



## Inventory of Wetlands in Puruliya District, West Bengal and Their Characterization as Natural Resources

### KEYWORDS

Wetlands, Inventory, Puruliya District, Natural Resources

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### ABSTRACT

The present study emphasized inventory of wetlands, which take account of the accumulation of information on location, characteristics (ownership pattern, water regime, origin, source of water) and activities related to use of the wetlands, source of pollution, plant and animal diversity. Inventory of 38 wetlands in Puruliya district, West Bengal, India has been prepared, adopting modified classification system used by Zalidis et al., (1997). Wetlands of this region need better management as well as conservation effort to support diverse life-forms for prolonged period.

### Introduction:

The inventory of a country's natural resource is a prerequisite for policy-making, conservation, utilization, and planning. Wetlands being valuable as a distinct natural resource (Mitsch et al., 2015) deserve inclusion in such stocktaking. The value of an inventory of the world's wetlands as distinct natural resources (i.e. distinct from soil and water resources) has been recognized in the recent past (Gupta & Palit, 2014b). National governments and international bodies seem to agree that a wetland inventory is necessary for several reasons, which according to Zalidis & Mantzavelas (1996) are:

- A wetland cannot be protected if no one is sure it exists, or if it exists, where is it found.
- Many wetlands have international importance as habitats for migratory birds, while two or more countries share others. Hence the inventory presents an opportunity for international co-operation, including information exchange and methods of gathering, processing and communicating such information.
- The maps created from an inventory frequently are useful in general physical planning studies. They can help the delineations of conservation areas and administrative units.
- An inventory shows knowledge gaps; it can therefore help identify research priorities.
- It encourages interdisciplinary co-operation and sharing of modern information technology across disciplines.
- An inventory is a rich and valuable source of data for public awareness programmes.

According to Zalidis et al. (1997) the choice of classification system is the main consideration when an inventory effort begins, and it comprises the infrastructure for distinction of different wetlands, units and types of data collected. Wetlands are generally classified (Chapman & Reiss, 1992) into four major groups, viz. (i) Salt marsh (ii) Flood land (iii) Swamp and Marsh (iv) Bog. Wetland is the collective term to encompass a wide range of inland, coastal and marine habitats, designated in various ways as estuaries and deltas, salt marshes, mangroves and mudflats, coastal lagoons, freshwater lakes and marshes, bogs, oasis, seasonal flood plain wetlands, swamps, oxbow lakes etc. In addition, there are many man-made and managed systems such as rice fields, fish ponds, reservoirs and tanks some of which have acquired considerable natural values. Due

to lack of readily available literature on wetlands of Puruliya district the present authors took the opportunity to address the wetlands for the first time in this region.

### Materials and Methods:

The present work was conducted in Puruliya district as located 23° 19' 50.23 " North latitudes and 86° 21' 46.91 " East longitudes. The total area of the district is 6259.00 sq Km. According to the 2011 Census, it accommodates a population of 2,930,115 of whom 1,496,996 are males and 1,433,119 females.

Puruliya has its boundaries on the east with the Midnapur and Bankura district of West Bengal. On the north with the Burdwan district of West Bengal and Dhanbad district of Bihar, on the north west, and south west with the Hazaribag, Ranchi and Singhbhum district of Jharkhand (Anon, 1985). In this work an inventory of wetlands in Puruliya District has been prepared in a way so as to constitute a basic information system giving a concise account of its location (Block, rural, urban, semi-urban, origin, source of water etc). The data gathering sheets included such aspects as location, area, uses, the legal status and the positive actions. Of the several waterbodies studied during field survey conducted in different scattered part of the district as many as 38 wetlands were identified, each having an area exceeding 2.023 hectare except Barikbunndh, Benabunndh, Benagora, Dewanbunndh, Kamalabunndh and Pokabunndh (which are 1.21 to 1.61 hectare in size) [Table 2]. The objectives and guidelines for preparation of wetland inventory have been elucidated by Zalidis et al., (1997) which have been followed as far as practicable during this work.

One of the earliest definitions of wetlands was presented by United States Fish and Wildlife Service in 1956 through their circular 39 which reads as "wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water." The definitions must express three wetland characteristics, viz. (i) presence of water for at least seven successive days during growing season (ii) the habitat supports aquatic macrophytes growing in water, soil and some other substrate that is periodically deficient in oxygen due to water logging in some parts of the year and (iii) the substrate is predominantly of hydric soils that are saturated or flooded for a sufficiently long period to become anaerobic in their upper layers. (Mitsch & Gosselink, 1986).

**Results and Discussion:**

Of the 38 wetlands studied 17 wetlands are located in urban areas, 17 wetlands in rural areas and all the rest (Burosayar, Kumaridam, Mahatobundh and Sayarbundh) are located in semi-urban areas of the district [FIG.2]. These wetlands occur in 19 Blocks out of 20 Blocks in the district.

Among the 19 Blocks wetlands represent in 7 blocks Arsha (Mahatobundh), Banduan (Pokabundh), Barabazar (Gorsaibundh / Namobundh), Hura (Gaylabundh), Jhalda I (Lihirbundh), Joypur (Ranibundh), Manbazar II (Sayarbundh) and Raghunathpur II (Burosayar) have only one each. While each of another blocks Baghmundi (Kamalabundh ,Ranibundh), Balarampur (Hanumatadam, Kumaridam), Neturiya (Guniyara Barabundh, Ruknibundh), Para (Benagora, Sankra Bara bundh), Pancha (Ghoshalpokur, Khagerbundh ), Puruliya II (Angarkhuri, Puranosayar) Raghunathpur I (Barikbundh, Dhanarbundh), Santuri (Deshbundh, Gayerbundh). As many as 3 wetlands were studied in each of Manbazar I (Benabundh, Gobindasayar, Maidhara) and 4 wetlands in Puruliya I (Ganakbundh, Nibaransayar / Sahebbundh, Nutanbundh, Rajabundh) and 7 wetlands were studied in Kashipur (Adra Sahebbundh, Babirbundh, Dewanbundh, Kalidaha Jore, Ketankiyari jore, Rampur Barabundh and Sindripathar) [Table 1, FIG. 1].

Wetlands studied were variable in size. As many as eight size classes the size class of 1.21 to 1.61 hectares includes six wetlands, 1.62 to 2.02 hectares includes four wetlands while those with area between 2.03-4.04 hectares are nine in number. The wetland areas ranging between 4.45-6.07 hectares, 6.47-8.09 hectares, 8.49-10.11 hectares , 10.52-12.14 hectares include nine, three, two, and two wetlands respectively. Only one wetland (Sahebbundh/Nibaransayar) 26.30-28.32 hectares and two wetlands (Hanumata dam and Joypur Ranibundh) spread over 40.46 hectares. The total area covered by the 38 wetlands studied is 309.09 hectares and the average area of each wetland is about 8.13 hectares.

Only 9 wetlands viz. Adra Sahebbundh, Babirbundh, Hanumatadam, Kalidaha (Jore) , Ketankiyari (Jore), Kumaridam, Rajabundh, Sahebbundh /Nibaransayar and Sindripathar are under Government ownership and only one wetland ( Barikbundh) is a disputed wetland covering which there is conflict over use and only one wetland (Dhanarbundh) belongs to the vested category. All the remaining 27 wetlands are privately owned [FIG.3].

All wetlands excepting three viz. Benabundh, Benagora and Sindripathar , are perennial so far water regime is concerned

[FIG.4]. Only five wetlands were seen to be of natural origin ( Hanumatadam, Kalidaha (Jore), Ketankiyari (Jore), Kumaridam and Sindripathar) and all the rest were man-made [FIG.5].

Only five wetlands are linked with river (Hanumatadam, Kalidaha (Jore), Ketankiyari (Jore), Kumaridam and Sindripathar) ,all the rest being rain fed [FIG.6].

Only three wetlands, viz. Deshbundh, Dewanbundh and Kumaridam are used for irrigation purposes and 31 wetlands have no specific use, four wetlands viz. Kamalabundh, Sahebbundh /Nibaransayar, Babirbundh/Sabirbundh and Barikbundh are used to meet domestic needs, to get aesthetic pleasure, sacred wetland and drinking water respectively [FIG.8].

Agricultural run-off is the main source of pollution in case of fourteen wetlands. In nineteen wetlands domestic sewage is the main source of pollution. Urban sewage is the main source of pollution for five wetlands [FIG.7].

Plant diversity is rich in six wetlands, viz. Adra Sahebbundh, Burosayar, Joypur Ranibundh, Kalidaha( Jore), Rampur Barabundh, Sahebbundh and moderate in twenty five wetlands. In seven wetlands plant diversity is relatively poor [FIG.9].

Animal diversity is rich in nine and moderate in twenty two wetlands. Seven wetlands have association with relatively poor animal diversity [FIG.10].

**Acknowledgement:**

The authors are grateful to Pranabesh Gangopadhyay, Library in Charge, Puruliya District Library, Puruliya, for providing facilities during this work.

**Table 1: Blockwise distribution of wetlands in Puruliya District, West Bengal.**

Number of wetlands studied				
1	2	3	4	7
1.Arsha	1.Baghmundi	1.Manbazar I	1.Puruliya I	1.Kashipur
2.Banduan	2.Balarampur			
3.Barabazar	3.Neturiya			
4.Hura	4.Para			
5.Jhalda I	5.Pancha			
6.Joypur	6.Puruliya II			
7.Manbazar II	7.Raghunathpur I			
8.Raghunathpur II	8.Santuri			

**Table 2 : General characteristics of wetlands in Puruliya District, West Bengal.**

Name of the wetlands	Blocks	Parameters									
		I	op	Size (hec)	wr	o	sw	up	pmf	Pd	ad
1.Adra Sahebbundh(23° 48'N, 86° 70' E)	Kashipur	Ul	G.W.	4.45	P.	Mm.	R.W.	N.S.	D.S.	PR.	A. Ri.
2.Angarkhuri (23° 21'N,86°47'E)	Puruliya II	Rl	P.W.	4.04	P.	Mm.	R.W.	N.S.	A.F.	P.M.	A. Mo
3.Babirbundh (Sabirbundh) [23°37'N,86°75']	Kashipur	Rl	G.W.	7.28	P.	Mm.	R.W.	S.W.	A.F.	P.M.	A. Ri
4.Barikbundh (23° 55'N,86° 67'E)	Raghunathpur I	Ul	D.W.	1.61	P.	Mm.	R.W.	D.W.	U.S.	P.M.	A.Mo.

5. Benabundh (23° 27'N, 86° 37'E )	Manbazar I	Ul	P.W.	1.21	S	Mm.	R.W.	N.S.	A.F.	P.P.	A.Po.
6. Benagora (23° 50'N, 86° 49'E )	Para	Rl	P.W.	1.21	S	Mm.	R.W.	N.S.	A.F.	P.M.	A.Mo.
7. Buro Sayar (23° 56'N, 86° 68'E)	Raghunath pur II	Sul	P.W.	5.66	P.	Mm.	R.W.	N.S.	D.S.	P.R.	A.Ri.
8. Deshbundh (23° 51'N, 86° 85'E)	Santuri	Rl	P.W.	4.45	P.	Mm.	R.W.	I.	A.F.	P.P.	A.Mo.
9. Dewanbundh (23° 37'N, 86° 75'E)	Kashipur	Rl	P.W.	1.21	P.	Mm.	R.W.	I.	A.F.	P.M.	A.Po.
10. Dhanarbundh (23° 55'N, 86° 67'E)	Raghunath pur I	Ul	V.W.	2.02	P.	Mm.	R.W.	N.S.	A.F.	P.M.	A.Mo.
11. Ganakbundh (23° 34'N, 86° 36'E)	Puruliya I	Ul	P.W.	2.83	P.	Mm.	R.W.	N.S.	A.F.	P.M.	A.Mo.
12. Gayerbundh (23° 51'N, 86° 85'E)	Santuri	Rl	P.W.	6.07	P.	Mm.	R.W.	N.S.	A.F.	P.P.	A.Ri.
13. Gaylabundh (23° 30'N, 86° 65'E)	Hura	Ul	P.W.	6.07	P.	Mm.	R.W.	N.S.	D.S.	P.M.	A.Mo.
14. Ghosal Pukur (23° 15'N, 86° 65'E)	Puncha	Ul	P.W.	2.42	P.	Mm.	R.W.	N.S.	D.S.	P.P.	A.Po.
15. Gobinda Sayar (23° 27'N, 86° 37'E)	Manbazar I	Ul	P.W.	3.64	P.	Mm.	R.W.	N.S.	D.S.	P.M.	A.Ri.
16. Gorsaibundh / Namobundh (23° 30'N, 86° 36'E)	Barabazar	Rl	P.W.	2.02	P.	Mm.	R.W.	N.S.	D.S.	P.M.	A.Mo.
17. Guniyara Barabundh (23° 58'N, 86° 71'E)	Neturiya	Rl	P.W.	4.45	P.	Mm.	R.W.	N.S.	D.S.	P.M.	A.Mo.
18. Hanumatadam (23° 12'N, 86° 26'E)	Balarampur	Ul	G.W.	80.93	P.	N.	R.Wa.	N.S.	A.F.	P.M.	A.Mo.
19. Joypur Ranibundh (23° 36'N, 86° 32'E)	Joypur	Ul	P.W.	48.56	P.	Mm.	R.W.	N.S.	D.S.	P.R.	A.Ri.
20. Kalidaha (Jore) [23° 37'N, 86° 75'E]	Kashipur	Rl	G.W.	3.64	P.	N.	R.Wa.	N.S.	A.F.	P.R.	A.Mo.
21. Kamalabundh (23° 19'N, 86° 06'E)	Baghmundi	Rl	P.W.	1.61	P.	Mm.	R.W.	D.U.	D.S.	P.P.	A.Po.
22. Ketankiyari (Jore) [23° 38'N, 86° 76'E]	Kashipur	Rl	G.W.	3.64	P.	N.	R.Wa.	N.S.	A.F.	P.M.	A.Mo.
23. K h a g e r b u n d h (23° 15'N, 86° 65'E)	Puncha	Ul	P.W.	4.45	P.	Mm.	R.W.	N.S.	D.S.	P.P.	A.Po.
24. Kumaridam (23° 16'N, 86° 29'E)	Balarampur	Sul	G.W.	8.49	P.	N.	R.Wa.	I.	A.F.	P.M.	A.Mo.
25. Lihirbundh (23° 37'N, 85° 97'E)	Jhalda I	Ul	P.W.	2.42	P.	Mm.	R.W.	N.S.	U.S.	P.M.	A.Mo.
26. Mahatobundh (23° 32'N, 86° 36'E)	Arsha	Sul	P.W.	4.45	P.	Mm.	R.W.	N.S.	D.S.	P.M.	A.Ri.
27. Maidhara (23° 27'N, 86° 37'E)	Manbazar I	Ul	P.W.	2.02	P.	Mm.	R.W.	N.S.	U.S.	P.M.	A.Po.
28. Nutanbundh (23° 34'N, 86° 36'E)	Puruliya I	Ul	P.W.	6.57	P.	Mm.	R.W.	N.S.	D.S.	P.M.	A.Mo.
29. Pokabundh (22° 88'N, 86° 50'E)	Banduan	Ul	P.W.	1.61	P.	Mm.	R.W.	N.S.	D.S.	P.M.	A.Mo.

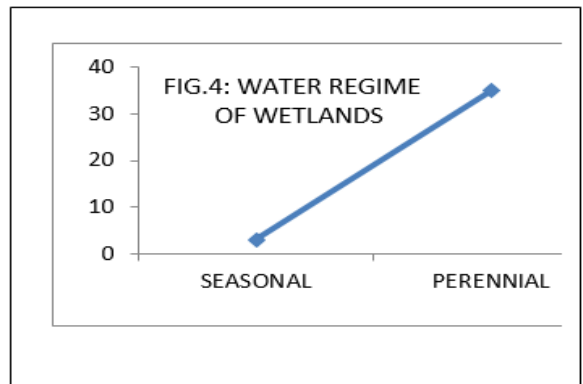
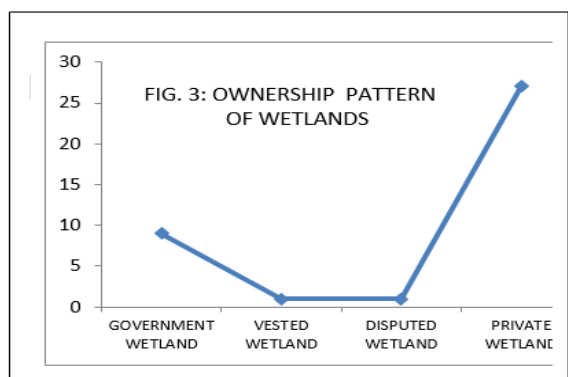
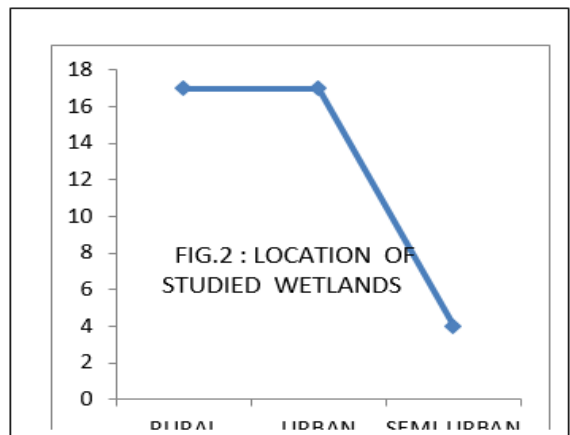
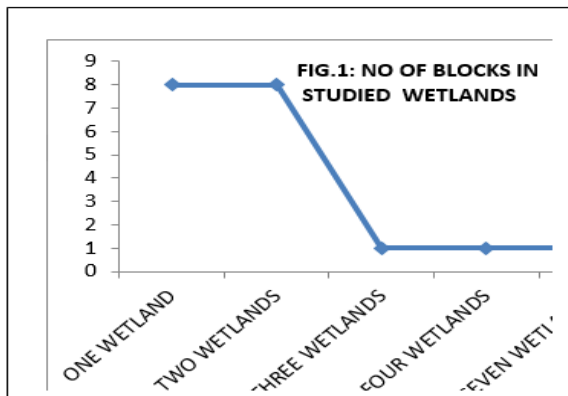
30.Purano Sayar (23°21'N,86°47'E)	Puruliya II	RI	P.W	12.14	P.	Mm.	R.W.	N.S.	D.S.	P.M.	A.Mo.
31.Rajabundh (23°32'N,86°37'E)	Puruliya I	UI	G.W.	8.49	P.	Mm.	R.W.	N.S.	U.S.	P.M.	A.Mo.
32.Rampur Barabundh (23°38'N,86°76'E)	Kashipur	RI	P.W	10.92	P.	Mm.	R.W.	N.S.	D.S.	P.R.	A.Ri
33.Ranibundh (23°19'N,86°06'E)	Baghmundi	RI	P.W	2.42	P.	Mm.	R.W.	N.S.	D.S.	P.P.	A.Po.
34.Ruknibundh (23°58'N,86°71'E)	Neturiya	RI	P.W	2.02	P.	Mm.	R.W.	N.S.	D.S.	P.M.	A.Mo.
35.Sahebbundh ( 23°20'N,86°21'E)	Puruliya I	UI	G.W	28.32	P.	Mm	R.W.	A.U	U.S.	P.R	A.Ri.
36.Sankra Barabundh(86° 49'E 23° 50'N )	Para	RI	P.W	7.28	P.	Mm.	R.W.	N.S	D.S.	P.M.	A.Mo
37.Sayarbundh(23° 24'N, 86° 39'E)	Manbazar II	Sul	P.W	2.83	P.	Mm.	R.W.	N.S	D.S.	P.M.	A.Mo
38.Sindripathar (23°38'N,86°76'E)	Kashipur	RI	G.W	5.66	S.	N.	R.Wa.	N.S.	A.F.	P.M.	A.Mo.

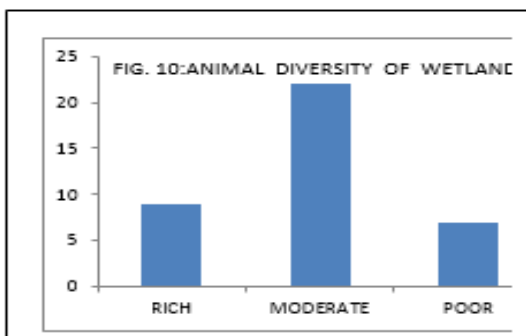
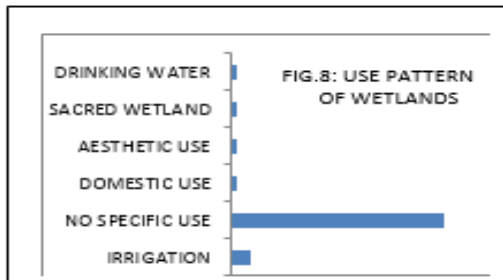
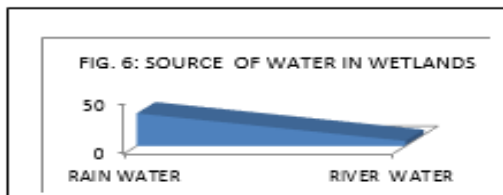
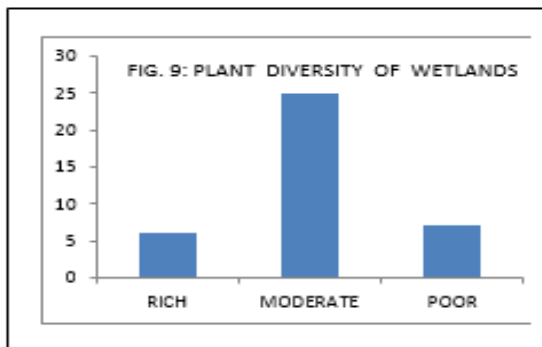
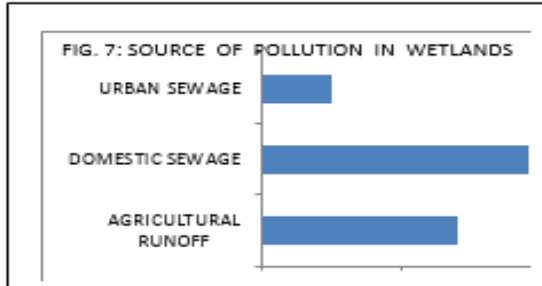
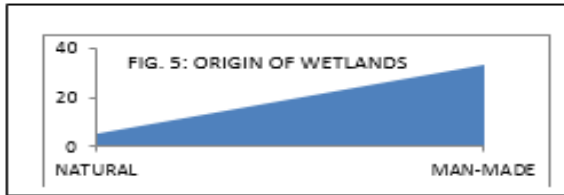
**Legend of abbreviations used:**

l=location; **op**=ownership pattern; **wr**=water regime;o=origin; **sp**=source of pollution; **up**=use pattern; pmf=pollution mainly from; pd=plant diversity; **ad**=animal diversity.

**Abbreviations: Location:** Rural location-RI, Urban location-UI, Semiurban location-Sul; **Ownership Pattern:** Government Wetland-G.W. Vested Wetland-V.W. Disputed Wetland-D. W. Private Wetland- P. W; **Water regime:** Seasonal- S. Perennial-P; Origin: Natural- N. Manmade

**Mm; Source of water: Rain Water-R.W., River Water-R. Wa.:** **Use Pattern:** Irrigation-I. Domestic Uses-D.U. Aesthetic Use-A.U. No Specific Uses-N.S. Sacred Wetland-S.W. Drinking Water-D.W. **Pollution mainly from:** Urban Sewage-U.S. Agricultural Field-A. F.Domestic Sewage-D.S; **Plant Diversity:** Plant Poor-P.P; Plant Rich-P.R; Plant Moderate-P.M; **Animal Diversity:** Animal Rich-A. Ri; Animal Moderate: A. Mo; Animal Poor: A. Po.





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