

Geospatial Map of Inland Fish Production across India

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ABSTRACT

In fisheries and aquaculture, GIS (Geographical Information System) is useful to understand complex systems in which most of the components are subject to spatial variability, and also it helps to the decision makers and managers in order to evaluate resources, estimate carrying capacities and implement regulations for a sustainable exploitation of the aquatic resources, integrating the ecological and socio-economic aspects. Now, GIS has become an integral part of aquatic science and limnology. Water, by its very nature is dynamic. Features associated with water are thus ever-changing. To be able to keep up with these changes, technological advancements have given scientists methods to enhance all aspects of scientific investigation, from satellite tracking of wildlife to computer mapping of habitats (D. Schindler, 2011). Here, in our study we used GIS to make the data handy and to interpret the trade pattern of fishery business.

Key words: Geospatial, GIS, satellite, wildlife etc.



INTRODUCTION

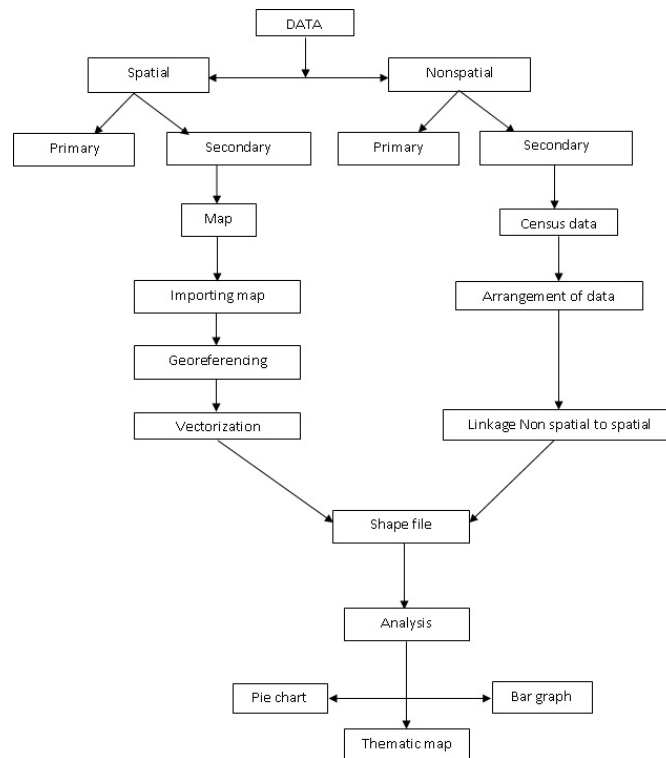
Geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data. It is a very handy tool for analyzing and modeling of a specific area synchronizing with the criteria needed. Hence, by using GIS we can simplify the process of any analysis, and it will help us to visualize, interpret and understand data to reveal relationships, patterns, and trends in relation with fishery business like other such sectors. GIS has a broad application in natural resources and environmental management. Although marine environments present some challenges in the use of this technique, due to the fact that it has been developed as a conceptual model of land environment. GIS has proven to provide valuable support for planning and management in fisheries and aquaculture. It provides a way to integrate large amounts of data into the decision making process and to implement new ways of understanding the integrated management of fisheries and aquaculture within the broader environmental context, thus implementing a full Ecosystem Approach to fisheries and aquaculture.

MATERIALS AND METHODS

Different methods are implemented as a set of well defined steps or phases which aids with a clear measurable set of existing entities. The methodology adopted in this study incorporates GIS analysis. It is a schematic presentation of procedures and rules used by the analyst who are working in a discipline or engaged in an enquiry.

In this study we have used only secondary data. The efficiency and performance of any information system highly depends on nature, quality and availability of data. For GIS analysis

we need two types of data at the same time viz. spatial & non-spatial. These data may be of primary data type or secondary data type.

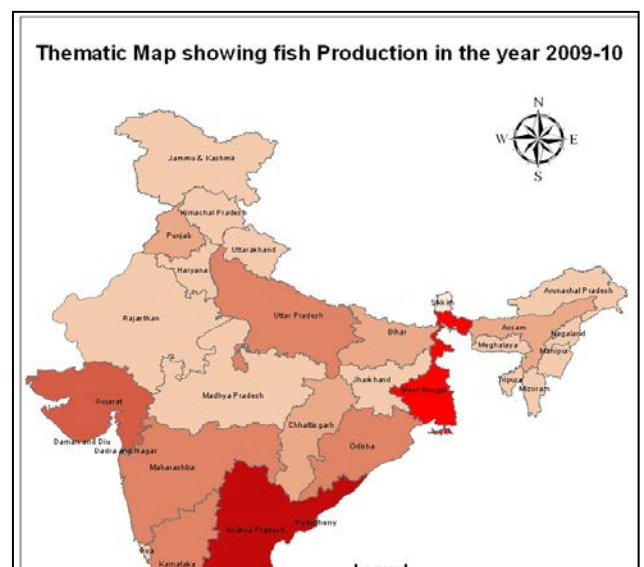
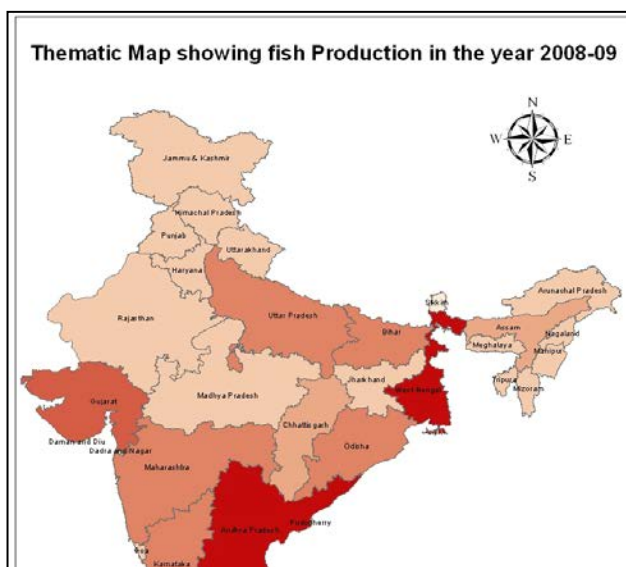
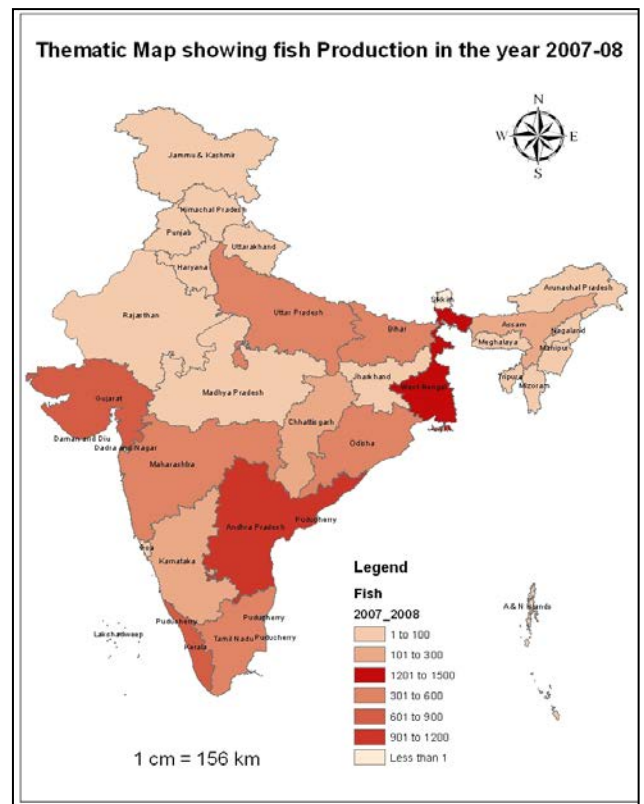
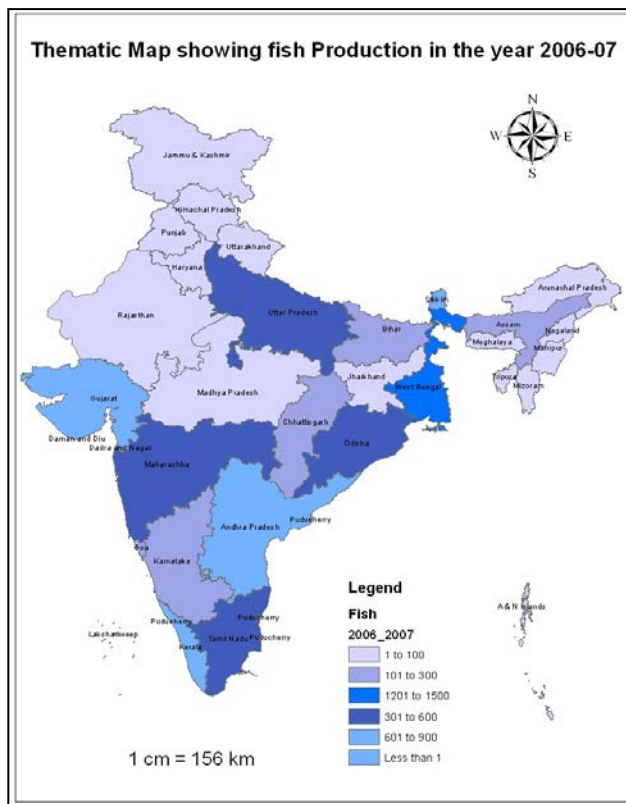


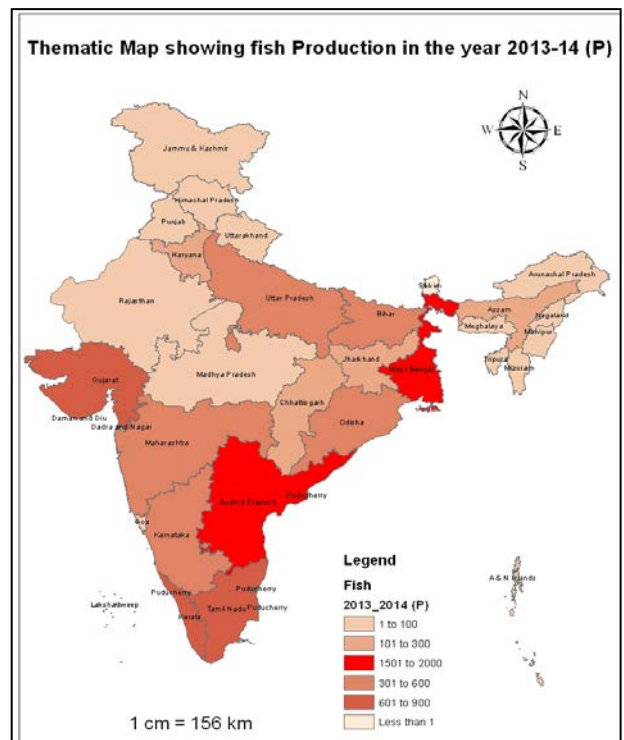
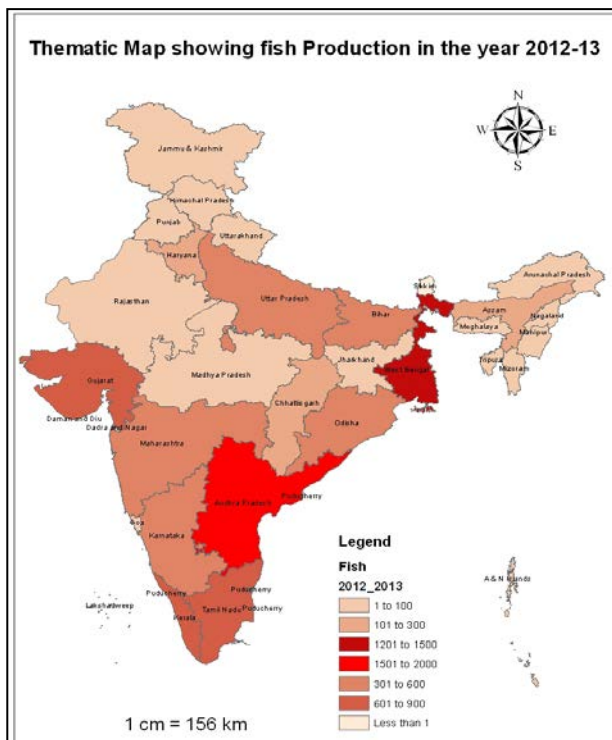
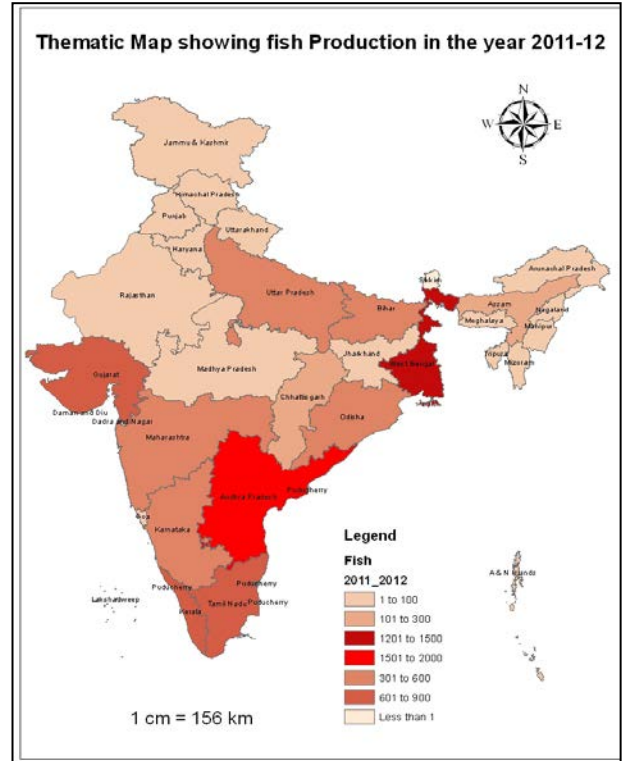
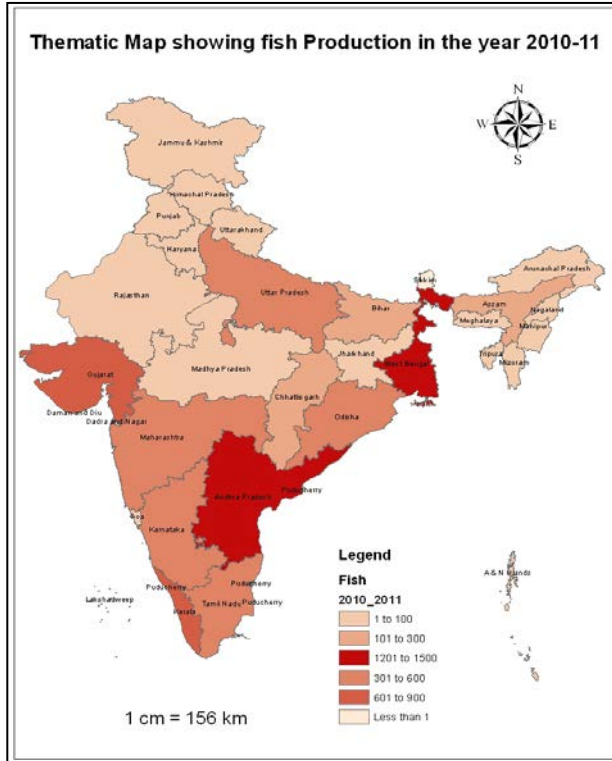
RESULTS:

As per data, map shows West Bengal, Andhra Pradesh, Gujrat & Kerela holds 1st four positions in State-wise Inland Fish Production from 2006 to 2014.

- ✓ Maharashtra & Tamil Nadu alternately occupies 5th and 6th position in Inland Fish Production during the period (2006 to 2014).

- ✓ Odisha, Uttar Pradesh, Karnataka & Bihar always gets position in between 7th to 10th position in Inland Fish Production for the same period (2006 to 2014).
- ✓ Assam holds 11th position in Inland Fish Production during from the year 2006 to 2010. But from 2011 till now its shifted to 12th position as Chattisgarh is forwarding and now and improved more in production than Assam from 2011 till now.





DISCUSSION

The Country has vast potential for fisheries in view of our long coastline of about 8,118 kms apart from the inland water resources. As per the estimates of CSO, the value of output from fisheries sector at current price was about 91,541 crore during 2012-13 which is about 4.36% of the value of agricultural and allied sector output at current price. India is the second largest producer of fish and the second largest producer of fresh water fish in the world. Fish production has increased from 41.57 lakh tonnes (24.47 lakh tonnes for marine and 17.10 lakh tonnes for inland fisheries) in 1991-92 to 90.40 lakh tonnes (33.21 lakh tonnes for marine and 57.19 lakh tonnes for inland fisheries) in 2012-13. Fishery business has enormous potential to accelerate Indian Economy by earning foreign currency as well as it may also reopen a door for young entrepreneurs to do fishery business if a systematic way is followed.

CONCLUSION

Fishery Science is a sub-part of a classical domain; to make its interpretation easier and more interesting here we are incorporating it with GIS sector. In fact through such IT instrument we can plot the globe in front of us within the monitor and make the best possible and suitable decision. Through such IT instrument we can plot the globe in front of us within the monitor and make the best possible and suitable decision.

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TABLES:

Table 1: Inland water Resources of India

Source: Annual Report, 2014. Department of Animal husbandry, Dairying & Fisheries, Ministry of Agriculture, Government of India

Sl. No	State/Uts	Rivers & Canals (kms.)	Reservoirs (Lakh Ha)	Tanks & Ponds (Lakh Ha)	Flood plain Lakes & Derelict Water bodies (Lakh Ha)	Brackish Water (Lakh Ha)	Total Water Bodies (Lakh Ha)
1	Andhra Pradesh	11514	2.34	5.17	-	0.6	8.11
2	Arunachal Pradesh	2000	-	2.76	0.42	-	3.18
3	Assam	4820	0.02	0.23	1.1	-	1.35
4	Bihar	3200	0.6	0.95	0.05	-	1.6
5	Chhattisgarh	3573	0.84	0.63	-	-	1.47
6	Goa	250	0.03	0.03	-	Neg.	0.06
7	Gujarat	3865	2.43	0.71	0.12	1	4.26
8	Haryana	5000	Neg.	0.1	0.1	-	0.2
9	Himachal Pradesh	3000	0.42	0.01	-	-	0.43
10	Jammu & Kashmir	27781	0.07	0.17	0.06	-	0.3
11	Jharkhand	4200	0.94	0.29	-	-	1.23
12	Karnataka	9000	4.4	2.9	-	0.1	7.4
13	Kerala	3092	0.3	0.3	2.43	2.4	5.43
14	Madhya Pradesh	17088	2.27	0.6	-	-	2.87
15	Maharashtra	16000	2.99	0.72	-	0.12	3.83
16	Manipur	3360	0.01	0.05	0.04	-	0.1
17	Meghalaya	5600	0.08	0.02	Neg.	-	0.1
18	Mizoram	1395	-	0.02	-	-	0.02
19	Nagaland	1600	0.17	0.5	Neg.	-	0.67

20	Odisha	4500	2.56	1.14	1.8	4.3	9.8
21	Punjab	15270	Neg.	0.07	-	-	0.07
22	Rajasthan	5290	1.2	1.8	-	-	3
23	Sikkim	900	-	-	0.03	-	0.03
24	Tamil Nadu	7420	5.7	0.56	0.07	0.6	6.93
25	Tripura	1200	0.05	0.13	-	-	0.18
26	Uttar Pradesh	28500	1.38	1.61	1.33	-	4.32
27	Uttarakhand	2686	0.2	0.01	0	-	0.21
28	West Bengal	2526	0.17	2.76	0.42	2.1	5.45
29	A & N Islands	-	0	0	-	0.33	0.34
30	Chandigarh	2	-	Neg.	Neg.	-	0
31	Dadra and Nagar Haveli	54	0.05	-	-	-	0.05
32	Daman and Diu	12	-	Neg.	-	Neg.	0.00
33	Delhi	150	0.04	-	-	-	0.04
34	Lakshadweep	-	-	-	-	-	0
35	Puducherry	247	-	Neg.	0.01	Neg.	0.01
	Total	195095	29.26	24.24	7.98	11.55	73.03

Table 2: State-wise Inland Fish Production ('000 tonnes) (2006–2014)

Source: Annual Report, 2014. Department of Animal husbandry, Dairying & Fisheries, Ministry of Agriculture, Government of India

State/Union Territory	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14 (P)
1. Andhra Pradesh	856.93	1,010.08	1,252.78	1293.85	1368.202	1603.17	1808.08	1930.49
2. Arunachal Pradesh	2.77	2.83	2.88	2.65	3.15	3.3	3.71	2.89
3. Assam	181.48	190.32	200.15	218.82	227.242	228.62	254.27	263.09
4. Bihar	267.04	319.1	300.65	297.4	299.91	344.47	400.14	465.99
5. Chhattisgarh	137.75	139.37	158.7	174.24	228.207	250.7	255.61	281.55
6. Goa	102.39	33.43	86.21	84.33	93.27	89.96	77.88	92.66
7. Gujarat	747.33	721.91	765.9	771.52	774.902	783.72	788.49	793.11
8. Haryana	60.08	67.24	76.29	100.46	96.195	106	111.48	116.9
9. Himachal Pradesh	6.89	7.85	7.79	7.75	7.381	8.05	8.56	8.76
10. Jammu & Kashmir	19.2	17.33	19.27	18.94	19.7	19.85	19.95	19.98
11. Jharkhand	34.27	67.89	75.8	70.5	71.886	91.68	96.6	106.56
12. Karnataka	292.46	297.69	361.85	408.05	526.579	546.44	525.57	492.06

13. Kerala	677.63	667.33	685.99	663.12	681.613	693.21	679.74	664.45
14. Madhya Pradesh	65.04	63.89	68.47	66.12	56.451	75.41	85.17	90.17
15. Maharashtra	595.94	556.45	523.1	538.35	595.249	578.79	586.37	583.87
16. Manipur	18.61	18.6	18.8	19.2	20.2	22.22	24.5	26.92
17. Meghalaya	5.49	4	3.96	4.21	4.557	4.77	5.42	5.89
18. Mizoram	3.76	3.76	2.89	3.04	2.901	2.93	5.43	5.87
19. Nagaland	5.8	5.8	6.18	6.36	6.585	6.84	7.13	7.15
20. Odisha	342.04	349.48	374.82	370.54	386.185	381.83	410.14	414.64
21. Punjab	86.7	78.73	86.21	122.86	97.04	97.62	99.13	100.3
22. Rajasthan	22.2	25.7	24.1	26.91	28.2	47.85	55.16	56.31
23. Sikkim	0.15	0.18	0.17	0.17	0.18	0.28	0.49	0.46
24. Tamil Nadu	542.28	559.36	534.17	534.17	614.809	611.49	620.4	620.51
25. Tripura	28.63	36.25	36	42.27	49.231	53.34	57.46	60.2
26. Uttar Pradesh	306.73	325.95	349.27	392.93	417.479	429.72	449.75	461.72
27. Uttarakhand	3.03	3.09	3.16	3.49	3.818	3.83	3.85	3.85
28. West Bengal	1,359.10	1,447.26	1484	1505	1443.259	1472.05	1490.02	1636.68
29. A & N Islands	28.68	28.68	32.49	33.19	33.921	35.26	36.62	39.39
30. Chandigarh	0.17	0.21	0.24	0.24	0.242	0.1	0.05	0.09
31. Dadra & Nagar Haveli	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
32. Daman & Diu	16.41	26.36	14.14	15.88	16.975	17.43	19.01	19.01
33. Delhi	0.61	0.61	0.72	0.71	0.82	0.74	0.69	0.69
34. Lakshadweep	11.75	11.04	12.59	12.37	12.372	12.37	12.37	12.37
35. Puducherry	39.66	39.01	40.3	41.94	41.949	42.4	41.07	41.17
Total	6,869.05	7,126.83	7,616.09	7851.61	8230.71	8666.49	9040.36	9425.8

Table 3: Top 12 State for Inland Fish Production ('000 tonnes) (2006–2014)

	2006/07	2007/08	2008/09	2009/10
1	West Bengal 1,359.10	West Bengal 1,447.26	West Bengal 1484	West Bengal 1505
2	Andhra Pradesh 856.93	Andhra Pradesh 1,010.08	Andhra Pradesh 1,252.78	Andhra Pradesh 1293.85
3	Gujarat 747.33	Gujarat 721.91	Gujarat 765.9	Gujarat 771.52
4	Kerala 677.63	Kerala 667.33	Kerala 685.99	Kerala 663.12
5	Maharashtra 595.94	Tamil Nadu 559.36	Tamil Nadu 534.17	Maharashtra 538.35
6	Tamil Nadu 542.28	Maharashtra 556.45	Maharashtra 523.1	Tamil Nadu 534.17
7	Odisha 342.04	Odisha 349.48	Odisha 374.82	Karnataka 408.05
8	Uttar Pradesh 306.73	Uttar Pradesh 325.95	Karnataka 361.85	Uttar Pradesh 392.93
9	Karnataka 292.46	Bihar 319.1	Uttar Pradesh 349.27	Odisha 370.54

10	Bihar	267.04	Karnataka	297.69	Bihar	300.65	Bihar	297.4
11	Assam	181.48	Assam	190.32	Assam	200.15	Assam	218.82
12	Chhattisgarh	137.75	Chhattisgarh	139.37	Chhattisgarh	158.7	Chhattisgarh	174.24

	2010/11	2011/12	2012/13	2013/14
1	West Bengal	1443.26	Andhra Pradesh	1603.17
2	Andhra Pradesh	1368.2	West Bengal	1472.05
3	Gujarat	774.902	Gujarat	783.72
4	Kerala	681.613	Kerala	693.21
5	Tamil Nadu	614.809	Tamil Nadu	611.49
6	Maharashtra	595.249	Maharashtra	578.79
7	Karnataka	526.579	Karnataka	546.44
8	Uttar Pradesh	417.479	Uttar Pradesh	429.72
9	Odisha	386.185	Odisha	381.83
10	Bihar	299.91	Bihar	344.47
11	Chhattisgarh	228.207	Chhattisgarh	250.7
12	Assam	227.242	Assam	228.62

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