An Overview of Water Resources of Orissa

Orissa depends largely upon monsoon for its water resources. Southwest monsoon triggers rainfall in the state. About 78% of total annual rainfall occurs during the period from June to September and the balance 22% in the remaining period. In addition to seasonal availability, the rainfall in the state also shows spatial variation i.e. from about 1200 mm in southern coastal plain to about 1700 mm in northern plateau. This has resulted in causing droughts in some parts of the state and floods in some others. The long-term average annual rainfall in the state is of the order of 1482 mm. Under normal condition, the state receives annual precipitation of about 230.76 billion cubic metres (BCM) of water. Of the total precipitation, a part is lost by evaporation, transpiration and deep percolation and a part stored in the form of ground water reserve and the remaining appears as surface runoff. The groundwater reserve and surface runoff constitute the water resources of the state. The water resources scenario of Orissa and India are given in the table below.

Water Resources: India & Orissa (Unit in BCM)

Description	India	Orissa*
Annual Precipitation	4000	230.76
Average Annual Water Resources	1869	141.408
Utilizable Water Resources (Surface & Ground)	1122	108.147
Utilizable Resources (% of precipitation)	28%	47%

* include resources available from outside state

Surface Water Resources:

The state is endowed with an extensive network of rivers and streams. As per an assessment made in 2001, the average annual availability of surface water is estimated as 120.397 BCM. Out of the above, the yield from its own drainage boundary is 82.841 BCM and inflow from neighbouring states through interstate rivers is 37.556 BCM. Considering the topography and geological limitations, 75% of the average annual flow can be utilized. Due to increasing demands for water for various uses, an attempt has been made to assess the availability of water by the year 2051. The assessment reveals that the surface water availability from its own drainage boundary remains more or less fixed but the inflow of surface water from neighbouring states will be reduced from 37.556 BCM to 25.272 BCM. The following table shows the assessed inflow of surface water pertaining to the years 2001 and 2051.

Assessed Inflow of Surface Water Scenario: 2001

Basin Name	Average Annual flow (in BCM)			75% dependable flow (in BCM)		
	Own	Outside State	Total	Own	Outside State	Total
Mahanadi	29.90	29.255	59.155	25.508	23.225	48.732
Brahmani	11.391	7.186	18.577	8.849	5.521	14.011
Baitarani	7.568	-	7.568	5.434	-	5.434
Rushikulya	3.949	-	3.949	2.782	-	2.782
Vamsadhara	5.083	-	5.083	3.881	-	3.881
Budhabalanga	3.111	-	3.111	2.521	-	2.521
Kolab	11.089	-	11.089	8.885	-	8.885
Indravati	6.265	-	6.265	4.451	-	4.451
Bahuda	0.438	-	0.438	0.213	-	0.213
Nagavali	2.853	-	2.853	2.322	-	2.322
Subernarekha	1.193	1.115	2.308	1.193	1.115	2.308
Total	**82.841**	**37.556**	**120.397**	**65.679**	**29.861**	**95.540**

Assessed Inflow of Surface Water (Future Scenario: 2051)

Basin Name	Average Annual flow (in BCM)			75% dependable flow (in BCM)		
	Own	Outside State	Total	Own	Outside State	Total
Mahanadi	29.90	21.039	50.939	25.508	16.702	42.210
Brahmani	11.391	3.118	14.509	8.849	2.395	10.884
Baitarani	7.568	-	7.568	5.434	-	5.434
Rushikulya	3.949	-	3.949	2.782	-	2.782
Vamsadhara	5.083	-	5.083	3.881	-	3.881
Budhabalanga	3.111	-	3.111	2.521	-	2.521
Kolab	11.089	-	11.089	8.885	-	8.885
Indravati	6.265	-	6.265	4.451	-	4.451
Bahuda	0.438	-	0.438	0.213	-	0.213
Nagavali	2.853	-	2.853	2.322	-	2.322
Subernarekha	1.193	1.115	2.308	1.193	1.115	2.308
Total	**82.841**	**25.272**	**108.113**	**65.679**	**20.212**	**85.891**

Source-State Water Plan

Ground Water Resources:

The natural recharge of ground water takes place through percolation from land after rain events. The quantum of dynamic ground water, which can be annually extracted, is generally reckoned as ground water potential. As per the assessment made in 2001, the total annual replenishable ground water resource of the state is 21.011 BCM, out of which 60% i,e 12.607 BCM is safe and usable.

Per-capitaWater Availability: The per-capita water availability is reducing progressively owing to increase in population. In 2001, the average per-capita water availability (both surface and ground) in the state was around 3359 cubic meter (cum) per year, as compared to the national average of 1820 cum. With the projected future population, the per-capita water availability in the state will reduce to 2218 cum in 2051. Per-capita water availability less than 1700 cum is termed water stress condition while if it falls below 1000 cum, it is termed as water scarce condition. Though per-capita availability of water resources in our state is relatively favorable in the aggregate, the Rushikulya basin will experience a scarcity condition and basins like Budhabalanga and Bahuda will be close to scarcity condition by 2051.

Water Requirement:

Water has always played an important role in providing livelihood, hygiene and environmental securities since the dawn of civilization. The demand pattern is changing rapidly with increase in population, urbanization and rapid industrialization. Keeping the constraints of water availability in view and the variety of its uses, water allocation issues need to be addressed in a wise manner. Considering this, the present and future requirement of water for all purposes have been assessed, which is given in the following table.

Water requirements for different uses (Qty. in BCM)

Uses	**Year-2001**			**Year-2051**		
	Surface	Ground	Total	Surface	Ground	Total
Domestic	0.798	1.198	1.996	1.202	1.803	3.006
Agriculture	18.00	4.688	22.688	40.00	9.408	49.408
Industry	0.606	0.100	0.706	1.750	0.20	1.950
Environment	21.00	8.40	29.40	21.00	8.40	29.40
Others	0.10	0.10	0.200	0.20	0.20	0.40
Total	**40.504**	**14.486**	**54.99**	**64.152**	**20.01**	**84.463**

Water Storage:

A storage capacity of 17.00 BCM has so far been developed through completed major, medium and minor(flow) projects. Besides, the projects under construction will contribute to an additional 1.47 BCM. The details are given in the table below.

Reservoir Storage Status as on 31.03.2009 (Qty. in BCM)

Category	Completed Projects		Projects under constn'	
	No	Capacity	No	Capacity
Major	7	14.86	4	1.04
Medium	38	1.30	9	0.43
Minor	2340	0.85	-	-
Total	**2385**	**17.01**	**13**	**1.47**