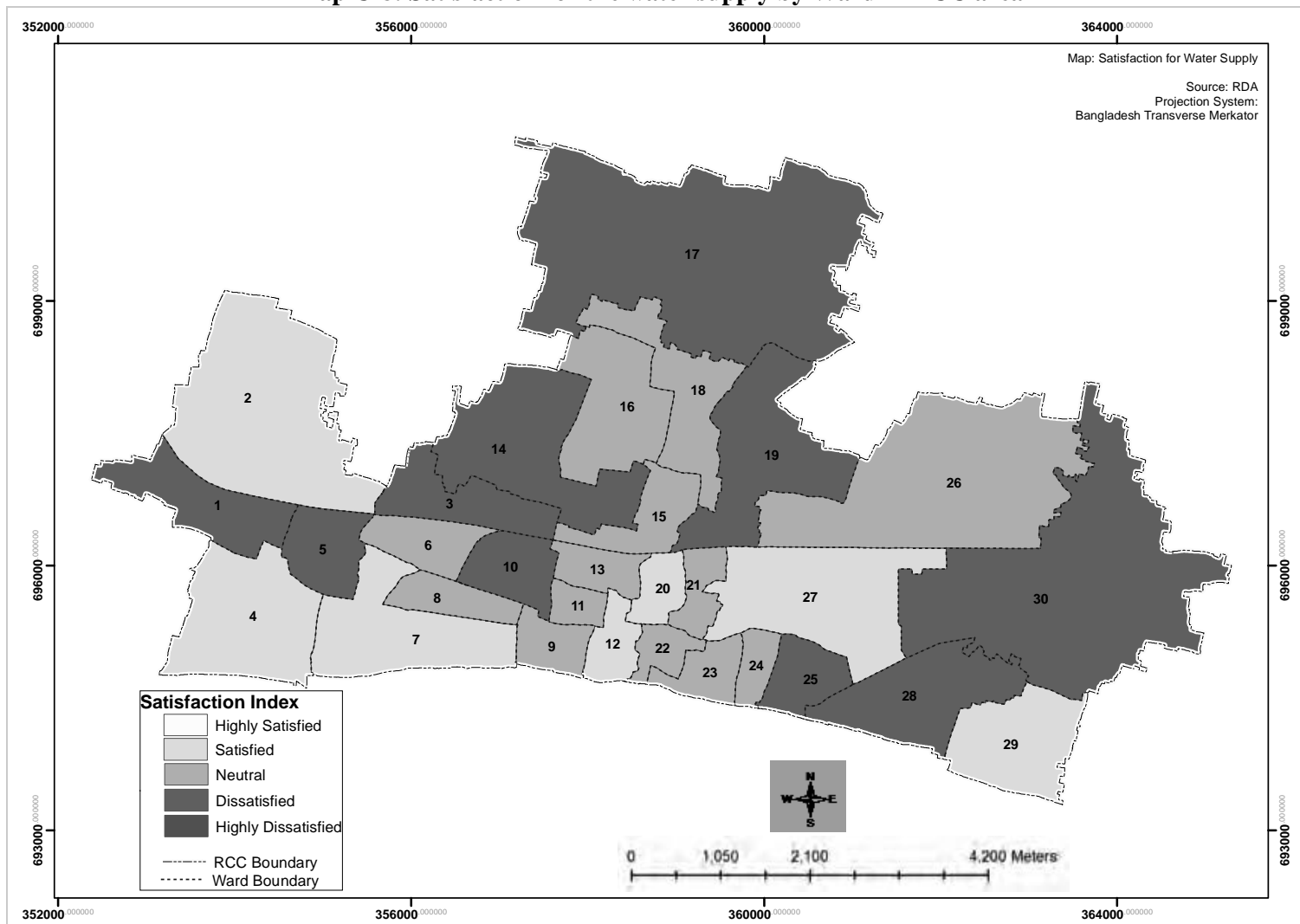
Source: RDA & Questionnaire Survey, 2013

Map C-7: Improvement of the Water Supply by Ward in RCC Area



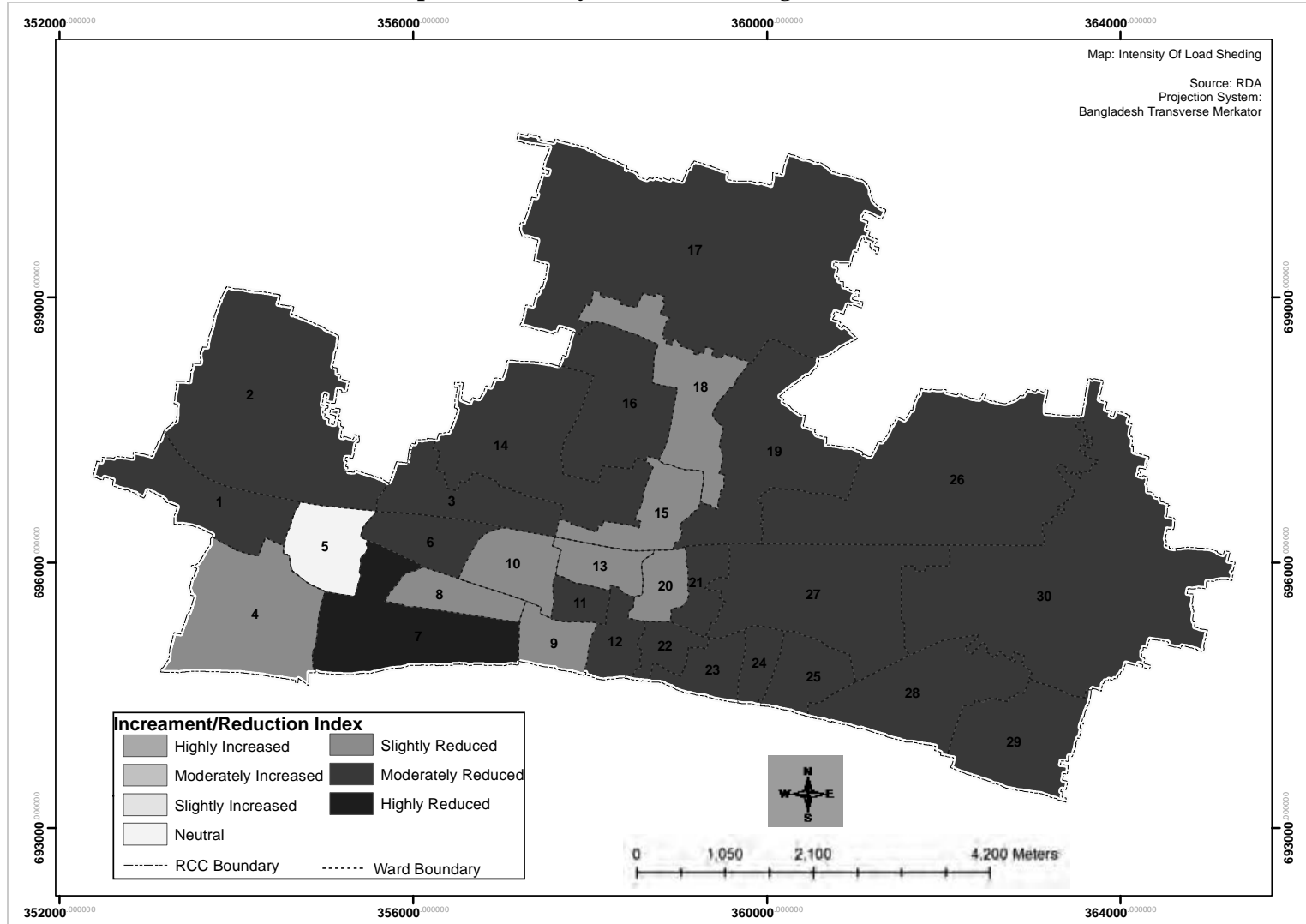
Source: RDA & Questionnaire Survey, 2013

Map C-8: Satisfaction for the water supply by Ward in RCC area



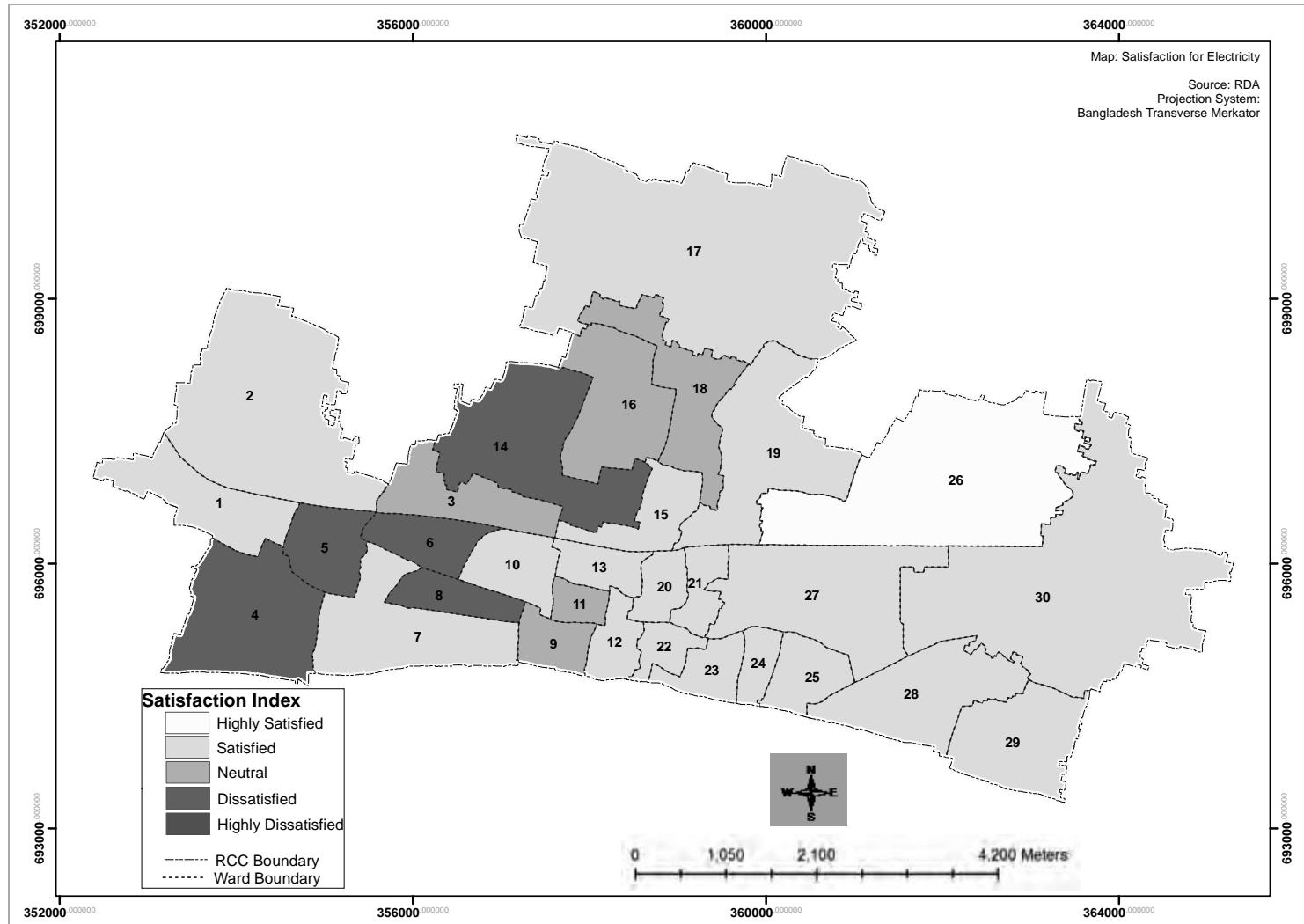
Source: RDA & Questionnaire Survey, 2013

Map C-9: Intensity of Load Shedding in RCC Area



Source: RDA & Questionnaire Survey, 2013

Map C-10: Satisfaction for Electricity in RCC Area



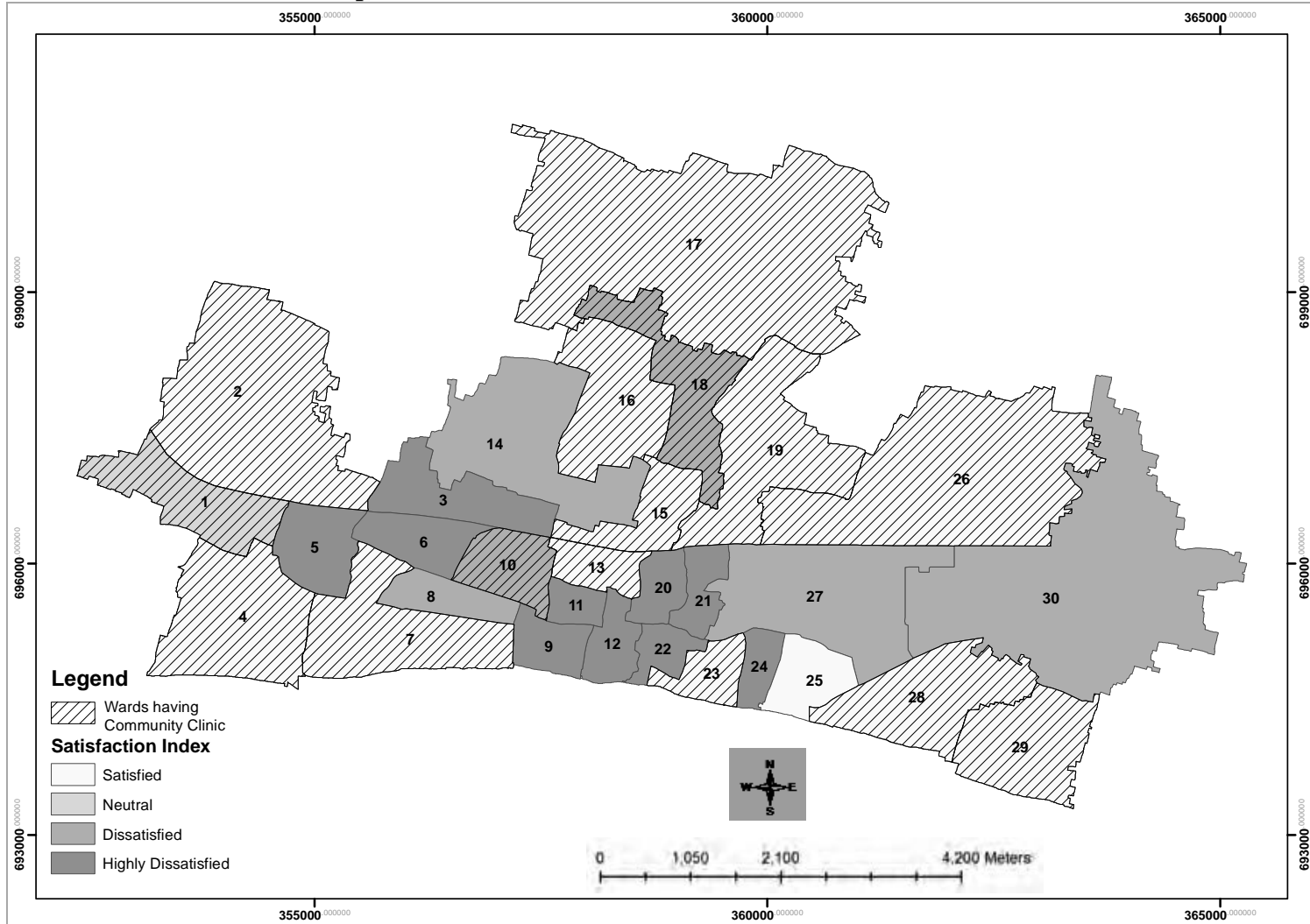
Source: RDA & Questionnaire Survey, 2013

Map C-11: Improvement the Health Facilities in RCC Area



Source: RDA & Questionnaire Survey, 2013

Map C-12: Satisfaction for the Health Facilities in RCC Area



Source: RDA & Questionnaire Survey, 2013

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Mst. Ilme Faridatul

October, 2014

ABSTRACT

Rajshahi is the fourth largest metropolitan city of Bangladesh. The city was established as a district town in 1825 along the northern side of the River Padma. It was one of the **first Municipalities in Bangladesh** and was declared as **City Corporation in 1991**. The Rajshahi Town Development Authority, RDA was established in 1978 with a view to ensure planned development of the city. The first Master Plan for Rajshahi was prepared in 1984 but the plan was not implemented properly. Therefore the second Master Plan was prepared in 2004. Presently two Master plans, one is Drainage Master Plan (1994-2020) and another is Rajshahi Metropolitan Development Plan (2004-2024), are being implemented by RCC and RDA respectively. In addition two water supply master plans were also prepared by DPHE and RCC in 1981 and 1994 respectively. Though a number plans are being implemented by the local level institutions, the city seems to be facing a lot of problems despite such efforts. The city exhibits a low rate of urbanization compared to other growing urban centres of Bangladesh. The reasons of slow development are absence of economic investments on a significant scale and consequent lack of economic opportunities in urban Rajshahi. The research is conducted to study pattern of physical development of the city and also to find out the successes/failures of the local level institutions in the implementation of the planning proposals. Physical survey, questionnaire survey and official opinion survey were conducted to assess the role of the local level institutions. The study shows that a significant improvement has taken place in the provision of road networks, waste management and water supply. Implementation status of the Functional Master Plan and DAP also shows that only the roads are being partially implemented but the proposed other community facilities are not executed yet. Citizen's perception also reveals that a significant improvement has been made in the provision of road networks, waste management, water supply but the improvement in other community facilities is not satisfactory. It is evident from the study that the local level institutions are unable to function properly due to lack of finance, political pressure, lack of coordination among the local level institutions and dependency on the central Government.

Thesis Title: **A Study on the Role of the Local Level Institutions in the Development of Rajshahi City**

Thesis Supervisor: Dr. Sarwar Jahan
 Professor
 Department of Urban and Regional Planning, BUET, Dhaka.

LIST OF ABBREVIATIONS

| | |
|----------------|--|
| ADP | Asian Development Program |
| AIPs | Area Improvement Plans |
| BBS | Bangladesh Bureau of Statistics |
| BDR | Bangladesh Rifles |
| BELA | Bangladesh Environment Lawyers Association |
| BIS | Bangladesh Institute of Studies |
| BRTA | Bangladesh Road Transport Authority |
| BSCIC | Bangladesh Small Cottage Industries Corporation |
| BSS | Bangladesh Sangbad Sangshta |
| BWDB | Bangladesh Water Development Board |
| DAP | Detail Area Plan |
| DPHE | Department of Public Health Engineering |
| FAR | Floor Area Ratio |
| GIS | Geographic Information System |
| GLD | Guided Land Development |
| HQs | Head Quarters |
| KV | Kilo-Volt |
| LGED | Local Government Engineering Department |
| MOLGRDC | Ministry of Local Government, Rural Development and Cooperatives |
| MT | Motorized Transport |
| MW | Mega-Watt |
| NGO | Non Government Organization |
| NHA | National Housing Authority |
| NMT | Non Motorized Transport |
| PDB | Power Development Board |
| PWD | Public Works Department |
| RCC | Rajshahi City Corporation |
| RCCI | Rajshahi Chamber of Commerce and Industry |
| RDA | Rajshahi Development Authority |
| RHD | Roads and Highway Department |
| RMDP | Rajshahi Metropolitan Development Plan |
| RTDA | Rajshahi Town Development Authority Ordinance |
| RUET | Rajshahi University of Engineering & Technology |
| RWASA | Rajshahi Water Supply and Sewerage Authority |
| SPSS | Statistical Package for Social Science |
| SPZ | Spatial Planning Zone |
| TM | Thematic Mapper |
| UDD | Urban Development Directorate |
| UN | United Nations |
| UNDP | United Nations Development Program |
| UPHCPs | Urban Primary Health Care Projects |
| USGS | U.S. Geological Survey |
| UTM | Universal Transverse Mercator |
| WASA | Water Supply and Sewerage Authority |
| WGS | World Geodetic System |

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Chapter 1 : INTRODUCTION

1.1 Background and Present State of the Problem

Along the northern side of Padma River, Rajshahi was established as a district town in 1825. It was one of the **first Municipalities** of Bangladesh, was established in **1876**. Rajshahi city was simply a district town prior to 1947 that became a divisional headquarters in 1947. Rajshahi Municipality was renamed as Rajshahi Pourashabha, and finally, Rajshahi Pourshava was declared as **Rajshahi City Corporation in 1991** (RCC, 1994). Now it is the 4th largest metropolitan city of Bangladesh next to Dhaka, Chittagong, and Khulna. The Rajshahi city is experiencing slow and steady urban growth, sharing about 0.5% of the national rural-urban migration (Rabbani, 1997). The city exhibits a low rate of urbanization compared to other growing urban centres. The reasons of slow development are absence of economic investments on a significant scale and consequent lack of economic opportunities in urban Rajshahi (Rahman, 2010).

A number of local level institutions are working for the development of the city. Among all these the local government institution, RCC and the autonomous Government organization, RDA are mainly responsible for the physical development of the city. To ensure planned development of the city a number of planning efforts have been undertaken in different periods. The first initiative of planned development for the city of Rajshahi dates back to 1968 when Urban Development Directorate (UDD) took the initiative to prepare a Master Plan. Other Planning efforts include BSCIC Industrial Estate at Sopura in 1961 and Upashahar Planned Housing Estate of the 1960s (RDA, 2003b). Just after the establishment of RDA in 1978 the first Master Plan for Rajshahi was finalized and started to implement from 1984 for the area of 177 sq. km. (RCC, 1994). After expire the first Master Plan, RDA prepared a new Master Plan named Rajshahi Metropolitan Development Plan (RMDP), 2004-2024 covering an area of 364.19 sq. km. (RDA, 2004b). In addition to these planning efforts, a Drainage Master Plan (1994-2020) was prepared by Rajshahi City Corporation covering the area of 4778 ha lands (DPHE, 1994). Two Water Supply Master Plans were prepared by DPHE, the first one was in 1981 and the second “Master plan for Rajshahi Water Supply, Sanitation and Drainage” was in 1994 (DPHE, 1994). Recently a new Master Plan named

“Water Supply and Sewerage System Improvement (2012-2030)” has been initiated by RWASA that will be implemented from 2014 (RWASA, 2012).

All the above mentioned planning efforts were undertaken considering future growth of the city and also considering the fact so that the city does not face the same type of problems that are facing the large urban centres of Bangladesh. In this research effort is given to study pattern of development of Rajshahi, to evaluate the success and failures of the local level institutions in developing the city according to the planning guidelines and also to identify the reasons of deviation from the planning guidelines.

1.2 Objectives of the Study

The objectives of the study are to detect the pattern of physical development of Rajshahi and to assess the performance, achievements and shortfalls of the local level institutions in executing the planning provisions.

Objectives

- To study the pattern of physical development of Rajshahi.
- To assess the role of the local level institutions in the development of Rajshahi as a planned city.

Possible Outcome

As Rajshahi city exhibits a low rate of urbanization compared to other urban centres and the city has ample vacant land to expand the city margin, therefore there is a great opportunity to develop Rajshahi in a planned way. This research will help to identify whether the city is expanding according to the planning guidelines. On the basis of this research the local level institutions would be able to formulate a better planning option focusing on the shortfalls of the existing plans.

1.3 Rationale of the Study

The research has been conducted to explore the success of the local level institutions in developing Rajshahi as a planned city. Though a number of plans are being implemented by the local level institutions, the city seems to be facing a lot of problems despite such efforts. It is therefore, necessary to study the pattern of physical development of the city and to

investigate the present scenario of development. It is expected that the study would help to identify the success and failures of the local level institutions in the implementation of the planning proposals. And also will help to identify the reasons of non implementation according to the planning guidelines. Moreover, it may also serve as guidance to overcome the shortfalls of the local level institutions for better implementation of the plans in future.

1.4 Limitations of the Study

The data required for this study was not in a common platform. To represent the pattern of physical development limited number of features are shown in GIS maps due to the non availability of digital data of different plan periods. The RMDP (2004) which was prepared by RDA had only digital data (GIS shape files). All other plans had the documents in paper format.

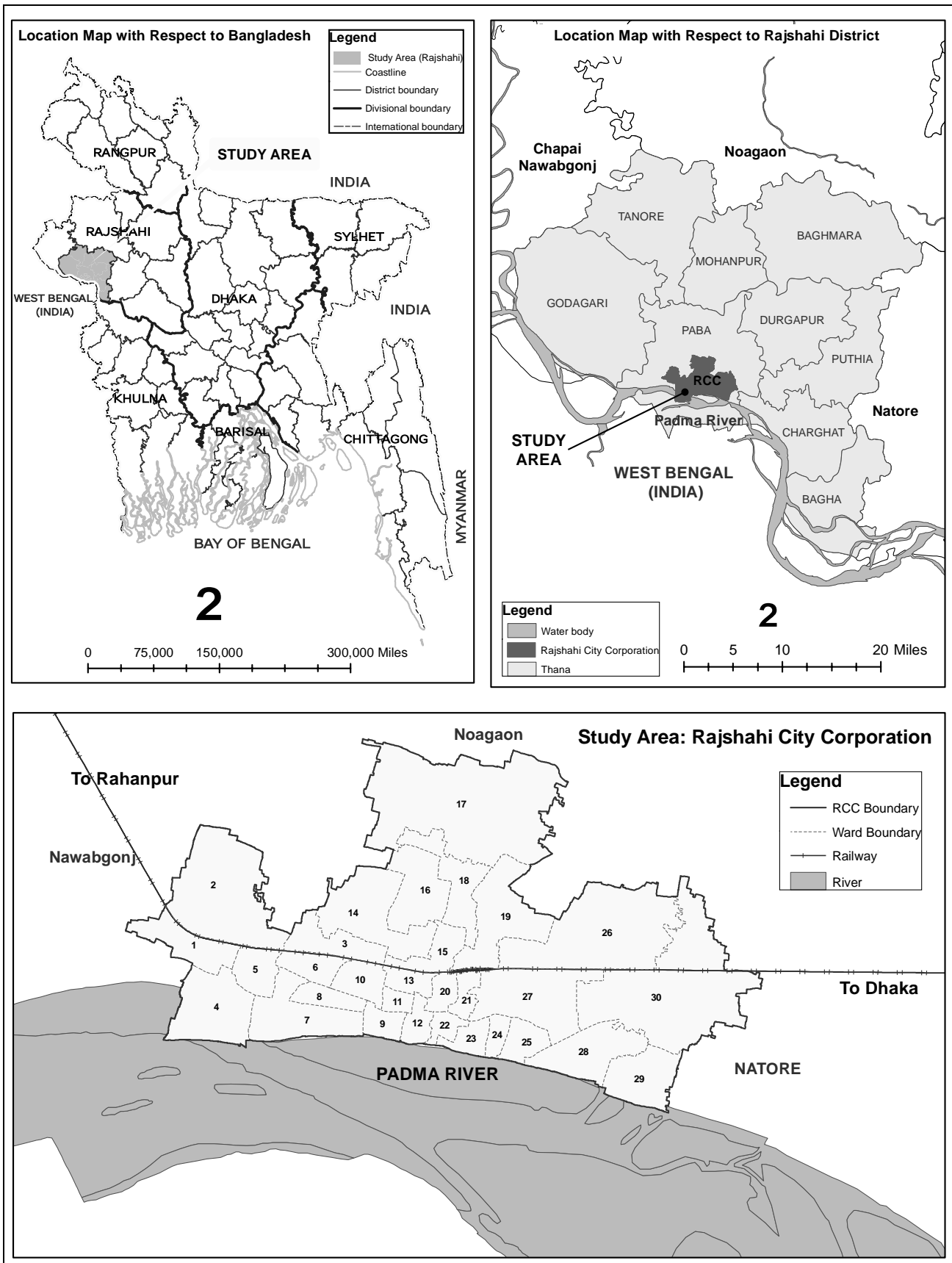
To study the change in builtup area, it is important to select the satellite images of the same time interval. Again the spatial resolution of the images is important. For this research purpose, Landsat satellite images have been chosen. The main problem of working with Landsat images is low resolution and the spatial resolution of Landsat Image is 30 meter. But due to limitations of resources, only free public-domain data have been used for this research.

To evaluate the present scenario of development it was important to collect updated data (GIS shape files) of the Detail Area Plans (DAPs). Due to non availability of digital data from secondary sources a physical feature survey has been conducted selecting one SPZ. It could be better option to conduct physical feature survey for the whole city corporation area but due to the limitation of time and money a sample SPZ 18 has been selected and the survey conducted covering the entire SPZ area.

1.5 Study Area Profile

Rajshahi is the 4th largest metropolitan city located at the north-west side of Bangladesh, close to the Indian border along the banks of the River Ganges (Padma). It is bounded on the north by Naogaon zila, on the east by Natore zila, on the south by Kushtia zila and India and on the west by Chapai Nawabganj zila. It lies between 24⁰07' to 24⁰43' north latitudes and between 88⁰17' to 88⁰58' east longitudes (RCC, 1994). Rajshahi City Corporation consists four Thanas and 30 Wards (Map 1.1).

Map 1.1: Location Map of the Study Area (Rajshahi City Corporation)



Source: NRP, 2010 & RDA, 2013

1.5.1 Historical Background of Rajshahi

Rajshahi was formerly known as **Rampur Boalia**. The beginning of modern Rajshahi can be traced from 1825 when the East India Company shifted their administrative center from Natore to then Rampur Boalia. Along the northern side of Padma River, Rajshahi was established as a district town in 1825. Rajshahi Town gained municipal status in 1876. It was simply a district town prior to 1947 that had become a divisional headquarters in 1947 and finally achieved the status of City Corporation in 1991 (Lima, 2003). Now it is the 4th largest metropolitan city of Bangladesh. Over the years it has grown as the administrative headquarters of Rajshahi Division and lately flourished as a centre of Education. Although agricultural activities have grown substantially in the hinterland, the growth of industrial and commercial activities has been very limited.

With the establishment of Medical College, University, Engineering University, Radio Centre and Airport the importance of the city increased and the city was started to grow in an unplanned way. In these consequences the Rajshahi Town Development Authority (RDA) was established in October, 1976 to ensure planned development of the city. Presently the Rajshahi Unnayan Kortripokkhko (**Rajshahi Development Authority-RDA**) is to plan the development of the city and to coordinate all the development related activities within the city area (RDA, 2003a).

1.5.2 Physical Characteristics of the City

Rajshahi has a tropical wet and dry climate. The climate of Rajshahi is generally marked with monsoons, high temperature, considerable humidity and moderate rainfall. The hot season commences early in March and continues till the middle of July. The maximum mean temperature is about 32 to 36 °C (90 to 97 °F) during the months of April, May, June and July and the minimum temperature in January is about 7 to 16 °C (45 to 61 °F). The city has a sub-tropical monsoon climate, which falls within a low rainfall zone of the country. The annual rainfall is 1350mm (Lima, 2003).

The study area forms a part of the much larger Ganges and Jamuna River Basin which is primarily a large flat alluvial basin made up of quaternary sediments having varied thickness ranging from a few hundred meters along the northern limit of the basin to 18 km at the deepest point in the south of the country. The general ground elevation in this area varies from 17.0m to 18 m and the embankment crest height is around 21m (RDA, 2004b).

1.5.3 Socio-economic Profile of the Study Area

Rajshahi is one of the oldest towns of Bangladesh. The city has grown from a small population of 40,000 in 1951 to about 339,932 in 2001 and 449757 in 2011 (RDA, 2003a & BBS, 2011). Economically Rajshahi is recognized as a backward area. Absence of manufacturing and related industrial occupation on a significant scale is a characteristic feature of the study area. In the city area informal sector play the main role while in the peri-urban area agriculture play the leading role (RDA, 2003c).

The industrial base of Rajshahi is comparatively poor. Process of industrialization could not keep pace with the rate of increase in population. Inadequate development of infrastructural facilities, shortage of capital and low productivity regionally acted as a brake on the development of economic base (industry, trade and commerce) of the city. Rajshahi is famous for its quality mangoes and fine silk products. While mango retains its importance in regional and national economy and silk has lost its glory and place of pride. But the city can benefit from setting up agro and mango based industries. The changes in the economic activity of Rajshahi in the last decade show that the city has continued to remain predominantly agricultural and a significant portion of households earn their income from agriculture.

Table 1.1: Major Employment in the RCC Area

| Type of Employment | Year | 1991 | 2001 | 2011 |
|---------------------------|----------------|-------|-------|-------|
| | Percentage (%) | | | |
| Service | | 0.55 | 0.43 | 0.46 |
| Business | | 5.17 | 4.68 | 4.73 |
| Agriculture | | 24.78 | 21.67 | 19.05 |
| Manufacturing | | 0.55 | 0.46 | 0.49 |
| Household work | | 37.56 | 33.46 | 32.46 |
| Transport & communication | | 0.77 | 1.47 | 1.40 |
| Construction | | 0.54 | 0.79 | 0.76 |
| Do not work | | 20.52 | 28.82 | 32.86 |
| Looking for work | | 0.70 | 1.65 | 1.63 |
| Others | | 8.87 | 6.57 | 6.16 |
| Total | | 100 | 100 | 100 |

Source: BBS, 2001 & 2011

Chapter 2 : THEORETICAL FRAMEWORK AND RESEARCH METHODOLOGY

2.1 Basic Terminologies

Local level institutions may include numerous institutions at the local level. As it is not possible to discuss the role of all the institutions in this thesis, I have concentrated my analysis on selected governmental institutions in Rajshahi city which are described in the following section.

2.1.1 Meaning of Local Level Institution

There is no formal definition of the local level institution. The institutions that work within the administrative boundary of RCC and having link with the physical development of the city are defined as local level institutions. Within the administrative boundary of RCC the following institutions are identified as having links with Rajshahi Metropolitan Development and service provisions:

- Urban Development Directorate (UDD)
- Rajshahi Development Authority (RDA)
- Rajshahi City Corporation (RCC)
- Roads and Highway Department (RHD)
- Department of Public Health Engineering (DPHE)
- Local Government Engineering Department (LGED)
- Bangladesh Small & Cottage Industries Corporation (BSCIC)
- Bangladesh Water Development Board (BWDB)
- Power Development Board (PDB)
- Rural Electrification Board (REB)
- Rajshahi Metropolitan Police (RMP)
- National Housing Authority (NHA)
- Public Works Department (PWD)
- House Building Finance Corporation (HBFC)
- Bangladesh Road Transport Authority (BRTA)
- Bangladesh Telegraph and Telephone Board (T&T)
- Bangladesh Parjatan Corporation (BPC)

- Bangladesh Rifles
- Bangladesh Railways

Amongst all these institutions the key local level institutions that play a significant role in the planning and development of the city are RCC and RDA. RDA is largely responsible for physical planning and development of the city and other organizations follow the city development plan prepared by RDA. In this research mainly the roles of RDA and RCC's are assessed as, these are directly involved with physical planning and development of the city.

2.1.2 Meaning of Development

Development can be defined in a variety of ways in terms of social, monetary, physical, environmental etc. The study focuses only on the physical development of the city. The change in builtup area and the growth of the physical infrastructures (road network, drainage, water supply, housing, recreational facilities, health centres, Katcha bazar etc.) in terms of area, length/coverage/number are assessed as the indicators of the physical development of RCC.

2.2 Methodology of the Research

2.2.1 Literature Review

An elaborate literature review was conducted for background study and better understanding of the problem and for the development of the objectives. Different documents were studied on the various planning proposals of Rajshahi. Structure plan, Master plan, Detail area plan and Drainage master plans were reviewed to know the history of planning of Rajshahi City.

A number of theses were reviewed to know the applied methods and techniques for the assessment of development and role of the concerned institutions in the development of an area. Suraiya (2007) assessed the role of the city corporation in urban development by analyzing the undertaken development activities and projects, perception of the residents were taken through questionnaire survey and simple statistical technique (frequency distribution) was applied to represent the data in tabular and graphical format. Ahmed (2013) conducted a research on Sylhet City Corporation's Services: Citizens' View. The paper aimed to find out citizens' satisfaction level on the services provided by the Sylhet City Corporation. He applied normal statistical technique (frequency distribution) to draw a picture of the quality of the public services and the level of the citizens' satisfaction. Data

was recorded as satisfied, dissatisfied and neither satisfied nor dissatisfied for the level of satisfaction, and improved, deteriorated, same as before for the level of improvement. Mamun (2007) conducted a research on the role of union plan book in rural development. The author reviewed the past planning efforts and conducted a physical feature survey to evaluate the performance of the plans. Finally a number of GIS maps were generated to show the variation in development. Another research was conducted on the Evaluation of Municipal Services in Selected Wards of Dhaka City Corporation: Citizen's Perspective using TUGI (The Urban Governance Initiative) index to measure the performance of services (Akther *et al.* 2009). Maqsd (2001) assessed the trend of development of Dhanmondi Residential area, Dhaka City using a base map to show the spatial variation of land uses, building height and FAR. A Simple statistical process was used to show the variation in tabular format. Lima (2003) assessed the problems and constraints in implementing the master plans of Rajshahi through a theoretical description and analysis.

Examples Related to Land Cover Change Detection

Basak (2006) classified some Landsat images of Dhaka Metropolitan Development Planning (DMDP) area using index-based expert classification process. The main objective was to identify the Spatio-temporal trends and dimension of urban form in DMDP area from 1989 to 2003. Dewan and Yamaguchi (2009) tried to evaluate land cover changes and urban expansion in greater Dhaka, between 1975 and 2003 using satellite images and socio-economic data. A supervised classification algorithm and the post-classification change detection technique in GIS were implemented by them. Emch and Peterson (2006) quantified mangrove forest cover change in the Sundarbans of south-west Bangladesh from 1989 to 2000 using Landsat Thematic Mapper (TM) satellite imagery. They used three image processing techniques: Normalized Differential Vegetation Index (NDVI), maximum likelihood classification and sub-pixel classification. In addition to these a number of books, articles, and research works have been reviewed from the faculty library, Bangladesh Institute of Studies (BIS) and internet.

2.2.2 Selection of Study Area

Rajshahi City Corporation (RCC) area have been selected for this study as a number of planning efforts have been undertaken for the development of the city but the city seems to be facing a lot of problems despite such efforts. Thus the study intends to identify the success and failures of the local level institutions in the physical development of RCC.

2.2.3 Data Collection

Both primary and secondary data have been used for the study. Primary data has been collected through conducting a physical survey, questionnaire survey and official opinion survey. A number of planning documents: Rajshahi Metropolitan Development Plan Volume I & II, Drainage Master Plan 1994, Water Supply Master Plan 1994 etc. and GIS shape files are used as secondary source. In addition to these Landsat satellite images (1991, 2003 and 2011) have been collected from the official website of U.S. Geological Survey (Table 2.1).

Table 2.1: Details of the Landsat satellite images used for analysis

| Year | Date Acquired (Day/Month/Year) | Sensor | Quality (100% Cloud Free) |
|-------------|---|-------------------------------------|--------------------------------------|
| 1991 | 22/MAR/1991 | Landsat 4-5 Thematic Mapper (TM) | 7 |
| 2003 | 18/NOV/2003 | Landsat 4-5 Thematic Mapper (TM) | 9 |
| 2011 | 08/NOV/2011 | Landsat 4-5 Thematic Mapper (TM) | 9 |

Source: U.S. Geological Survey, 2014

Landsat Path 138 Row 43 covers the whole study area. Map Projection of the collected satellite images is Universal Transverse Mercator (UTM) within Zone 45 N–Datum World Geodetic System (WGS) 84 and the pixel size is 30 meters.

2.2.3.1 Physical Feature Survey

The physical survey has been conducted to know the real scenario of development of the proposed facilities indicated in the Detail Area Plans. For this purpose one sample Spatial Planning Zone (SPZ) was selected. RMDP divided the entire city area into 25 SPZs among all these RCC consists of a total 7 SPZs. To conduct physical survey SPZ 18 has been selected as it covers the core of the RCC area and was the target to develop this zone within 1st phase of the plan period (2004-2009). A base map indicating the location of the proposed facilities was prepared and the physical survey has been conducted to find out whether the proposed facilities are implemented or not.

2.2.3.2 Questionnaire Survey

A questionnaire survey has been conducted to know the perception of the citizens regarding the development of the community facilities. However, it is not possible to assess all the services due to resource constraint. Therefore, among different community facilities only the

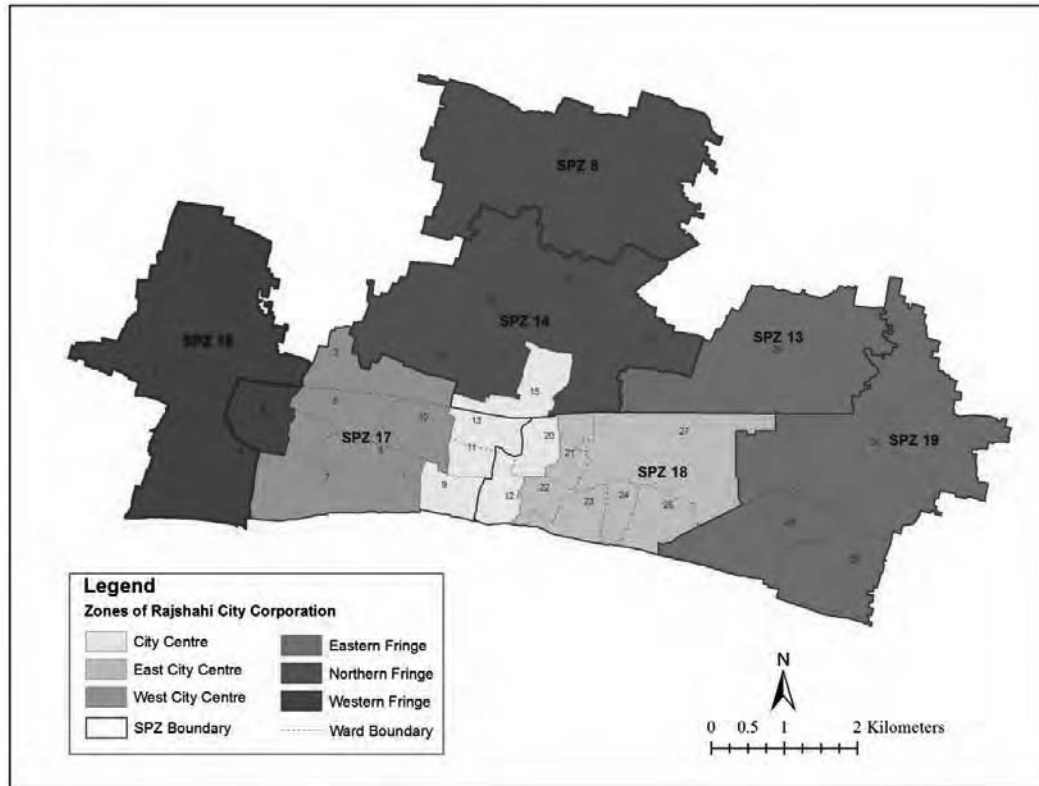
level of perception for nine facilities such as road network, drainage, waste management, water supply, electricity, recreational facilities, katcha bazaar, health facilities and community center are taken.

Rajshahi City Corporation consist of a total 30 wards and 7 SPZs. For proper assessment it was desirable to get the respondent's from all over the city. Thus a total 300 samples were selected taking 10 samples randomly from each ward and the survey was conducted. In collecting the survey samples, consideration was made so that samples were representative of the wards. The respondents were chosen in such a way that they are a responsible adult. To investigate the variation of development in the core and fringe area of the city the study area has been divided into six zones as follows (Table 2.2). The main commercial area and its surroundings have been defined as city centre and the wards located far away from the central area of RCC have been defined as East, West and Northern fringe. While the city centre covers three parts of SPZ 14, 17 & 18; East city centre covers major portion of SPZ 18; West city centre covers maximum part of SPZ 17; Western fringe covers the entire area of SPZ 15 and a small part of SPZ 17; Eastern fringe covers the entire area of the SPZ 13 and 19; Northern fringe covers the entire area of SPZ 8 and a small part of SPZ 14 (Map 2.1).

Table 2.2: Study Zones of Rajshahi City Corporation

| City Zones | Area Coverage | Sample Size |
|-------------------|----------------------------------|--------------------|
| City Centre | Ward No. 9, 11, 12, 13, 15 & 20 | 60 |
| East City Centre | Ward No. 21, 22, 23, 24, 25 & 27 | 60 |
| West City Centre | Ward No. 3, 6, 7, 8 & 10 | 50 |
| Eastern Fringe | Ward No. 26, 28, 29 & 30 | 40 |
| Western Fringe | Ward No. 1, 2, 4 & 5 | 40 |
| Northern Fringe | Ward No. 14, 16, 17, 18 & 19 | 50 |
| Total | | 300 |

Map 2.1: Study Zones of Rajshahi City Corporation



Source: Map Prepared by Researcher, 2014 & RMDP-VII

Finally the data has been recorded on the basis of the following constructed scale.

Level of Satisfaction: The respondents were asked about their satisfaction and dissatisfaction levels for the available community facilities. As a “*satisfaction*” scale (“How satisfied are you with ?”) the response were recorded: “highly satisfied,” “satisfied,” “neither satisfied nor dissatisfied,” “dissatisfied,” and “highly dissatisfied.” The constructed scale was as follows:

| Highly Satisfied | Satisfied | Neutral | Dissatisfied | Highly Dissatisfied |
|------------------|-----------|---------|--------------|---------------------|
| 1 | 0.5 | 0 | -0.5 | -1 |

Level of Improvement: The respondents were asked if the services have improved over the last few years. Therefore, the following seven point scale was used to record the performance of the community facilities. As an “*Improvement*” scale the responses were recorded: “highly improved”, “moderately improved”, “slightly improved”, “neither improved nor deteriorated (Neutral)”, and “slightly deteriorated”, “moderately deteriorated” and “highly deteriorated”. The constructed scale was as follows:

| Improved | | | Neutral | Deteriorated | | |
|----------|------------|----------|-----------|--------------|------------|--------|
| Highly | Moderately | Slightly | No Change | Slightly | Moderately | Highly |
| 3 | 2 | 1 | 0 | -1 | -2 | -3 |

Level of Development: The Citizen's were asked to indicate the rate of development of the city. To record the overall degree of development the following five-point scale is constructed. The high the scale value, the high is the development.

| | | | | |
|-----------------------|------------------|-----------------|-------------|------------------|
| No Development | Very Slow | Moderate | High | Very High |
| 0 | 1 | 2 | 3 | 4 |

2.2.3.3 Official Opinion Survey

The officials who are involved in the implementation and monitoring of the planning proposals in particular the view of them have been taken. The table 2.3 shows the list of the concerned officials of RDA and RCC to whom the opinion was taken regarding the execution of the planning proposals. A check list of the proposed facilities was prepared to mark the implementation status (fully implemented, partially implemented and non-implemented facilities). The officials were asked to point out the problems that are faced in executing the plans and also to specify the reasons of deviation from the planning guidelines.

Table 2.3: List of the Officials

| Designation | Organization | No. of Personnel's |
|--------------------|---------------------|---------------------------|
| Chairman | RDA | 1 |
| Chief Engineer | RCC | 1 |
| Town Planner | RDA | 2 |
| Executive Engineer | RCC | 1 |

2.2.4 Data Analysis

The collected data have been analysed both qualitatively and quantitatively. The softwares ERDAS Imagine 10, ArcMap 10.1, SPSS and Microsoft Excel have been used to analysis the collected data.

2.2.4.1 Physical Development Pattern

To study the pattern of physical development of Rajshahi City Corporation the Landsat satellite images have been classified into five land cover types (Table 2.4). The supervised classification method has been applied to detect the change in land cover over the last 20 years (1991 to 2011). To perform supervised classification the spectral signatures for each type of land cover have been created. Signatures are developed incorporating the vector files on the study area and the bands used for analysis. These signature files contain statistical information about the reflectance values of the pixels of the training sites for each land cover type.

Table 2.4: Details of the Land Cover Types

| Type | Description |
|---------------------|---|
| Builtup Area | All residential, commercial and industrial areas, villages, settlements and transportation infrastructure. |
| Water Body | River, permanent open water, lakes, ponds, canals and reservoirs. |
| Vegetation | Trees, shrub lands and semi natural vegetation: deciduous, coniferous, and mixed forest, palms, orchard, herbs, climbers, gardens, inner-city recreational areas, parks and playgrounds, grassland and vegetable lands. |
| Low land | Permanent and seasonal wetlands, low-lying areas, marshy land, rills and gully, swamps, mudflats, all cultivated areas including urban agriculture; crop fields and rice-paddies. |
| Fallow land | Fallow land, earth and sand land in-fillings, construction sites, developed land, excavation sites, solid waste landfills, open space, bare and exposed soils. |

A comparative analysis has also been performed between the past and present status/coverage of the infrastructures and community facilities within RCC area. Finally a number of maps, tables and figures are generated to represent the pattern of development of the study area.

2.2.4.2 Role Assessment of the Local Level Institutions

The performance of the local level institutions (RDA and RCC) has been assessed through documentary analysis and comparison showing between the proposed and existing development scenario. In addition to these the data collected from questionnaire survey have been stored in SPSS and calculated the performance of the community facilities as assessed by the citizen's. Following mathematical expression shows how the performance index has been determined:

The computational formula to calculate satisfaction index is as follows:

$$I = \frac{1 * f_{hs} + 0.5 * f_s + 0 * f_0 - 0.5 * f_d - 1 * f_{hd}}{N}$$

Where,

I = satisfaction index such that $+1 \geq I \geq -1$

f_{hs} = frequency of responses indicating high satisfaction

f_s = frequency of responses indicating satisfaction

f_0 = frequency of responses indicating neutral

f_d = frequency of responses indicating dissatisfaction

f_{hd} = frequency of responses indicating high dissatisfaction

N = total number of observations.

** The positive and negative value indicates satisfaction and dissatisfaction of the residents respectively. And high the index value, the high level of satisfaction and index value '0' represents the neutral situation.

The computational formula to calculate improvement index is as follows:

$$I = \frac{3 * f_{hi} + 2 * f_{mi} + 1 * f_{si} + 0 * f_0 - 1 * f_{sd} - 2 * f_{md} - 3 * f_{hd}}{N}$$

Where,

- I= Improvement index such that $+3 \geq I \geq -3$
- f_{hi} = frequency of responses indicating highly improved
- f_{mi} = frequency of responses indicating moderately improved
- f_{si} = frequency of responses indicating slightly improved
- f_0 = frequency of responses indicating neutral
- f_{sd} = frequency of responses indicating slightly deteriorated
- f_{md} = frequency of responses indicating moderately deteriorated
- f_{hd} = frequency of responses indicating highly deteriorated
- N= total number of observations.

** The positive and negative value indicates improvement and deterioration of the municipal services respectively. And high the index value, the high level of improvement and index value '0' represents no improvement of the service.

The computational formula to calculate development index is as follows:

$$I = \frac{0 * f_{nd} + 1 * f_{vs} + 2 * f_{md} + 3 * f_{hd} + 4 * f_{vh}}{N}$$

Where,

- I = Development Index such that $0 \leq I \leq 4$
- f_{nd} = frequency of responses indicating no development
- f_{vs} = frequency of responses indicating very slow development
- f_{md} = frequency of responses indicating moderate development
- f_{hd} = frequency of responses indicating high development
- f_{vh} = frequency of responses indicating very high development
- N= total number of observations.

** The high the index value, the high is the development and index value '0' represents no development.

After calculate the satisfaction, improvement and development index values a number of maps are generated using GIS to show zone wise variation in development of the community facilities within RCC area.

Chapter 3 : GENESIS OF PHYSICAL PLANNING IN RAJSHAHI

3.1 Institutions Involved with Planning and Development

The following institutions are identified as having link with the development and planning of Rajshahi City.

3.1.1 Rajshahi Development Authority (RDA)

The government of the people's republic of Bangladesh established the Rajshahi Town Development Authority in 1976. RDA functions under the Ministry of Housing and Public Works and is headed by an appointed government official. The aim of the Rajshahi Development Authority is city planning and also to ensure planned growth and development of the city. The Authority is in charge of preparing and executing the plans and schemes for the development of Rajshahi City. RDA is also responsible for preparing master plans in line with the general development plan indicating land use zoning, water supply, roads, housing, sewerage and drainage etc.

3.1.2 Rajshahi City Corporation (RCC)

Rajshahi municipality was upgraded to the status of City Corporation in 1987. RCC, under the Ministry of Local Government is headed by an elected Mayor. It is the key local government institution of the city. Its activities include the disposal of solid wastes; provide street lighting, restoration of storm water and wastewater drains; the construction and reconstruction of roads and culverts; eradication of mosquitoes; and the provision of health services to the city residents. It is also responsible for implementing the Drainage Master Plan (1994) which aims to meet the physical needs of drainage and environmental sanitation. The entire RCC area is divided into 30 wards and the Ward Commissioners (WC) place the requirements of their wards to the RCC. They are mandated to ensure that the basic rights of their people including the provision of clean roads and drains, provision for a safe environment under existing laws and regulations, access to hygienic latrines and supportive health treatment facilities for all members of their ward.

3.1.3 Department of Public Health Engineering (DPHE)

Except Dhaka, Chittagong city areas and Narayanganj town, DPHE is responsible for the Water Supply and Sanitation (Human excreta & sullage disposal, drainage and solid waste

management) of the whole country, both in rural and urban (City Corporation, Pourashava, Upazila HQs and growth centers) areas. In Rajshahi before the establishment of RCC and RWASA, DPHE worked for water supply, sanitation and drainage improvement of the city. Now the Department of Public Health Engineering (DPHE) is not active in the RCC area except in some low income community areas.

3.1.4 Rajshahi Water Supply and Sewerage Authority (RWASA)

Rajshahi WASA is an autonomous body under the Ministry of Local Government of Bangladesh, Started its journey from 1st August, 2010. Rajshahi WASA is the only organization providing water supply in the Rajshahi City at present. Rajshahi WASA is a very new organization. It has been established with the following objectives:

- To achieve 100% coverage of water supply and sanitation services throughout the city including their safe use and effective management.
- To ensure quality of water for drinking and other purposes.
- To achieve congenial environmental sanitation for overall development of the city in a sustained manner.

3.1.5 BSCIC Industrial Estate

Bangladesh Small and Cottage Industries Corporation (BSCIC) is a prime government organization entrusted for rapid industrialization of small and cottage industries in the country. Under the direct or indirect initiative of BSCIC a plenty of entrepreneurs has been created and enterprises has been set up in the country. BSCIC is to provide facilities to the existing and new entrepreneurs to expand and develop their markets and to stay and sustain in the competitive environment. In Rajshahi, BSCIC is the only organization, working for industrial development, started its journey in 1960. The estate is located at Sapura, 2km north in the downtown Rajshahi Metropolitan City, about 100 meter from the Airport road, near to the Rajshahi Cantonment.

3.2 Planning Initiatives for Rajshahi

In this section a thorough review has been conducted of the planning initiatives for the development of Rajshahi.

3.2.1 UDD's Effort for Rajshahi Planning (1968)

Urban Development Directorate of the Ministry of Housing and Public Works prepared a Physical development plan for Rajshahi City back in 1968. It was largely a land use plan. But the plan could not be implemented because, at that time there was no development authority to take care of its planning and development of the city.

3.2.2 Water Supply Master Plan of DPHE (1981)

In 1981, a feasibility study for Rajshahi Water Supply was conducted by DHV Consultants to develop a Master Plan up to the year 2000. The primary objective of the Plan was to develop a master plan for the improvement of water supply. The study also considered the public health and sanitation situation of the city. The plan suggested that a large scale sanitation program based on pit latrines and septic tanks be implemented along with water supply, drainage and garbage collection programs in order to effectively improve the overall environmental sanitation of the city. Based on this plan an interim water supply plan was implemented in 1986 to meet the immediate needs of the city dwellers. The plan comprised phased construction and extension of the water supply systems including an Interim Immediate Program and proposal for legal and organizational frame work for future water supply. However the planned phased development could not be implemented primarily due to resource constraint, lack of trained personnel, funding limitation, improper management and poor logistic support.

3.2.3 Master Plan of 1984

After the establishment of RDA, for the first time in 1984 an initiative was taken to prepare a Master Plan for Rajshahi City. The 1984 Master Plan of Rajshahi City was a joint effort by Urban Development Directorate (UDD), UNDP-UNCHS and RDA. UNCHS consultants and the professionals from UDD participated in the plan preparation. The plan was prepared for a population of 1, 00,000 during Third Five Year Plan and for additional population of 300000 inhabitants for the period 1985-2000. The style and manner used to describe the plan was similar to the Master Plans prepared in the 1950s and 1960s for other major cities of the country. The plan proposals were the following:

- The plan recommended to locate a new town centre on the north of the railway line by the Naohata Road where new commercial and administrative establishments could be set up and linked with main city by access roads.

- The plan recommended to work out a special drainage plan for the city using Baranai river. Septic tank was suggested for multistoried buildings and comprehensive sewerage system at a later stage. It also laid importance for new waste disposal site.
- The plan proposed five new light industrial sites on the north of the railway line including extension of area of BSCIC Industrial Estate which was running short of land in its existing site
- It proposed to replace existing Natore and Nawabganj Road by new roads. These were to be linked with Greater Road and Naohata Road. The plan suggested to avoid direct access to new developments along the new roads. New roads were proposed to have a ROW of 100 ft. and Greater Road to be extended to 80 ft.
- The plan suggested to form housing units around a primary school with 550 dwellings accommodating 3500 inhabitants of which 400 would be primary school going children. It was suggested to develop two or three housing units together so that common facilities, like, secondary school, recreational space, mosque, market with parking area, shops and other services could be used jointly.
- The plan recommended to safeguard the river bank and protect it from scattered development. To enhance beauty of the embankment area tree plantation and other arrangements were suggested. More playgrounds for children were recommended. A major recreational zone was proposed in the new town area to the north-east where lake was recommended combining low lands with drainage collection, a zoo could also be created. Recreational lanes network within green / open spaces were recommended for traffic access to markets, employment areas and city centres.

3.2.4 Drainage Master Plan of RCC (1994-2020)

RCC prepared a drainage master plan in 1994 for the improvement of the drainage system of the City. The project aim was to improve environmental aspects of the people of RCC by reducing incidence of drainage blockage and water logging areas through provision of proper drainage system and environmental sanitation services which includes improved sanitation, drainage and solid waste disposal. The plan was prepared by AQUA Consultants Ltd. The plan proposed to construct and rehabilitate a total 180 km of primary, secondary, tertiary and plot drains in three phases.

Phase I: 1995-2000

Phase II: 2001-2010

Phase III: 2011-2020

The plan proposed a framework to improve environmental sanitation by providing public toilets, single pit latrines and twin pit latrines. A framework was also proposed to improve solid waste management of the city by increasing capacity and efficiency of operations.

3.2.5 Water Supply Master Plan of DPHE (1994)

After the failure of the 1981 Water Supply Master plan, a project on feasibility study for Rajshahi water supply, sanitation and drainage was undertaken in April 1994. The objective of the study was to provide a socially, technically and financially feasible plan for water supply, sanitation and drainage within the project until the year 2015.

The plan aimed to increase treatment plant, house connection, hand pump tubwell, production well, street hydrants and distribution network to improve water supply. The plan also aimed to construct pour flush latrines, septic tanks and communal facilities to improve the sanitation of the city. To achieve the objectives a four phases of development programme was formulated as follows:

Phase I: 1995-2000

Phase II: 2000-2005

Phase III: 2005-2010

Phase IV: 2010-2015

3.2.6 Rajshahi Metropolitan Development Plan (2004-2024)

This is a plan package which has been prepared for an area of 364.19sq. Km to provide a long term strategy for the next 20 years for the planned development of the city and its adjoining areas. This plan package consists of

- **Strategic Plan:** In the Strategic Plan the future city growth strategies have been determined considering a number of growth options.
- **Structure Plan:** It is a policy plan, prepared for the entire planning area, is aimed for a period of 20 years (2004-2024). The structure plan lays down **major policy recommendations for selected critical issues** that served as the basis for development proposals in the subsequent lower level plans. The policy recommendations are provided for the following areas: Housing, economy and employment, infrastructure and municipal services, transportation, tourism and recreation, flood and erosion control, rural and agricultural areas, environment etc.

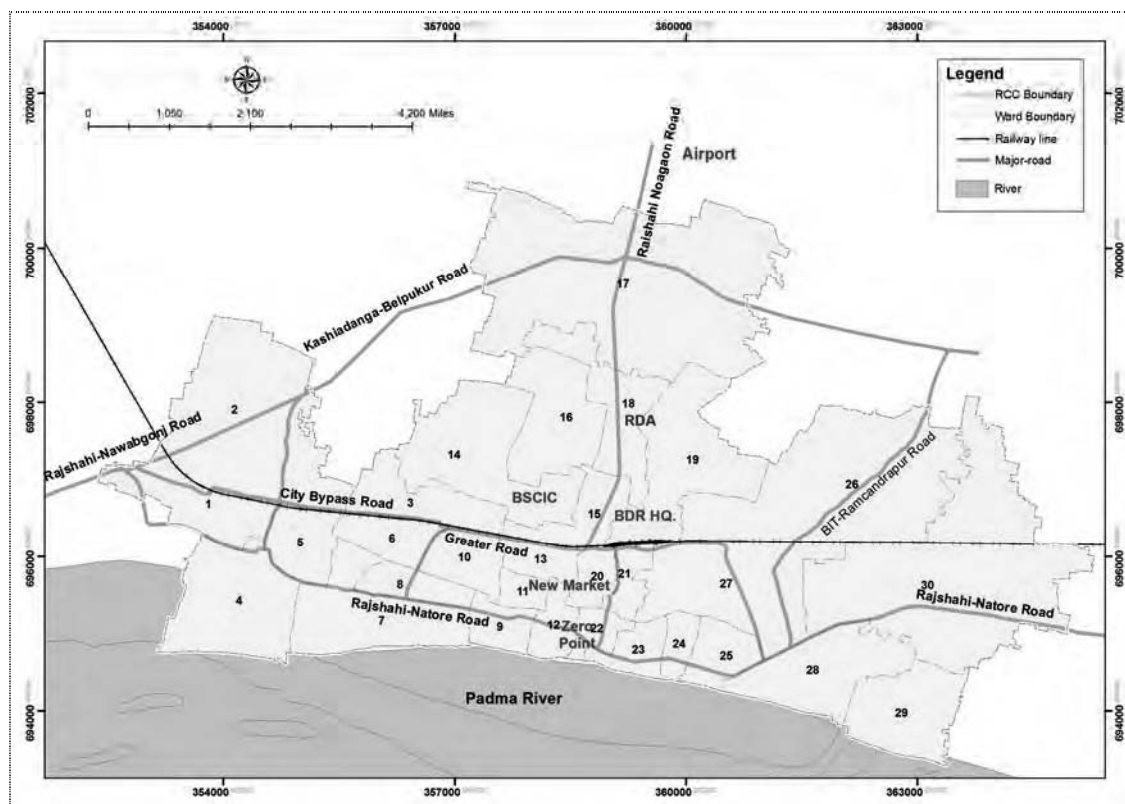
- **Functional Master Plan:** In the Functional Master Plan development proposals were suggested. It also covers the same jurisdiction as the Structure Plan but for a period of 10 years (2004-2014). The Master Plan area is divided into two parts Urban Area and Extended Area. The development proposals under the Functional Master Plan include such areas as, housing, infrastructure and municipal services, town centre, transport, investment and employment, education, health facilities development, open space social services apart from the above development proposals some **special development proposals** were made like rehabilitation of informal sector economic activities, relocation of sericulture farm and old Jaiikhana, Conservation of parks, open space, play field, natural water body, women development, poverty reduction. The plan also **sets forth a land use zoning map** to enable development permission within its jurisdiction.
- **Detailed Area Development Plan:** It made detailed development plans for micro level areas that are likely to face development problems in the immediate future. For the purpose of detailed area planning the entire Master Plan area has been sub-divided into **25 Spatial Planning Zones (SPZ), with 12 SPZ in urban area** and 13 SPZ in extended area.
DAP includes special development plans, the participatory land readjustment plans, guided land development plans and infrastructure led development plans and area improvement plans. The DAP has been formulated for execution in a period of 3-5 years.

Chapter 4 : PHYSICAL DEVELOPMENT PATTERN OF RCC

4.1 Physical Growth of the City

Rajshahi is one of the prominent cities in the northern region of Bangladesh, developed along the river Padma. The core area of the City is bounded by the railway line in north and the river Padma in south. Over the years the city is developed linearly along a single thoroughfare, Rajshahi-Natore Road. The growth is further promoted by the Greater Road that is running through the heart of the city toward East-West. The linear trend of development continued upto 1950. A breakthrough in the northward direction along Noahata road became imminent after 1958 and the growth was influenced by the development of Rajshahi-Noagaon Road (RMDP, V-I) (Map 4.1).

Map 4.1: Physical Growth of Rajshahi City Corporation



Source: RDA, 2013

Growth in northward direction was also influenced by the development of Cantonment, Upashahar Housing Estate, BSCIC Industrial Estate, BDR HQ, Postal Academy and Airport etc. These developments attracted new housing and retail commercial developments and enhanced the importance of the area. The development of RDAs commercial and residential

projects, Mohila Polytechnic, Forest Training Institute, Inter District Bus Terminal and New City Bypass link road further accentuated the possibility of northward development of the city. Thus the growth of the city took a three way direction-north, east and west. The satellite images have been used to explore the expansion of the urban built up areas.

The figure 4.1 shows the location of RCC on the Landsat satellite images for different years. The surroundings of RCC have also been included to detect the land cover changes. The Band Combination used, for the base Landsat satellite images is 4-3-2 Red-Green-Blue (RGB). The False Color Composite of RGB= bands 4, 3 and 2 has been chosen for the study. This combination normally makes urban areas appear blue, vegetation red, water bodies from dark blue to black, soils with no vegetation from white to brown (GDSC, 2008).

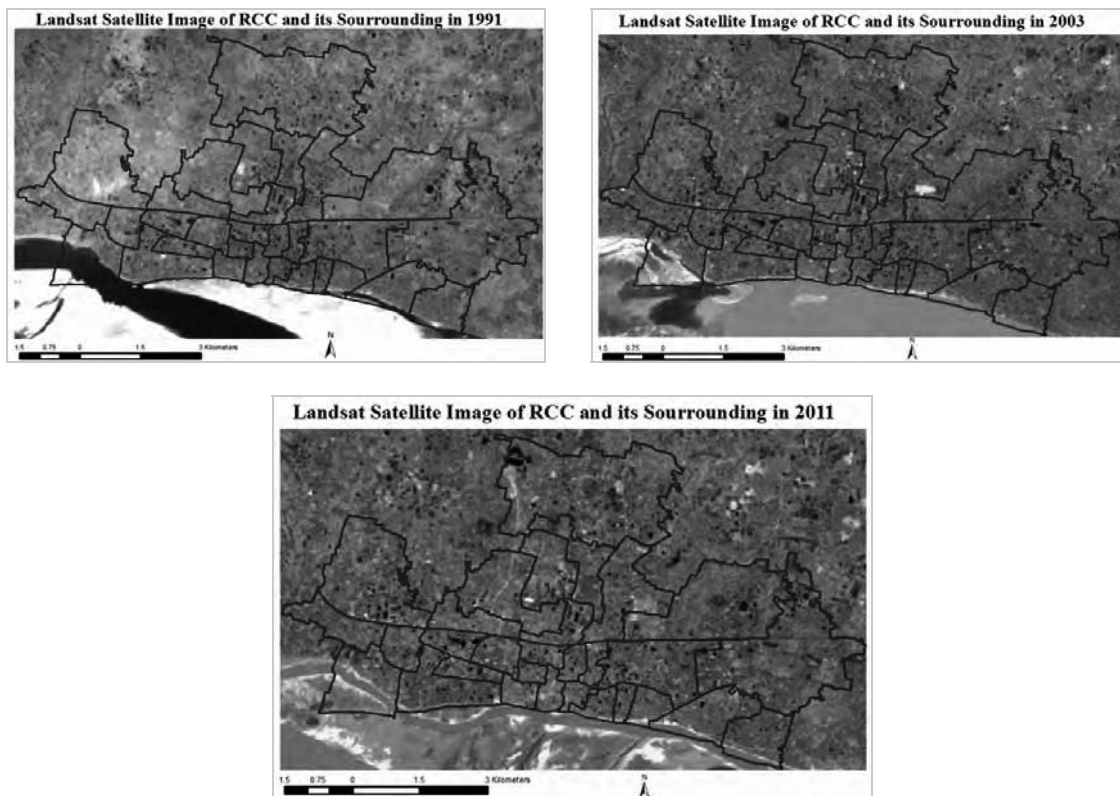


Figure 4.1:Rajshahi City Corporation and its Surroundings
Prepared by the Researcher; Source: USGS, 2014

Urban area is highly dynamic. Numerous factors put impact on the growth or changing pattern for a particular city. Therefore, understanding the urban dynamics is a complex task while planning for a planned and sustainable urban development. To predict the future expansion and change of highly dynamic urban areas it is necessary to assess and monitor the

urban land cover change on a regular basis. In remote sensing, ‘Change Detection’ is defined as the process of determining and monitoring the changes in the land cover types in different time periods. It provides the quantitative analysis of the spatial distribution in the area of interest. Change detection is important because it helps the researcher to understand and monitor the land cover change pattern (e.g. urbanization, deforestation, agricultural land management) within the study area.

To explore the change in land cover and physical expansion of the RCC area the collected satellite images have been classified that are presented in the Map 4.2, 4.3 & 4.4. From the classified images the corresponding areas have been calculated that are presented in the table 4.1 and figure 4.2. It shows sluggish growth in the builtup areas while low land/agriculture is the predominant. Rajshahi City Corporation and its surrounding area consisted a number of water bodies but these decreased rapidly (1732.14 to 868.15 hectares) between the year 2003 to 2011. The vegetation and water bodies also show the decreasing trend. Though the builtup areas are not increased significantly between the year 2003 to 2011, the fallow lands are increased. This may be due to the filling up of water bodies and increment of the Padma Rivers Char land (Table 4.1 and Figure 4.2). The overall expansion of the builtup areas within RCC area is presented in the figure 4.3.

Table 4.1: Change in Land Cover in RCC and its surrounding area

| Land Cover Types | Area in Hactres | | |
|----------------------|-----------------|---------|---------|
| | 1991 | 2003 | 2011 |
| Water Body | 1842.12 | 1732.14 | 868.15 |
| Builtup area | 342.72 | 1167.75 | 1291.59 |
| Fallow land | 854.91 | 421.47 | 1217.16 |
| Vegetation | 1392.48 | 1119.39 | 1056.04 |
| Agriculture/Low land | 5714.91 | 5402.37 | 5387.13 |

Source: Calculated from the classified satellite images

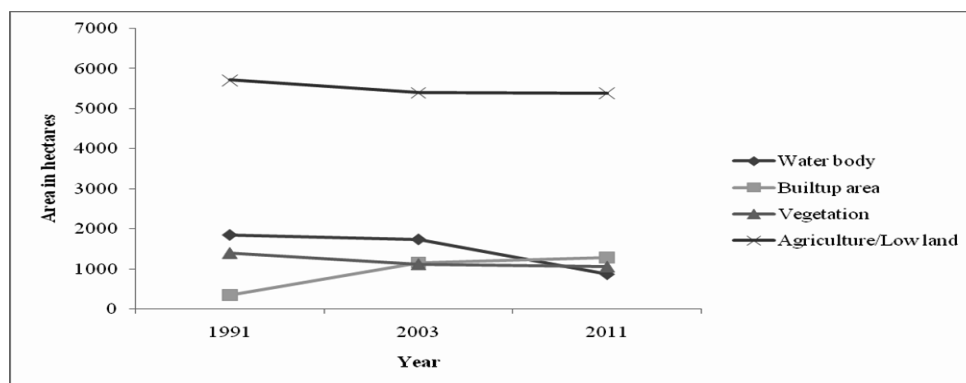
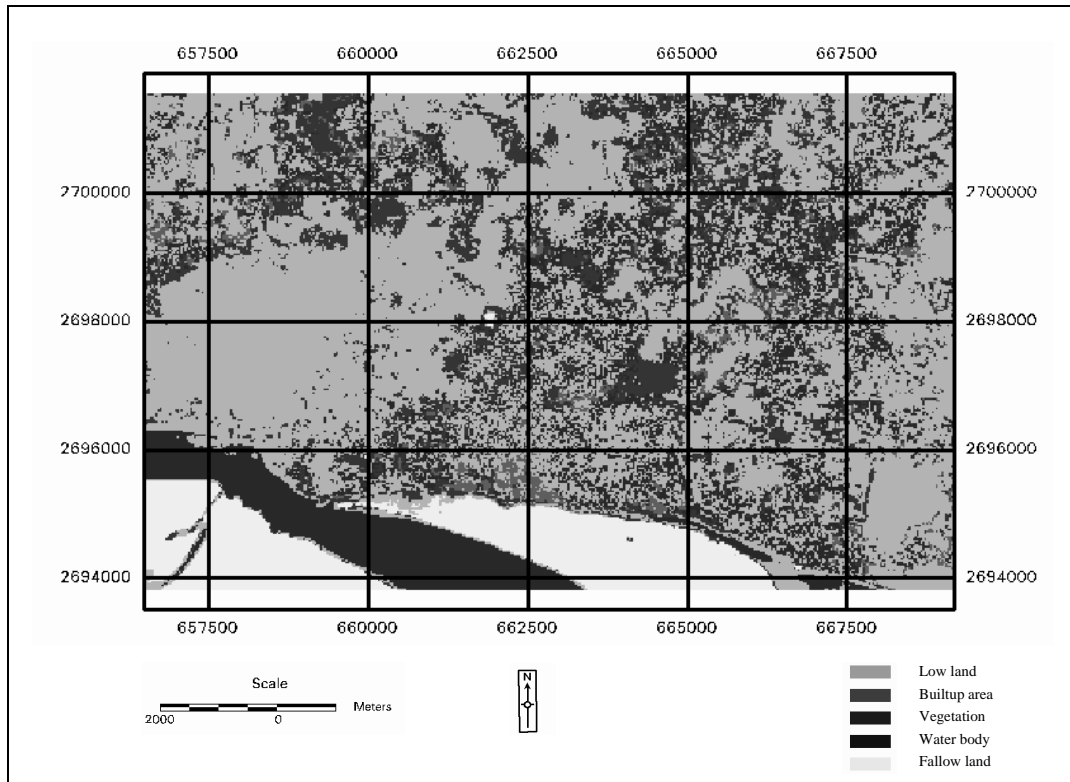


Figure 4.2: Physical Growth of RCC and its Surrounding Area in terms of Land cover

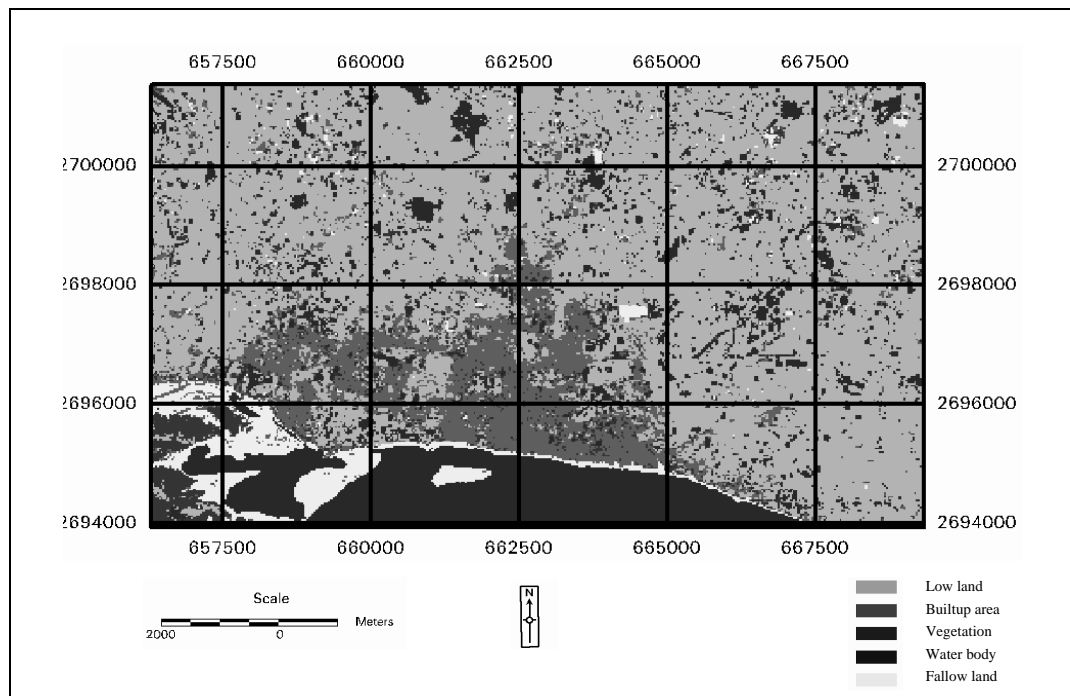
Source: Calculated from the classified satellite images

Map 4.2: Land Cover of RCC and its surrounding area in 1991



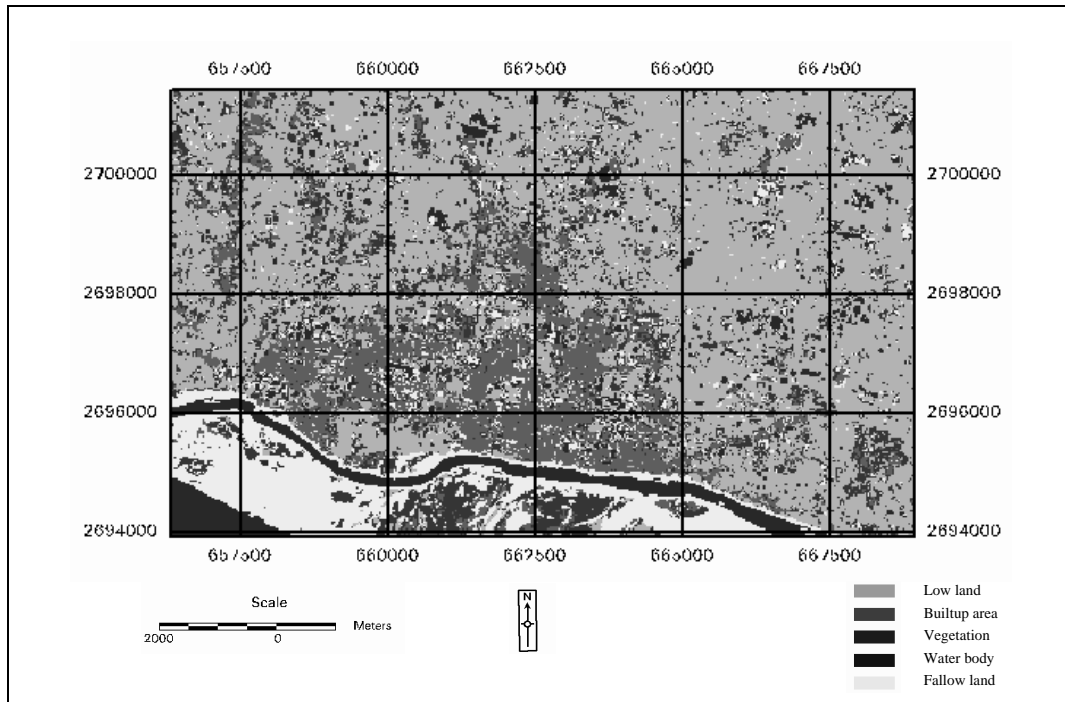
Map Prepared by the Researcher; Source: USGS, 2014

Map 4.3: Land Cover of RCC and its surrounding area in 2003



Map Prepared by the Researcher; Source: USGS, 2014

Map 4.4: Land Cover of RCC and its surrounding area in 2011



Map Prepared by the Researcher; Source: USGS, 2014

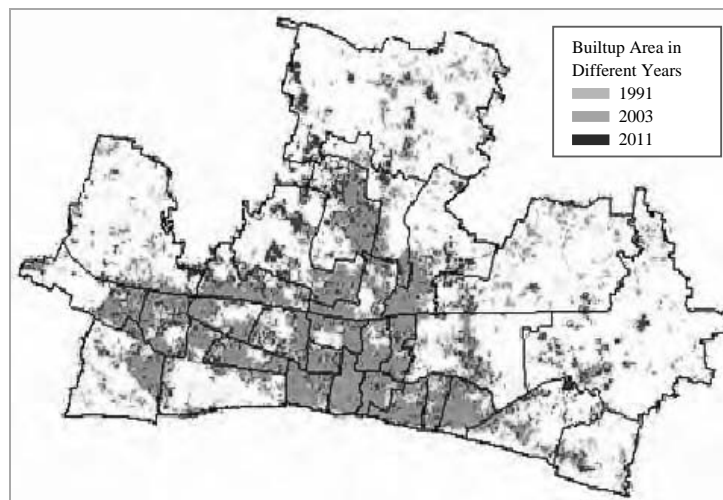


Figure 4.3: Expansion of Built-up areas from 1991 to 2011 within RCC Area
Prepared by the Researcher; Source: USGS, 2014

The increase in builtup area was prominent and expanded rapidly after the declaration of City Corporation in 1991. From the figure 4.3 it is evident that the builtup area increased rapidly between 1991 and 2003 afterward it shows no significant change in the builtup area between 2003 and 2011. Another remarkable feature is that each of the land covers show changes except agriculture. Among all the five types of land cover some shows increasing trend and some shows decreasing trend but the agriculture/low lands show no significant changes over

the years. The decreasing trend of water bodies and vegetation indicates that the city area will be expanded very soon.

4.1.1 Growth in Terms of Area

The growth of the RCC area in terms of area shows that the city is experiencing slow urban growth. The figure 4.4 & 4.5 shows the expansion of the city's urban area from 1980 to 2012. Where areas in 1980 the total urban area of Rajshahi was 23sq.km, after 32 years the total urban area has reached to only 45sq. km in 2012. The growth of the city is also very slow comparing to the major urban center (Dhaka City) of Bangladesh (figure 4.6).

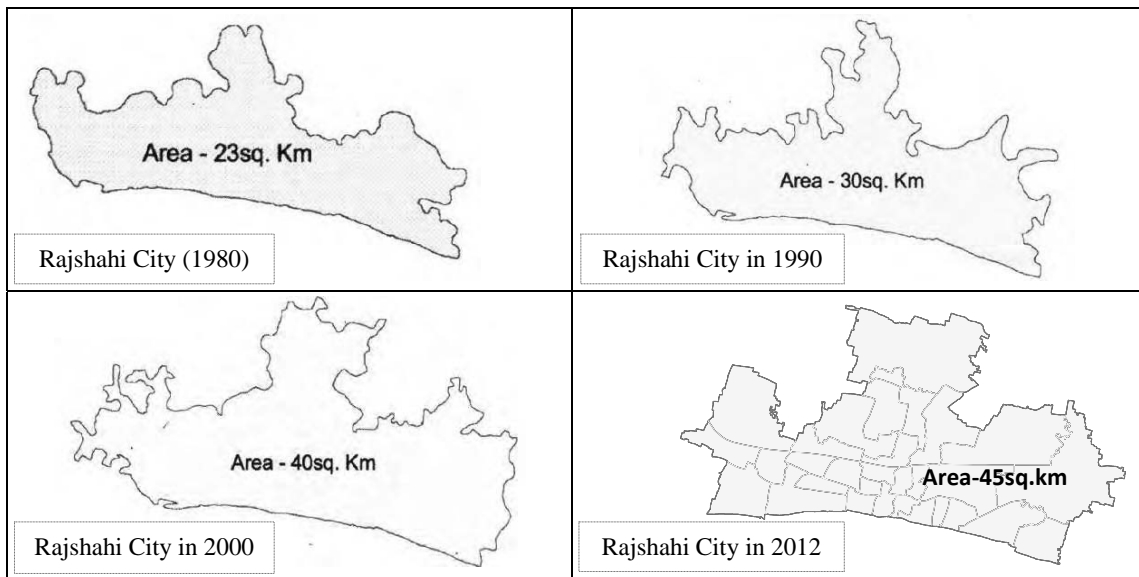


Figure 4.4: Expansion of the Urban Area of Rajshahi City
Source: RMDP V-I & RDA, 2013

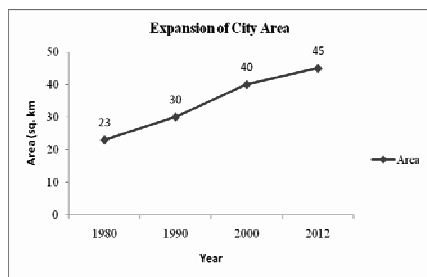


Figure 4.6: Historical growth of Urban Area in terms of area

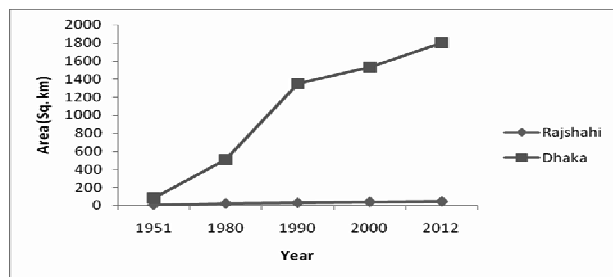


Figure 4.5: Trend of development of Dhaka & Rajshahi city in terms of area

Source: RMDP V-I; RDA, 2013 & BBS, 2011

4.1.2 Growth in terms of Population

Historical growth of Rajshahi Municipality in terms of urban population shows an increasing trend form the year 1951 to 2011 (figure 4.7) however it shows the decreasing trend of urban growth. In 1991 when the city was declared as City Corporation the urban growth rate was

very high 98% later the growth rate started to decline and it was dropped to 16% by the year 2011 (figure 4. 8).

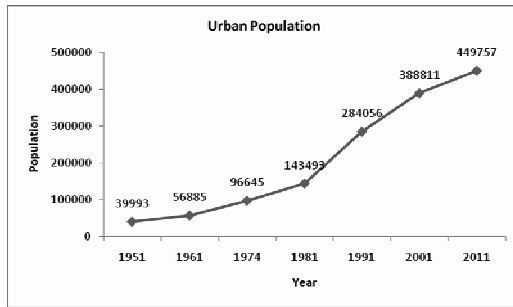


Figure 4.7: Growth of Population of RCC

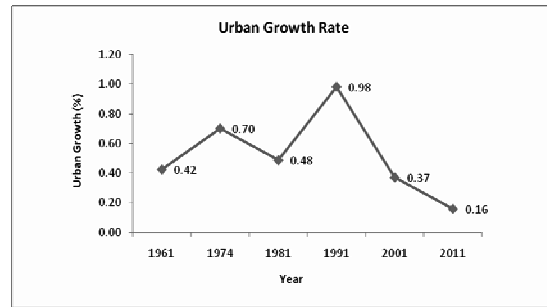


Figure 4.8: Urban Growth Rate of Rajshahi

Urbanization plays an important role to the development of a city. The comparative analysis of the level of urbanization of the four major urban centres of Bangladesh shows the lowest increase in urban population of Rajshahi and the level of urbanization of Rajshahi has not been at the scale to the other metropolitan cities of Bangladesh (table 4.2 and figure 4.9). As the level of urbanization is a good indicator of development so in terms of it Rajshahi is least developed than the other major urban centers of Bangladesh.

Table 4.2: Level of Urbanization of the Major Cities of Bangladesh

| City | Popn(milion) | 1991 | | | 2001 | | | 2011 | | |
|------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | Total | Urban | % | Total | Urban | % | Total | Urban | % |
| Dhaka | | 5.84 | 5.14 | 88.01 | 8.51 | 7.73 | 90.83 | 12.43 | 11.5 | 92.51 |
| Chittagong | | 5.29 | 2.41 | 45.56 | 6.61 | 3.13 | 47.35 | 7.61 | 2.97 | 39.03 |
| Khulna | | 2.01 | 1 | 49.75 | 2.38 | 1.18 | 49.58 | 2.32 | 0.69 | 29.74 |
| Rajshahi | | 1.89 | 0.58 | 30.69 | 2.28 | 0.8 | 35.09 | 2.59 | 0.83 | 32.05 |

Source: RMDP, V-I; BBS, 2011 & Kawsar, 2012

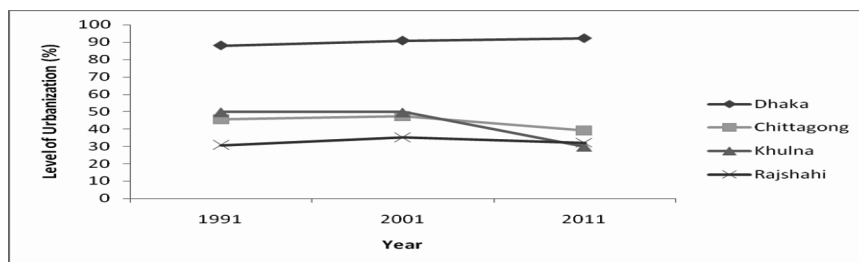


Figure 4.9: Trend of Urbanization of the Major Urban Centers of Bangladesh
Source: BBS 2001, 2011 & Kawsar, 2012

Rural urban migration is also an important determinant to urban growth in Bangladesh. Rajshahi lacks of pull factors of migration therefore only 0.5% of the rural migrants migrate to Rajshahi (table 4.3). The rate of in-migration and out-migration is also very low compared to the other major cities of Bangladesh (figure 4.10). Lack of economic opportunities and

economic investment are the obstacles to the development of the city which in turn attract least rural migrants.

Table 4.3: Destination of Rural Migrants

| Statistical Metropolitan Area | Percentage (%) |
|-------------------------------|----------------|
| Dhaka | 70 |
| Chittagong | 8 |
| Khulna | 1.5 |
| Rajshahi | 0.5 |
| Other Urban Areas | 20 |
| Total | 100 |

Source: Rabbani, 1997

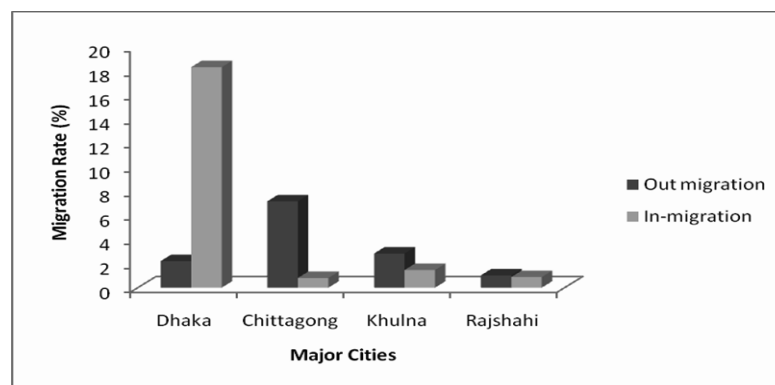


Figure 4.10: Rate of in-migration and out-migration of the major urban centers of Bangladesh
Source: Oakil, 2007

From the above analysis it is apparent that Rajshahi is a least urbanized city with downward trend of urban growth thus the development of the city is also very slow.

4.1.3 Growth in terms of Landuse

Rajshahi is the most dominant urban centre in the northern region of Bangladesh. Despite a municipal area still a large part of the RCC area is being used for agricultural purposes and shows low density of structures and population. The city shows no remarkable change in the land uses of RCC over 20 years.

In 2003 a significant portion, 18.74% land was used for agricultural purposes and in 2013, 17.75% land is still being used for agricultural purposes. A slight change is occurred in transport, communication and business sector while the industrial land use is remained 0.81% (table 4.4). Lack of industrialization in Rajshahi is a vital impediment for the development of the city.

Table 4.4: Changing Pattern of Land use in RCC Area

| Landuse | Year | 1993 | 2003 | 2013 |
|-----------------------------|------|------------|------------|------------|
| | | % | % | % |
| Residential | | 26.2 | 33.47 | 36.50 |
| Agriculture | | 27 | 18.74 | 17.75 |
| Education and Research | | 6.8 | 10.50 | 11.25 |
| Business | | 1.00 | 1.98 | 2.11 |
| Public Administration | | 0.37 | 0.44 | 0.44 |
| Mixed use | | 0.20 | 0.22 | 0.84 |
| Industrial | | 1.1 | 0.81 | 0.81 |
| Open Space | | 0.8 | 1.10 | 1.01 |
| Security and Defence | | - | 2.02 | 2.02 |
| Transport and Communication | | 13.13 | 6.96 | 8.85 |
| Vacant Land | | 1 | 11.09 | 10.78 |
| Water Body | | 13 | 10.78 | 5.10 |
| Others | | 9.5 | 1.89 | 2.53 |
| Total | | 100 | 100 | 100 |

Source: RCC 1994; RMDP V-I; RDA, 2013

Another important factor is that the water bodies are decreasing very rapidly. According to the Engineer Ashrafal Haque of RCC there were 729 ponds and canals in the metropolis in 2002 but the figure is declined to 393 in 2013. The climate of Rajshahi is generally marked with sub-tropical monsoons, high temperature and a low rainfall zone thus the decrease in water bodies may have negative impact on the environment of the city. Increase in industry, commerce and business can accelerate the growth of a city as there is no significant change in these land uses therefore the city is remaining under developed over the years.

4.2 Development of Transport Infrastructures

Though the city shows a marginal growth during the last two decades considering future growth of the city the Functional Master Plan conferred more importance to improve the transport infrastructures especially the road networks. The plan proposed to improve major traffic intersections, widening of the major roads and development of pedestrian facilities within RCC area. An assessment on the overall development of transport infrastructures in terms of road, rail, air and water is presented below.

4.2.1 Road Network

Well planned and connected road network is inevitable to flourish the development of any city. Over the last 20 years a remarkable development is occurred in the transport sector of Rajshahi City Corporation. The coverage of road network is doubled from 271.58 km to

515.2km by the year 2003 and a further improved is occurred after the initiation of the Rajshahi Metropolitan Development Plan in 2004. Now the city has total 662.96 km roads. The development trend of the road networks from 1994 to 2013 is shown in the table 4.5.

Table 4.5: Road Networks within RCC area

| Year Type | Length (in km) | | |
|--------------|----------------|--------------|---------------|
| | 1994 | 2003 | 2013 |
| Pucca | 155.92 | 352.38 | 450.25 |
| Semi-pucca | 61.96 | 119.45 | 182.56 |
| Katcha | 53.70 | 43.37 | 30.15 |
| Total | 271.58 | 515.2 | 662.96 |
| Footpath | - | 9 | 20 |

Source: RCC, 1994; RMDP-VI & RDA, 2013

4.2.2 Footpath

In Rajshahi city around 30% trips were generated on foot then the city had only 9 km footpaths (RMDP-VI). Later RMDP proposed to construct missing footpaths on all major roads within RCC area. Now city has total 20 km footpaths. The map 4.5 shows the developed road networks with pedestrian pathways.

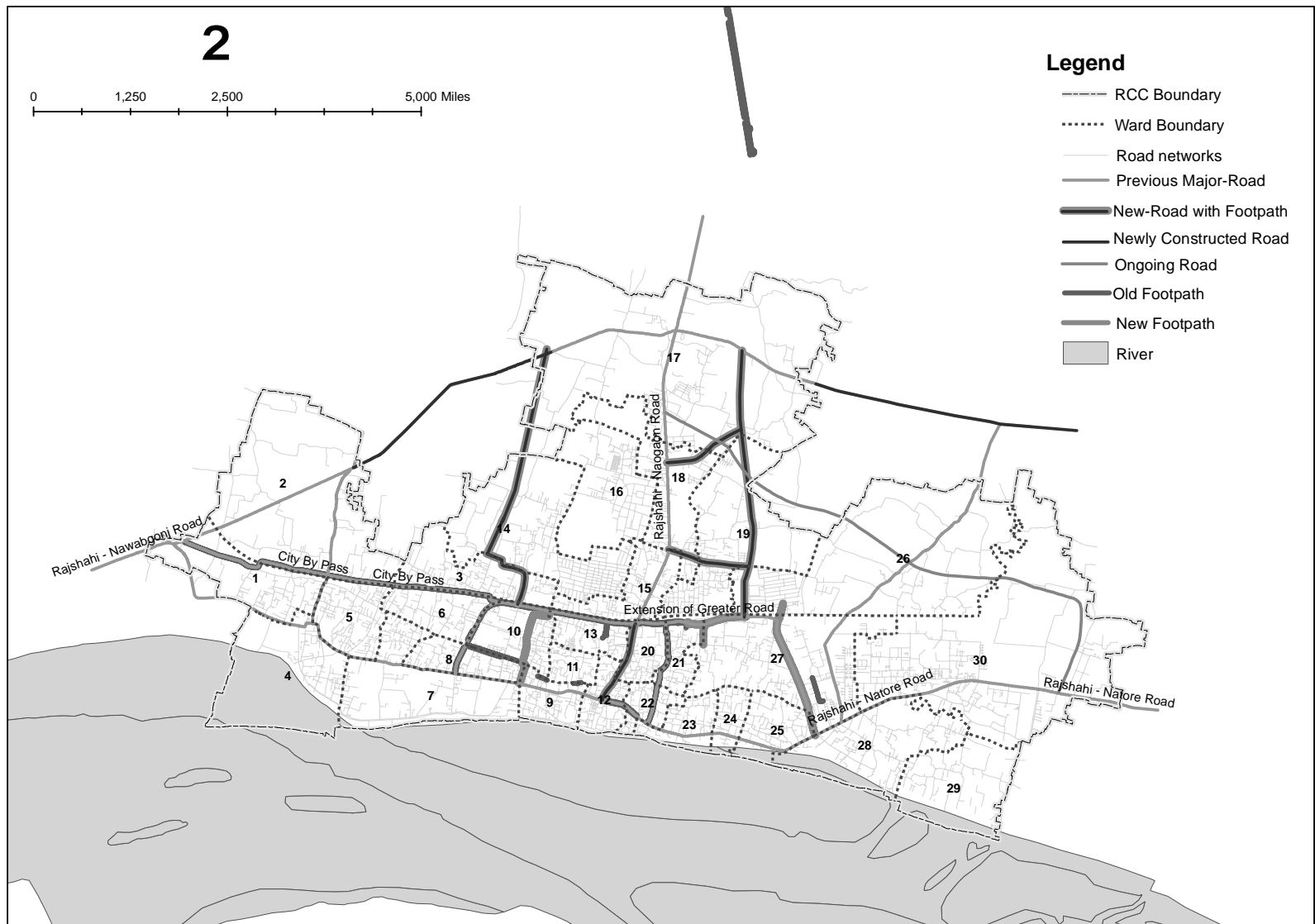
4.2.3 Water Transport

During British period the river Padma was used to be an important inland water transport route and Rajshahi was an important river Ghat along Goalanda-Pakshi route. After partition of India in 1947 this route started to loose its importance. Following the construction of Farraka Barrage in 1974 the hydrological and hydrographic situation of the river was drastically changed. The navigability of the river throughout the year has reduced almost to zero. Therefore, the water transport has lost its importance as a major mode for Rajshahi. Now only in the rainy season some local boats are used for carrying mostly sand from the Chars of Padma and no other functions are available in the waterway of Rajshahi.

4.2.4 Rail Transport

Rajshahi city is well connected by railway line with other parts of the country. The broad gauge railway line from Rohanpur to Ishurdi with a link to Chapainawabgonj passes through the heart of the City. It has direct connection with Zessore, Khulna, Rangpur, Nilphamahi, Dinajpur and Dhaka. The most significant factor is that the incorporation of three intercity trains (Padma Express, Dhumketu Express and Silk City Express) between Rajshahi and Dhaka has added a value to the rail transport of Rajshahi.

Map 4.5: Developed Road Networks within RCC area



Source: RDA, 2013

4.2.5 Air Transport

The airport of Rajshahi was established in January 1984. Since the establishment of the airport regular flight was maintained between Rajshahi and Dhaka. Initially the Demand for air travel was high as the communication from Rajshahi by other modes used to take longer time. But after the establishment of Bangabandhu Bridge the demand for air transport was started to decline. The situation was affected more when Dualgauge railway connection between Dhaka and Rajshahi was completed in 2003. Gradually the demand for air transport started to decline due to the incorporation of good quality intercity trains between Dhaka and Rajshahi and the increment to the plane fare. In these consequences the flight was closed up to 2006 to 2010. Presently only two flights per week are maintained between Dhaka and Rajshahi. Due to low economic concentration the demand for air transport is remained unchanged over the years. The low demand for air travel is the impediment to the development of it.

4.3 Development of Housing

Housing is the most dominant land use in any human settlement. Provision of appropriate housing policy may bring positive change in urban development through the improvement of living standard and productivity of the people. Over the last few years the supply of planned housing is increased. The implementation of the Functional Master Plan from 2004 has accentuated the development of housing. The city shows a steep rise in the development of planned housing over the last eight years from 2005 to 2013 but the trend was very slow during 1979 to 2005 (figure 4.11).

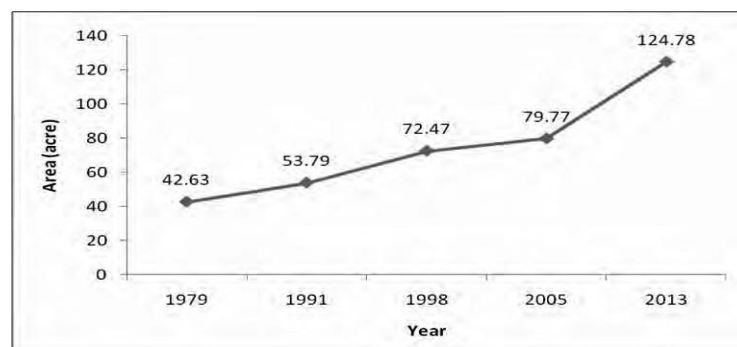


Figure 4.11: Expansion of Planned Housing in RCC Area
Source: Town Planner, RDA, 2013

The Padma Residential area covering an area of 42.63 acre was the first planned housing by RDA. Now the city occupies a total 124.78 acres planned housing with 1843 plots. The table 4.6 shows the details of the planned housing within RCC area.

Table 4.6: Developed Housing in Rajshahi City Corporation Area

| Housing Projects | Implementation Status | Year of Development | Target Group | Area (acre) | No. of Plots |
|---|-----------------------|---------------------|-------------------------|-------------|--------------|
| Upashahar Residential Area | Completed | 1960 | Middle and Lower Middle | NA | NA |
| Padma Residential Area | Completed | 1979 | Middle and Lower Middle | 42.63 | 565 |
| Chayanir Residential Area | Completed | 1991 | Middle and Lower Middle | 7.64 | 224 |
| Parijat Residential Area | Completed | 1991 | Middle and Lower Middle | 3.52 | 56 |
| Chandrima Residential Area | Completed | 1998 | Middle and Lower Middle | 18.68 | 391 |
| Mohananda Residential Area | Completed | 2005 | Middle and Lower Middle | 7.30 | 97 |
| Banalata Residential Area | On going | 2012 | Middle and Lower Middle | 12.66 | 117 |
| Prantik Residential Area (Goaalpara Mouza of kashiadanga) | On going | 2013 | Middle and Lower Middle | 14.24 | 192 |
| Barnoy Residential Area (near to new bus stand) | On going | 2013 | Middle and Lower Middle | 18.11 | 201 |

Source: Town Planner, RDA, 2013

To investigate the balance between supply and demand for housing a field survey has been conducted in the Padma Residential area. As long as it was the first planned housing estate of RCC and located very near to the city centre therefore by this time all of the plots should be developed. But the result shows that still it occupies a majority of the plots (53%) vacant and buildings are constructed only in the 43% plots (Figure 4.12). Though the supply of planned housing is increasing still a large number of plots are remaining under-utilized/vacant due to low demand, low economic investment and low economic rate of return.

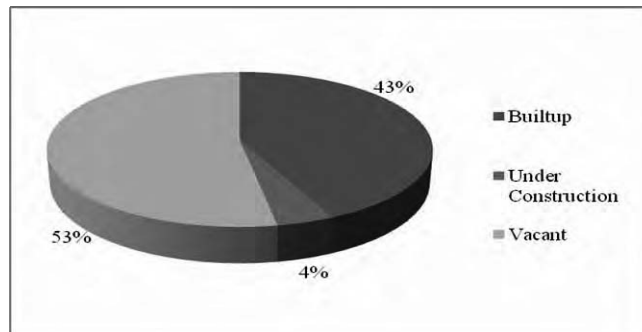


Figure 4.12: Existing Usage of the Plots of the Padma Residential Area
Source: Field Survey, 2014

4.4 Industrial Development

Industrialization promotes rapid urbanization which in turn helps to accelerate the development of a city. Rajshahi City lacks of industrial development here BSCIC Industrial Estate is the main industrial zone and Sericulture Board contains some silk industries (Map 4.3). However, 3 large industries, 1 Textile mill, 1 Jute mill and 1 sugar mill are located in peri-urban area of the city and no other major industries are established in Rajshahi. The city shows the sluggish growth of industrial landuse that is presented in figure 4.13.

Bangladesh Small Cottage Industries Corporation (BSCIC) planned 66.21 acre land for industrial development in 1961 now it has reached to 96.63 acre excluding the sericulture board. Presently BSCIC Industrial Estate is planning to acquire 30 acre land outside the RCC boundary at Paba thana, Mouza 131 Ketua, 156 Lolitahar and 159 Uzirpur (Estate Officer, BSCIC, 2013).

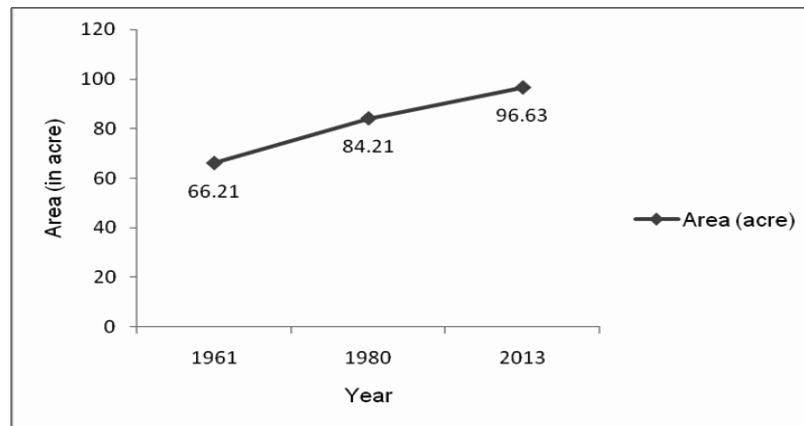


Figure 4.13: Expansion of Industrial Area in Rajshahi

Source: BSCIC office, 2013

In addition to these the following six private Jute mills are established outside the RCC area at Noudapara.

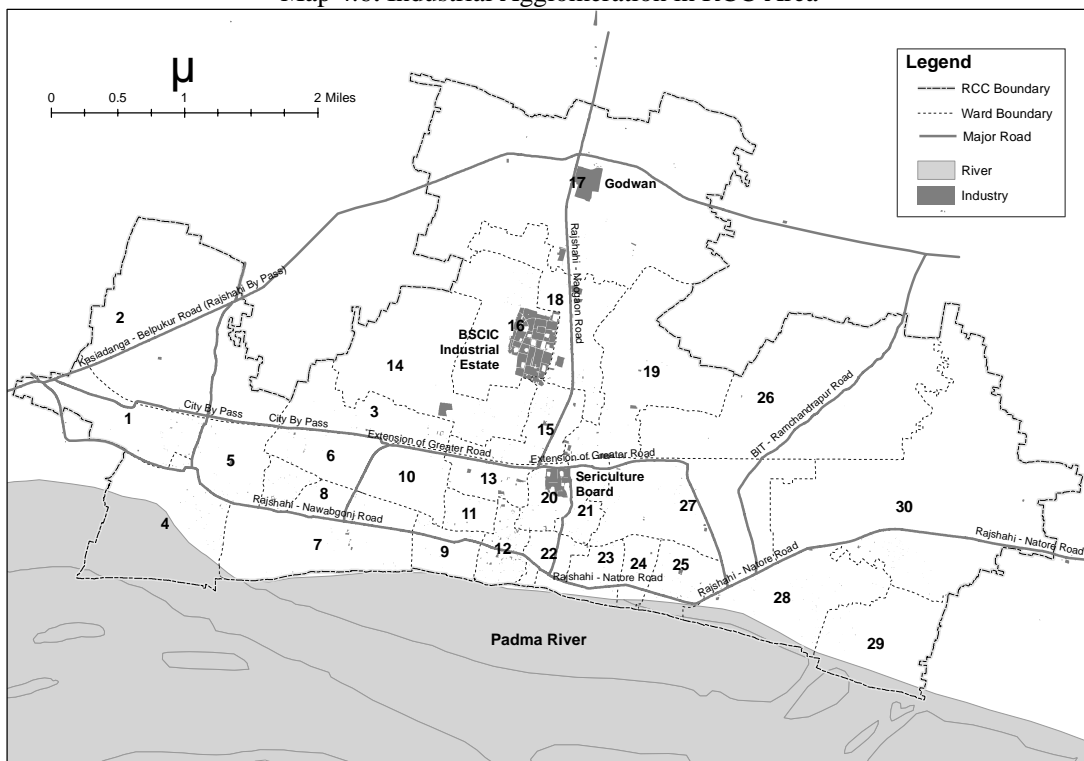
| <u>Type of Industry</u> | <u>Year of establishment</u> |
|----------------------------------|------------------------------|
| 1. Rahman Jute Mills Pvt. Ltd. | 2006 |
| 2. Jamuna Jute Industries | 2011 |
| 3. Rahim Jute Spinning Pvt. Ltd. | 2012 |
| 4. Hasan Jute Mills Pvt. Ltd. | Under Construction |
| 5. Noahata Jute Mills Pvt. Ltd. | Under Construction |
| 6. SP Jute Mills Pvt. Ltd. | Under Construction |

Source: RCCI, 2013

Among all the available industries the silk industries are the prominent in Rajshahi. Once the city was very famous for quality silk production but it has started to lose its glory. Up to 1990

the sericulture board produced a lot of silk yarn and quality silk products at reasonable price and the demand for Rajshahi Silk Shari's and cloths was also very high. However due to change in Government policy, corruption and mismanagement of the Sericulture Board the production cost increased highly in these consequences the private sector involved in the establishment of silk industries. The first private silk industry, North Bengal Silk Weaving and Printing Ltd. was established in 1991. Later a number of silk industries were established named Usha, Sopura, Rajshahi, and Mohananda etc. These industries started to import silk yarn at low cost from China and the business was very good for the first 15 years after then the industries started to shrink due to increase in yarn cost which consequently increased the production cost. Presently most of the silk industries are closed and diverting to cotton production.

Map 4.6: Industrial Agglomeration in RCC Area



Source: RDA, 2013

The industrial base of Rajshahi is comparatively poor than the other major urban centers of Bangladesh. As Rajshahi is located at the fringe of Bangladesh and lacks of utility facilities especially gas so the outer entrepreneurs are not interested to establish large industries. Inadequate development of infrastructural facilities, shortage of capital and lack of local entrepreneur act as a barrier in the development of the industry, trade and commerce.

4.5 Social and Community Facilities

4.5.1 Healthcare Facilities

Provision of urban health care services are the responsibility of the Ministry of Local Government, Rural Development and Cooperatives (MOLGRDC). The Municipal Administration Ordinance of 1960, the Pourashova Ordinance of 1977, the City Corporation Ordinance of 1983 and the Local Government (Pourashova) Act 2009, undoubtedly allocated the provision of preventive health and limited curative care as a responsibility of the city corporations and municipalities.

The city has many private but limited government hospitals. Other than Rajshahi Medical College Hospital, there are children hospital, chest hospital and Sadar hospital. There is also a Christian missionary hospital in the city area. But, the public-sector health services are not greatly assisted with the requirements as there are limitations in resources and manpower. Therefore the primary health care facilities and services for the urban population at large and, specifically for the urban poor are insufficient.

Through the implementation of two urban primary health care projects (UPHCPs) since 1998, health services are being provided by the city corporation through contracted NGOs under MOLGRDC. Rajshahi City Coporation (RCC) has been putting in its best efforts to ensure healthcare services to its citizens particularly the poor and slum dwellers. The city corporation has been implementing Urban Primary Healthcare Project aimed at improving the maternal and child health. At present 14 healthcare centers and two maternal clinics are providing maternal and child healthcare services within the city area. The city corporation has also taken initiative to providing more than 8,000 red cards among the poor and distressed families from ward No. 20 to 30 for extending maternal and child healthcare services free of cost (BSS, 2013). The incorporation of the urban primary health care projects (UPHCPs) have increased the health facilities for the urban poor in Rajshahi.

The questionnaire survey result shows that a significant portion (43%) of the citizens go to community clinic for health treatment (figure 4.14) and the citizens taking health facilities from the community clinics are more satisfied than the facilities from public and private hospitals (figure 4.15).

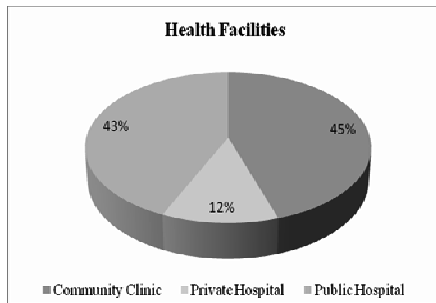


Figure 4.14: Access to Health Facilities



Figure 4.15: Satisfaction for Health Facilities

Source: Questionnaire Survey, 2013

4.5.2 Recreational Facilities

Provision of recreational facilities is one of the responsibilities of RCC. Among all the recreational facilities Parks and Play fields are vital elements in urban life for passive and active recreation. But these facilities are inadequate in Rajshahi and the recreational areas occupy only 0.98% of the total city area. The city occupies 25 play fields but each of them belongs to the particular educational institutions therefore there is no scope for free access to the general people. Inventory of the recreational facilities are shown in the table 4.7.

Rajshahi City lacks of recreational facilities therefore RMDP proposed to develop a number of playfields and community parks for the entire city area. Among all these in the last few years the Padma River bank is developed with some facilities and good landscaping now it is an attractive place to the citizens for passive recreation. Except the development of the Padma River bank no initiative is taken for the improvement of the other recreational facilities.

Table 4.7: Available Recreational Facilities within the RCC Area

| Types | Quantity | Name & Location |
|-------------|----------|--|
| Parks | 4 | <ul style="list-style-type: none"> Central Park (Shahid Kamruzzaman Park) Bhuban Mohan Park (Near Eidgah Maidan) RDA Park at Padma Housing Zia Shishu Park at Noudapara |
| Stadiums | 4 | <ul style="list-style-type: none"> Shahid Kamruzzaman Stadium at Terokhadia Rajshahi Zila Statium at Seroil Tennis Complex Mohila Sports Complex Stadium |
| Play fields | 25 | <ul style="list-style-type: none"> Belong to particular educational institutions |

Source: RMDP V-I & RDA, 2013

4.5.3 Education

The department of Education is responsible for the development of educational facilities and the city development authority is responsible for the preparation of general development plan regarding the distribution of future educational institutions. The development authority proposed to develop a number of educational institutions to meet the future demand. Over the last 10 years no remarkable development is occurred in the provision of educational facilities except a few schools and colleges. An inventory of the available education facilities are shown in the table 4.8.

Table 4.8: Available Educational Institutions in RCC Area

| Type of Institutions | No. of Institutions | |
|----------------------------------|---------------------|------|
| | 2003 | 2013 |
| Public University | 1 | 1 |
| Private University | 1 | 3 |
| Public Medical College | 1 | 1 |
| Private Medical College | 1 | 2 |
| Engineering University | 1 | 1 |
| Colleges | 15 | 16 |
| Secondary Schools | 40 | 42 |
| Kindergarten & Primary Schools | 153 | 160 |
| Madrasas | 65 | 67 |
| Polytechnic Institute | 1 | 1 |
| Homeopathic Medical College | 1 | 1 |
| Vocational Education Institution | 1 | 1 |
| Teachers Training College | 1 | 1 |
| Primary Training Institute | 1 | 1 |

Source: RMDP V-I, & RDA, 2013

4.5.4 Katcha Bazar

Availability to a nearby Katcha bazaar is one of the requirements of the citizens for daily life. Rajshahi had only 8 authorized katcha bazaars and were not evenly distributed over the city area. Therefore the RMDP proposed to develop 20 katcha bazaars by the year 2014 (RMDP V-I). But till now no improvement is occurred in the provision of katcha bazaar facilities. Therefore, still a significant portion of the citizens (46%) faces the problems of Katcha bazar due to the absence of any nearest bazar (Table 4.9).

Table 4.9: Problems of Katcha Bazar in the RCC Area

| Response | No. of Respondents | Percentage (%) |
|--------------|--------------------|----------------|
| Yes | 138 | 46 |
| No | 162 | 54 |
| Total | 300 | 100 |

Source: Field survey, 2013

4.5.5 Community Centre

The city had no municipal owned community centre. Therefore, the RMDP recommended to construct a total 30 community centres, one in each ward. Especially the Ward Commissioners office will be constructed in such a way so that it could be used as a community centre. But till now no such initiative is taken and the questionnaire survey result also reveals the absence of community centre in each ward of RCC.

4.5.6 Water Supply

The Rajshahi water supply system was installed in 1937 by the then water supply section of the Ministry of Works, Calcutta, India. The system had more than 100 street water reservoirs, locally called “Dhopekal” (DPHE, 1994). Later from 1961 the planning, designing and construction of the water supply system was done by DPHE. After the establishment of RCC, DPHE handed over the responsibility of water supply to RCC in 1991. Soon after in 1994 a socially accepted, technologically sound and financially sustainable project was taken by RCC. At that time RCC was able to distribute water among 6040 households that was only 18% of the total households (DPHE, 1994). Shortly a massive improvement is occurred in the provision of the water supply facilities.

The table 4.10 shows a gradual improvement of the water supply facilities from where it is evident that a significant improvement in the water supply is occurred from 1994 to 2012. With the main thrust of meeting up the gradually increasing demands, a master-plan has also been adopted by RWASA and the project will be implemented by December 2014.

Table 4.10: Water Supply Facilities in RCC Area

| Source of Water | No. Facilities in Different Years | | |
|-------------------------|-----------------------------------|--------|-------|
| | 1994 | 2003 | 2012 |
| Production Tubwell | 19 | 40 | 70 |
| Street Hydrant | 465 | 785 | 38713 |
| Pipe lines | 82 km | 248 km | 512km |
| No of Households Served | 6040 | NA | 30263 |
| Water Treatment Plant | - | - | 1 |
| Hand Tubwell | 1970 | 3750 | 3811 |

Source: RCC, 1994; RMDP V-I & Editor, 2012

The questionnaire survey result also shows that presently 97% citizens have the access to municipal water supply while it was only 18% in 1994 (figure 4.16 & 4.17). From the study it is obvious that the water supply facilities of the city are improved over the last 18 years.

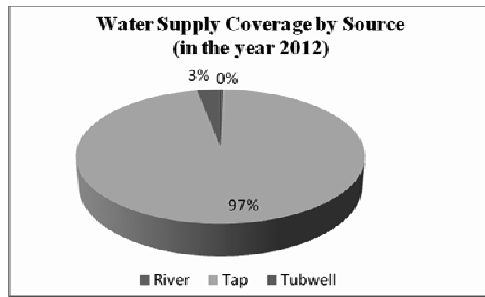


Figure 4.17: Sources of water in 2012

Source: Questionnaire Survey, 2013

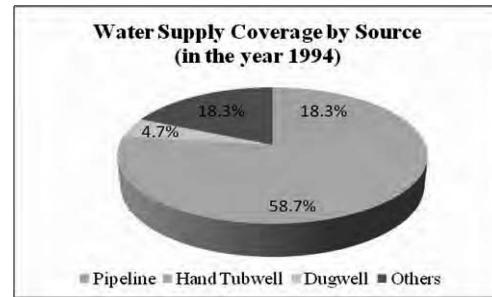


Figure 4.16: Sources of water in 1994

Source: DPHE, 1994

4.5.7 Drainage

Provision of drainage is one of the responsibilities of RCC. The Padma River collected most of the drainage water but the establishment of Rajshahi Town Protection embankment on the bank of River Padma and regulating the drainage channel with switch gates restricted natural drainage discharge in the River Padma. Therefore, many core parts of the city faced severe water logging problem and the drainage condition was very poor. In these consequences a Drainage Master Plan was prepared by RCC in 1994.

Table 4.11: Developed Drainage Networks in RCC Area

| Year Type | Length in km. | | |
|--------------|---------------|--------|--------|
| | 1994 | 2004 | 2012 |
| Pucca | 53.99 | 82.56 | 110.25 |
| Katcha | 63.78 | 55.43 | 47.25 |
| Total | 117.7 | 140.99 | 157.5 |

Source: RCC, 1994; RMDP V-I & RCC, 2013

The execution of the Drainage Master Plan has increased the coverage of the drainage networks from 117.7 km to 157.5 km (table 4.11). Though the coverage of drains is increased still a significant portion of the citizen's face both the drainage and water logging problems (Appendix B, figure B-1 and B-2). The questionnaire survey result also reveals that most of the citizens are dissatisfied (53%) and perceive that the drainage condition of the city is slightly improved (Figure 4.18 & figure 4.19).

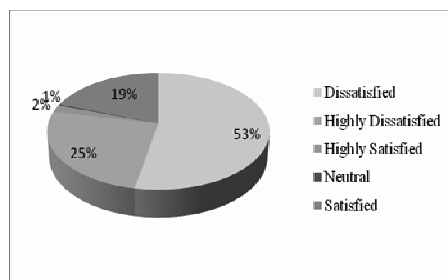


Figure 4.19: Citizens Satisfaction for Drainage

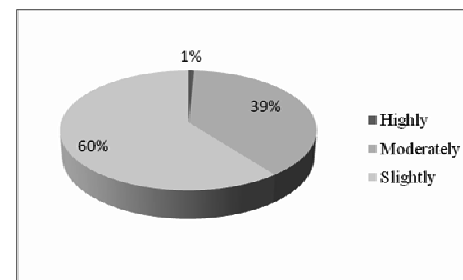


Figure 4.18: Citizens View Regarding the Improvement of the Drainage

The study reveals that though the coverage of the drains is increased the overall drainage condition of the city is not satisfactory.

4.5.8 Solid Waste Management

Management of waste is a costly and troublesome problem for most of the local authorities of developing countries. The conservancy section of RCC was weak in terms of manpower, skill and equipment hence was able to collect only 50% of the generated waste. The solid waste disposal bins covered only 19.52% of the area. Due to shortage of dustbins and inadequate collection facilities dumping of solid waste in water bodies, drains and vacant lands was very common (RCC, 1994).

Thus the overall waste management system of the city was very poor in 1994 later a massive improvement is occurred in the waste management system both in terms of collection and required facilities that is presented in the table 4.12 & table 4.13.

Table 4.12: Waste Generation and Collection Rate

| Type \ Year | 1994 | 2004 | 2013 |
|------------------|-------------|-------------|-------------|
| Waste Generation | 100 tons | 200 M. tons | 500 M. tons |
| Waste Collection | 40-50 tones | 142 M. tons | 380 M. tons |

Source: RCC, 1994, RMDP V-I & RCC, 2013

Table 4.13: Solid Waste Management Facilities

| Facilities | Quantities in Different Years | | |
|----------------|-------------------------------|-----------|------|
| | 1994 | 2004 | 2013 |
| Rubbish bins | 325 | 590 | 1050 |
| Push carts | 30 | 126 (NMT) | 100 |
| Rickshaw van | 20 | | 150 |
| Trailer | 1 | 17 (MT) | 3 |
| Garbage Truck | 7 | | 10 |
| Sweepers | 372 | 934 | 1200 |
| Landfill sites | 1 | 1 | 2 |

Source: RCC, 1994; RMDP-VI & RCC, 2013

***NMT=Non Motorized Transport

***MT= Motorized Transport

The questionnaire survey result shows that though most of the citizens (54%) dump their household waste alongside the road, the wastes are collected regularly from the dumping sites (Appendix B, figure B-3 and B-4). The result also reveals that most of the citizens are satisfied (79%) and perceive that the waste management system of the city is moderately improved (76%) (Figure 4.20 & figure 4.21).

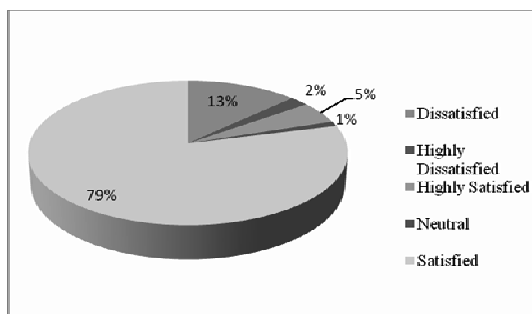


Figure 4.20: Citizens satisfaction for waste management

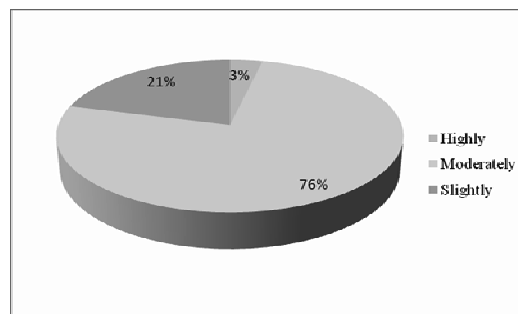


Figure 4.21: Citizens view regarding the improvement of waste management

Source: Questionnaire Survey, 2013

So it can be concluded that both in terms of collection and facilities the overall waste management system of the city is improved.

4.5.9 Sanitation

RCC is responsible to ensure access to hygienic latrines to improve the environmental sanitation. According to Rajshahi Water Supply, Sanitation and Drainage Master Plan, 1994 the sanitation coverage of the city was very limited where majority of the households used unsanitary toilet facilities. Households in the core area of the city generally had septic tank that was about 18% of the city population. The rest of the populations used unhygienic bucket latrines and most of the households had unhygienic latrines illegally connected with the drains. Later the sanitary condition of the city is gradually improved. The table 4.14 shows that gradual improvement of the sanitation where areas the rate of open defecation is reduced and the majority of the households (71%) are using sanitary latrines. In the year 1994 the city had only 4 public toilets but the number is increased to 50 by 2013 (RCC, 3013). So it is apparent that the overall sanitation situation of Rajshahi is improving.

Table 4.14: Households (%) using different type of latrines

| Type | Year | 1994 | 2003 | 2013 |
|----------------------------|------|------|------|------|
| Sanitary with Septic Tank | | 38 | 50 | 71 |
| Pit Latrine | | 49 | 40 | 23 |
| Open Defecation/Unhygienic | | 13 | 10 | 6 |

Source: RMDP V-I; RCC, 1994 & RCC, 2013

Rajshahi city lacks of sewerage and treatment facilities for wastewater. Therefore, RWASA has taken an initiative to prepare sewerage network for Rajshahi. The successful execution of the water supply and sanitation master plan will bring further development of sanitation in the city area.

4.5.10 Electricity

PDB operates power supply in RCC area and in Paba Upazila of Rajshahi. The power problem in Rajshahi lied with its extreme load- shedding and low voltage which disrupted normal power based activities (RMDP-VI). To overcome this problem PDB has implemented ‘Greater Rajshahi Power Distribution Project Phase-2’. Under this project PDB extended its 132 KV grid sub-station at Katakhal

At present two power stations are operating one is non-government Rental Northern Power Solution (Established in 2011) and second one is Peaking Power Plant at Katakhal (Established in 2012). After the installation of these two power plants the supply of electricity is increased from 66 MW/day to 106 MW/day. It is apparent from the table 4.15 that with the increase in demand the supply of electricity is also increased significantly. Therefore the power problem of Rajshahi is mostly minimized over the last two years.

Table 4.15: Supply of Electricity in Rajshahi City

| Demand / Supply \ Year | 2003 | 2007 | 2012 |
|--------------------------------------|-------------|-------------|-------------|
| Demand | 55 MW/day | 72 MW/day | 87 MW/day |
| Supply | 66 MW/day | 66 MW/day | 106 MW/day |

Source: RMDP V-I & Katakhal Power Station, 2013

Chapter 5 : PLANNING PROPOSALS AND IMPLEMENTATION STATUS

The chapter is designed to exhibit the progress of implementation of the planning proposals. The Drainage Master Plan (1994-2020) and the Functional Master Plan (2004-2014) are currently being implemented. Therefore, the progress of implementation of these two Master Plans have been assessed.

5.1 Features of the Drainage Master Plan (1994-2020)

The first Master Plan of 1984 recommended to develop a special drainage plan for the city. After passing ten years of the plan period a Drainage Master Plan (1994-2020) was prepared by RCC. Prior to the preparation of the Drainage Master Plan the city had no guidelines for the development of the drains. The drains were inadequate and developed without proper design, shape, size and outlets and most of the runoff naturally discharged in the river Padma. The construction of flood protection embankment in 1990 restricted the natural drainage in the river Padma that further aggravated the drainage problem. Therefore, many core parts of the city faced severe water logging. In these consequences the Drainage Master Plan was prepared by RCC in 1994. It was the first Master Plan for the improvement of the drainage.

5.1.1 Objectives of the Plan

The Drainage Master Plan (1994-2020) was prepared with the following objectives:

- To assess the problems and causes of storm water drainage of RCC area.
- To formulate a Master Plan for storm water drainage, solid waste and sanitation for Rajshahi City up to the year 2020.
- To suggest institutional strengthening for effective operation and maintenance of the drainage and solid waste management.
- To develop 1st stage improvement programme up to the year 2000.

5.1.2 Budget

Total cost of the Drainage Master Plan was estimated as **Tk. 4280 lac** at 1993 market prices. But it did not include the establishment cost for the sanitation and solid waste management components.

5.1.3 Phases of Development

The plan proposed to develop a total 7098 hectares area in three phases (Table 5.1 and Map B-1, Appendix B) based on the population density per hectare. The areas containing low density (<70 people/hectare) were excluded from the plan therefore the ward no. 18 and 2 were excluded as these wards seem to be unchanged over the 20 years. The area containing more than 200 peoples/hectares were identified as high density zone therefore it was the target to develop the core area of the RCC in the first phase.

Table 5.1: Phases of Development

| Phases | Target Plan Period | Year of Achievement |
|-----------------------|--------------------|---------------------|
| 1 st phase | 1994-2000 | 2000 |
| 2 nd phase | 2001-2010 | 2012 |
| 3 rd phase | 2011-2020 | Continuing |

Source: RCC, 1994 & RCC, 2013

5.1.4 Development Proposals and Achievement

The plan proposed to develop not only the drainage but also the environmental sanitation and solid waste management of the city.

5.1.4.1 Drainage

The plan proposed to improve the internal drainage of the city by rehabilitating the existing khals, constructing new drains and re-excavating the existing Katcha drains.

It planned to implement a total 180 km drains (Table 5.2) in three phases. But provided detail work components only for the first phase of development and no other details for the second and third phases of development. The proposed drainage network is shown in the map 5.1.

Table 5.2: Proposed Drains for Rajshahi

| Types | Length (km) |
|-----------------|-------------|
| Primary drain | 38 |
| Secondary drain | 50 |
| Tertiary drain | 54 |
| Plot drain | 38 |
| Total | 180 |

Source: RCC, 1994

Among all the proposed work components a few of them are executed that is presented in the table 5.3

Table 5.3: Proposed and Achieved Work Components of the Drainage

| Proposals for Drainage | 1 st Phase (upto 2000) | |
|--|-----------------------------------|--------------------------------|
| | Targets | Achievements |
| Primary Drain - Resection - Rehabilitation - New Pucca - New Katcha | 18 km 15 km 1 km 4 km | 8.2 km 9 km 1 km 1 km |
| Secondary Drain - Rehabilitation - New | 9.3 km 7.6 km | 3 km 2.5 km |
| Tertiary Drain - Rehabilitation - New - Pipe (500mm) | 8 km 6 km 4.5 km | 3 km 1 km 1.5 km |
| Plot Drain - Rehabilitation - New | 7.5 km 5 km | 0 km 0 km |
| Culverts - Rehabilitation - New | 30 nos 20 nos | 8 - |
| Cleaning & removal of blockage of existing khals & drains. | 90 km | 13 km |

Source: RCC, 1994 & RCC, 2013

5.1.4.2 Sanitation and Solid Waste Management

The plan proposed to improve the household sanitation and solid waste management of the city by providing the facilities depicted in the table 5.4.

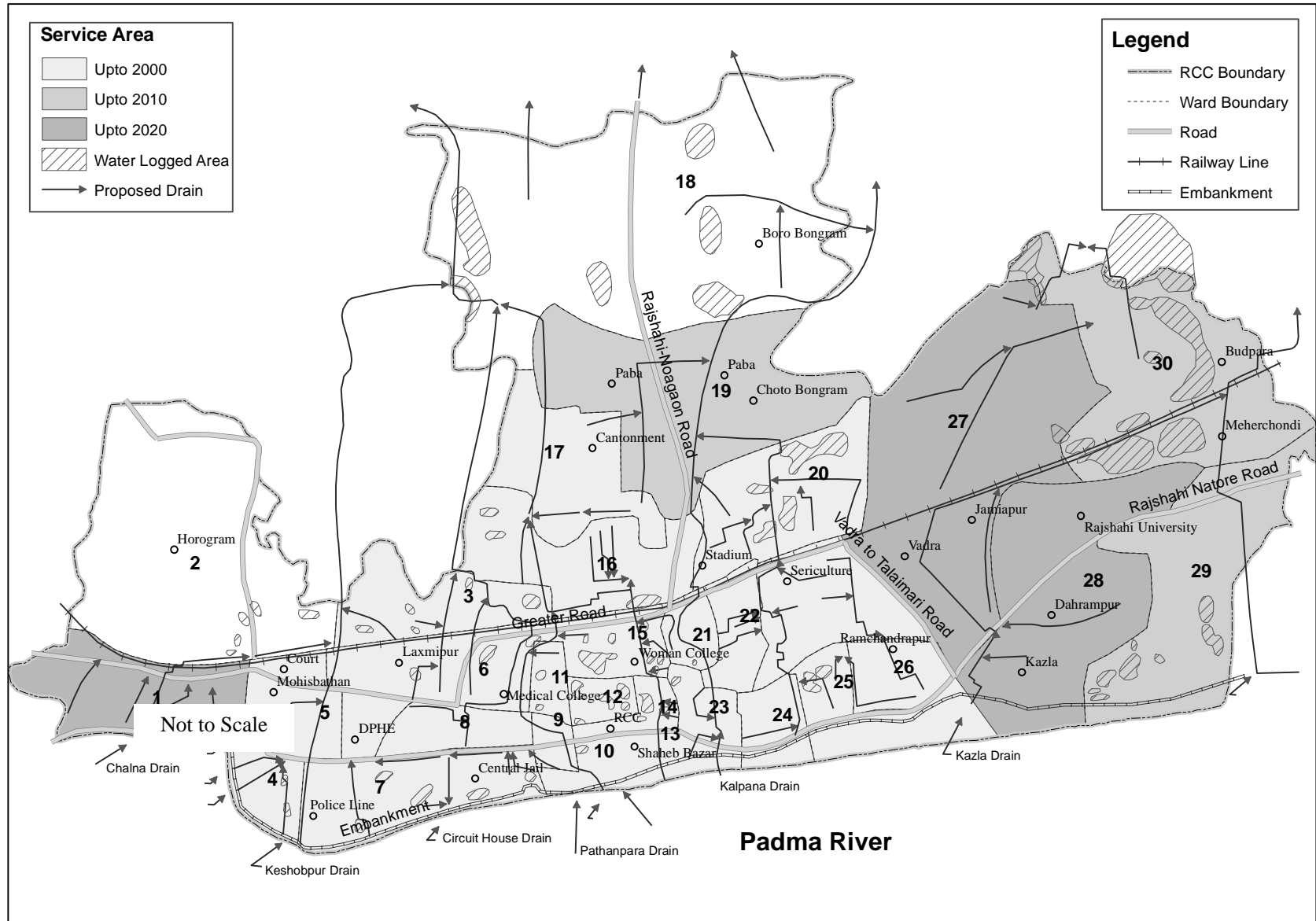
Table 5.4: Proposed and Achieved Work Components of the Sanitation and Solid Waste Management

| Proposals | 1 st Phase (upto 2000) | |
|-------------------------------|---|--|
| | Targets | Achievements |
| Sanitation | - Single pit latrine 2000 nos - Twin pit latrine 4000 nos - Conversion of surface latrine into twin pit latrines 40 nos. - Construction of public toilets 6 nos. | - 1250 - 2100 - None - 4 nos |
| Solid Waste Management | - Disposal land: 0.5 hectares - Push cart/Hand Trolley: 50 nos - Richshaw Van: 40 nos - Garbage Truck: 2 nos - Rubbish bin: 150 nos | - None - 30 nos - 35 nos - 2 nos - 120 nos |

Source: RCC, 1994 & RCC, 2013

Among all the work components a few of the drainage facilities are executed and the achievement is approximately 24% of its target. On the contrary the maximum achievement (approximately 60% of its target) is occurred in the provision of the solid waste management facilities.

Map 5.1: Proposed Alignment of the Drains in the Rajshahi City Corporation Area



Source: RCC, 1994

5.1.5 Existing Drainage Condition

The execution of the Drainage Master Plan was started from the year 1994. In the mean time first two phases of the Plan are accomplished and the third phase is ongoing. The quantitative data shows that the coverage of the drains is increased (section 4.5.7) upon this it seems that the drainage condition of the city is improved. But the citizen's view shows that though the drainage condition is slightly improved and water logging problem is slightly reduced still a majority (79%) of the citizens face drainage problem (figure 5.1).

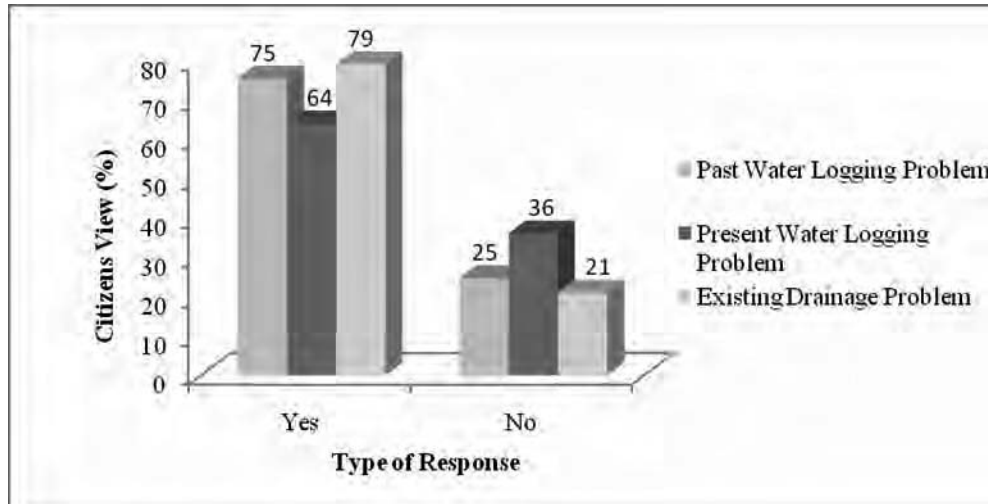
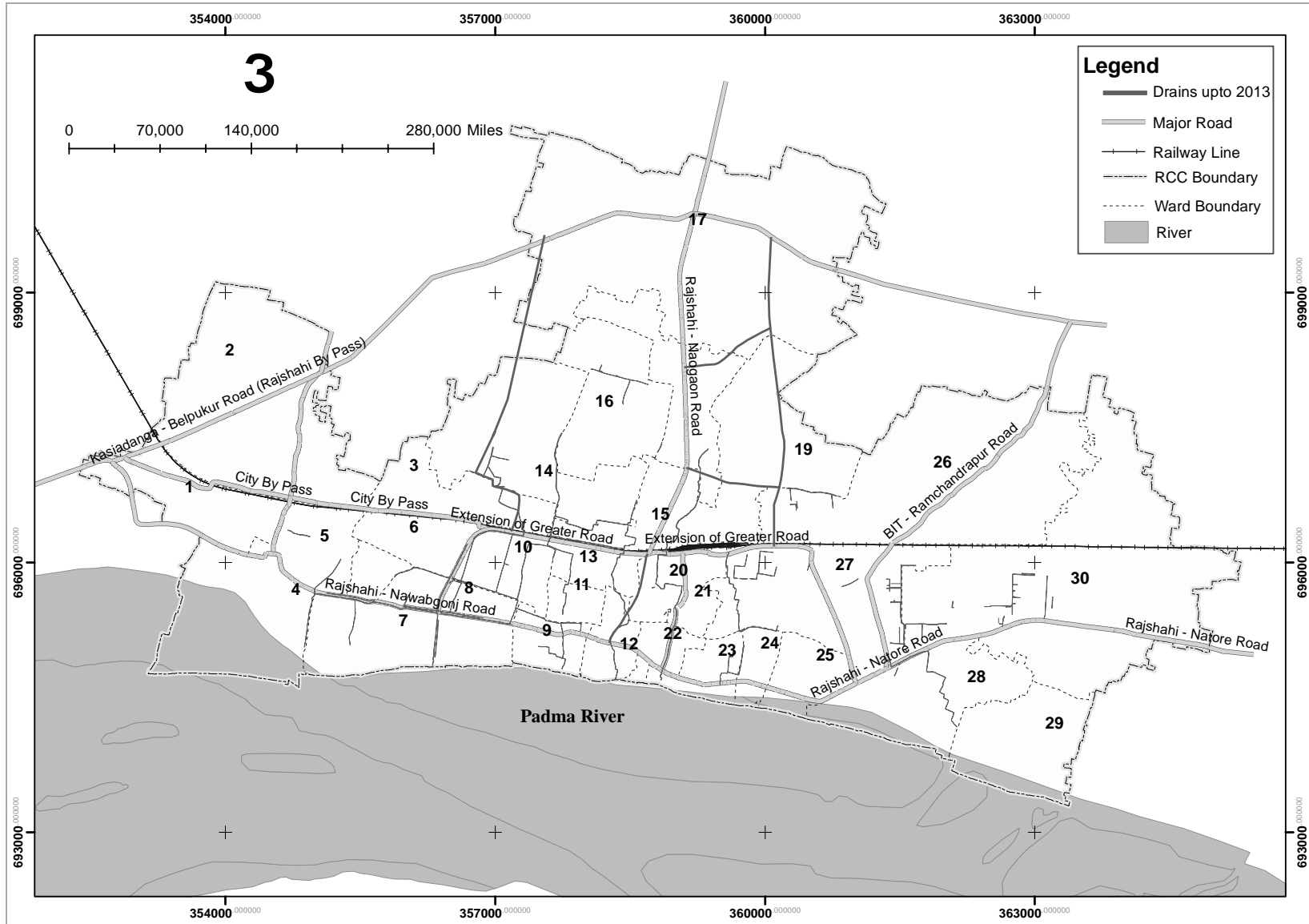


Figure 5.1: Drainage and Water Logging Problem in RCC area
Source: Questionnaire Survey, 2013

The map 5.2 shows the developed drains but it is very difficult to find out the similarities between the proposed and developed drainage networks of the city. As the plan only proposed to develop different types of drains and the proposals were given in tabular format. Moreover the proposed plan (map 5.1) shows only the tentative direction of the drains and no other locational detail. Therefore the drains are developed arbitrarily following the major roads of the city.

Another notable feature is that the city had a large number of ponds and these acted as retention pond for the storm water but the filling up of these ponds is aggravating the drainage and water logging problem (Appendix B, Map B-2 shows that out of 30 wards the water bodies are decreased in most of the wards of the city). In these consequences the drainage and water logging problem dominates in each of the wards despite the increment of the drains.

Map 5.2: Developed Drainage Networks in RCC Area (Upto 2013)



Source: Physical Feature Survey by RDA, 2003 & RDA, 2013

5.1.6 Achievement of the Objectives

The Drainage Master Plan formulated a number of objectives but none of these is completely achieved.

- One of the objectives was to assess the problems and causes of storm water drainage. The plan identified a number of problems and developed proposals to mitigate the drainage problems but the implemented proposals did not bring any positive change. Therefore still a majority of the citizen's faces drainage problem.
- Another objective was to formulate a Master Plan for the storm water drainage, solid waste and sanitation for Rajshahi City for the year 2020. In this case the plan provided detail development works upto 2000 and no other details were provided for the next phases of development.
- The plan suggested institutional strengthening for the effective operation and maintenance of drainage and solid waste management. But in reality no significant initiatives are taken for the institutional strengthening except the conservancy department of RCC. Therefore the solid waste management system is improved but the drains are not in a satisfactory condition.
- Finally it aimed to develop 1st stage improvement programme up to the year 2000. The plan provided the detail development program for the first phase but a few of them are executed.

5.1.7 Officials View Regarding the Progress of Implementation

The authority is unable to achieve of all the work components and target phase of development. The first phase was reviewed in 2000 but could not achieve all the work components. The remaining works of the 1st phase was implemented in later stage. While the third phase should have been started in 2011 but actually started in 2013. It seems that the authority has been able to achieve approximate 30-35% of the proposed work components (Executive Engineer, RCC).

5.1.8 Problems in Executing the Plan

The followings are identified as the causes of failure to achieve of all the objectives and work components successfully:

- The total budget was estimated as **Tk. 4280 lac**. The budget was very small for the successful implementation of all the work components (Chief Engineer, RCC).

- Lack of resources especially skilled man power is a major impediment to the successful implementation of the plan. The authority aimed to appoint town planner for the better implementation of the plan but still there is no a single town planner (Executive Engineer, RCC).
- The authority also faces shortage of modern survey instrument and training for the officials to be upto date (Chief & Executive Engineer, RCC).
- Political pressure and lack of proper management of the authority is also a major impediment to be successful (Chief & Executive Engineer, RCC).
- Finally the proposed drainage network plan did not provide any concrete evidence of the drains. The plan provided only the tentative direction of the proposed drains, no other information (existing land use, roads) were included in the background of the map. In these consequences it is very difficult to implement the proposed work components in conformity with the proposed plan (Executive Engineer, RCC).

5.2 Features of the of the Functional Master Plan (2004-2014)

The third level of the Rajshahi Metropolitan Development Plan (2004-2024) was to implement the Functional Master Plan for the urban area of Rajshahi. After expiration of it another Master Plan (2014-2024) was prepared for the extended area of the city. The plan was prepared to guide and control the physical development of Rajshahi during the next 10 years (2004-2014). The functional master plan was prepared within the policy framework of the structure plan and aimed to attain the overall project objectives.

5.2.1 Objectives of the Plan

The functional master plan was prepared with the following objectives:

- To determine the present and future functional structure of the city.
- To provide the mechanism for improving and guiding the development of future Rajshahi.

The objectives were formulated with the aim to attain:

- Orderly location of services and facilities
- Orderly location of various urban land uses and
- Locating appropriate communication network.

5.2.2 Phases of Development

The Functional Master Plan was designed to implement in the following three phases:

| <u>Phases</u> | <u>Plan Period</u> |
|---------------|--------------------|
| Phase – 1 | 2004-2009 |
| Phase – 2 | 2009-2014 |
| Phase – 3 | 2014-2024 |

The entire planning area was divided into two parts urban area and extended area. Phase 1 and 2 was designed for urban area and phase 3 for the extended area.

5.2.3 Duration and Revision of the Plan

It was proposed to review and update the Structure Plan in every five years. The review was supposed to take place at the end of every 4th year of each five year period. Therefore, a midterm revision of the plan was supposed to carry out on the 4th year of the plan period in 2009. It was a target to accomplish all the work components by 2014 and to prepare a new master plan at the end of 2014 that will replace the current plan in the year 2015 and will continue up to 2024.

5.2.4 Development Proposals and Implementation Status

To ensure planned growth and development of the city the following proposals were formulated for the development of the infrastructures and community facilities.

5.2.4.1 Drainage Development

Proposal: Though a drainage master plan was being implemented by RCC from the year 1994, the drainage condition of the city was not satisfactory. Therefore, to enhance further improvement RMDP proposed to develop a new drainage network for the extended area of the city. The plan also proposed to build a drainage water pump station at Charghat Upazila (Map B-3, Appendix-B).

Implementation Status: It is the responsibility of RCC to ensure planned development of the drainage networks. As there is no coordination between RDA and RCC therefore currently RCC is implementing the drains independently and do not bother to consider the provisions of the Functional Master Plan.

5.2.4.2 Water Supply and Sewerage System Development

Proposal: Rajshahi city had no sewerage system therefore it proposed to develop a sewerage network along with storm drains. In addition to this the water supply was maintained from ground water and adequate quality water was not available therefore it also proposed to establish a water supply pump station at the upstream side of the river Padma in Haripur union. The proposed location of the sewerage treatment plant and water supply pump station along with alignment of the network is shown in the Map B-3, Appendix-B.

Implementation Status: The city had no water supply and sewerage authority therefore no initiative was taken up to 2010. After the establishment of RWASA in 2010 a sewerage and water supply network plan (Map B-4 & B-5, Appendix-B) was prepared in 2012 that will be implemented by 2014. But RWASA prepared the plan without considering the proposal of the functional master plan. This also illustrates that there is no coordination among the local level institutions in the development of the city.

5.2.4.3 Town Centre Development

Proposal: Considering future growth of the city and to avoid congestion of the central city area the plan proposed to design Choto Bongram, Baze Silindar and Lalitahar areas in a most ideal ways with all possible services and land use provisions that a town centre should have.

Implementation Status: A priority project was also formulated for the development of the town centre in the first phase but till now no initiative is taken for the implementation of the project.

5.2.4.4 ICT Village Development

The plan proposed to develop a separate ICT village at Budhpara-Meherchandi Mouza, north of the Rajshahi University covering an area of 30 acres. It was the target to develop this area in the first phase but till now no initiative is taken for the development of this area.

5.2.4.5 Solid Waste Management

Proposal: The plan estimated that waste generation rate will be increased from 200 M tons to 500 M tons at the end of planning period. Therefore, it suggested to a select a bigger dumping site at the north corner of the study area in the Huzuripara union.

Implementation Status: The proposed site is selected as a new dumping site and the overall waste management system is improved due to improvement in the collection system and logistic supports of RCC.

5.2.4.6 Road Network Development

Proposal: The plan proposed to increase the road network and widen the major roads within built up areas. It proposed to construct four major roads.

- It proposed to build “Bus Bays” in all primary and secondary roads to ensure uninterrupted loading and unloading the passengers. Service lanes with bus bays at required interval were also proposed to ensure fast movement of the through traffic.
- Certain sections of Natore road between Moni Chattar and CNB junction and Kalpana Cinema Hall to Talaimari were proposed to widen with at least 44 wide pavement plus space for drainage-cum-footpath.
- The plan proposed to construct the missing footpaths on the major roads and also to improve the major intersection points.

Implementation Status: Over the last 10 years the road network of the city is improved significantly. Among all the proposed major roads three are implemented and construction of one road is ongoing. A number of missing footpaths are constructed and also being constructed. The developed road network within the RCC area is shown in map 4.5.

In addition to the road networks a number of major intersection points are being developed though there is a slight deviation in the geometric design. But the proposed bus bays and service lanes are not implemented yet.

5.2.4.7 Relocation of Kadirganj Market

A wholesale rice market is located in Kadirganj, Rajshahi. As it is a residential area the market was incompatible to the surrounding land use therefore the plan proposed to relocate the market to Lalithar. But till now no initiative is taken to relocate the market.

5.2.4.8 Industrial Area Development

For industrial development 380 acres land was earmarked at Kaliapara, Nakhola, Ranihat areas east of the city. A detail layout plan was also prepared to ensure planned development of the site.

Implementation Status: BSCIC is a key organization for the industrial development of the city and recently BSCIC is extending industrial site to the west of the city but the proposal was to extend the industrial site in the east. As there is no coordination among the local level institutions therefore they are working independently without considering the proposals of the Master Plan.

5.2.4.9 Education and Health Facilities

The plan proposed to provide one primary school for every 4000 population, one secondary school for every 6000 population and one college for every 30000 population. Estimating these it proposed to establish additional 24 primary schools, 38 secondary schools and 6 colleges by 2014.

To enhance the health facilities the plan recommended to establish two 500 bed hospitals in the urban area and a specialized hospital was recommended on an area of 56 acres at katakhali

Implementation Status: Education and health department are responsible for the implementation of the education and health facilities respectively. Due to lack of coordination each of the local level institutions are working independently. Therefore, the proposed facilities are not developed as per guidelines of the plan.

5.2.4.10 Recreational Facilities

Park and Play field: Open space was proposed in two categories- central park and community level park. A central park was proposed at Meherchandi over an area of 80 acres and two community parks were proposed at Budhpara and Bariapara with a total land of 80 acres. In addition to these a number of play fields were also proposed for different SPZs.

Botanical Garden: A 200 acre botanical garden was proposed at Uzirpukur for conservation of valuable trees and plants of Rajshahi region.

Padma River bank development: The Padma River bank (30 acre) was proposed to develop as recreation zone.

Implementation Status Among all the proposed recreational facilities only 5 acre area of the Padma River bank is developed as a recreation zone. No other initiatives are taken for the implementation of other recreational facilities.

5.2.4.11 Social Services

The social services 20 new daily bazaars having an area of 0.30 acre each, 9 new post offices, 9 new graveyards and 30 community centres cum ward commissioners' office were proposed for the future urban area in different DAP blocks. So far none of these facilities have been established.

5.2.5 Overall Progress of Implementation

The overall implementation status of the proposed facilities is shown in tabular format (table 5.5).

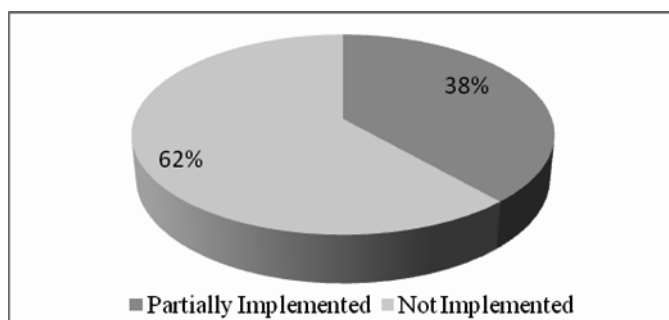
Table 5.5: Implementation Status of the Development Proposals

| Proposed Facilities | Implementation Status | | |
|---|-----------------------|---|---|
| | F | P | X |
| Drainage development | | √ | |
| Sewerage system development | | | √ |
| Water supply system development | | | √ |
| Increase waste disposal site | | √ | |
| Development of town centre | | | √ |
| Development of housing areas | | √ | |
| Construction of new roads | | √ | |
| Widening of roads | | √ | |
| Improvements of pedestrian facilities | | √ | |
| Improvements of major Intersections | | √ | |
| Creation of parallel roads along Major Thoroughfare | | | √ |
| Build Truck Terminal alongside Bypass road | | √ | |
| Relocate wholesale rice market from Kadirganj | | | √ |
| Development of ICT village at Budhpara, Meherchandi | | | √ |
| Establishment of EPZ at Mallikpur-Ranhat | | | √ |
| Development of industrial area with necessary infrastructure and services | | | √ |
| Development of Education Facilities | | | √ |
| • Primary school-24 | | | |
| • Secondary school-38 | | | |
| • College-6 | | | |
| Development of a specialized hospital at Katakhal | | | √ |
| Development of two community park at Budhpara and Bariapara | | | √ |
| Development of 5 play field within the urban area | | | √ |
| Development of a Botanical garden at Uzirpukur | | | √ |
| Development of Padma River bank as a recreation area | | √ | |
| Development of Social Services | | | √ |
| • Katcha Bazar-20 | | | |
| • Post office-6 | | | |
| • Graveyard-9 | | | |
| • Community centre cum ward commissioner's office-30 | | | |

***F=fully implemented; ***P=partially/ongoing; ***X=not implemented

Source: Town Planner, RDA, 2013

The following figure generated from the table 5.5 shows that among all the proposed facilities a majority (62%) of the facilities are not executed yet, only 38% of the facilities are being partially implemented and none of the facilities is fully implemented.



5.2: Progress of Implementation of the Planning Proposals

Source: Town Planner, RDA, 2013

5.2.6 Implementation Status of the Recommended Projects

Among all the proposed facilities a priority project list was prepared and recommended for the implementation in the first phase of development. The table 5.6 shows that among all the proposed projects the roads are being implemented; the Padma river bank is partly developed as recreational zone and some housing projects are being implemented by RDA. It was the target to accomplish the projects by 2009 but these are not executed in the prescribed time frame and still some of the projects are ongoing.

Table 5.6: List of Priority Projects for the first phase of Development

| Type of Projects | Implementation Status |
|--|-----------------------|
| <u>Road Project</u> | |
| 1. Gourhanga Maor to Zero Point (Length-1.20km, Width-80') | √ |
| 2. Sericulture to Bypass Link Road (Length-3.25km, Width-80') | √ |
| 3. Fire Brigade to Greater Road to Bypass Link Road (Length-4.41km, Width-80') | √ |
| 4. Postal Academy to Budhpara (Length-7.80km, Width-80') | On going |
| <u>Town Centre</u> | |
| Town Centre-1 at Baze Silinder Mouza 119.28 acre | x |
| <u>Recreational Project</u> | |
| Padma River Bank Recreational Project, Area: 30 acres | Partial |
| <u>Industrial Area Development Project</u> | |
| ICT Village at Budhpara-Meherchandi Mouza, Area: 30 acres | x |
| <u>Health Project</u> | |
| Specialized Hospital at Katakhal, Area: 55.90 acres | x |
| <u>Housing Area Development Project</u> | |
| Development of all AIPs under SPZ 4 | Partial |

Source: RMDP V-I & Town Planner, RDA, 2013

5.2.7 Progress of Achievement

The study shows that the development authority has failed to achieve most of the targets of development. The view of the Town Planner, RDA also reveals that the progress of implementation of the planning proposals is very slow. Among all the planning proposals maximum achievement is occurred in the development of the road networks. The achievement in the development of the transport infrastructures specially the roads is approximate 30-40% and the overall achievement of the authority is almost 20-25% (Town Planner, RDA).

5.3 Implementation Status of the Detail Area Plans (DAPs)

The previous section 5.2 exhibits the development proposals and implementation status of the proposed facilities. This section shows the existing scenario of development of the DAP based on primary data.

To ensure better management of planning and implementation of the DAPs the entire Master Plan area was sub-divided into 25 Spatial Planning Zones (SPZ). Among all these RCC contains a total 7 SPZs, future urban area 5 SPZs and the extended area 13 SPZs. The table 5.7 shows the Spatial Planning Zones within the city corporation area.

Table 5.7: Spatial Planning Zones within RCC Area

| SPZ | Area Coverage |
|--------|--|
| SPZ 8 | RCC Ward No. 17 |
| SPZ 13 | RCC Ward No. 26 |
| SPZ 14 | RCC Ward No. 14, 15, 16, 18, 19 & Cantonment |
| SPZ 15 | RCC Ward No. 1, 2, 4 |
| SPZ 17 | RCC Ward No. 3, 5, 6, 7, 8, 9, 10, 11, 13 |
| SPZ 18 | RCC Ward No. 12, 20, 21, 22, 23, 24, 25, 27 |
| SPZ 19 | RCC Ward No. 28, 29, 30 |

Source: RMDP, VII

5.3.1 Selection of a DAP Block SPZ-18

To know the details of the development a sample SPZ is selected for the study. Among all the 7 SPZs of RCC one sample SPZ 18 is selected for the study as it is the core and oldest part of the city and was the target to develop this zone by 2014.

5.3.2 Profile of the SPZ-18

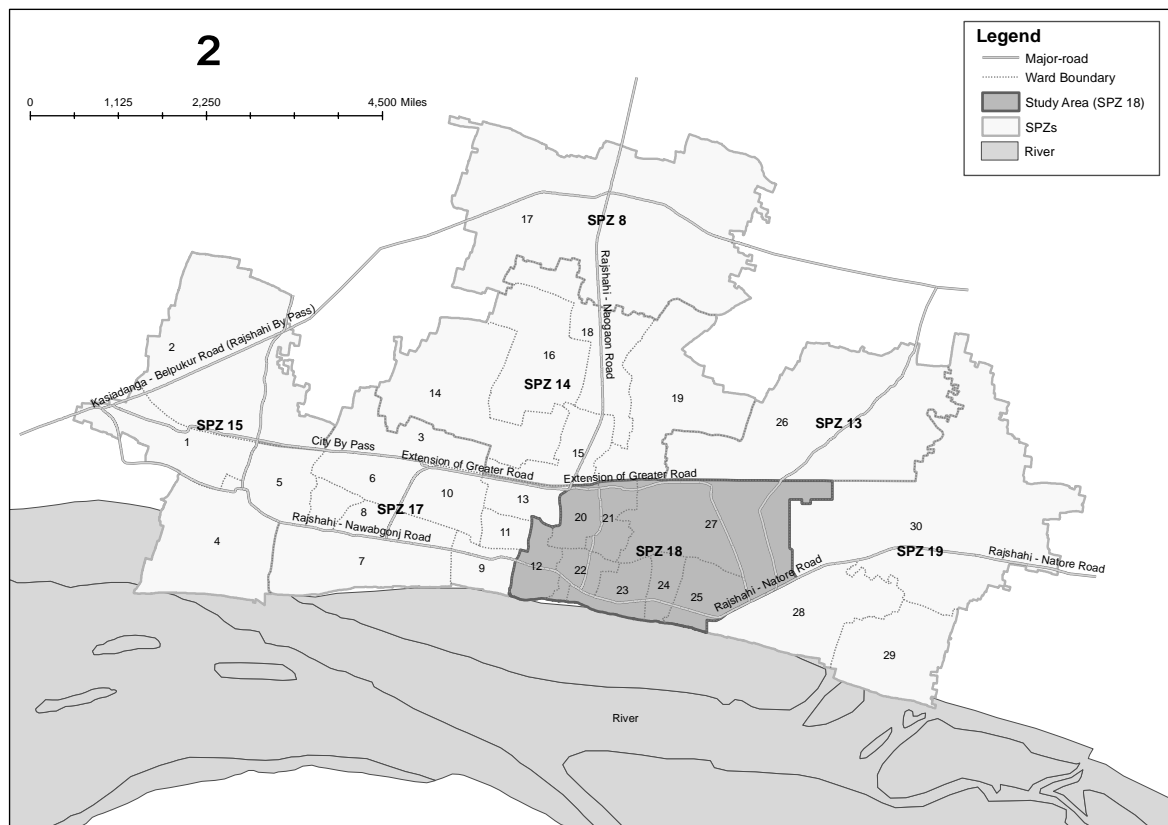
The zone accommodates the main commercial area of the city together with a few educational establishments. The city center-Shaheb Bazar, Railway Station, RUET, Sericulture Board, New Market and Central Bus Terminal etc. are located in this zone. It consists 9 mouzas (Vadra, Meherchandi, Jainalpur, Ramchandrapur, Rampur, Seroil, Tatipara, Sagarpara) under 8 RCC wards, namely ward no. 12, 20, 21, 22, 23, 24, 25 and 27. It covers an area of 5.56 sq.km and is situated on the south-eastern part of RCC (Map 5.3).

Table 5.8: Basic Statistics of SPZ-18

| SPZ No. | Area in Acre | No. of Ward | No. of Mouza | Population | | |
|---------|--------------|-------------|--------------|------------|-------|-------------------|
| | | | | 2001 | 2011 | Projected in 2014 |
| SPZ-18 | 1372.89 | 8 | 9 | 93140 | 96321 | 112687 |

Source: RMDP V-II & BBS, 2011

Map 5.3: SPZs within Rajshahi City Corporation Area



Source: RMDP, V II

5.3.3 Proposals for the Development of SPZ-18

The plan proposed to develop the road networks and to enhance the availability of the community facilities for the entire zone.

5.3.3.1 Proposal for Road Networks

The plan emphasized the widening of the narrow and congested roads and few new roads for construction. It proposed to construct 9.7 km new roads and 22.55 km roads for widening. The table 5.9 shows the inventory of the proposed road networks and the map 5.4 shows the location of the proposed road networks for this zone.

Table 5.9: Proposed Roads of SPZ-18

| Type | Width (Meter) | Length (Meter) | Total |
|---------------|---------------|----------------|----------|
| New Road | 6.09 | 8380.84 | 9.7 km |
| | 9.15 | 282.83 | |
| | 12.20 | 770.64 | |
| | 24.39 | 328.99 | |
| Road Widening | 6.09 | 7240.90 | 22.55 km |
| | 9.15 | 1515.82 | |
| | 12.20 | 9978.56 | |
| | 24.39 | 3816.17 | |

Source: RMDP, V-II

5.3.3.2 Proposal for Community Facilities

Estimating future demand and to meet the present requirements a number of community facilities were proposed for the SPZ-18. The table 5.10 shows the available and proposed community facilities within the SPZ 18. The entire zone had only two play fields but belongs to the particular educational institutions, a number of temporary katcha bazaars were available but no permanent bazaars, therefore, it proposed to establish, 4 playfields and 3 katcha bazaars respectively. In addition to these it proposed to establish 8 community centers and one primary school by the year 2014. The detail of the proposed facilities is presented in the map 5.4.

Table 5.10: Recommended Community Facilities for the SPZ-18

| Type | Unit/Number | |
|------------------|--------------------|----------|
| | Previous (in 2003) | Proposed |
| Primary school | 15 | 1 |
| High school | 10 | 0 |
| College | 4 | 0 |
| Madrassa | 12 | 0 |
| Post office | 4 | 0 |
| Katcha Bazar | 5 | 3 |
| Graveyard | 3 | 0 |
| Playfield | 2 | 4 |
| Community centre | 0 | 8 |

Source: RMDP, V-II

5.3.4 Implementation Status of the Proposed Facilities

Among all the proposed facilities it is found from the field survey that only the roads are implemented partially. The plan proposed to construct 9.7 km new roads and 22.55 km roads for widening but in reality it is found that only 2.67 km new roads are constructed and 5.5 km roads are widened. The overall implementation status is shown in the table 5.11 and the details of the implemented road networks and community facilities are shown in the map 5.5 and 5.6 respectively.

Table 5.11: Implementation Status of the Proposed Facilities

| Type | Unit/Number | |
|------------------|-------------|-----------------------|
| | Proposed | Implementation Status |
| Primary school | 1 nos | X |
| Katcha Bazar | 3 nos | 1 |
| Playfield | 4 nos | X |
| Community centre | 8 nos | X |
| New Roads | 9.7 km | 2.67 km (P) |
| Road Widening | 22.55 km | 5.5 km (P) |

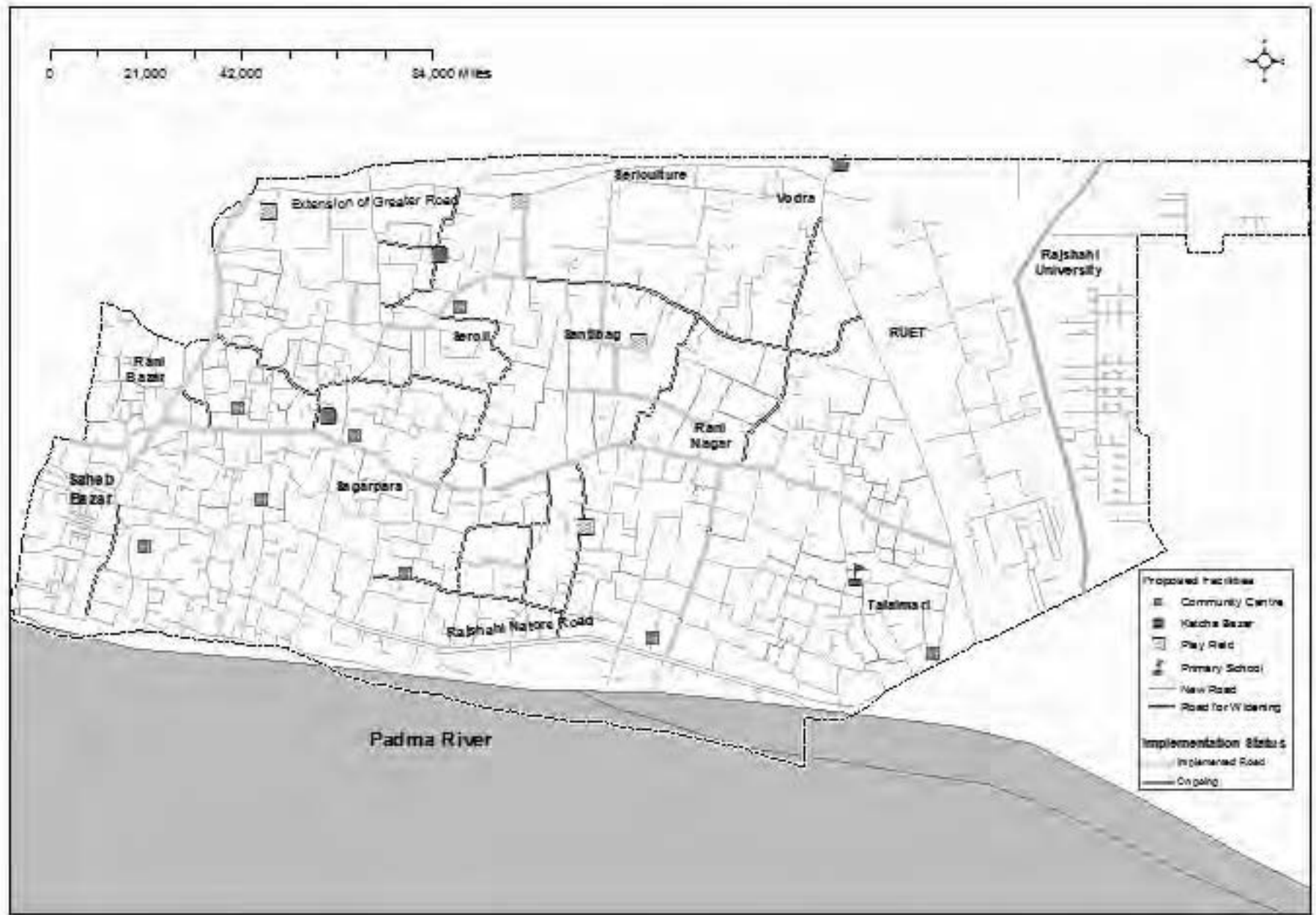
Source: Physical Feature Survey & Town Planner, RDA, 2013

*** ✓=implemented; *** X= not-implemented; ***P= Partial Implementation

5.3.5 Achievement in the Implementation of the DAPs

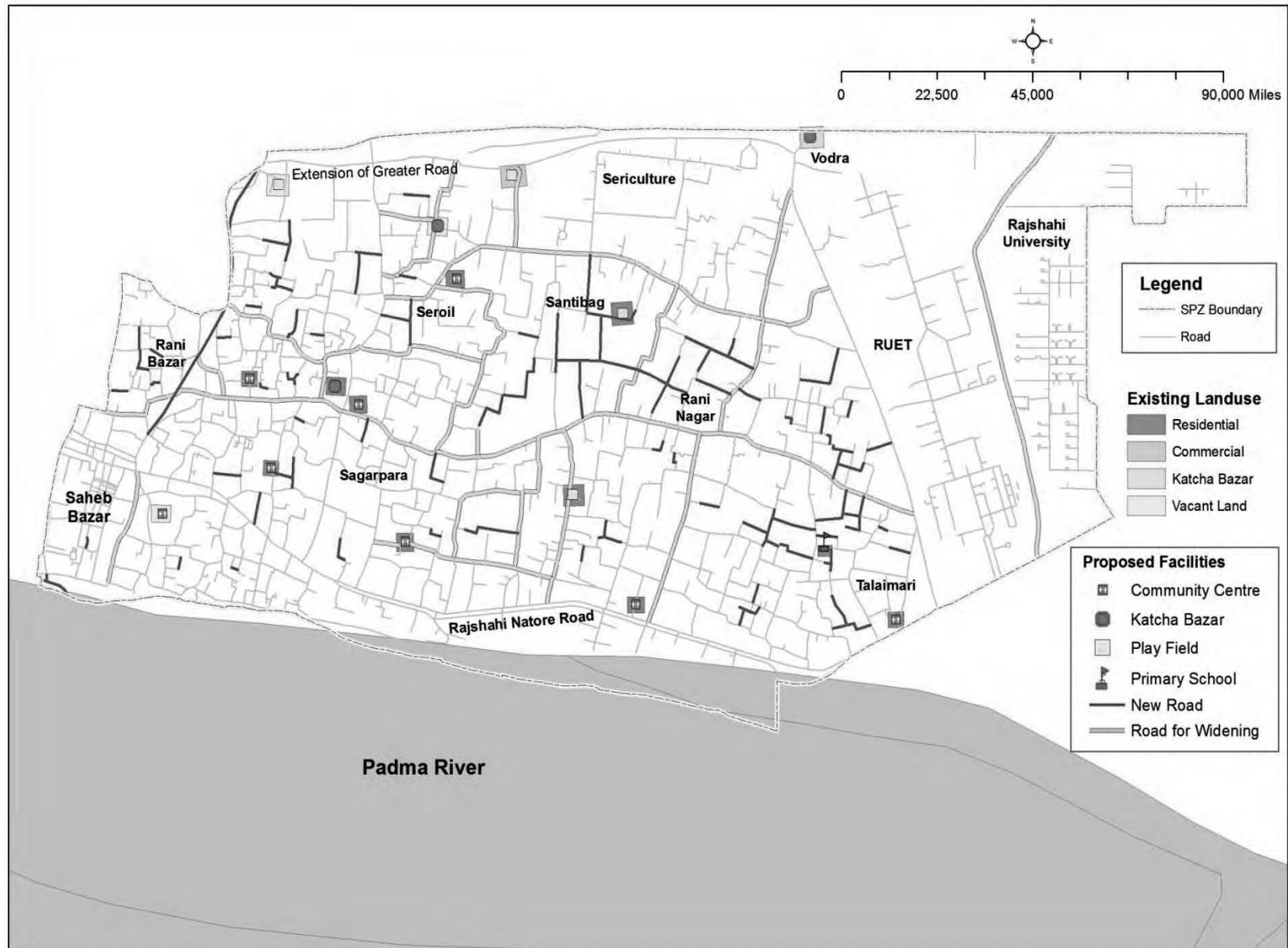
Both the physical feature survey and official opinion survey show that the authority has failed to implement the DAPs according to the planning guidelines. None of the proposed facilities are developed except some improvement in the road networks. It was a plan to review the DAPs at the end of every 4th year and the first review should be conducted in 2009 but the authority has also failed to do it.

Map 5.5: Implementation Status of the Proposed Road Networks of the DAP, SPZ 18



Source: RMDP, VII & Physical Feature Survey, 2013

Map 5.6: Implementation Status of the Proposed Facilities of the DAP, SPZ 18



Source: RMDP, VII & Physical Feature Survey, 2013

5.3.6 Causes of the Non-Implementation of the DAP Blocks

A number of factors acted as a barrier in the implementation of the DAPs. The main reasons are identified as lack of capacity in terms of financial, technical and skilled manpower. In addition to these according to the opinion of a Town Planner, RDA it is not possible to implement the plan according to the guidelines as the DAP blocks contain only the proposed location of the facilities but no justification was given why the facilities will be provided there. In addition to these the DAPs identified a number of techniques such as Area Improvement Plan, Site and Services Method, Guided Land Development Techniques which will be applied in the implementation of the plan but no guidelines are provided about the locations/areas where what type of techniques will be applied.

5.4 Achievements of the Objectives of Functional Master Plan

- The first objective of the functional master plan was to determine the present and future functional structure of the city. To achieve this objective it formulated a number of planning proposals for the future development of the city but except some development of the road networks none of the proposed facilities are being implemented properly.
- Another objective was to provide the mechanism for improving and guiding the development of future Rajshahi. It recommended a number of guidelines to strengthen institutional capacity, finance, coordination, monitoring etc. for the better implementation of the plans but none of the guidelines are followed in executing the plans.
- One of the objectives of the functional Master Plan was to review the plan at the end of every four years of each plan period but till now no review is conducted.
- It proposed to prepare a new master plan at the end of 2014 that will replace the current plan in the year 2015 and will continue up to 2024. As majority of the planning proposals are not executed yet, therefore, there is no hope that the new plan will be prepared within the proposed time frame.
- It aimed to ensure the orderly location of urban land uses, services and facilities. Therefore it formulated a number of planning proposals and DAPs to ensure planned development of the city. But the development authority has failed to execute most of the urban services.

5.5 Problems in Executing the Plans

The study shows that the planning proposals are not being implemented according to the guidelines of the Master Plans. The following problems are identified as the impediments to the implementation of the plans.

- **Institutional:** RDA and RCC are mainly responsible for the physical development of the city. But the coordination between these two institutions is very limited. In addition to this there exists some gap between these institutions because of the higher status of the Mayor of RCC compared to the Chairman of RDA.
- **Management:** The institutions lack adequate manpower specially the Town Planners and surveyors. RDA has only 2 Town planners and 2 surveyors but not skilled enough. On the contrary RCC has no Town Planner. Due to lack of manpower it is not possible to monitor the works at field level (Town Planner, RDA).
- **Technical:** Lack of training, modern office and equipment are also the impediments in the execution of the plans. In addition to these the appointment procedure is not technical and does not have the qualifications according to the desired post (Town Planner, RDA).
- **Financial:** Dependency on the central government for fund and long procedure of project approval is also an obstacle. A limited fund is available for the execution of the roads but in many cases no fund is available for the provision of the community facilities (Chairman, RDA).
- **Others:** Lack of hierarchy in the post of Town Planners and political pressure is also significant. The main development authorities RDA and RCC belong to under different a ministries. That's why different types of problems arise while working together (Town Planner, RDA).

The officials' view reveals that it is not possible to complete the functional Master Plan by 2014. Because the authority had a planning cell including 3 Assistant Town Planners, 2 Town Planners and one Chief Town Planner during the preparation of the plan. It was suggested to absorb the planning cell to be successful in the implementation of the plan but the authority

absorb the planning team and currently RDA has only two Town Planners (Town Planner, RDA).

According to the Rajshahi Town Development Authority Ordinance, RDA prepares the development plan proposals and responsible for the implementation of the land use plan but the execution of the other planning components lies with other local level institutions. RDA sends the copies of Master Plans to each of the local level institutions. After then the authority does not keep any records whether the proposed facilities are being implemented or not. Among all the problems lack of coordination is one of the major impediment to the implementation of the planning proposals.

Chapter 6 : DEVELOPMENT OF THE COMMUNITY FACILITIES IN RCC: CITIZEN’S VIEW

The chapter is organized to measure the quality of services as assessed by the citizen. Here a qualitative analysis has been done to assess the level of improvement and satisfaction for the services provided by the local level institutions of RCC. A number of GIS maps have been generated to show the variation of development in the core and fringe of the city corporation.

6.1 Interpretation of the Index

Table 6.1 and 6.2 shows the improvement and satisfaction index values for the community facilities by zones of RCC (The improvement and satisfaction index values by ward are also shown in the table C-1 and C-2, Appendix-C). It shows the variation of the index values for the central and fringe area of the city. The index values describe the status of a particular facility in a zone above or below the value 0 (i.e. the value > 0 means improvement has taken place and the value < 0 indicates the deterioration of the particular facility).

Table 6.1: Improvement Index Values by Zone of RCC for the Community Facilities

| Zones | | Drainage | Waste Management | Road | Water Supply | Health Facilities | Recreation | Community Center |
|-------|------------------|----------|------------------|------|--------------|-------------------|------------|------------------|
| 1 | Western Fringe | 1.2 | 1.5 | 2.0 | 1.7 | 1.0 | 0 | 0 |
| 2 | West City Centre | 1.2 | 1.7 | 1.7 | 1.7 | 0 | 0 | 0 |
| 3 | City Centre | 1.0 | 1.9 | 1.8 | 1.5 | 0 | 0 | 0 |
| 4 | East City Centre | 0.8 | 1.8 | 1.7 | 1.5 | 0 | 0 | 0 |
| 5 | Eastern Fringe | 1.3 | 1.8 | 1.7 | 1.6 | 0.6 | 0 | 0 |
| 6 | Northern Fringe | 1.1 | 1.7 | 1.9 | 1.8 | 0.6 | 0 | 0 |

Source: Calculated from the Questionnaire Survey Data, 2013

Table 6.2: Satisfaction Index Values by Zone of RCC for the Community Facilities

| Zones | | Drainage | Waste Management | Road | Water Supply | Health Facilities | Recreation | Community Center | Electricity | Katcha Bazar |
|-------|------------------|----------|------------------|------|--------------|-------------------|------------|------------------|-------------|--------------|
| 1 | Western Fringe | -0.40 | 0.10 | 0.5 | 0.1 | 0.0 | -1.0 | -1.0 | 0.1 | 0.0 |
| 2 | West City Centre | -0.40 | 0.30 | 0.4 | 0.1 | -0.3 | -1.0 | -1.0 | 0.1 | -0.2 |
| 3 | City Centre | -0.50 | 0.60 | 0.4 | 0.2 | -0.4 | -1.0 | -1.0 | 0.3 | -0.5 |
| 4 | East City Centre | -0.40 | 0.50 | 0.4 | 0.1 | -0.4 | -1.0 | -1.0 | 0.4 | 0.1 |
| 5 | Eastern Fringe | -0.20 | 0.40 | 0.4 | 0.0 | 0.2 | -1.0 | -1.0 | 0.5 | 0.4 |
| 6 | Northern Fringe | -0.52 | 0.30 | 0.61 | -0.2 | 0.2 | -1.0 | -1.0 | 0.2 | 0.1 |

Source: Calculated from the Questionnaire Survey Data, 2013

6.1.1 Perception regarding the Development of Drainage

To ensure planned development of the drainage networks a Master Plan is being implemented by RCC from 1994. The quantitative data analysis shows that the first two phases of the plan have been implemented and the coverage of the drainage network has also been increased (section 4.5.7 and section 5.1.3). Thus it seems that the drainage condition of the city is improved.

From the table 6.1 it is evident that among all the six zones four have the index value between the ranges 1.1 to 2 that indicate moderate improvement in these zones. Only the city centre and east of the city centre shows slight improvement. The level of improvement by zone is shown in the Map 6.1 and by ward in the Map C-1, Appendix-C. Citizen's view for satisfaction shows that each of the zones has the negative index value that indicates dissatisfaction for the drainage. The level of satisfaction by zone is shown in the Map 6.2 and also by ward in the Map C-2, Appendix-C.

Though each of the zones of RCC shows the improvement of the drainage, it shows dissatisfaction for the drainage as a significant portion of the citizens are facing both the drainage and water logging problem (figure 6.1). The reasons may be unplanned development of the drainage and filling up of water bodies in addition it lacks proper management therefore, most of drains are blocked and overflowed. So, it can be concluded that improvement has taken place in the provision of the drainage but these are not satisfactory.

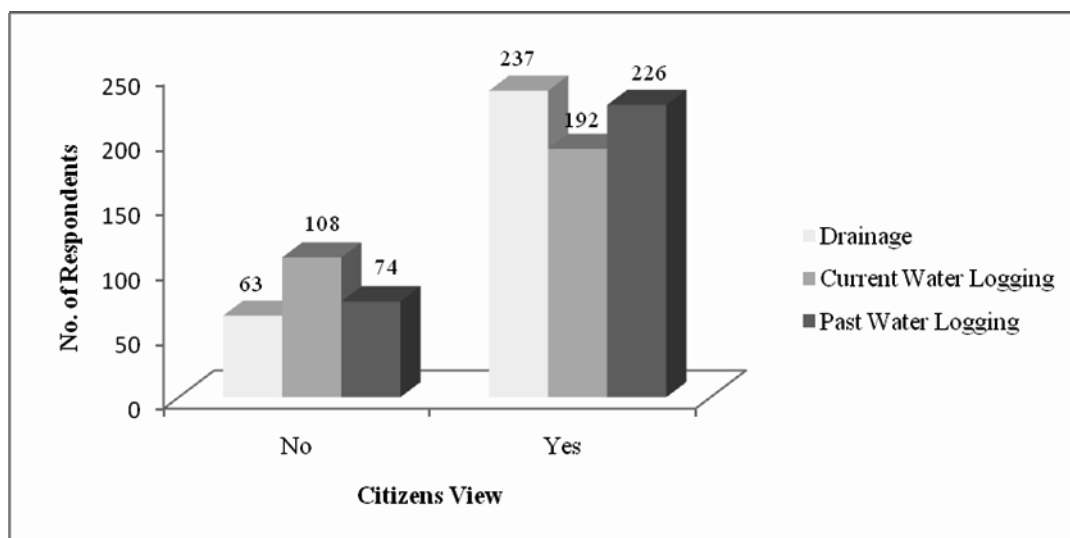
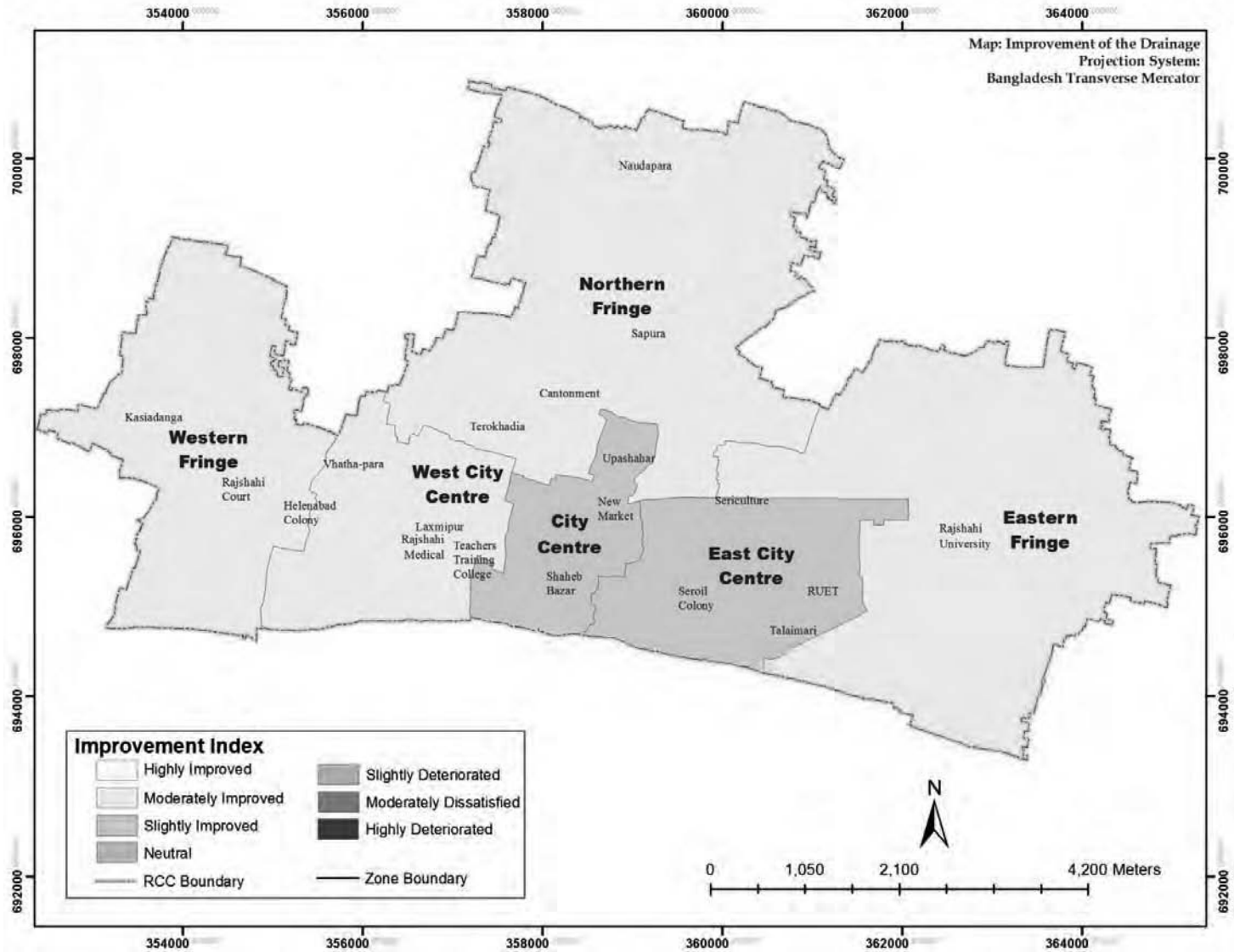
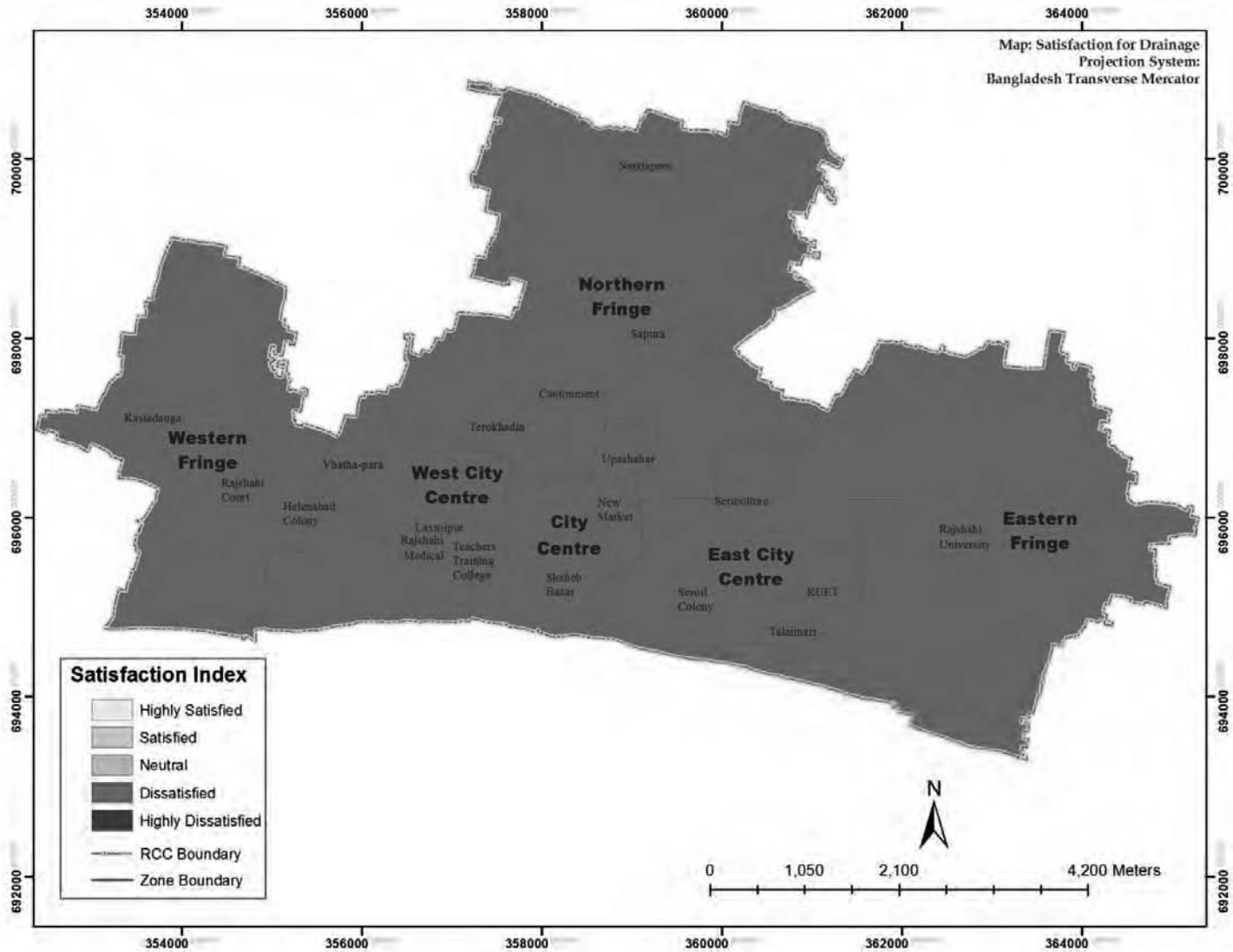


Figure 6.1: Drainage and water logging problem faced by the citizens
Source: Questionnaire Survey, 2013

Map 6.1: Improvement of the Drainage by Zone of RCC



Map 6.2: Satisfaction for the Drainage by Zone of RCC



Source: Map Prepared by Researcher, 2014 & RDA

6.1.2 Perception for the Waste Management System

Management of waste is a costly and troublesome problem for most of the local authorities of the developing countries. The quantitative data analysis shows that the waste management system of the city is improved (Section 4.5.8). The citizen's view also depicts same that is described below.

The table 6.1 shows that the waste management system is moderately improved in each of the zones (core and fringe) of RCC as each of them have the positive index values between the ranges of 1.1 to 2. The level of improvement by zone is shown in the Map 6.3 and by ward in the Map C-3, Appendix-C. On the contrary citizen's view for satisfaction shows that each of the zones are satisfactory in terms of the waste management system as each of them contains positive index value. But only the city centre shows high satisfaction for the waste management system as it contains the index value >0.5 (table 6.2). The level of satisfaction for the waste management by zone of RCC is shown in the Map 6.4 also by ward in the Map C-4, Appendix-C.

On the basis of quantitative and qualitative data analysis it can be concluded that the overall waste management system is moderately improved and all of the citizens of RCC are satisfied with the existing waste management system.

6.1.3 Perception for the Road Networks

The quantitative data shows that the coverage of the road networks is increased significantly within RCC area (section 4.2.1) and among all the development proposals of RDA only the roads are being implemented (section 5.3.6). Thus it seems that the road network of the city is improved and the citizen's view also depicts the same that is presented below.

The table 6.1 shows that the road network of RCC is moderately improved in each of the zones of RCC as each of them have the positive index values between the ranges of 1.1 to 2. The level of improvement of the road networks by zone is shown in the Map 6.5 and by ward in the Map C-5, Appendix-C.

From the table 6.2 it is evident that each of the zones shows satisfaction for the road networks as each of them contains positive index value. But only the northern fringe of RCC shows high satisfaction for the networks as it contains the index value >0.5 . As the city is now expanding in north ward direction therefore recently a number of new

connecting roads are constructed in this zone that results high satisfaction for the road networks. The level of satisfaction by zone of RCC is shown in the Map 6.6 also by ward in the Map C-6, Appendix-C. On the basis of quantitative and qualitative data analysis it can be concluded that the overall road network of the city is improved both in the core and fringe area of RCC.

6.1.4 Perception for the Water Supply

The quantitative data shows a gradual improvement of the water supply from 1994 to 2012 (section 4.5.6) and the citizen’s view also depicts the same. From the table 6.1 it is obvious that the water supply is moderately improved in all the zones of RCC as all of them have the positive index values between the ranges of 1.1 to 2. The level of improvement by zone of RCC is shown in the Map 6.7 and by ward in the Map C-7, Appendix-C.

The table 6.2 shows that out of six zones of RCC only northern fringe of RCC shows dissatisfaction for the water supply as it contains negative (-0.2) index value. On the contrary the eastern fringe shows neutral situation as it contains zero (0) index value. The remaining four zones show satisfaction for the water supply as they have the index value between the ranges of > 0 to 0.5. The level of satisfaction by zone of RCC is shown in the Map 6.8 also by ward in the Map C-8, Appendix-C.

Though the water supply is improved in each of the zones of RCC, the northern fringe shows dissatisfaction as majority of the citizens (64%) of this zone complained that the supplied water is impure. The eastern fringe also reveals the same complain (figure 6.2). This may be the reason for dissatisfaction and neutral situation in the northern and eastern fringe of RCC despite the improvement in the water supply.

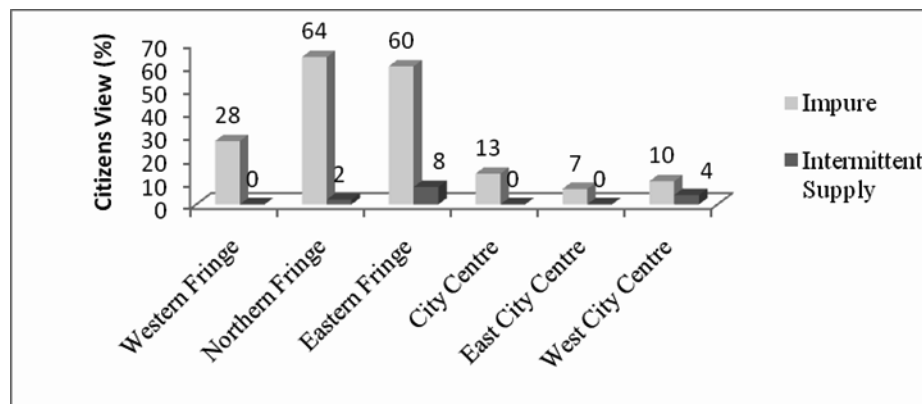
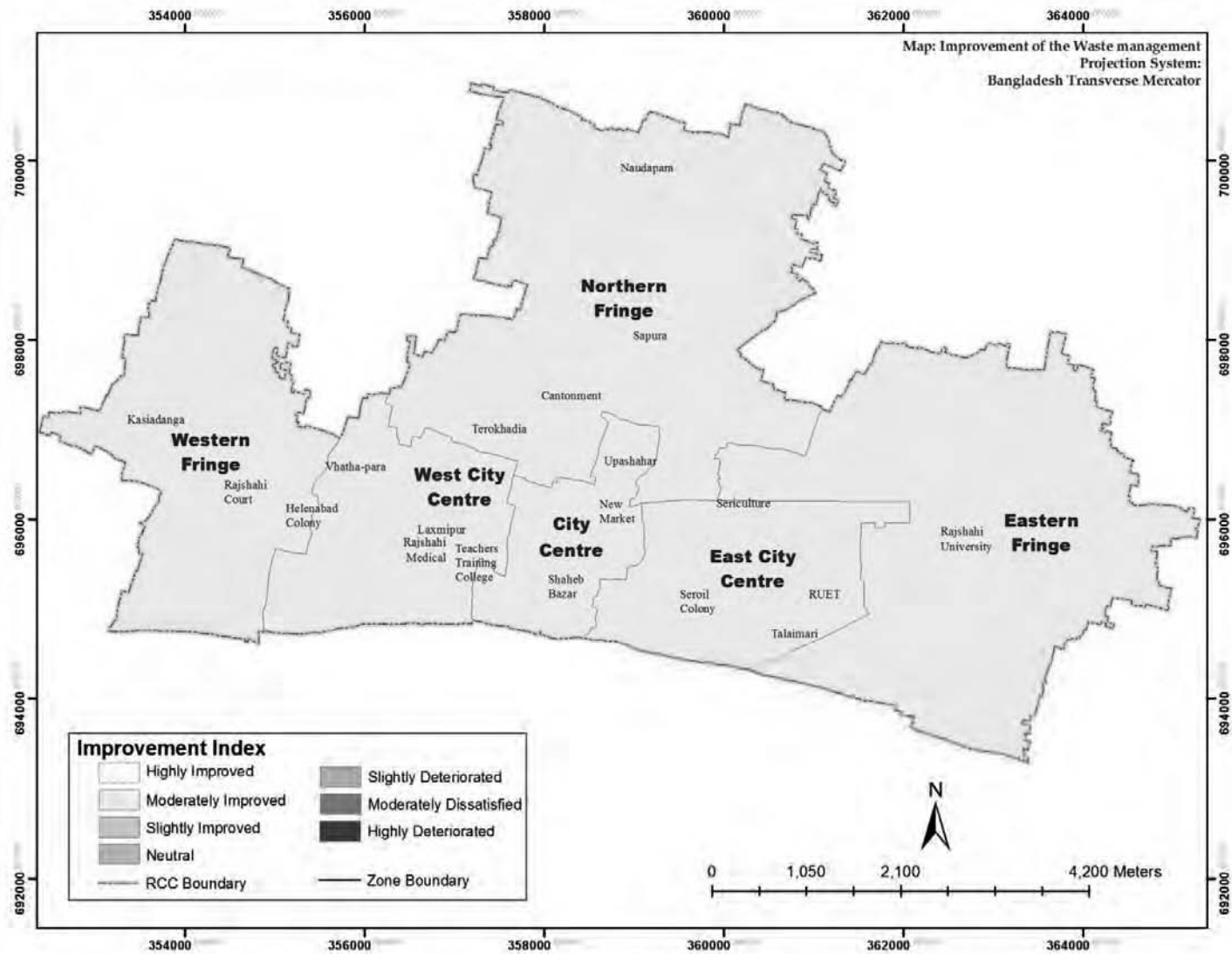


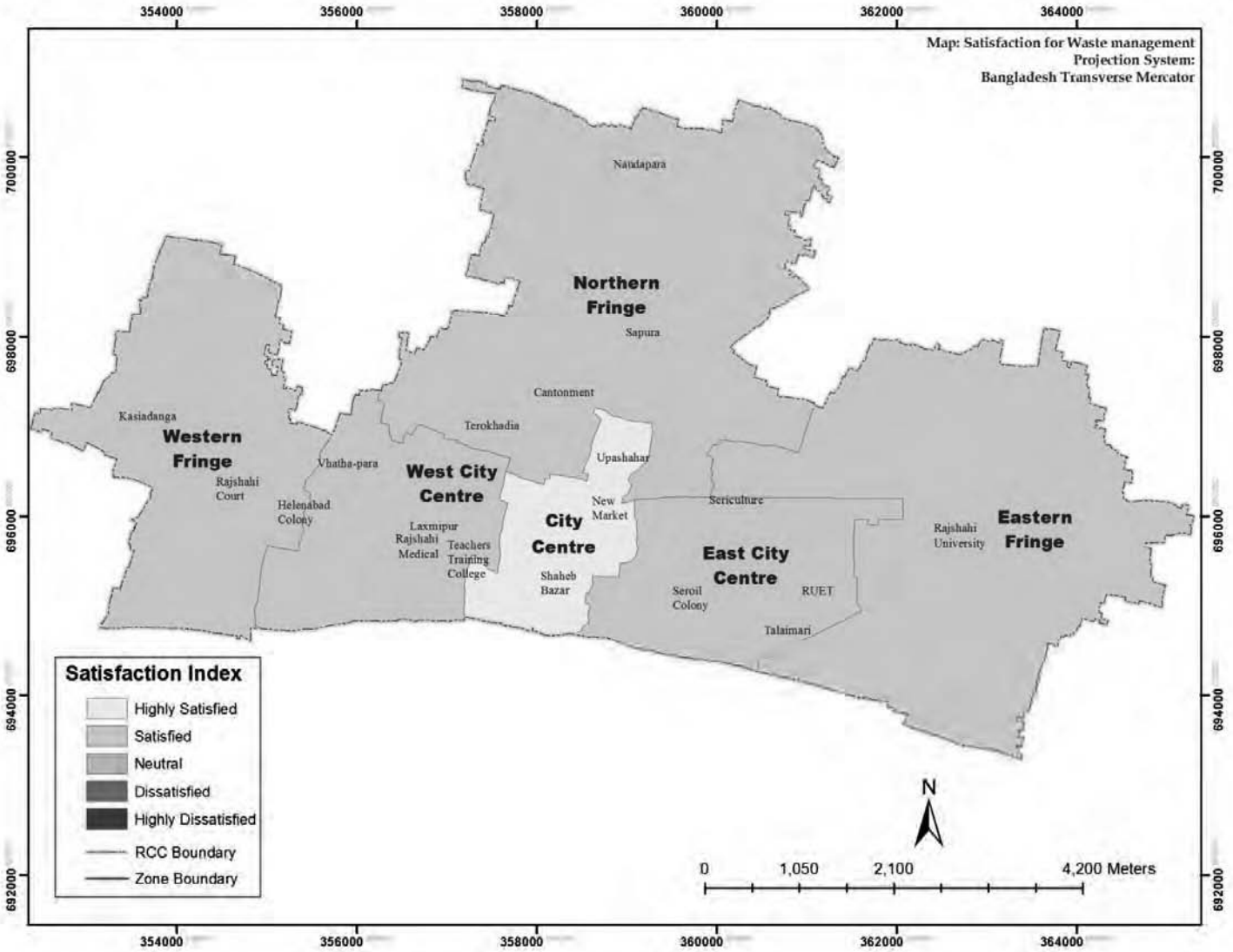
Figure 6.2: Problems with the Supplied Water of the Municipality
Source: Questionnaire Survey, 2013

Map 6.3: Improvement of the Waste Management System by Zone of RCC



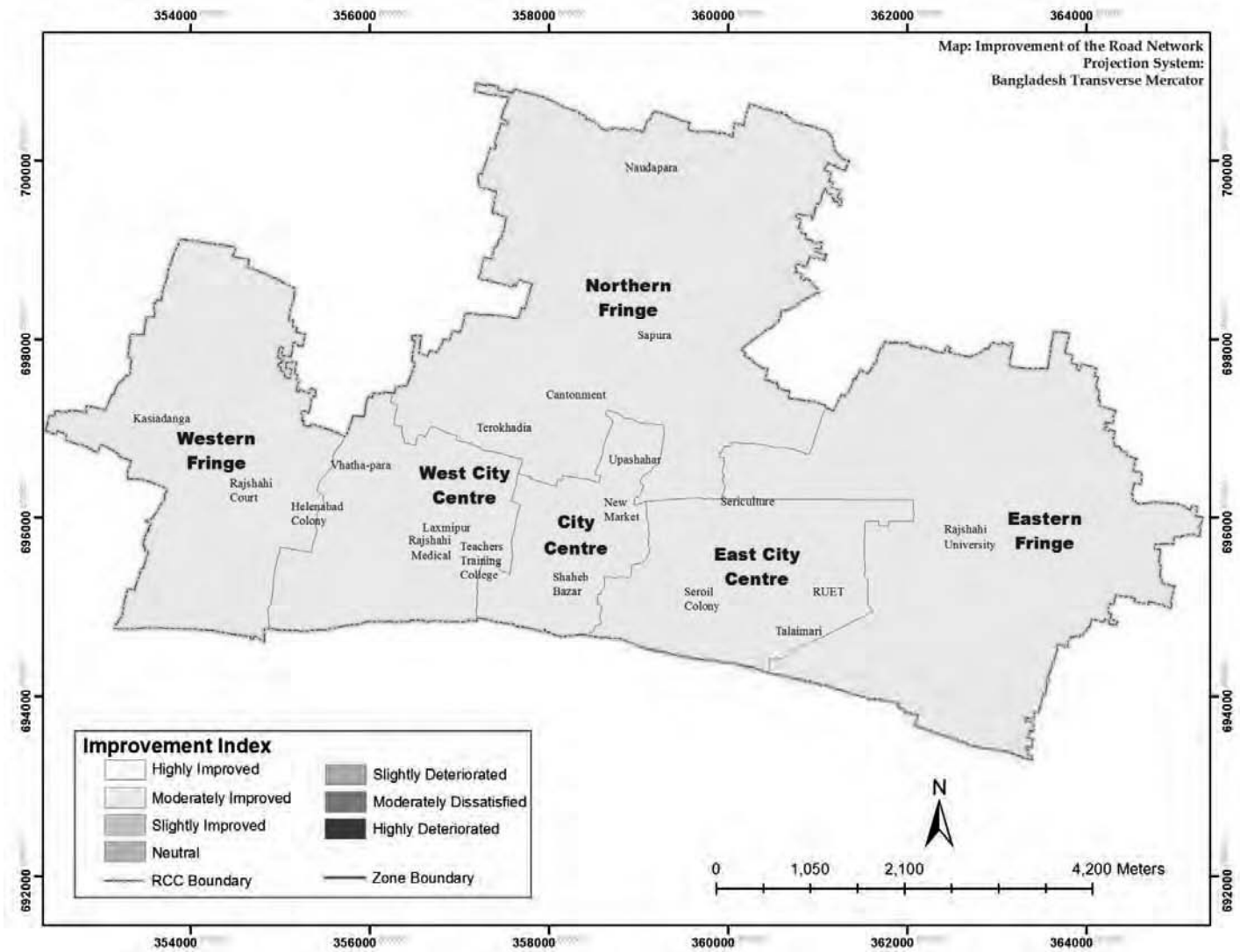
Source: Map Prepared by Researcher, 2014 & RDA

Map 6.4: Satisfaction for the Waste Management System by Zone of RCC



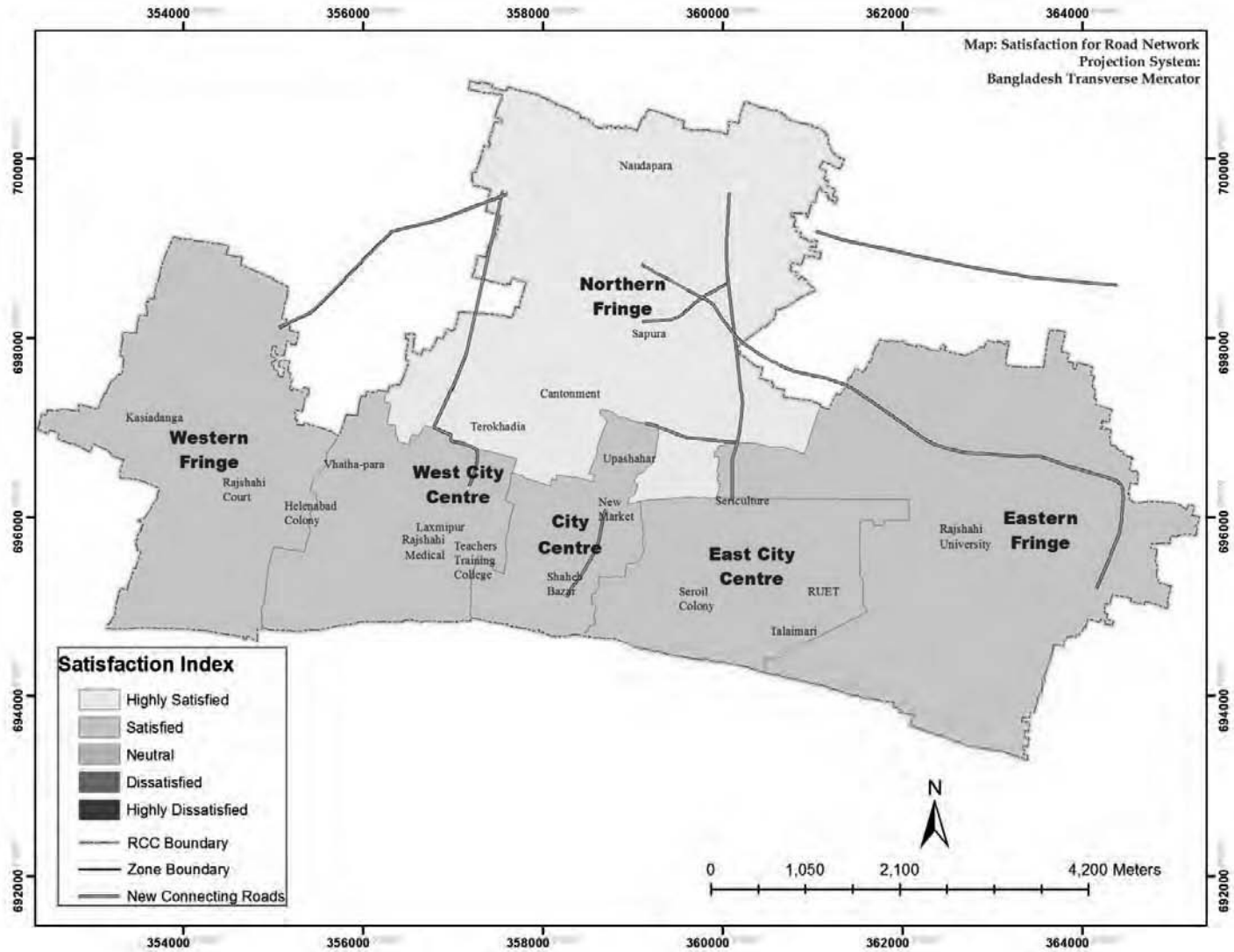
Source: Map Prepared by Researcher, 2014 & RDA

Map 6.5: Improvement of the Road Networks by Zone of RCC



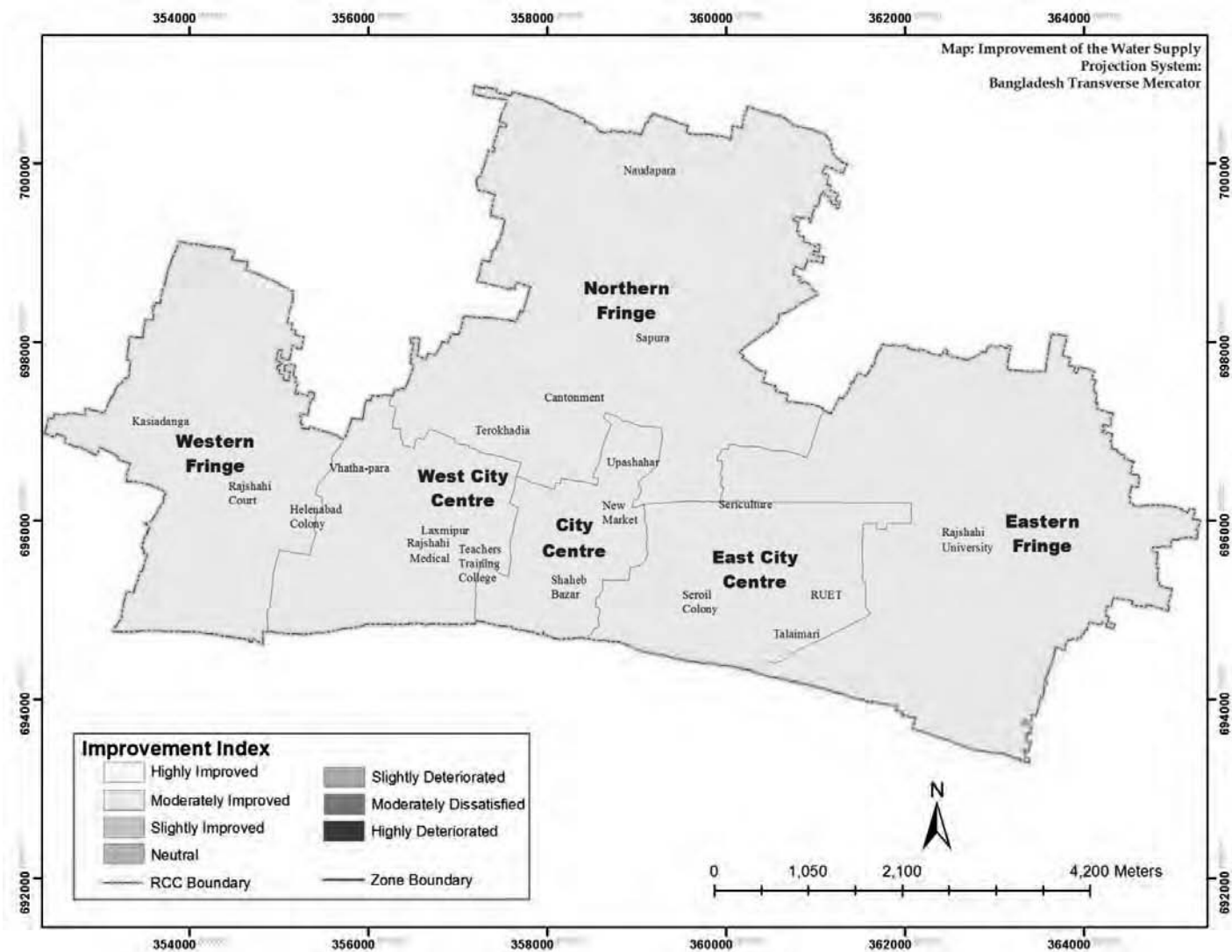
Source: Map Prepared by Researcher, 2014 & RDA

Map 6.6: Satisfaction for the Road Networks by Zone of RCC



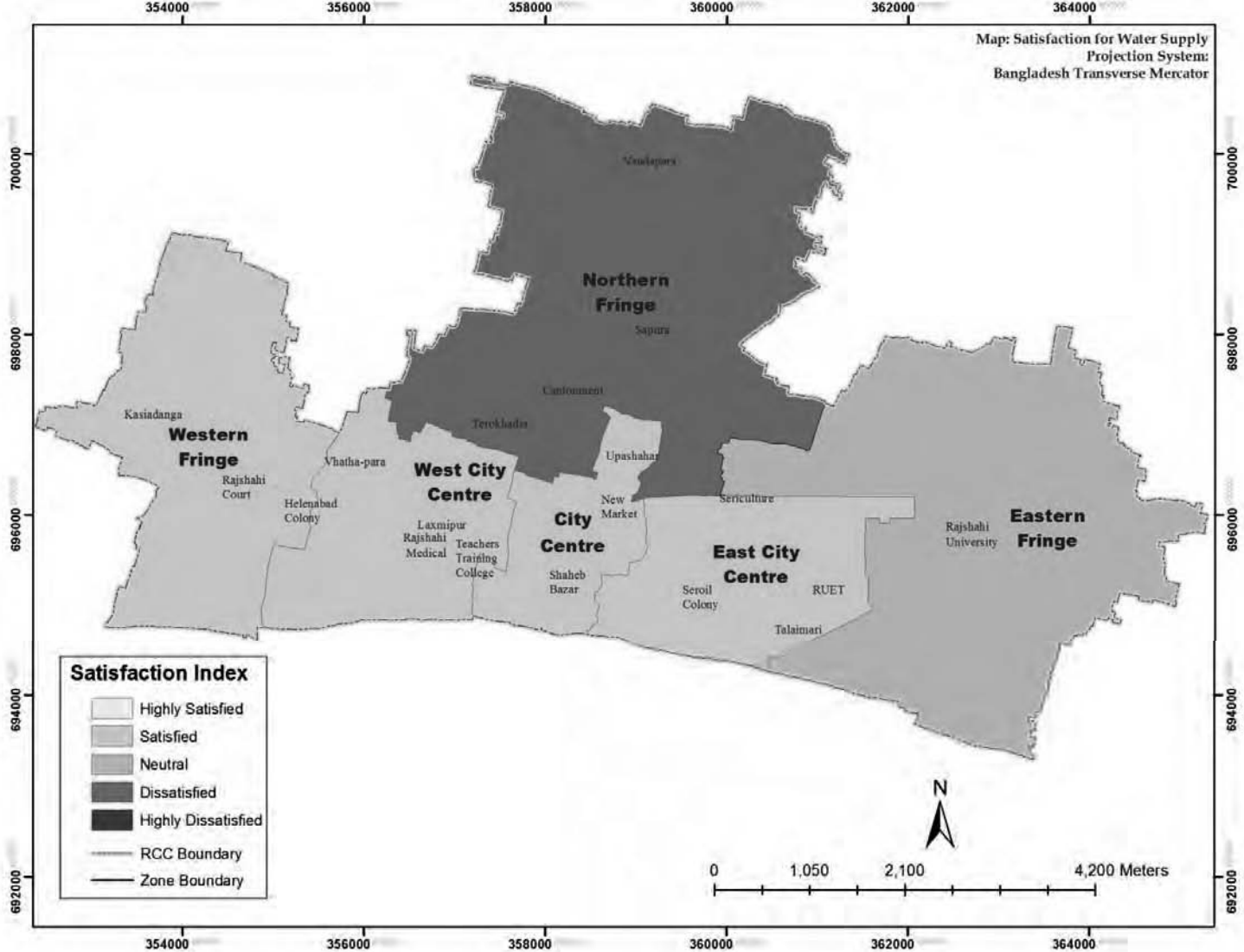
Source: Map Prepared by Researcher, 2014 & RDA

Map 6.7: Improvement of the Water Supply by Zone of RCC



Source: Map Prepared by Researcher, 2014 & RDA

Map 6.8: Satisfaction for the water supply by Zone of RCC



Source: Map Prepared by Researcher, 2014 & RDA

6.1.5 Perception for the Recreational Facilities

The recreational facilities are inadequate in Rajshahi City Corporation and the recreational areas occupy only 0.98% of the total city area. The citizens view also depicts that there is a limited recreational facilities within the city area that's why a majority of the citizens (72%) do not have the access to any recreational facilities (figure 6.3). The table 6.1 shows that the index value is 0 for all the zones of RCC that indicates no improvement in the provision of the recreational facilities. As there is limited access to the recreational facilities therefore the satisfaction index values are also negative (Table 6.2) that indicates the high dissatisfaction for this facility.

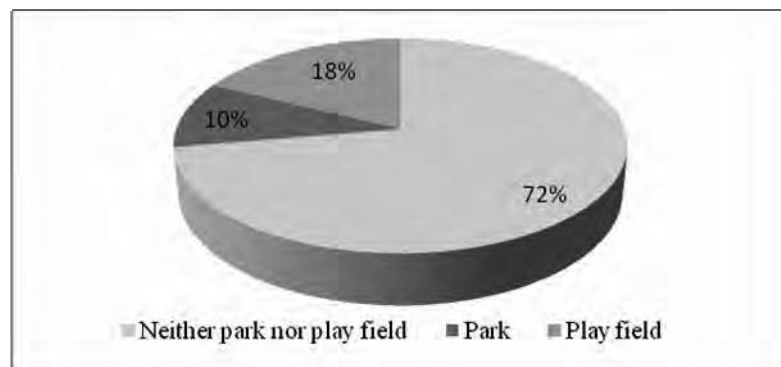


Figure 6.3: Access to Recreational Facilities in RCC area
Source: Questionnaire Survey, 2013

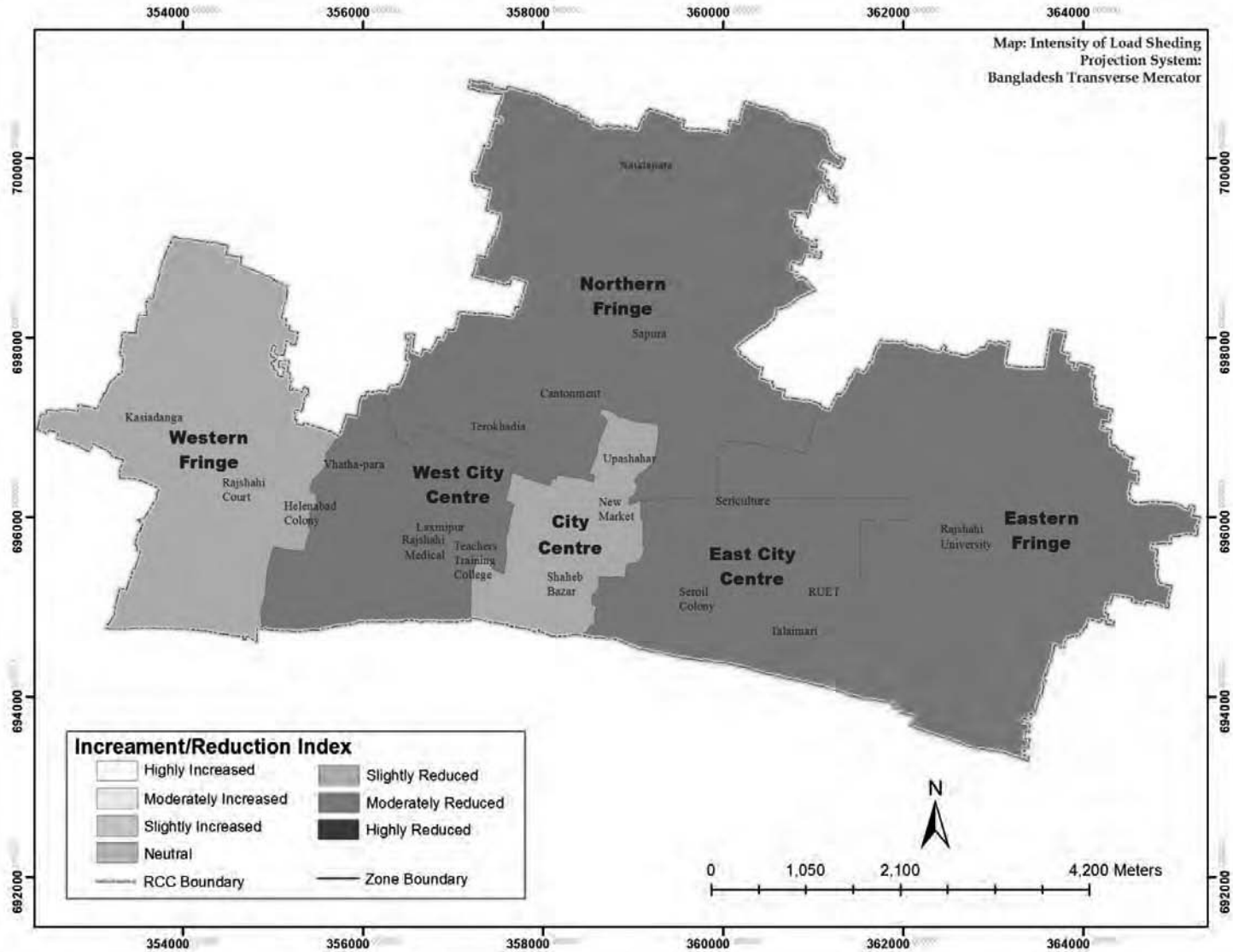
6.1.6 Perception for the Electricity

Rajshahi faced severe load shedding and low voltage that disrupted normal power based activities before the year 2012. After the establishment of two power stations at Katakhalī in 2011 the power problem is significantly solved. The citizen's view also depicts that the intensity of load shedding is moderately reduced in most of zones of RCC (Map 6.9).

From the table 6.2 it is evident that each of the zones has the positive index values between the ranges of > 0.0 to 0.5 that indicates the satisfaction for electricity. The level of satisfaction for electricity by zone of RCC is shown in the Map 6.10 also by ward in the Map C-10, Appendix-C.

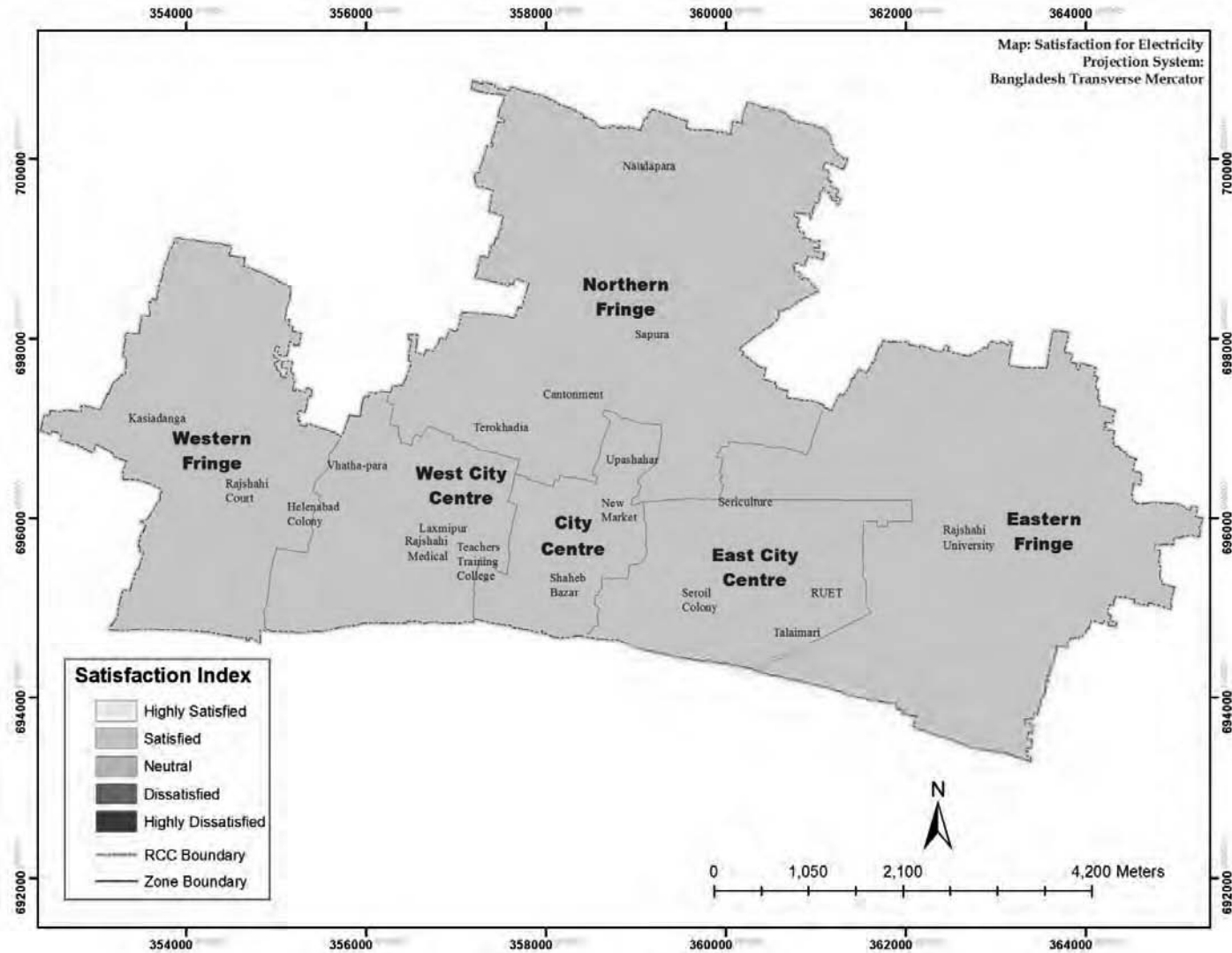
The improvement of the electricity is not a long history it started to improve basically from 2012 as the questionnaire survey was conducted in 2013 therefore the citizens view reveals satisfaction for the electricity.

Map 6.9: Intensity of Load Shedding by Zone of RCC



Source: Map Prepared by Researcher, 2014 & RDA

Map 6.10: Satisfaction for Electricity by Zone of RCC



Source: Map Prepared by Researcher, 2014 & RDA

6.1.7 Perception for the Community Centre

The Functional Master Plan proposed to develop a total 30 community centres one in each ward of the City Corporation. The plan was to enhance the ward commissioner's office as community centre so that it could be used for public meeting or gathering. The implementation status of the planning proposals and citizens' view depicts the same that till now no initiative is taken to develop any community centre. The table 6.1 and 6.2 shows the index values for the community center 0 and -1 respectively that indicates no improvement in the provision of this facility and high level of dissatisfaction for this.

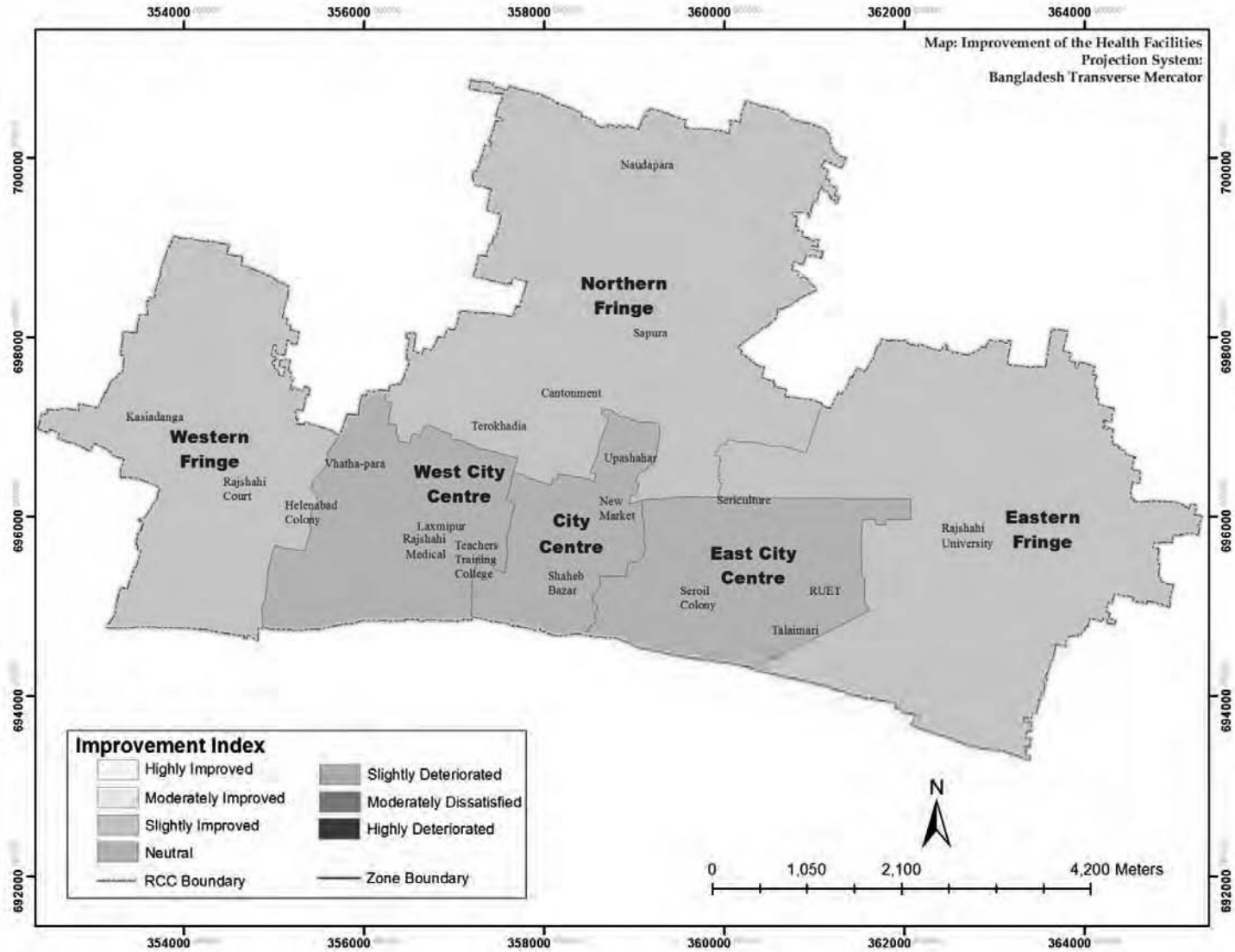
6.1.8 Perception for the Health Facilities

The city corporation is implementing Urban Primary Healthcare Project aimed at improving the maternal and child health but the projects are unable to cover of all the wards of RCC. The citizen's view depicts that a slight improvement is occurred in the fringe of the City Corporation area but the central city zones show no improvement as these contain zero index value (table 6.1).

The improvement of the health care facilities by zone is shown in the map 6.11 and by ward in the Map C-11, Appendix-C. On the contrary from the table 6.2 and map 6.12 it is evident that central city zones show dissatisfaction for the health facilities.

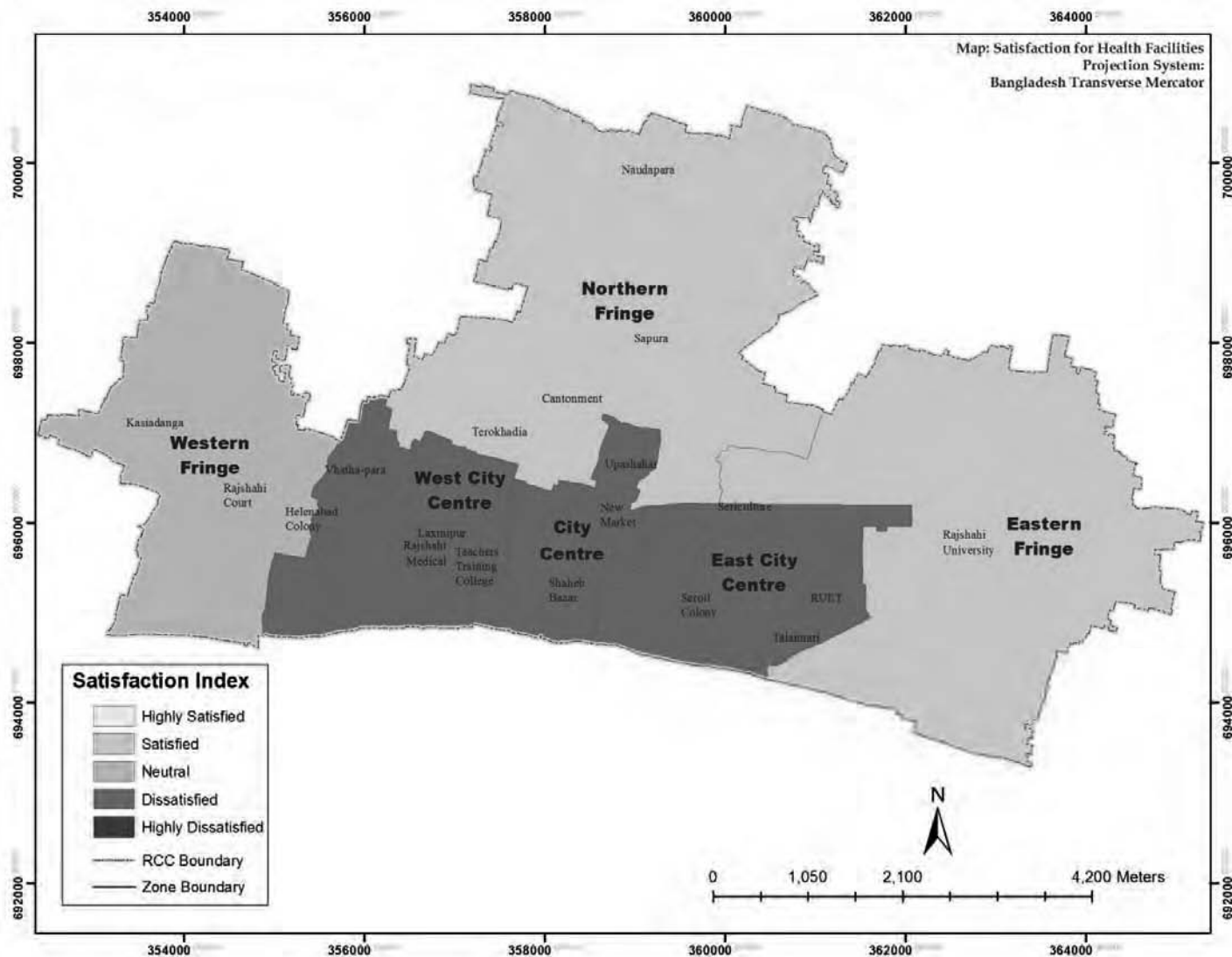
As Rajshahi Medical College Hospital is located at the city centre therefore a number of community clinics are providing health facilities at the fringe of the RCC area. This results satisfaction at the fringe of the city and the wards having community clinic show satisfaction for health facilities than the other wards (Appendix map C-12). So it can be concluded that the incorporation of the primary health care services have improved the health facilities in the city.

Map 6.11: Improvement of the Health Facilities by Zone of RCC



Source: Map Prepared by Researcher, 2014 & RDA

Map 6.12: Satisfaction for the Health Facilities by Zone of RCC



Source: Map Prepared by Researcher, 2014 & RDA

6.1.9 Perception for the Katcha Bazar

Availability to a nearby Katcha bazaar is very important for the daily life. In Rajshahi the katcha bazaars were not evenly distributed over the city area. Therefore the RMDP proposed to develop 20 katcha bazaars by the year 2014. The citizen's view shows that the katcha bazaar facilities are slightly increased only in the east city centre and eastern fringe of the city where areas it shows no change in the remaining four zones of RCC (map 6.13).

On the contrary table 6.2 shows that only two zones (east city centre and eastern fringe) having positive index value show satisfaction for this facility this is due slight increment in the provision of katcha bazaar facilities. The central area of the city and west of the city centre shows dissatisfaction as these are the congested part of the city but the facility is not adequate to meet the demand of the citizens. The level of satisfaction by zone is shown in the Map 6.14.

6.2 Overall Improvement of the Community Facilities

The overall improvement of the community facilities as assessed by the citizen's shows that among all the facilities the road network and waste management have the highest index value 1.8 that indicates moderate improvement (figure 6.4). On the contrary the water supply, drainage and health facilities are also improved but comparatively less while the community center, katcha bazaar and recreational facilities are unchanged as the index values are 0.

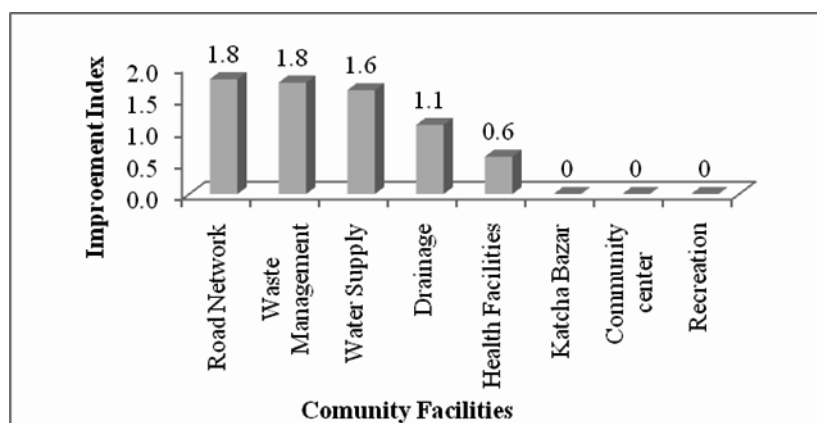
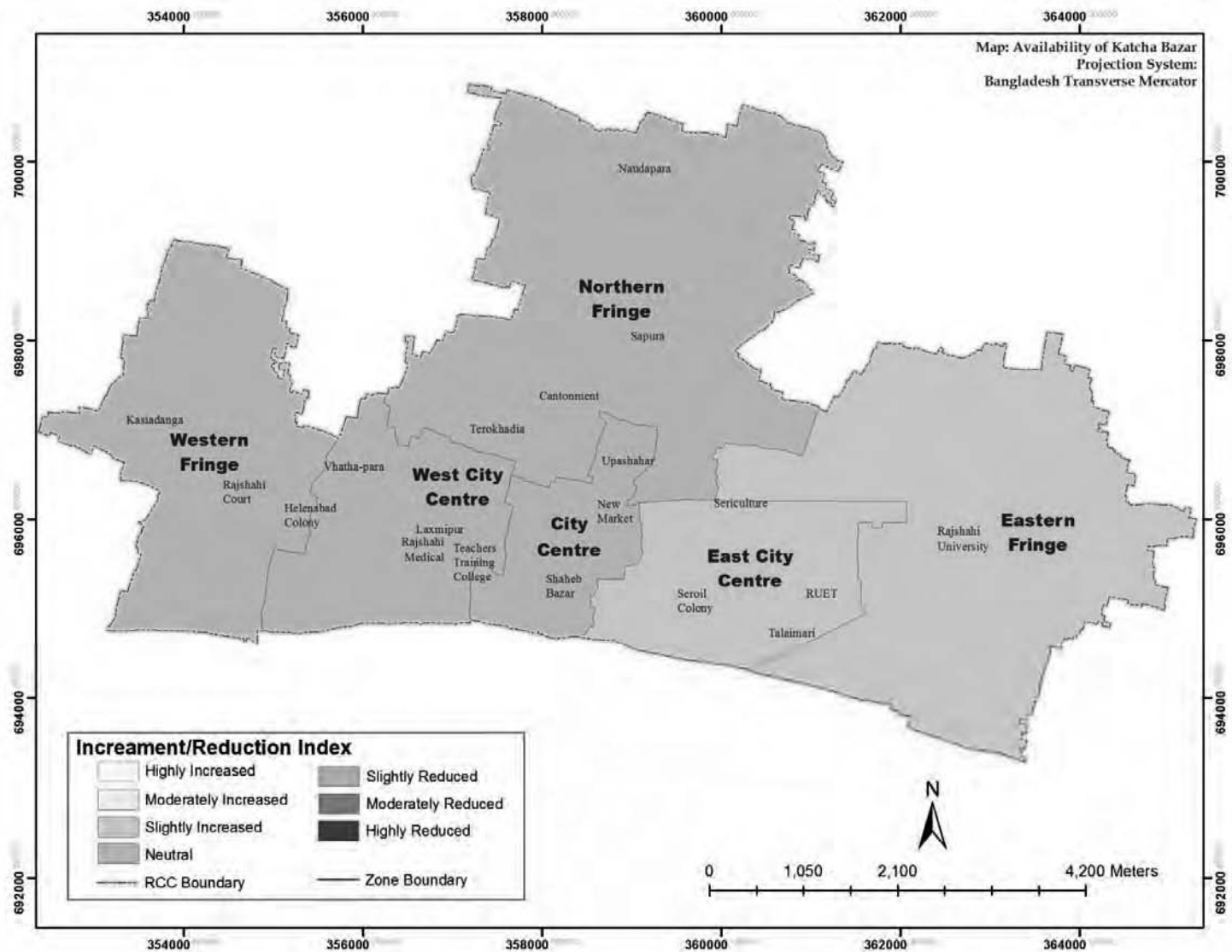


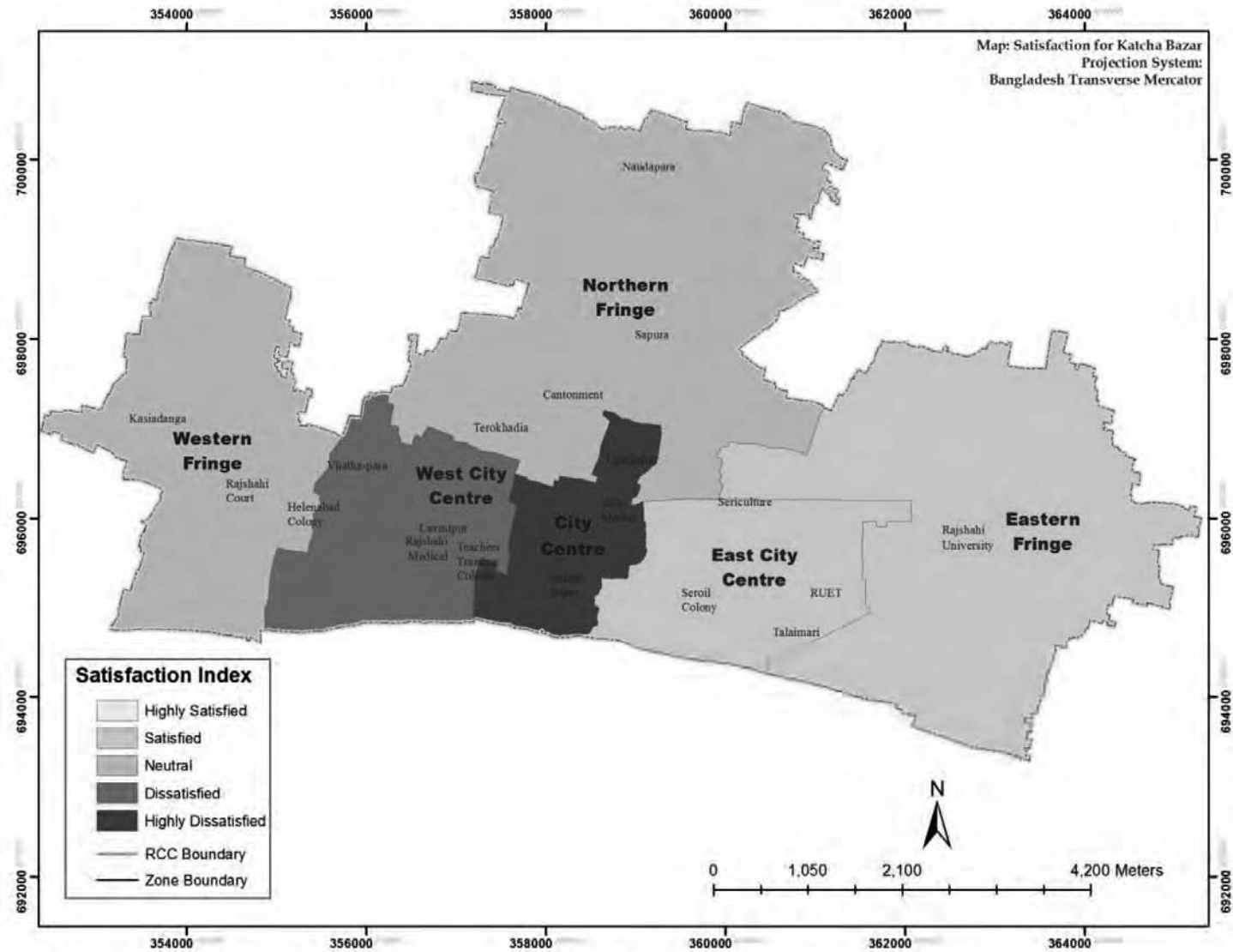
Figure 6.4: Improvement of the Community Facilities
Source: Questionnaire Survey, 2013

Map 6.13: Availability of the Katcha Bazaar Facilities by Zone of RCC



Source: Map Prepared by Researcher, 2014 & RDA

Map 6.14: Satisfaction for the Katcha Bazaar Facilities by Zone of RCC



Source: Map Prepared by Researcher, 2014 & RDA

6.3 Overall Satisfaction for the Community Facilities

The overall satisfaction for the community facilities as assessed by the citizen's show that among all the community facilities the citizens are satisfied with the road network, waste management and electricity as these contain positive index value. On the contrary the citizens are dissatisfied with the health facilities, drainage and community centers as these contain negative index values (figure 6.5)

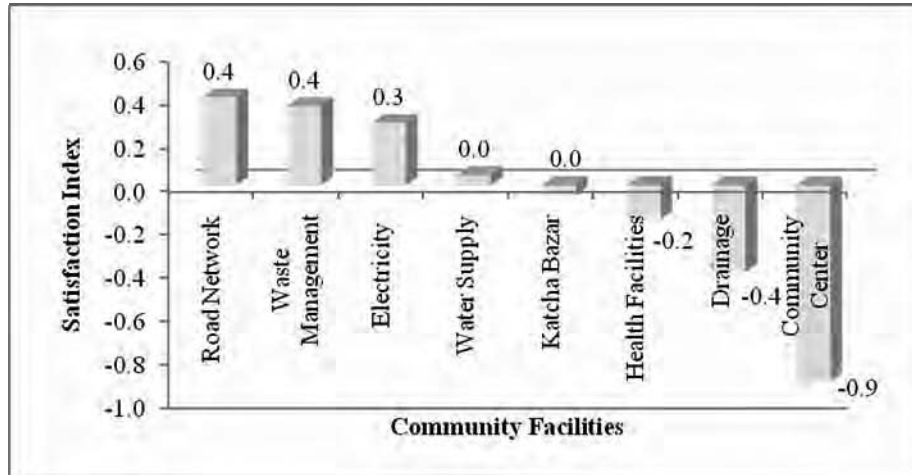


Figure 6.5: Satisfaction for the Community Facilities
Source: Questionnaire Survey, 2013

6.4 Overall Development of RCC

The citizen's view reveals that the development of the city was very slow during 2003-2007 but gradually the city is developing as the index value is increased from 1.46 to 2.4 (figure 6.6). The development index value by ward (Table C-3, Appendix-C) also indicates that each of the wards is developing though the rate is very sluggish. After all RCC shows an upward trend of development from very slow to moderate.

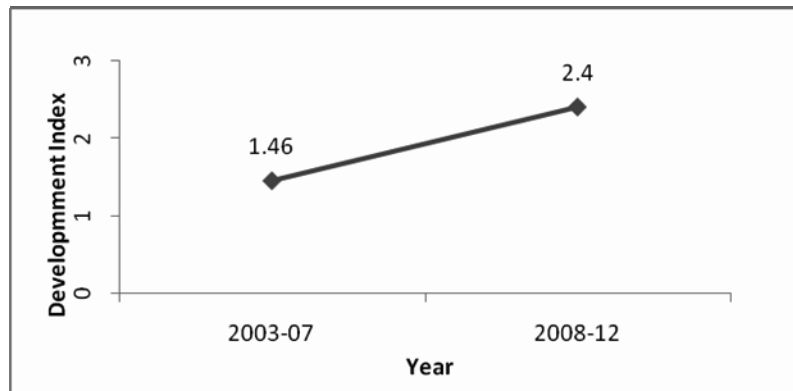


Figure 6.6: Overall Trend of Development of RCC
Source: Questionnaire Survey, 2013

Chapter 7: CONCLUSION

7.1 Summary Findings

The physical growth of the city is very slow and despite being a municipal area still a large part of the RCC area is being used for agricultural purpose. After declaration of City Corporation in 1991 the builtup area rapidly increased afterward it shows no remarkable change in the builtup area. The city shows sluggish growth both in terms of area and population and exhibits a low rate of urbanization compared to other major urban centers of Bangladesh. Lack of industrialization, trade, business, job opportunities and economic investments are the vital impediment for the development of the city.

A number of local level institutions are working for the development of the city. Among all these Rajshahi Development Authority (RDA) and Rajshahi City Corporation (RCC) are mainly responsible for the physical planning and development of the city. After the establishment of RDA, two master Plans were prepared in 1984 and 2004. A drainage Master Plan is also being implemented by RCC from 1999. Despite these efforts the city seems to be facing a lot of problems

The physical and infrastructural development pattern shows that over the last ten years the transport infrastructure specially the road networks of the city are improved significantly. A number of new roads are constructed, narrow roads are widened and missing footpaths are being constructed along the major roads of the city.

The industrial base of the city is very poor and no major industrial development is occurred over the years. Rajshahi was famous for quality silk production but it has lost its glory. As Rajshahi is famous for quality mango production and a significant portion of the city area is still being used for agricultural purposes. Therefore, the city has a big opportunity to flourish the industrial development by establishing agro based and mango based industry.

Among all the social and community facilities the water supply and waste management system of the city is improved significantly. The coverage of the drainage networks is slightly

increased but the drainage condition is not satisfactory as most of the citizens face both the drainage and water logging problem.

The study shows no remarkable development in the provision of recreational facilities (Play field, community parks), education, community centres and katcha bazars. But the power problem of the city is reduced significantly over the last two years.

The review of the Rajshahi Metropolitan Development Plan and Detail Area Plan shows that a number of planning proposals (for housing, road networks, drainage, water supply, education, health, recreation, industry) were formulated for the development of the city. Among all these only the roads are being partially implemented and some of the housing projects are being developed. No other facilities are being provided according to the planning guidelines. The overall achievement of the Master Plan is approximate 20%-25% (Town Planner, RDA).

The review of the Drainage Master Plan shows that the coverage of the drainage networks is increased but still deficient. The budget of the master plan was too small to execute all the drainage components. In addition to this the authority also faces the problem of skilled manpower, technical support and political pressure etc. Therefore the plan is not being implemented according to the planning guidelines. Among all the proposed drainage components approximate 30% is achieved (Executive Engineer, RCC).

The citizens view regarding the quality of the available community facilities show that the road networks and waste management system is moderately improved and the citizens are satisfied with these facilities. But there is no improvement in the provision of community centre, katcha bazaar and recreational facilities therefore shows high dissatisfaction for these facilities.

Finally it shows that the local level institutions are not functioning properly for the development of the city and have failed to implement the plans in accordance to the planning guidelines. Lack of finance, monitoring, coordination, skilled man power, modern office and equipments are identified as the obstacles in the implementation of the planning proposals.

7.2 Recommendations

From the study it is obvious that the economic base of the city is very poor and the physical growth of the city is very sluggish. The overall economic development of a country depends on mainly agriculture, industry, trade and service sectors. In Bangladesh economy, the role played by the agriculture sector is tremendous than the other sectors (Bakshi, 2005). In this respect Rajshahi has a great opportunity to strengthen the economic base of the city as a significant portion of RCC area and its surrounding is being used for agricultural purposes. The following sub-sectors are identified as thrust sub sectors for promoting industry for overall economic development of the RCC area and its surrounding:

- Mango-based industries: Juice, Chutney, Sauces and Pickles, Mango Bar, Candy, Jam, Pulp, etc.
- Agro-based industries: Food processing, Sugar, Livestock, Poultry etc.
- Sericulture and Silk Industry
- Textiles
- In addition to these the Padma River bank might be developed as a main recreation zone to attract tourists.

Without agricultural and rural development it is not viable to ensure balanced economic growth or, if it succeeds, would create severe internal imbalances in the economy such as widespread poverty, inequality and unemployment. In applied economic theory, it is said that to achieve the acceleration of economic growth either balanced growth approach or a big push approach should be followed in a formal manner. Therefore, first of all a sound relationships or linkages between industrial sector and agricultural sector should be maintained in order to achieve economic wellbeing (RKD, 2011).

Rajshahi is one of the prominent cities in the northern region of Bangladesh. It could be a major economic hub in the northern region of Bangladesh if the economic opportunities are created. But over the years no major industrial development has taken place; thus the economic base of the city remains poor. Lack of natural gas, adequate power supply and poor infrastructures were identified as the obstacles of industrial development in Rajshahi. This study reveals that the city has overcome these shortfalls significantly. From the year 2014 the city has the access to natural gas; the power problem is mostly solved due the establishment of two power plants at Katakali adjacent to RCC area and the transport infrastructures of the city has improved significantly.

The city occupies potential urban fringe, its land value is low and climate is favorable to quality mango and silk production. It also produces adequate crops including food-grains, fruits and vegetables and also has the opportunity to get low cost labor from the surrounding districts. So it is evident that the RCC has a number of strengths and opportunities to flourish the economic base of the city by establishing agro based and mango based industries. The functional master plan proposed for the establishment of an EPZ but no initiative has been taken yet. If necessary actions are taken by the government to establish different factories related to agriculture through a well developed industrial park large volume of employment opportunities can be created for those who are unemployed not only in this city but other districts in the northern region of Bangladesh.

The experiences of the neighboring countries of Bangladesh could be applied to strengthen the economic base of the city. Fifty years ago, the city-state of Singapore was an undeveloped country with a GDP per capita of less than US \$320. Today, it is one of the world's fastest growing economies. One of the keys to Singaporean development was the upgrading of infrastructure, streets, roads, an airport and port facilities (Zhou, 2014). The strategy was also to improve the training of Singaporean workers through government training institutes (Watkins, 2014). In Malaysia, in the early phase of development agriculture was the main source of growth. Presently exports play a dominant role in the Malaysian economy and are traditionally the most important determinant of the state of economic activity over the short and medium terms (Yusof, 2008).

Being agrarian is not a problem of RCC to be economically backward rather it is a great prospect to enhance the economic base of the city. It only lacks government intervention and local entrepreneur. To attract the foreign direct investment first of all the airport facilities should be improved and the EPZ should be established as soon as possible. To encourage the local entrepreneurs concession may be allowed in the form of remission of local rates/taxes, easy and low charges on government loans for industrial development. The entrepreneurs could also be persuaded through the establishment of industrial estates on favorable sites with the development of roads, railway, port facilities and provision of water supply, electricity, gas etc. The enhancement of the economic opportunities will attract more rural migrants that in turn will reduce the pressure on the major urban centres especially the Dhaka City.

From the study it is also obvious that the planning proposals are not being implemented properly and the local level institutions are facing a lot of problems in executing the plans.

Therefore, the following recommendations may be taken into account to be successful in the implementation of the planning proposals:

Ensure Coordination among the Local Level Institutions

RDA is the custodian of all the plan packages but is not responsible for the implementation of all the planning proposals. A large number of local level institutions are working for the development of the city and are responsible for the execution of dissimilar facilities. For example provision of Education and health facilities lies with the department of education and health; provision of recreation facilities, katcha bazaar, community centers and waste management lies with RCC.

The RTDA Ordinance empowers RDA to ask other urban management agencies to prepare their respective plans for the development of the city (RTDA, 1976). But the Development Authority prepares Master Plans independently without consultation to other local level institutions. At the end of preparation of the Master Plans, RDA sends a copy to each of the local level institutions afterward it does not keep any record whether the proposed facilities are being implemented or not. Lack of involvement make them indifferent and do not create sense of belongingness in the execution of the proposed facilities. Thus a number of facilities are not being implemented. The successful implementation of the planning proposals is only possible if the local level institutions work collectively.

So it is imperative to form a coordination body comprising representatives from all the development and service agencies working in the city area headed by the chairman of RDA. Representatives from civil society and professional bodies can be included in the committee to ensure better governance. The involvement of the local level institutions from the plan making to the implementation phase could speed up the coordination among them. The flow chart to ensure coordination could be as follows (figure 7.1):

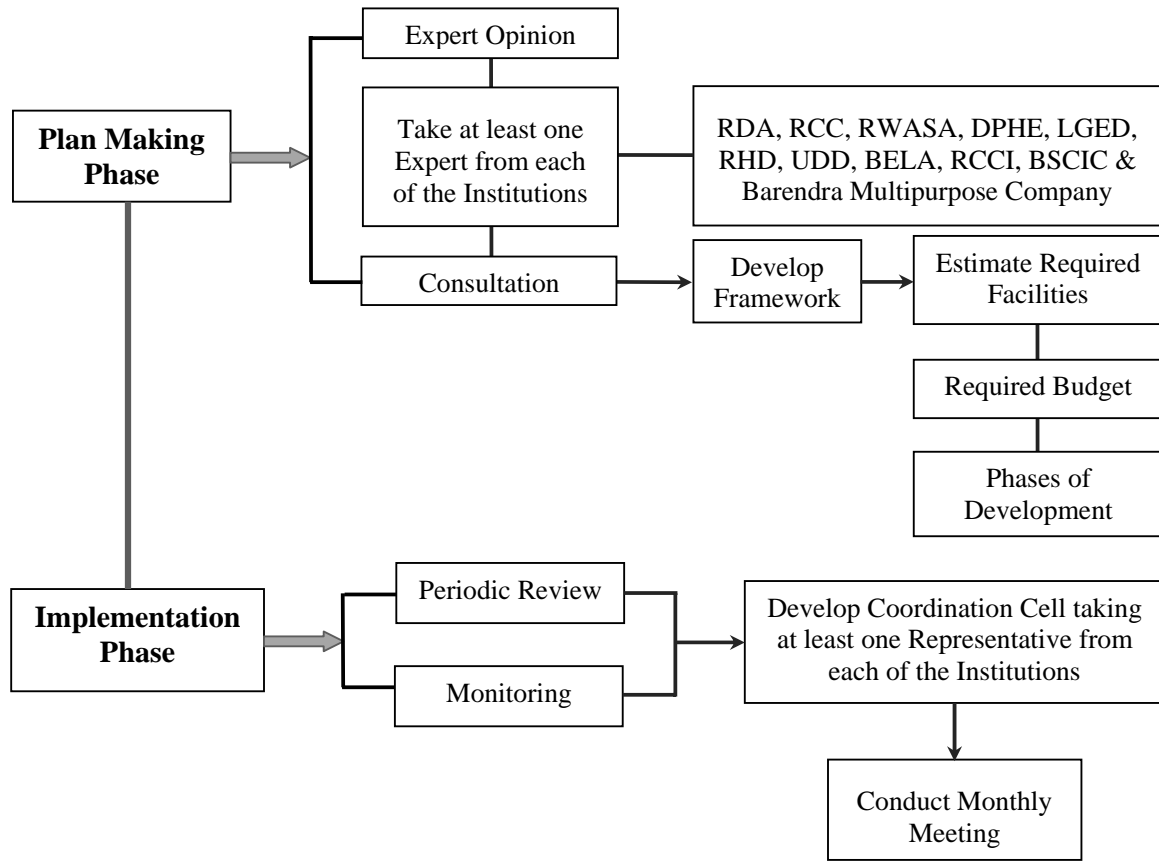


Figure 7.1: Framework of Institutional Coordination

Strengthen Institutional Capacity

RDA is not only the custodian of plan, it also directly implements a number of development projects and it should also monitor the implementation and development projects of other agencies. To handle large volume of works adequate manpower is required in the Planning section, Engineering section and Authorized Section. But the authority lacks adequate manpower thus it becomes very difficult to monitor, revise or update the plans, execute development works and control the development like building constructions. Thus the existing manpower position of the different sections should be substantially raised. Another remarkable feature is that the development authority has no proper institutional set up for Urban Planners; as they do have the same for the Engineers. In most cases, the planners work under the Engineers; thus they do not get visionary planning direction, guidance and aspirations for the activities they undertake. Therefore, the Development Authority should recruit enough planning professionals in its regular set-up for increasing its institutional

capacity. Planners should be appointed in the key positions of town planning and development control.

Beyond this to raise working capacity, training programs should be organized and modern office and working equipment should be installed. Use of modern technology will increase working efficiency and finally expedite decision making process. For the efficient management and development control, it is necessary to develop and update a strong GIS data base of each parcel of land and its land use. In addition the development authority should increase access to the Aerial photograph and Satellite images that will help to monitor the growth and development of the city in a cost effective way. Adequate database, cross checking of data, frequent field supervision and provision of accountability should be regularized and made compulsory. Provision of strong penalty in case of default or violation of the planning rules and standards should be enforced to expedite planned development.

Ensure Public Participation

Planning and development should conform to the expectation of the citizens. For this, their active participation in certain stages is very effective, by which some hurdles of development activities can be eliminated. Therefore public participation in preparing Master Plan should be a key agenda for any city development authority. But till now there is no provision of public participation in the Rajshahi Town Development Authority Ordinance. Therefore the citizen's desires and views are not reflected in the plans that have been undertaken. However it is essential to include the people's participation during the planning stage rather than hanging the map after completion of the proposals for citizen's opinion. The following options can be considered to create more space in the planning process for the citizens:

- *Community Briefings-* An important step in the public participation process is to establish contact with key constituencies in Bangladesh: community groups, building industry groups, environmental organizations, the Chamber of Commerce, and other relevant parties. The neighborhood and business groups may provide excellent leveraging opportunities for the planning team to keep community members informed and gain feedback.
- *Focus Group Discussion-* Focus groups enable qualitative discussions with a small number of randomly selected people, brought together to discuss potential choices, especially in designing and evaluating alternatives and a preferred plan.

- *Children and Youth Program*- One of the most effective public outreach techniques is the involvement of local schools. This may involve activities in which children either participate directly or serve as the conduit of information to their parents. Drawing pictures and making collages of their favorite and least favorite places, making plans for neighborhoods and districts; writing essays about community issues and their visions for the future of the city and/or responding to questionnaires, the young children can communicate to the Development Authority about the type of city they practically would like to live.
- *Newsletters*- A newsletter is an excellent medium for informing the public updating the process and describing how people should participate in planning and development. It can present schedules, information about community workshops, key issues, alternative plans, and policy recommendations. The newsletters may emphasize graphics, photos, and illustrations in order to be eye-catching and make the planning concepts easily understood.

Formation of Monitoring Cell

The existence of a monitoring cell can expedite planned and phased development of the city. Therefore, it is very important to form a monitoring cell to be successful in the implementation of the planning proposals. The cell should be formed taking at least one representative from each of the local level institutions. Successful monitoring is not just about generating information. It is also about creating institutional mechanism through which monitoring can inform development and implementation of policy. Prior to formation of the monitoring cell the framework should be developed regarding the frequency and levels of monitoring and the parameters against which monitoring is to be done. The monitoring cell will help to identify the progress of work and to resolve bottlenecks of implementation. To ensure transparency and accountability the cell should include town planner, environmentalist, geographer, social worker, engineer etc.

Reduction of Dependency on the Central Government

Dependency on the central government for the project approval and finance slow down the implementation process. Once the gazette notification is completed the Development Authority should be free to execute the projects in accordance to priority. The development authority has to depend on the central government for finance that is also a major impediment

in the implementation of the planning proposals. The financial dependency can be reduced by involving the private sector in revenue collection. Imposition of betterment fee can also be a big source to raise income. In addition to these the development authority should undertake more housing and commercial projects as a cost saving approach to the development.

Preparation of Realistic DAPs and Ensuring Periodic Review

The plans should be realistic and not imaginary so that the plans can be executed. The Spatial Planning Zones of the DAP blocks only included the proposed facilities but the plans did not indicate the exact plots where the facilities will be provided. In addition no justifications were provided behind the provision of the facilities. Therefore the proposed facilities are not implemented yet. The DAPs should be prepared by investigating the physical environment and consultation with the local peoples so that the proposed facilities can be implemented. In addition it only proposed that the plans would be reviewed in every five years but provided no framework of revision. Thus to ensure periodic review a framework should be developed regarding the procedure of revision.

Reform Institutional Power and Status

Among all the local level institutions RCC and RDA are mainly responsible for the physical development of the city. These two agencies are functioning under two different ministries and also lack coordination therefore it becomes impossible to work collectively. The conflict arises when working together. Though RDA is the custodian of the plans the power/position of the City Mayor is more than the chairman of RDA. Therefore the chairman of RDA cannot enforce planning decisions on City Corporation. . Therefore, power and status of institutions should match the functions conferred on them in order to be successful in the implementation of the plans.

Amendment of the Rajshahi Town Development Authority Ordinance, 1976: In order to ensure effective implementation of the plans there is need to make reform of many of the provisions of the existing legal document, RTDA Ordinance. Among all these it is necessary to bring change in the realization of betterment fee and incorporate the provision of participatory planning for the successful implementation of the plans.

7.3 Conclusion

The physical growth of Rajshahi is very slow but the city has potential urban fringe for future expansion. It is not as populated as other major urban centers of Bangladesh. If the local level institutions could overcome the obstacles in the execution of the planning proposals and function properly then it would be possible to develop the city in a planned way. Due to the implementation of the functional Master Plan the road networks of the city has improved significantly. The improved road networks and the incorporation of gas facilities from the year 2014 has created the opportunity for industrial and commercial activities in the city. Presently two master plans are being implemented by RDA and RCC but the planning proposals are not being implemented according to the planning guidelines as the local level institutions are facing a lot of problems such as technical, financial, institutional and political. To overcome the problems in the execution of the planning proposals the coordination among the local level institutions is urgent. Citizen's views should also be considered in providing the community facilities in unprivileged city zones.