Resource management for Sustainable Development: Community and GIS based Approach

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Background

Proper policy and planning is indispensable for sustainable rural development and poverty eradication.

This requires thorough information of human and natural resources of the target region including the involvement of community people.

The community people can identify such resources using Participatory Rural Appraisal (PRA) and Focus Group Discussion (FGD) methods.

The availability and shortage of resources in a framework is convenient to locate using GIS and participatory tool like resource mapping.

Resource mapping is a participatory exercise involving all local stakeholders in order to produce detailed local maps (CS Mouza Map), showing all the available natural resources

Objectives

To prepare the resource map by community involvement and to assess the stakeholders status.

To find the pattern of land types existing and estimate the use of land in natural resources

To find out the distribution of water bodies and financial returns from this natural resources

To know the community attitude of all level of stakeholders using PRA and FGD towards resource management for sustainable development

Haor Resources

The areas under part of northeast portion of greater Sylhet region and a part of greater Mymensingh are termed as haor areas.

The unfavorable availability of water in the rainy season and scarcity of water in the dry season are the common phenomenon of the haor areas.

The haor areas are affected by the flash flood that comes from the hilly areas of the Indian upstream side on it's north causing huge damage to the boro-paddy (especially due to early flood) during mid-April.

Study Area

Jagannathpur, the third largest Upazila of Sunamganj district in respect of population, came into existence in 1922. The Upazila occupies of an area of 368.27 sq.km including 2.95-sq.km river area.

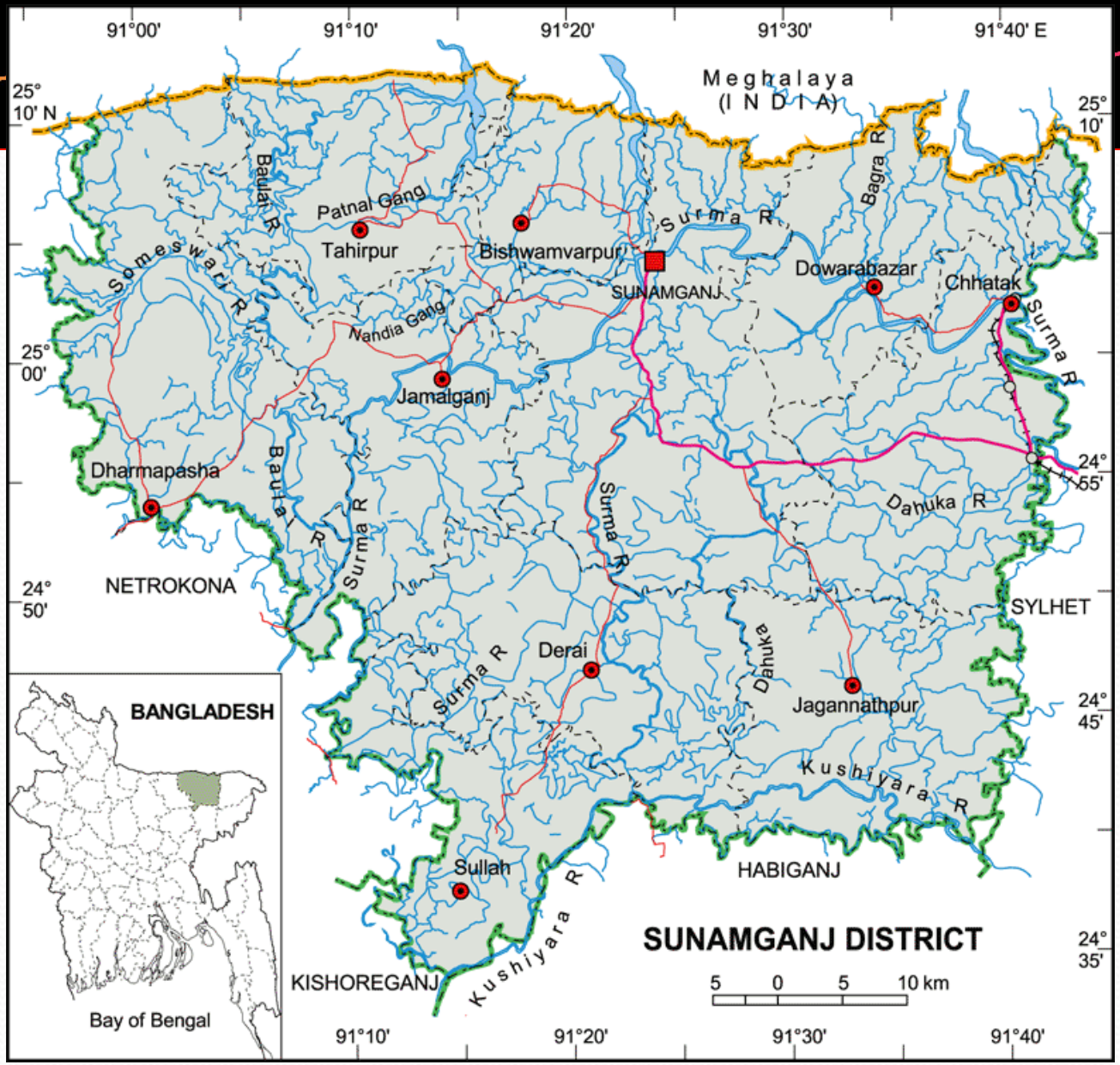

Figure 1. Location of Jaganathpur Upazila in sunamganj district

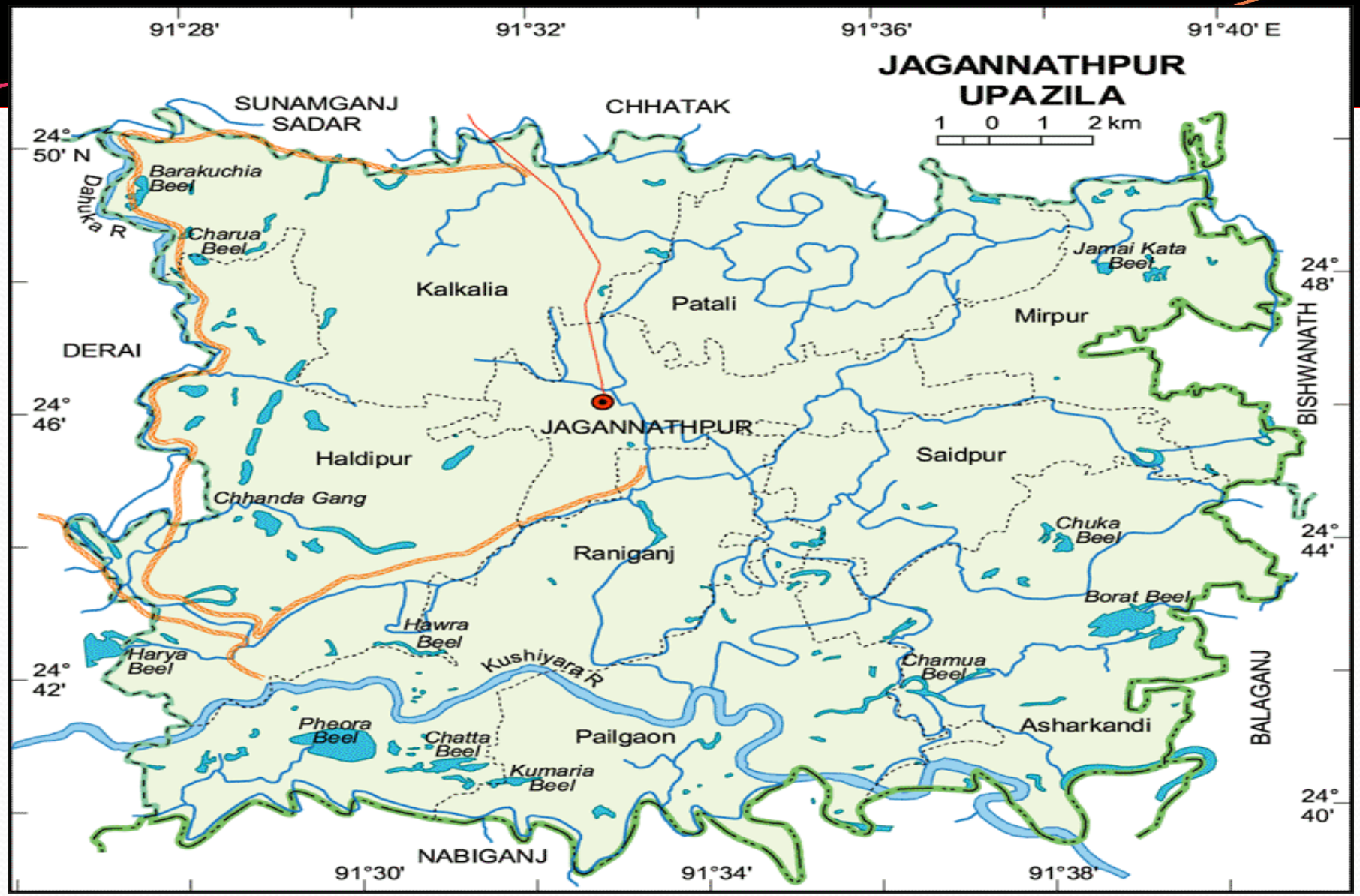

Figure 2. Unions of Jaganathpur Upazila

The Methodology

- ***The Conceptual Framework***
- ***Resource map preparation on original Mouza map through PRA***
- ***Triangulation***
- ***Associate Group Formation***
- ***Map Digitization using Arc view and Arc info***

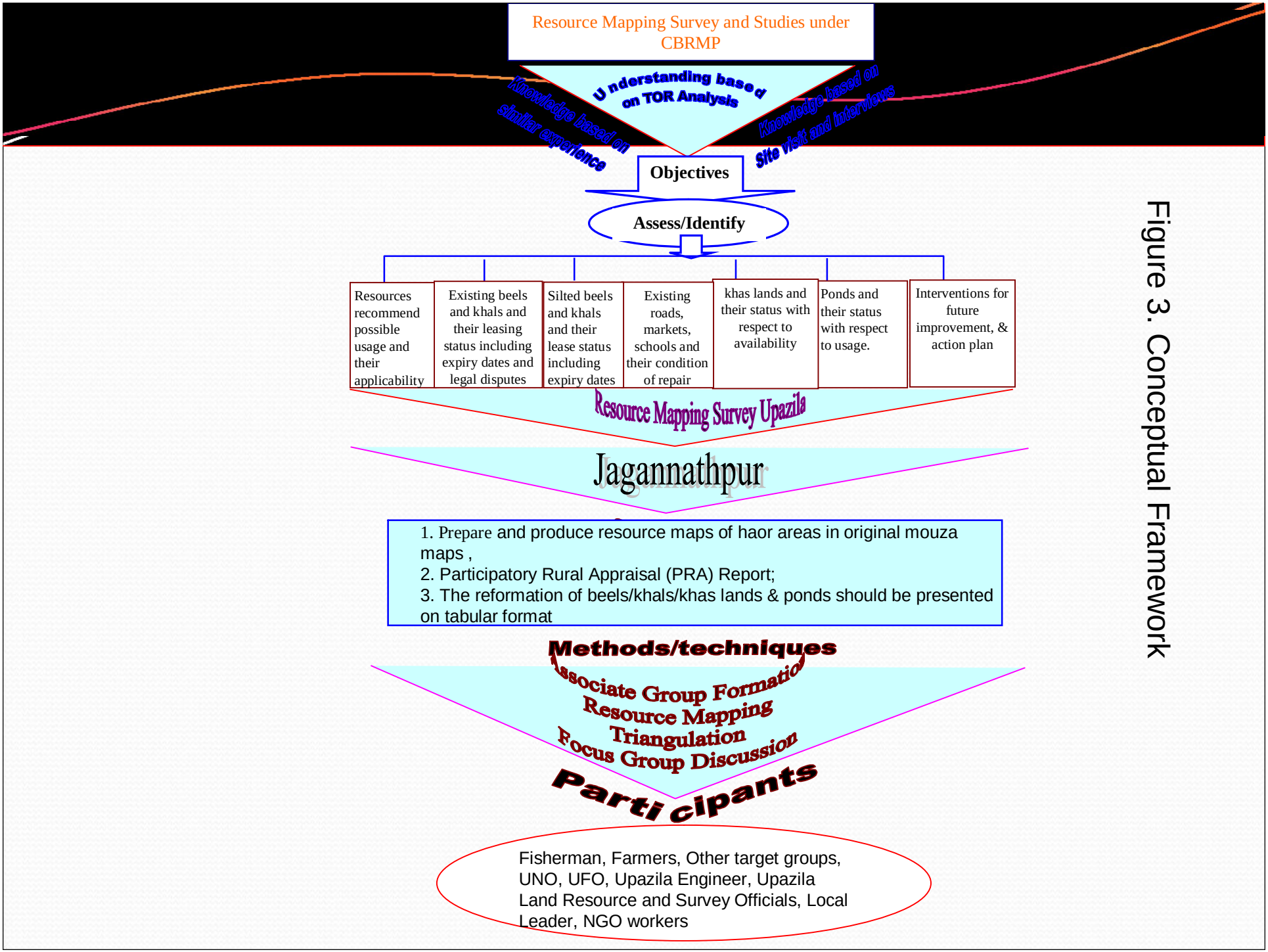

Figure 3. Conceptual Framework

Figure 4. PRA for resource mapping with participants

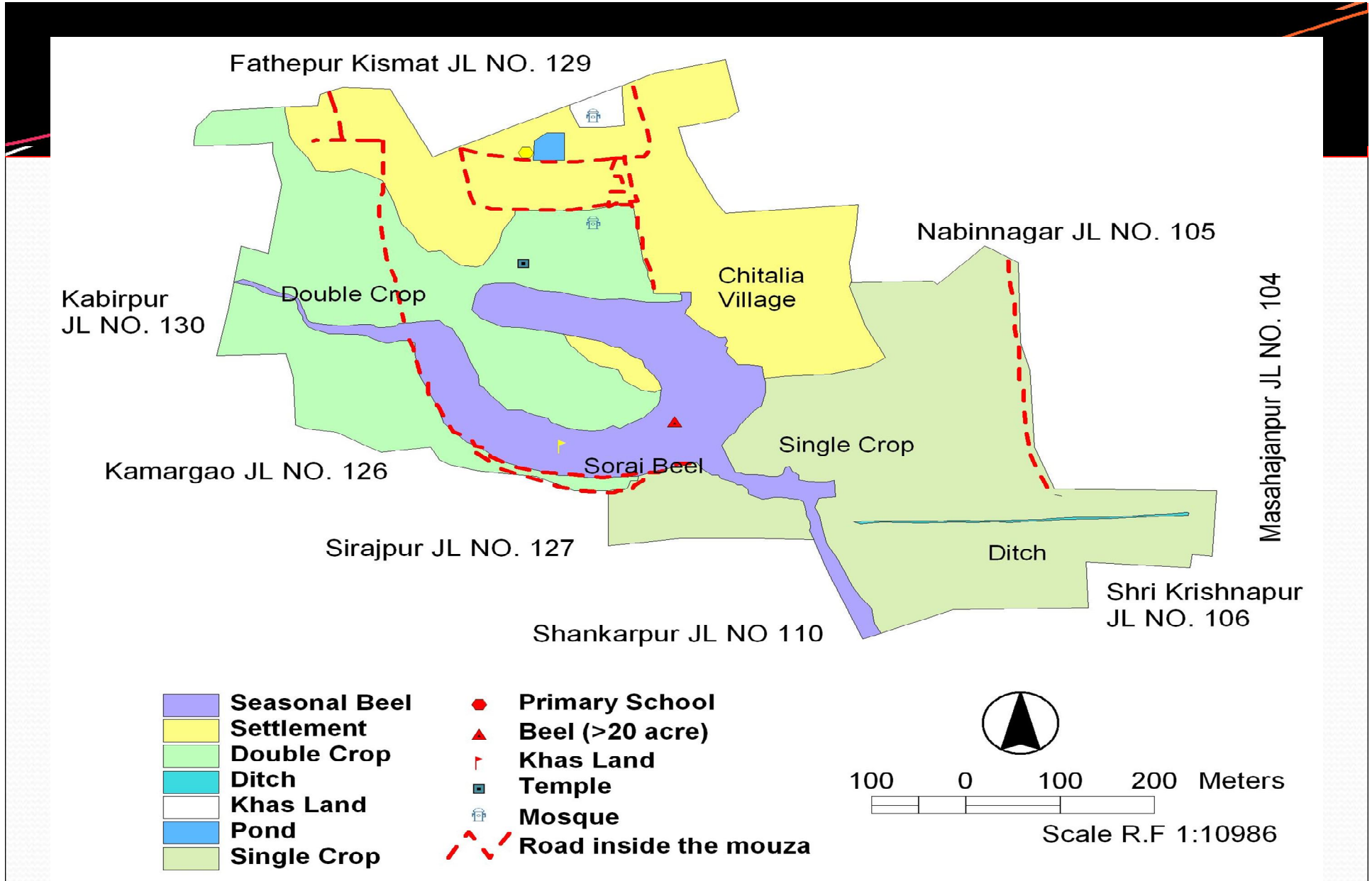

Figure 5. Resource Map, Mouza Chitalia, Sheet-1, JL NO. 128, Union: Saidpur

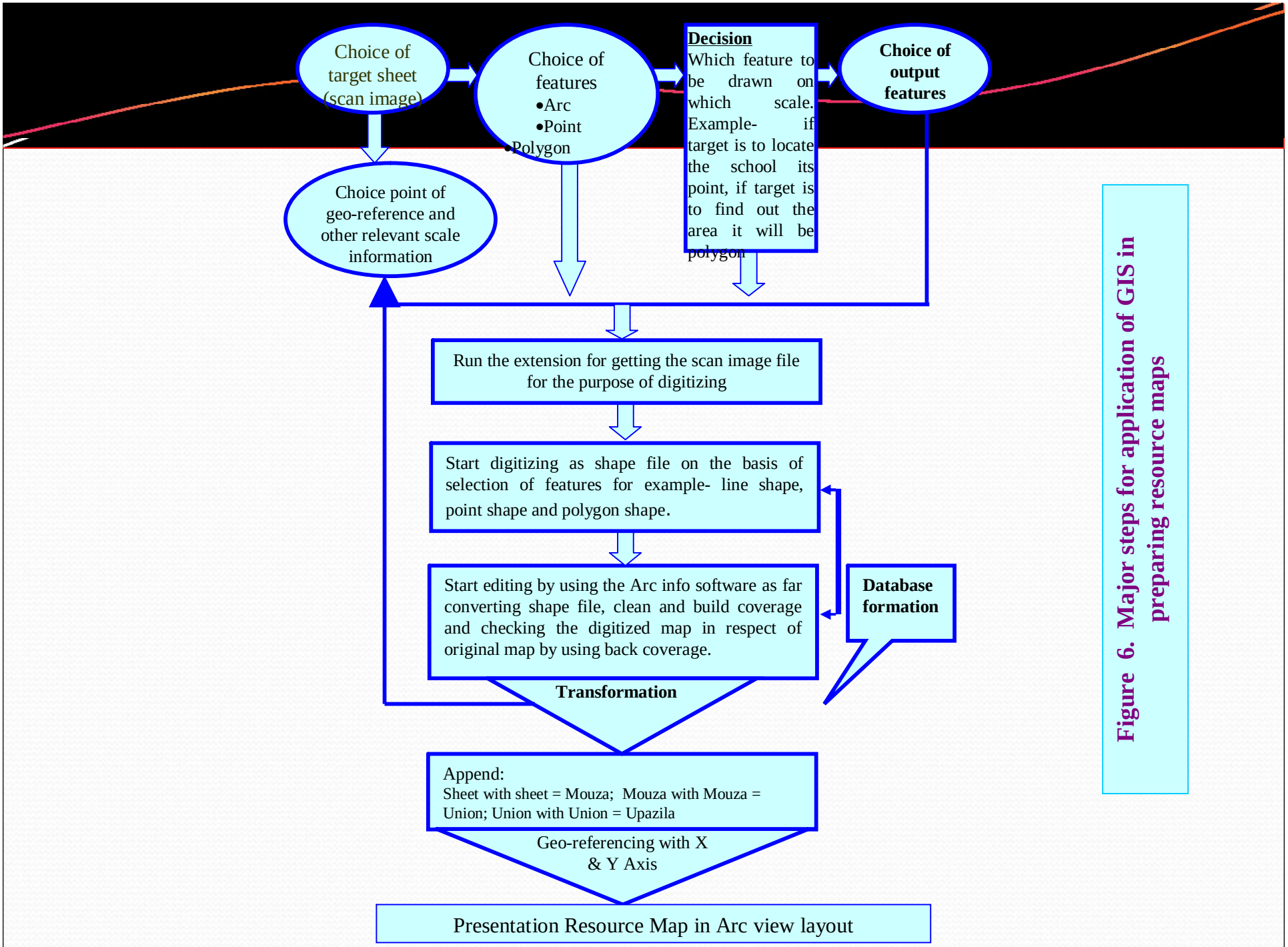

Figure 6. Major steps for application of GIS in preparing resource maps

Findings from the Study

- *Land Use Pattern of the Upazila*
- *Detail Information on Large Jalmahals*
- *Union Wise Status of Ponds*
- *Union wise status of Khas land (Government) and legal dispute*
- *Leasing Status and Year Wise Lease Value of Jalmahals/ large water bodies*

Name of Union	Occupation in Percentage(%)				Total
	Farmer	Fishermen	day labors /landless	Others *	
Asherkandi	69	8	17	6	100
Haldipur	57	7	30	6	100
Jagannathpur	47	2	21	30	100
Kalkalia	59	4	31	10	104
Mirpur	55	2	31	12	100
Pailgaon	71	6	18	5	100
Patali	64	2	20	14	100
Raniganj	69	11	16	4	100
Saidpur	66	1	22	11	100
Upazila (avg)	**62**	**5**	**23**	**11**	**100**

(service, working in abroad and other labor force)

Name of Union	Land use (ha)						Total Area, ha
	Agricultural land	Kanda	Settlement	Water body	Fallow land	Degraded land	
Asherkandi	3774	Nil	825	344.686	188.324	82	5214.01
Haldipur	3885.762	8.868	412	415.551	623.593	114	5459.774
Jagannathpur	1380.867	Nil	419.337	118.632	45.162	61	2024.998
Kalkalia	3222.659	Nil	527.63	322.141	299.76	78.556	4450.746
Mirpur	1668.051	Nil	383.36	157.065	243.874	49.83	2502.18
Pailgaon	2681.211	5.575	467.495	322.71	81.483	18.32	3576.794
Patali	1889.388	Nil	548.414	154.708	103.188	44.95	2740.648
Raniganj	4037.584	Nil	1475	438.733	277.138	48.36	6276.815
Saidpur	1857.64	0.226	342.09	120.959	25.081	22.973	2368.969
Total Upazila	**24397 (70)**	**15 (0.04)**	**5946 (17)**	**2395(7)**	**1888(5)**	**520(1.4)**	**34615 (100)**

Figure in the parenthesis indicates percentage

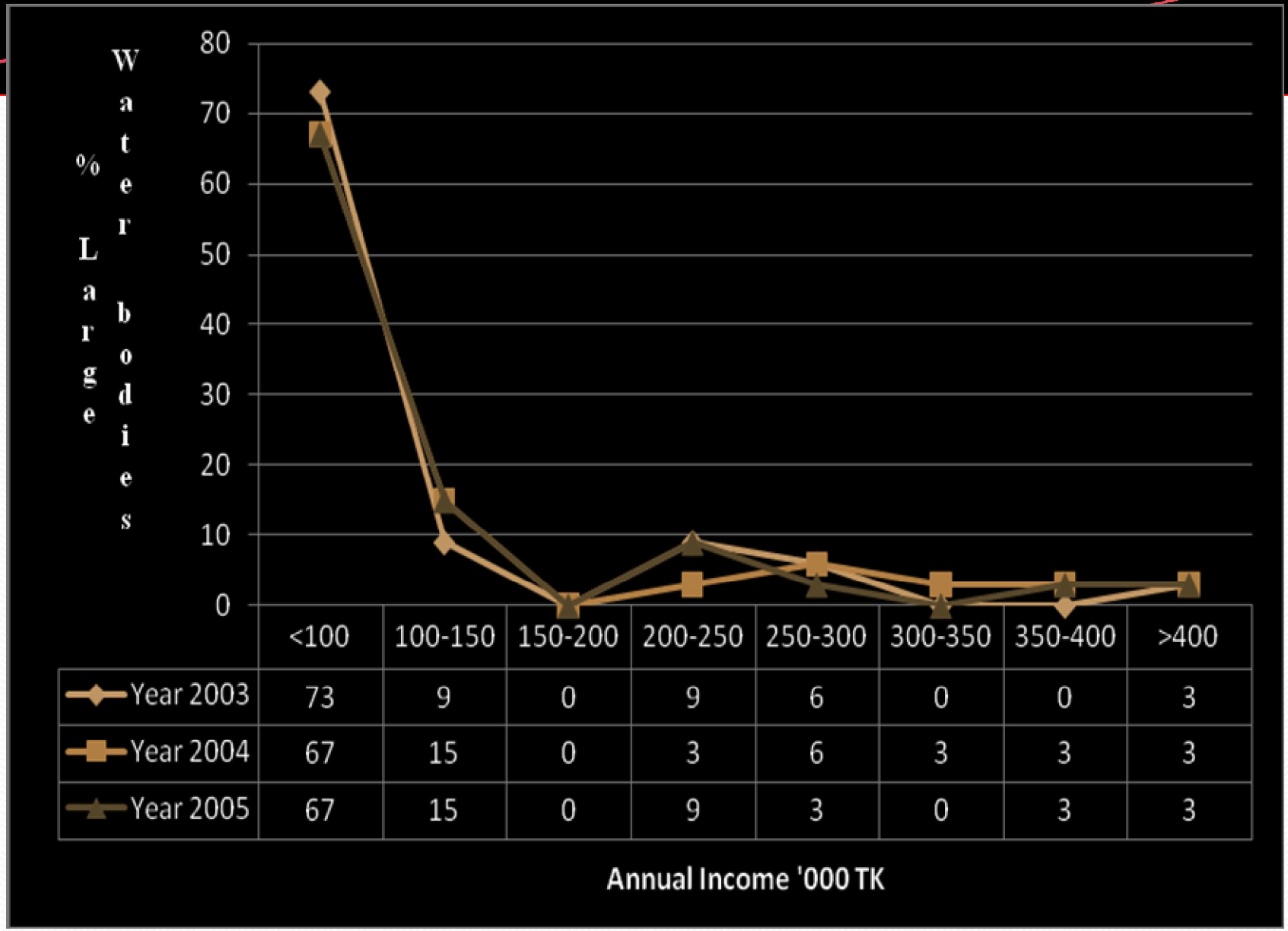

Figure 7 Annual lease value from large water bodies

Area (acre)	Large Water Bodies (>8 ha)						Area (acre)	Small Water Bodies (<8 ha)					
	Normal		Winter/Dry		Monsoon			Normal		Winter/Dry		Monsoon	
	No.	%	No.	%	No.	%		No	%	No	%	No	%
<50	23	70	27	82	10	30	<10	61	79	76	99	32	42
50 ? 75	3	9	6	18	15	46	10 - 15	11	14	1	1	3	3
75 - 100	3	9	0	0	1	3	15 - 20	5	6	0	0	40	52
100 - 125	3	9	0	0	3	9	20 - 25	0	0	0	0	0	0
125 - 150	0	0	0	0	3	9	25 - 30	0	0	0	0	2	3
150+	1	3	0	0	1	3							
Total	**33**	**100**	**33**	**100**	**33**	**100**		**77**	**100**	**77**	**100**	**77**	**100**

Depth (ft)	Large Water Bodies (>8 ha)						Small Water Bodies (<8 ha)					
	Normal		Winter/dry		Monsoon		Normal		Winter/dry		Monsoon	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<5	0	0	0	0	0	0	43	56	72	94	7	9
5-10	5	15	22	67	0	0	34	44	5	6	44	57
10 - 15	10	30	11	33	0	0	0	0	0	0	16	21
15 - 20	18	55	0	0	8	24	0	0	0	0	10	13
20 - 25	0	0	0	0	16	48	0	0	0	0	0	0
25 -30	0	0	0	0	9	27	0	0	0	0	0	0
Total	**33**	**100**	**33**	**100**	**33**	**100**	**77**	**100**	**77**	**100**	**77**	**100**

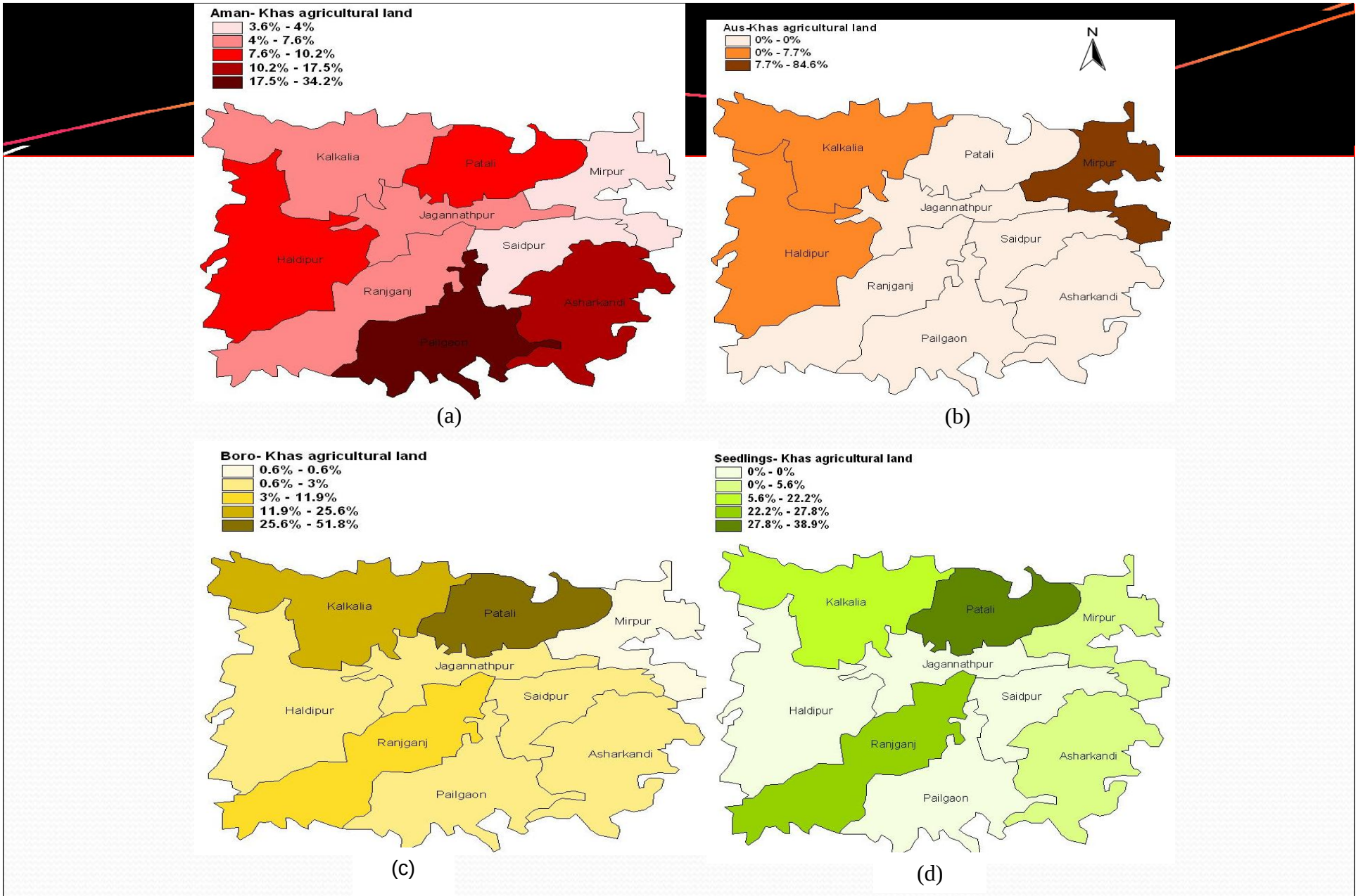

Figure 8. Seasonal *Khas* agricultural land distributions in Jaggannathpur *Upazila* a) Aman b) Aus c) Boro and d) Seedlings

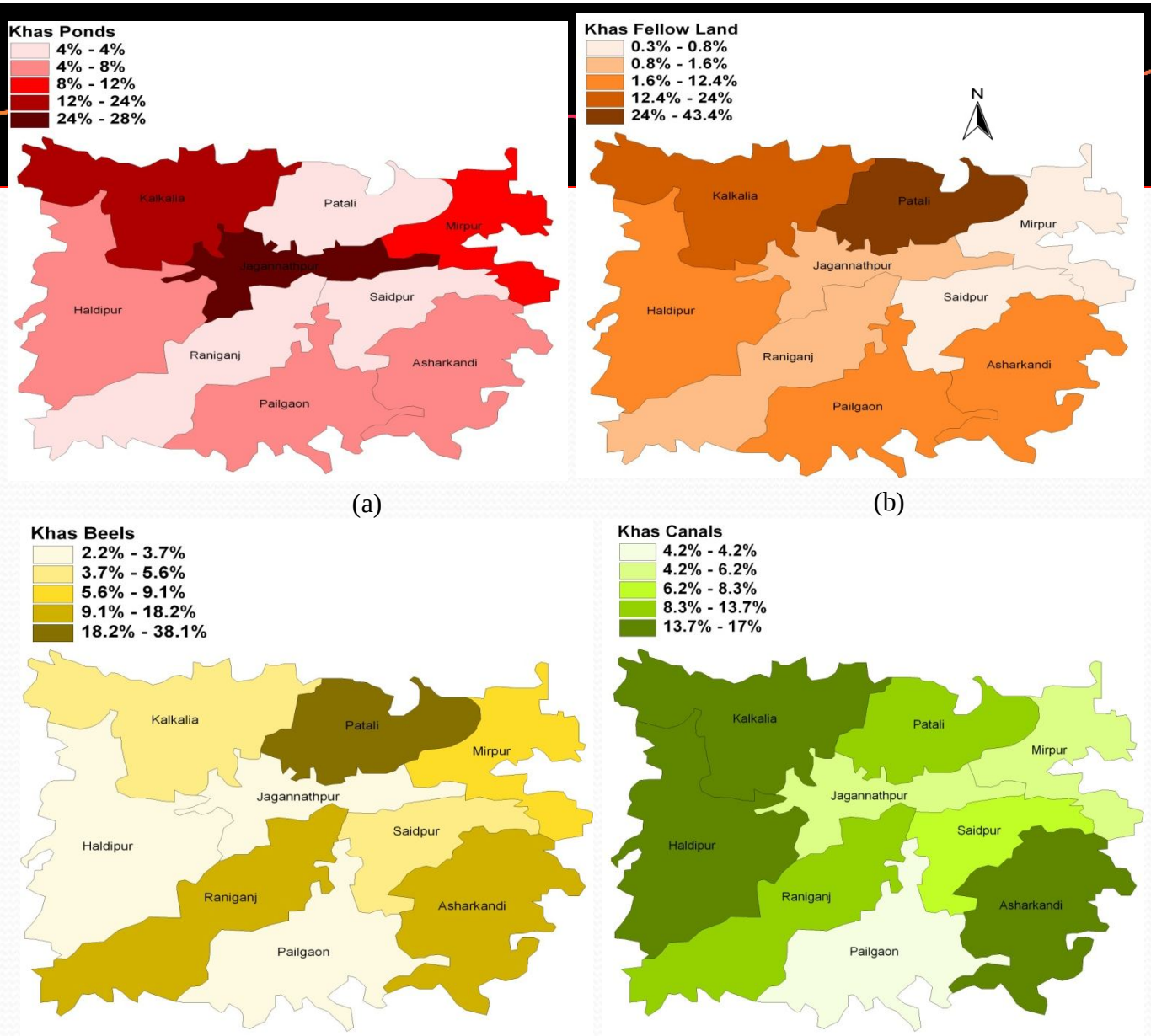

Figure 9. Different *Khas* land distributions in Jaggannathpur *Upazila* a) *Khas* ponds, b) *Khas* fellow land c) *Khas Beels* and d) *Khas* Canals

Community Attitude towards Resources and Expert Opinion

- Union wise development roadmap
- Restoration of degraded natural resources
- Khas (Government) land management
- Rural Infrastructure development
- Disaster management
- Crop diversification and cropping pattern
- Cropping intensity

Conclusions

Combined approach of PRA, FGD, and GIS developed for resource mapping in rural poverty prone hoar areas. A complete MIS is developed for the poverty prone area.

This model uses modern technology as well as social science methods to include the voice of the stakeholders, in assessing available natural resources and their physical status and disputes

The PRA also revealed the stake holder's opinions and suggestions for proper land and water body management and the road map for union wise development.

The community based resource management model can turn into a powerful policy making tool for sustainable land development and poverty eradication.

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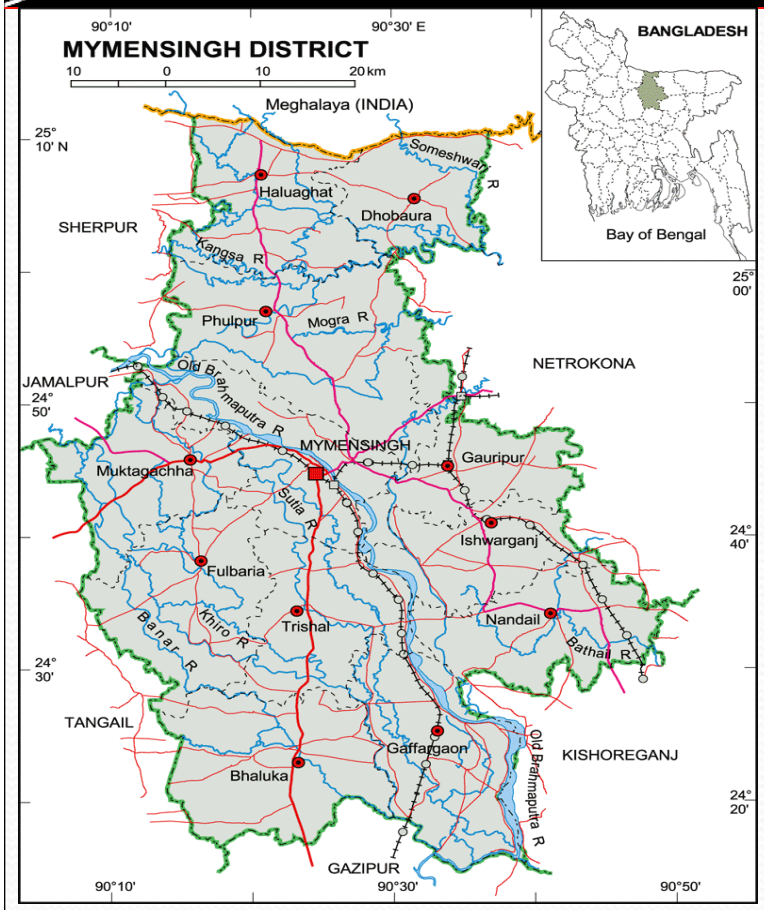

GIS based Impact Assessment For Agricultural Mechanization In Mymensingh District

GIS-GPS based Efficient Management of Waste Disposals for Municipal Corporation: A Case Study for Mymensingh Town

Thank you for your attention and further cooperation