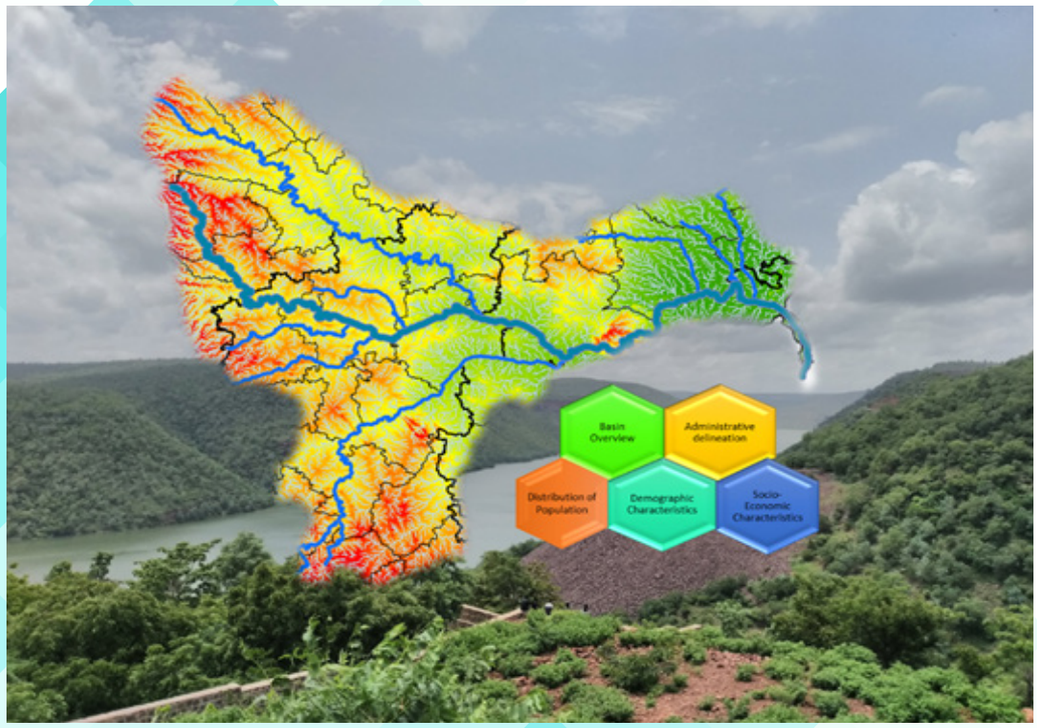
सत्यमेव जयते

National River Conservation Directorate
Department of Water Resources, River Development & Ganga Rejuvenation
Ministry of Jal Shakti
Government of India



DEMOGRAPHY OF KRISHNA RIVER BASIN

SEPTEMBER 2024

Centres for Krishna River Basin Management Studies (cKrishna)

cGanga
Centre for Ganga River Basin Management and Studies (cGanga)

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KRISHNA RIVER BASIN

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Centres for Krishna River Basin Management Studies (cKrishna)

Centre for Ganga River Basin Management and Studies (cGanga)

NATIONAL RIVER CONSERVATION DIRECTORATE (NRCD)

The National River Conservation Directorate, functioning under the Department of Water Resources, River Development & Ganga Rejuvenation, and Ministry of Jal Shakti providing financial assistance to the State Government for conservation of rivers under the Centrally Sponsored Schemes of 'National River Conservation Plan (NRCP)'. National River Conservation Plan to the State Governments/ local bodies to set up infrastructure for pollution abatement of rivers in identified polluted river stretches based on proposals received from the State Governments/ local bodies.

www.nrcd.nic.in

CENTRES FOR KRISHNA RIVER BASIN MANAGEMENT STUDIES (cKRISHNA)

The Centres for Krishna River Basin Management Studies (cKrishna) is a Brain Trust dedicated to River Science and River Basin Management. Established in 2024 by NIT Warangal and NIT Surathkal, under the supervision of cGanga at IIT Kanpur, the centre serves as a knowledge wing of the National River Conservation Directorate (NRCD). cKrishna is committed to restoring and conserving the Krishna River and its resources through the collation of information and knowledge, research and development, planning, monitoring, education, advocacy, and stakeholder engagement.

www.cgodavari.org

CENTRE FOR GANGA RIVER BASIN MANAGEMENT AND STUDIES (cGANGA)

cGanga is a think tank formed under the aegis of NMCG, and one of its stated objectives is to make India a world leader in river and water science. The Centre is headquartered at IIT Kanpur and has representation from most leading science and technological institutes of the country. cGanga's mandate is to serve as think-tank in implementation and dynamic evolution of Ganga River Basin Management Plan (GRBMP) prepared by the Consortium of 7 IITs. In addition to this, it is also responsible for introducing new technologies, innovations, and solutions into India.

www.cganga.org

ACKNOWLEDGMENT

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SUGGESTED CITATION

cKrishna and cGanga (2024), Demography of Krishna River Basin, NRCD, DoWR, RD & GR, Ministry of Jal Shakti, Government of India.

TEAM

Jew Das, cKrishna, NIT Warangal
Manali Pal, cKrishna, NIT Warangal
Lita Kumar Ray, cKrishna, NIT Warangal
K. Srikanth, cKrishna, NIT Warangal
B. Eswar Sai, cKrishna, NIT Warangal
S. Shrihari, cKrishna, NITK Surathkal
B. Manu, cKrishna, NITK Surathkal
Jacklin Jeke Nilling, cKrishna, NITK Surathkal
Saranya P, cKrishna, NITK Surathkal
Chandan Pradhan, cKrishna, NITK Surathkal
Vinod Tare, cGanga, IIT Kanpur
Rahul Ramachandran, cGanga, IIT Kanpur
Rajith K, cGanga, IIT Kanpur

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जल शक्ति मंत्री
भारत सरकार

Minister for Jal Shakti
Government of India

संदेश

मानव सभ्यता का विकास नदियों के किनारे हुआ है, और इसे सुरक्षित रखने के लिए नदियों का संरक्षण अत्यंत आवश्यक है। भारत की नदियों के स्वास्थ और सुरक्षा के लिए 2019 में संसद के संयुक्त सत्र में राष्ट्रपति ने गंगा नदी के उदाहरण पर अन्य प्रमुख नदियों के बेसिन प्रबंधन की आवश्यकता पर बल दिया था। इस उद्देश्य की पूर्ति हेतु छह प्रमुख नदियों के बेसिन प्रबंधन में सी–गंगा के समग्र समन्वय से 12 प्रतिष्ठित शैक्षणिक संस्थाओं को शामिल करने का निर्णय लिया गया। राष्ट्रीय नदी संरक्षण निदेशालय द्वारा संचालित कंडीशन एसेसमेंट एंड मैनेजमेंट प्लान (कैंप) प्रोजेक्ट नदियों के समग्र बेसिन प्रबंधन को साकार करने का प्रयास है।

नदियों के संरक्षण और उनके प्रबंधन के लिए इस तरह की पहल से न केवल हमारे प्राकृतिक संसाधनों का बचाव होगा, बल्कि स्थानीय समुदायों के जीवन और संस्कृति को भी संरक्षित किया जा सकेगा। यह अत्यंत हर्ष का भविष्य है कि इस प्रोजेक्ट के तहत तैयार की गई ''रिवर एट ए ग्लांस'' रिपोर्ट का लोकार्पण होने जा रहा है। जैसे किसी व्यक्ति के बाह्य स्वरूप से उसकी पुरी पहचान नहीं होती, वैसे ही नदी के व्यवहार और चुनौतियों को सिर्फ मुख्यधारा से नही समझा जा सकता। इसके लिए नदी के इतिहास, उसके किनारे बसे नगरों और गांवों की संस्कृति, सहायक नदियों और उस क्षेत्र के भूगोल को भी समझाना पड़ता है। इसी रिपोर्ट के जरिए नदी की पूरी प्रकृति, उसकी चुनौतियाँ, सहायक नदियां और आसपास के क्षेत्रों की सांस्कृतिक–भौगोलिक स्थिति को समझने के जो कोशिश की गई है, वह बहुत महत्वपूर्ण है।

हमें विश्वास है कि यह रिपोर्ट नदी, जल और पर्यावरण के क्षेत्र में काम करने वाले व्यक्तियों, संस्थाओं और हितकारकों के लिए अत्यधिक उपयोगी साबित होगी। रिपोर्ट के प्रकाशन और लोकार्पण के इस विशेष अवसर पर बधाई।

सीआर पाटील

सत्यमेव जयते

जल शक्ति राज्य मंत्री
भारत सरकार, नई दिल्ली

Minister of State for Jal Shakti
Government of India, New Delhi

संदेश

नदियां हमारे जीवन के लिए अत्यावश्यक संसाधन हैं और उनका पर्यावरणीय, सामाजिक, और आर्थिक महत्व भी बहुत अधिक है। नदियों का संरक्षण भविष्य की पीढ़ियों के लिए जीवन की गुणवत्ता सुनिचित करने की दिशा में एक महत्वपूर्ण कदम है। देश की छह प्रमुख नदियों के बेसिन प्रबंधन के लिए शीर्ष तकनीकी शिक्षण संस्थाओं के सहयोग से राष्ट्रीय नदी संरक्षण निदेशालय का कैंप (कंडीशन एसेसमेंट एंड मैनेजमेंट प्लान) प्रोजेक्ट संरक्षण के लिए वर्तमान सरकार की प्रतिबद्ता दर्शाता है। भारत सरकार के नमामि गंगे मिशन के अंतर्गत किये प्रयासों से आज गंगा नदी के पुनर्जीवन को वैशिक मान्यता मिल चुकी है। उम्मीद है की ऐसी ही सफलता हमें कैंप प्रोजेक्ट में भी मिलेगी।

रिवर बेसिन जनसांखियकी (डेमोग्राफिक) रिपोर्ट को देखकर हार्दिक प्रसन्नता हुई। कम समय में विस्तृत रिपोर्ट तैयार करने के लिए सभी सदस्यों को बधाई। जनसंख्यिकी रिपोर्ट न केवल हमें वर्तमान के बारे में अवगत कराता है, बल्कि इस रिपोर्ट को देखकर भविष्य की चुनौतियों और अपेक्षाओं का भी अनुमान लगाया जा सकता है। यह रिपोर्ट शासन, प्रशासन शिक्षण के लिए एक अहम् दस्तावेज है।

डा. राज भूषण चौधरी

PREFACE

In an era of unprecedented environmental change, understanding our rivers and their ecosystems has never been more critical. This report aims to provide a comprehensive overview of our rivers, highlighting their importance, current health, and the challenges they face. As we explore the various facets of river systems, we aim to equip readers with the knowledge necessary to appreciate and protect these vital waterways.

Throughout the following pages, you will find an in-depth analysis of the principles and practices that support healthy river ecosystems. Our team of experts has meticulously compiled data, case studies, and testimonials to illustrate the significant impact of rivers on both natural environments and human communities. By sharing these insights, we hope to inspire and empower our readers to engage in river conservation efforts.

This report is not merely a collection of statistics and theories; it is a call to action. We urge all stakeholders to recognize the value of our rivers and to take proactive steps to ensure their preservation. Whether you are an environmental professional, a policy maker, or simply someone who cares about our planet, this guide is designed to support you in your efforts to protect our rivers.

We extend our heartfelt gratitude to the numerous contributors who have generously shared their stories and expertise. Their invaluable input has enriched this report, making it a beacon of knowledge and a practical resource for all who read it. It is our hope that this report will serve as a catalyst for positive environmental action, fostering a culture of stewardship that benefits both current and future generations.

As you delve into this overview of our rivers, we invite you to embrace the opportunities and challenges that lie ahead. Together, we can ensure that our rivers continue to thrive and sustain life for generations to come.

cKrishna and cGanga

CONTENT

ABBREVIATIONS AND ACRONYMS

KRB	**Krishna River Basin**
NSDP	**Net State Domestic Product**
ULB	**Urban Local Bodies**

1. Basin overview

The Krishna River also known as Krishnaveni is one of the longest rivers in the Deccan plateau is the third-longest river in India, after the Ganges and Godavari. The Krishna River is a significant river in India, originating in the Western Ghats near Mahabaleshwar in Maharashtra. Flowing eastward across the Indian states of Maharashtra, Karnataka, Telangana and Andhra Pradesh, it eventually empties into the Bay of Bengal. Spanning approximately 1,400 kilometres, the Krishna River has a drainage basin covering around 258,948 square kilometres and represents the catchment area of Krishna River Basin (KRB) covering four states in India and spatial variation of elevation of the KRB.

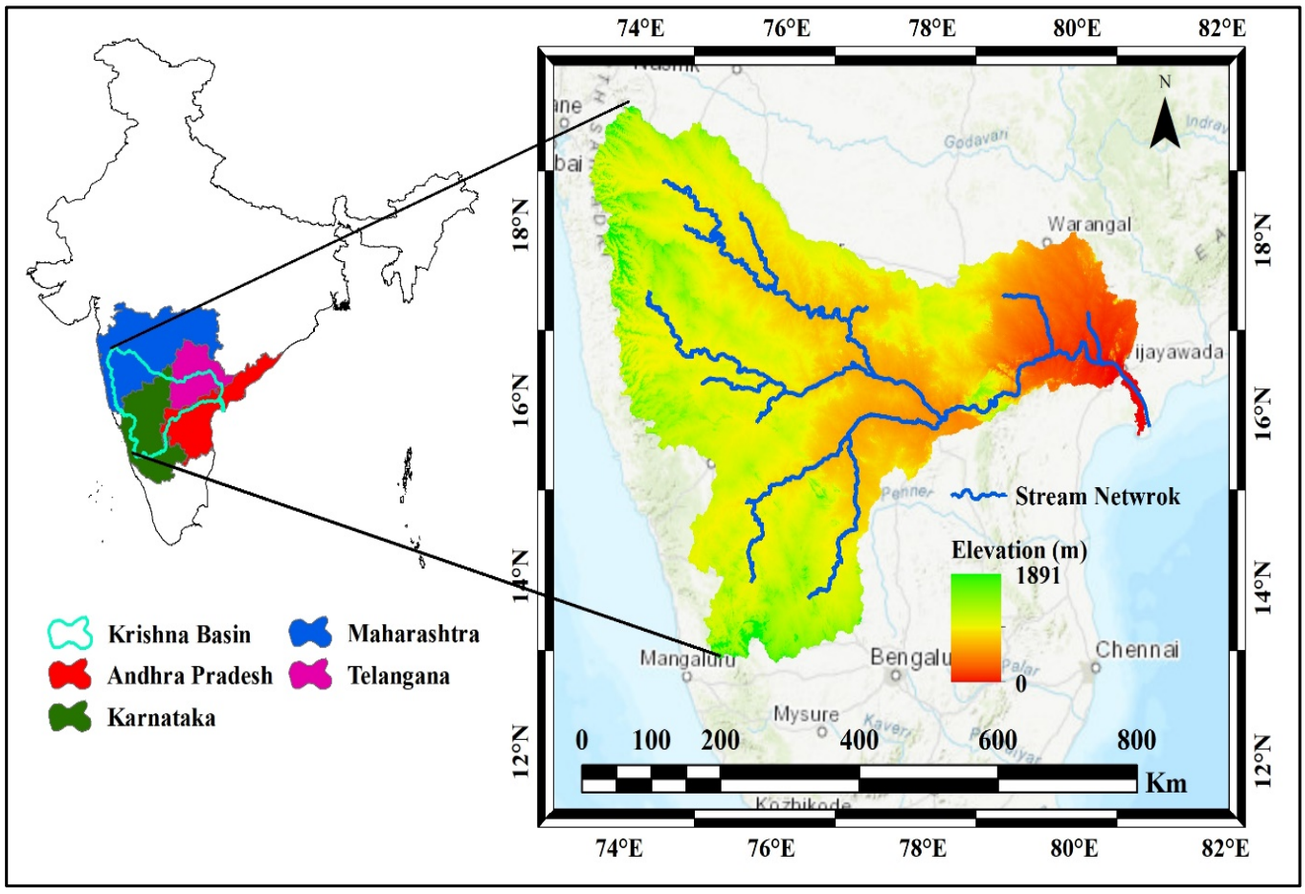


Figure 1. Catchment area of Krishna River Basin covering four states in India and spatial variation of elevation of the basin

The Krishna River has 13 major tributaries, which contribute to its water flow and overall hydrology. Figure 2 shows the map of the Krishna River and its major tributaries. The Krishna basin is split into 7 sub-basins namely Bhima lower sub-basin (9.28%), Bhima upper sub-basin (17.58%), Krishna lower sub-basin (15.5%), Krishna middle sub-basin (8.73%), Krishna upper sub-basin (21.4%), Tungabhadra lower sub-basin (16.31%), and Tungabhadra upper sub-basin (11.2%) as shown in Figure 3.

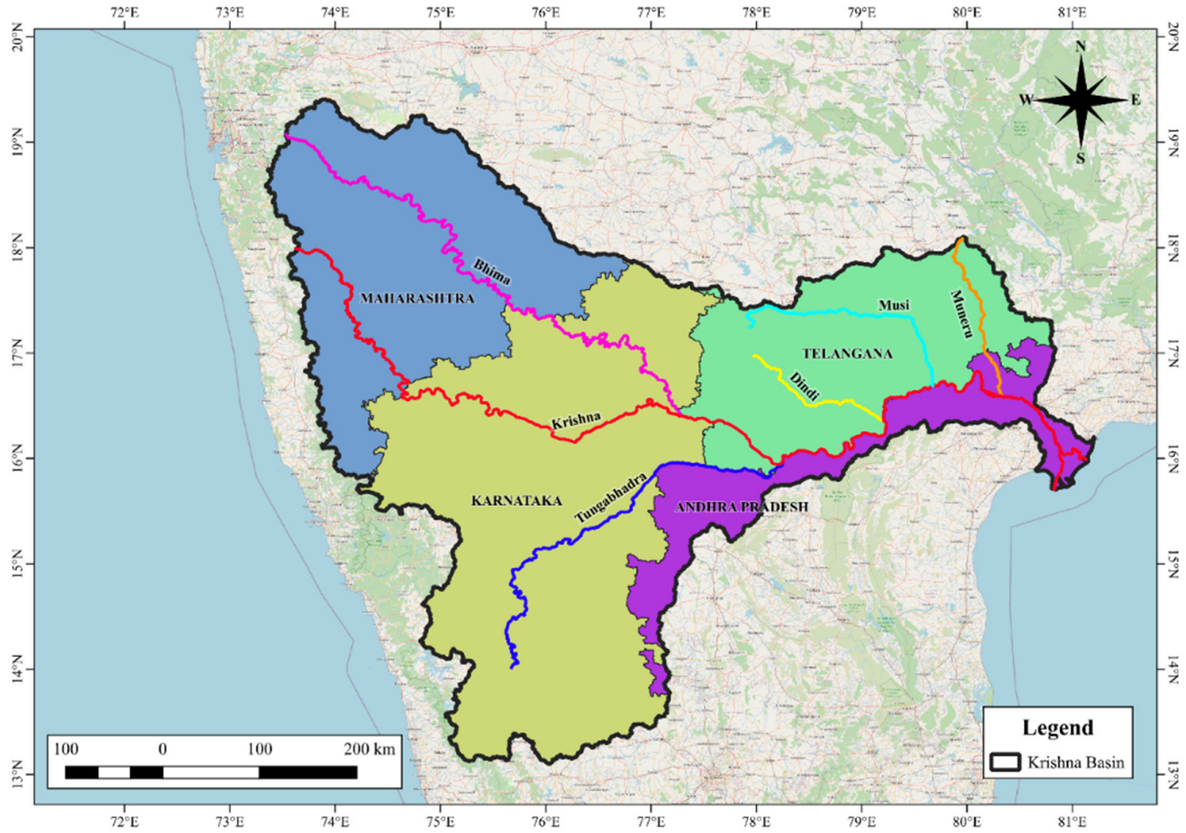


Figure 2. Krishna River and its major tributaries

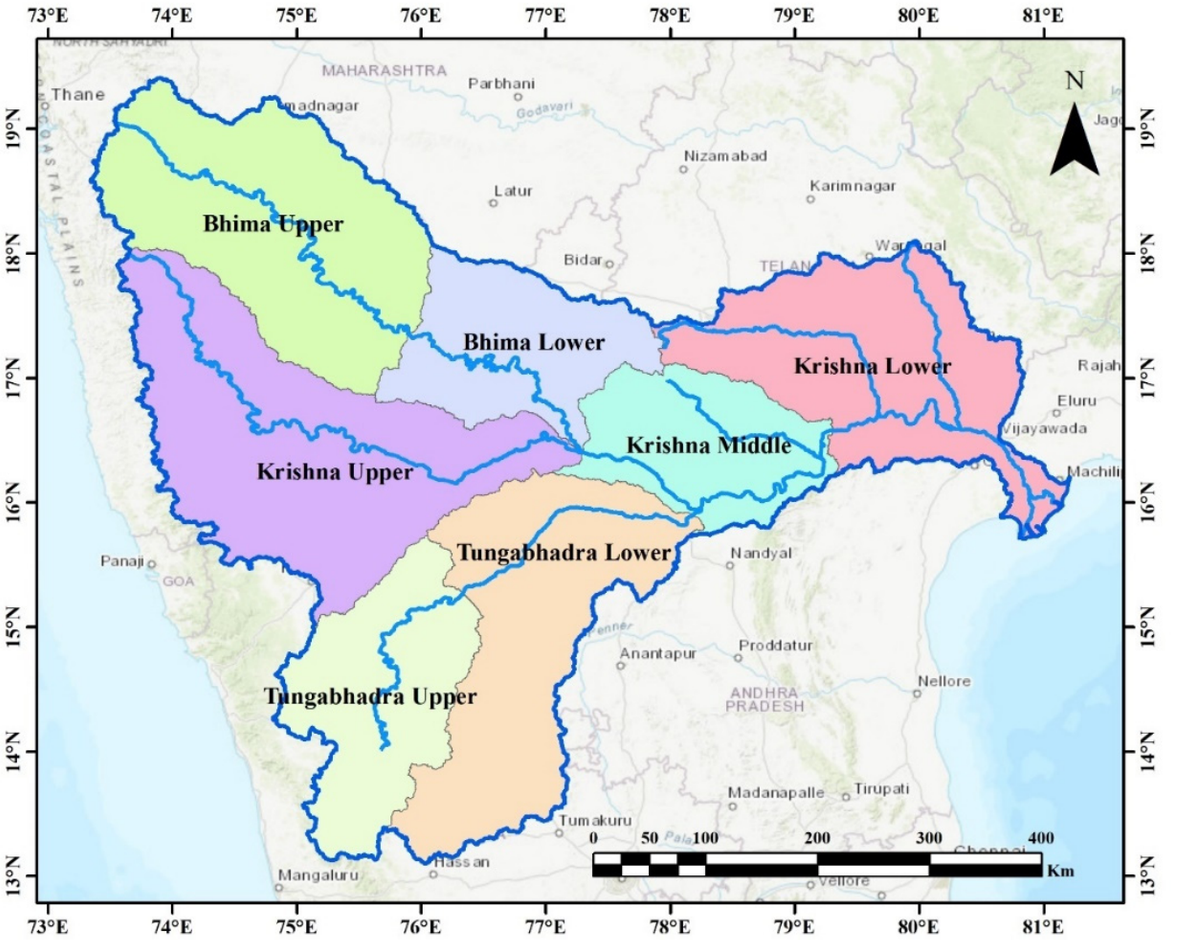


Figure 1. Sub-Basins of Krishna River Basin

2. Administrative delineation at various levels within the basin

The Krishna River Basin encompasses a significant geographic area, extending across multiple states in India. Within this expansive region, there are a total of 257 taluks (administrative subdivisions) spread over 53 districts. Figure 4. and Figure 5. show the districts and taluks under the Krishna basin respectively. Anantapur and Hyderabad are the largest and smallest districts in the Krishna basin with the areas of 19,165.56 Km^2 and 186.45 Km^2 respectively. Table 1. and Table 2. list the names of districts and taluks respectively. The major Urban Local Bodies (ULB's) present in the Krishna Basin are represented in Figure 6.

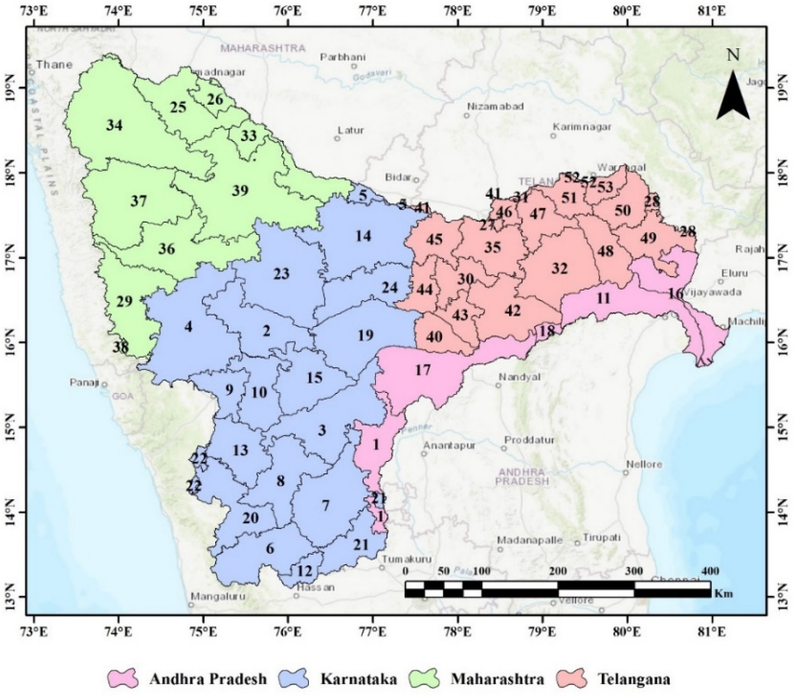


Figure 4. Districts under Krishna River Basin

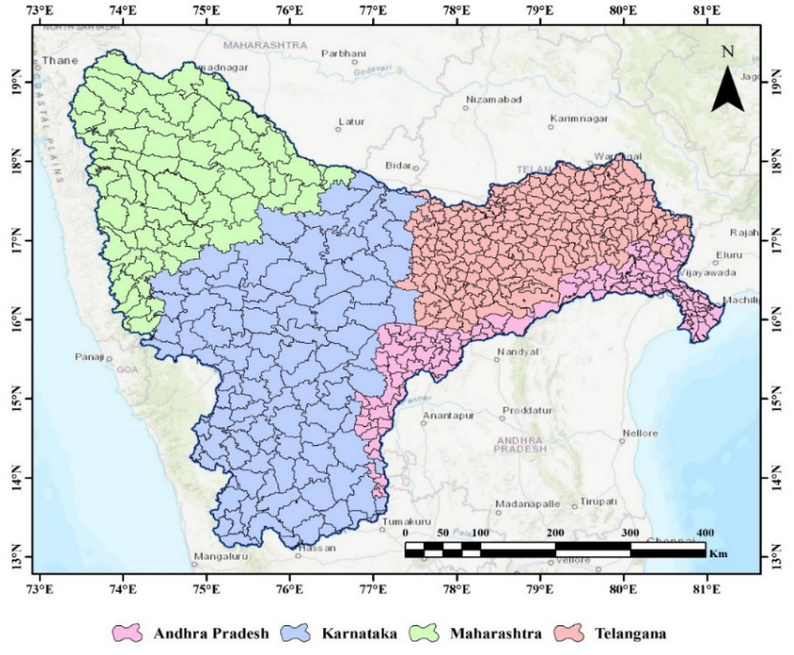


Figure 5. Taluks (administrative subdivisions) under Krishna River Basin

Table 1. Names of districts in Krishna Basin

Sl. No.	District Name
1	Anantapur
2	Bagalkot
3	Ballari
4	Belagavi
5	Bidar
6	Chikkamagaluru
7	Chitradurga
8	Davangere
9	Dharwad
10	Gadag
11	Guntur
12	Hassan
13	Haveri
14	Kalaburagi
15	Koppal
16	Krishna
17	Kurnool
18	Prakasam
19	Raichur
20	Shivamogga
21	Tumakuru
22	Uttara Kannada
23	Vijayapura
24	Yadgir
25	Ahamadnagar
26	Bid
27	Hyderabad

Sl. No.	District Name
28	Bhadradri Kothagudem
29	Kolhapur
30	Mahabubnagar
31	Siddipet
32	Nalgonda
33	Usmanabad
34	Pune
35	Rangareddy
36	Sangli
37	Satara
38	Sindhudurg
39	Solapur
40	Jogulamba Gadwal
41	Sangareddy
42	Nagarkurnool
43	Wanaparthy
44	Narayanpet
45	Vikarabad
46	Medchal-Malkajgiri
47	Yadadri Bhuvanagiri
48	Suryapet
49	Khammam
50	Mahabubabad
51	Jangaon
52	Warangal (Urban)
53	Warangal (Rural)

Table 2. Name of Taluks under Krishna River Basin

S.No	Taluk	S.No	Taluk	S.No	Taluk	S.No	Taluk	S.No	Taluk
1	Gooty	52	Homnabad	103	Savanur	154	Radhanagari	205	Savantvadi
2	Kalyandurg	53	Basavana Bagevadi	104	Shiggaon	155	Shahuwadi	206	Vaibhavwadi
3	Madakasira	54	Bijapur	105	Gangawati	156	Shirol	207	Akalkot
4	Rayadurg	55	Indi	106	Koppal	157	Nilanga	208	Barsi
5	Guntur	56	Muddebihal	107	Kushtagi	158	Bhum	209	Karmal
6	Guruzala	57	Sindgi	108	Yelbarga	159	Kallam	210	Madha
7	Narasaraopet	58	Chikmagalur	109	Deodrug	160	Osmanabad	211	Malsiras
8	Repalle	59	Kadur	110	Lingsugur	161	Parenda	212	Mangalwedha
9	Sattenapalle	60	Koppa	111	Manvi	162	Tuljapur	213	Mohol
10	Tenali	61	Mudigere	112	Raichur	163	Umarga	214	Pandharpur
11	Vinukonda	62	Narasimharajapura	113	Sindhnur	164	Baramati	215	Sangole
12	Avanigadda	63	Sringeri	114	Hosanagara	165	Bhor	216	Solapur
13	Gannavaram	64	Tarikere	115	Sagar	166	Daund	217	Murbad
14	Gudivada	65	Challakere	116	Shikarpur	167	Ghod	218	Hyderabad
15	Jaggayyapeta	66	Chitradurga	117	Shimoga	168	Indapur	219	Huzurabad
16	Nandigama	67	Hiriyur	118	Sorab	169	Junnar	220	Karimnagar
17	Nuzvid	68	Holalkere	119	Tirthalli	170	Paud	221	Khammam
18	Tiruvuru	69	Hosdurga	120	Chiknayakanhalli	171	Rajgurunagar	222	Kottagudem
19	Vijayawada	70	Molakalmuru	121	Gubbi	172	Sasvad	223	Madhira
20	Adoni	71	Bhadravati	122	Koratagere	173	Shirur	224	Yellandu
21	Alur	72	Channagiri	123	Madhugiri	174	Wadgaon	225	Achampet
22	Atmakur	73	Davangere	124	Pavagada	175	Mahad	226	Alampur
23	Dhone	74	Harihar	125	Sira	176	Mangaon	227	Atamkur
24	Kurnool	75	Harpanahalli	126	Tiptur	177	Pali	228	Farooq Nagar
25	Nandikotkur	76	Honnali	127	Tumkur	178	Poladpur	229	Gadwal
26	Pattikonda	77	Jagalur	128	Karkal	179	Chiplun	230	Kalwakurti
27	Markapur	78	Dharwad	129	Mundgod	180	Devrukh	231	Kolhapur
28	Badami	79	Hubli	130	Siddapur	181	Khed	232	Korangal
29	Bagalkot	80	Kalghatgi	131	Sirsi	182	Lanja	233	Mahbubnagar
30	Bilgi	81	Kundgol	132	Shahpur	183	Rajapur	234	Makhtal
31	Hungund	82	Navalgund	133	Shorapur	184	Atpadi	235	Nagar Karnul
32	Jamkhandi	83	Gadag	134	Yadgir	185	Islampur	236	Wanparthy
33	Mudhol	84	Mundargi	135	Ahmadnagar	186	Jath	237	Gajwel
34	Athni	85	Nargund	136	Akola	187	Kavathe Mahankal	238	Narsapur
35	Bail Hongal	86	Ron	137	Karjat	188	Sangli	239	Sangareddi
36	Belgaum	87	Shirhatti	138	Parner	189	Shirala	240	Zahirabad
37	Chikodi	88	Afzalpur	139	Pathardi	190	Tasgaon	241	Bhongir
38	Gokak	89	Aland	140	Sangamner	191	Vite	242	Devarkonda
39	Hukeri	90	Chincholi	141	Shrigonda	192	Dahivadi	243	Huzurnagar
40	Khanapur	91	Chitapur	142	Ashti	193	Karad	244	Mirialguda
41	Ramdurg	92	Gulbarga	143	Jamkhed	194	Koregaon	245	Nalgonda
42	Raybag	93	Jevargi	144	Patoda	195	Mahabaleshwar	246	Ramannapet
43	Saundatti	94	Seram	145	Ajra	196	Medha	247	Suriapet
44	Bellary	95	Arsikere	146	Bavda	197	Patan	248	Chevella
45	Hagaribommanahalli	96	Belur	147	Chandgad	198	Phaltan	249	Ibrahimpatan
46	Hospet	97	Hassan	148	Gadhinglaj	199	Satara	250	Medchal
47	Huvvinahadagalli	98	Byadgi	149	Gargoti	200	Shirwal	251	Pargi
48	Kudligi	99	Hangal	150	Hatkalangda	201	Vaduj	252	Tandur
49	Sandur	100	Haveri	151	Kagal	202	Wai	253	Vikarabad
50	Siruguppa	101	Hirekerur	152	Kolhapur	203	Kankauli	254	Hanmakonda
51	Basavakalyan	102	Ranibennur	153	Panhala	204	Kudal	255	Jangaon
								256	Mulug
								257	Narsampet

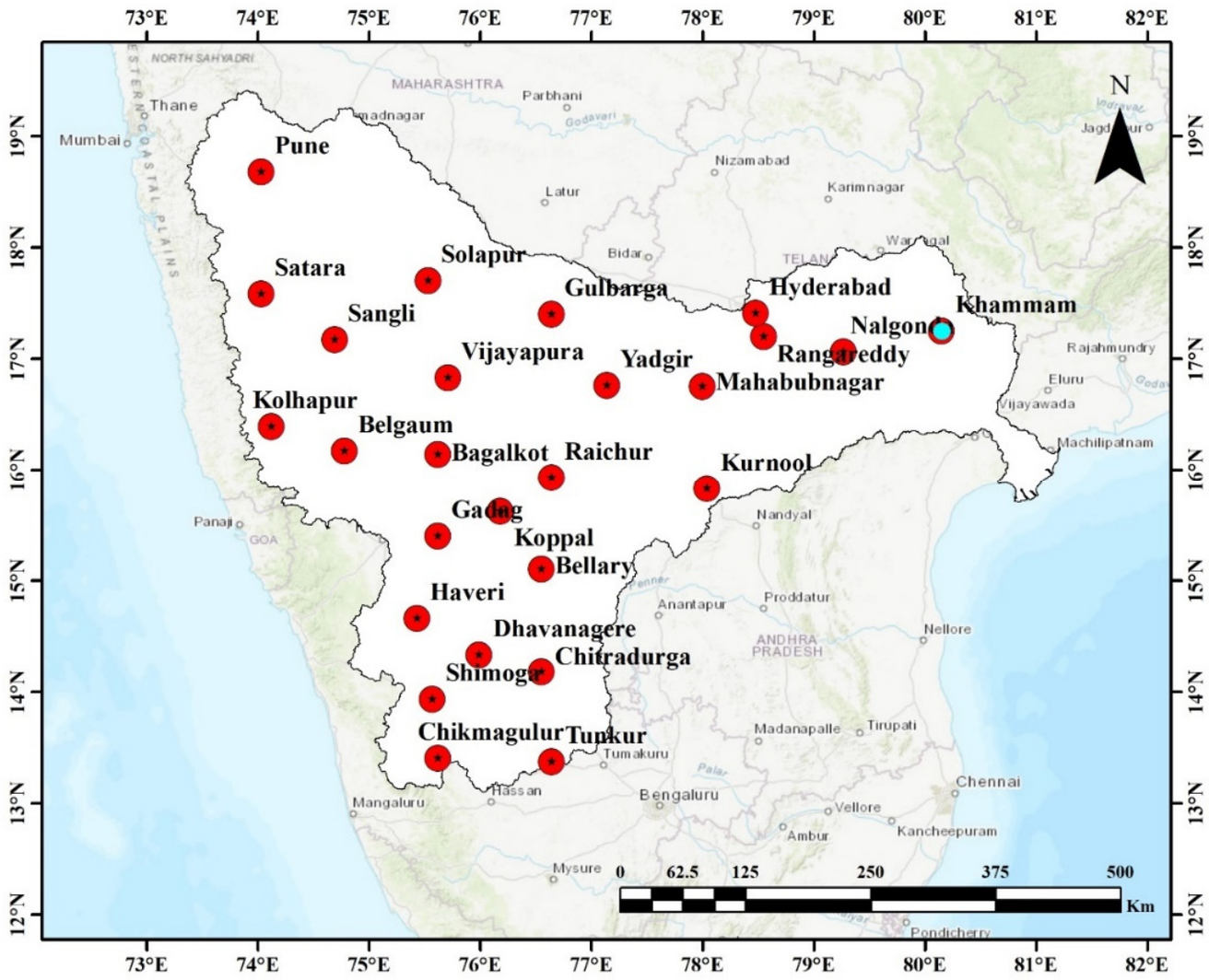


Figure 6. The major Urban Local Bodies present in the Krishna Basin

3. Distribution of Population

3.1. Total Population

The Krishna River Basin is home to a total population of 66,341,683 people, encompassing 53 major districts. Figure 7 shows the spatial variation of population in million throughout the Krishna basin and major urban areas present in the basin. Key urban areas within the basin include Pune, Hyderabad, Rangareddy, Guntur, Davanagere and Shimoga. The urban population in these major cities constitutes 16.8% of the total population in the basin, with the majority depending on agriculture for their livelihood. Demographic patterns of rural and urban areas over the Krishna River Basin are represented in Table 3. The Krishna River Basin encompasses a large portion of the population, with nearly 87.7 million people, of which 60.8% live in rural areas. The basin's rural population is approximately 1.55 times larger than the urban population.

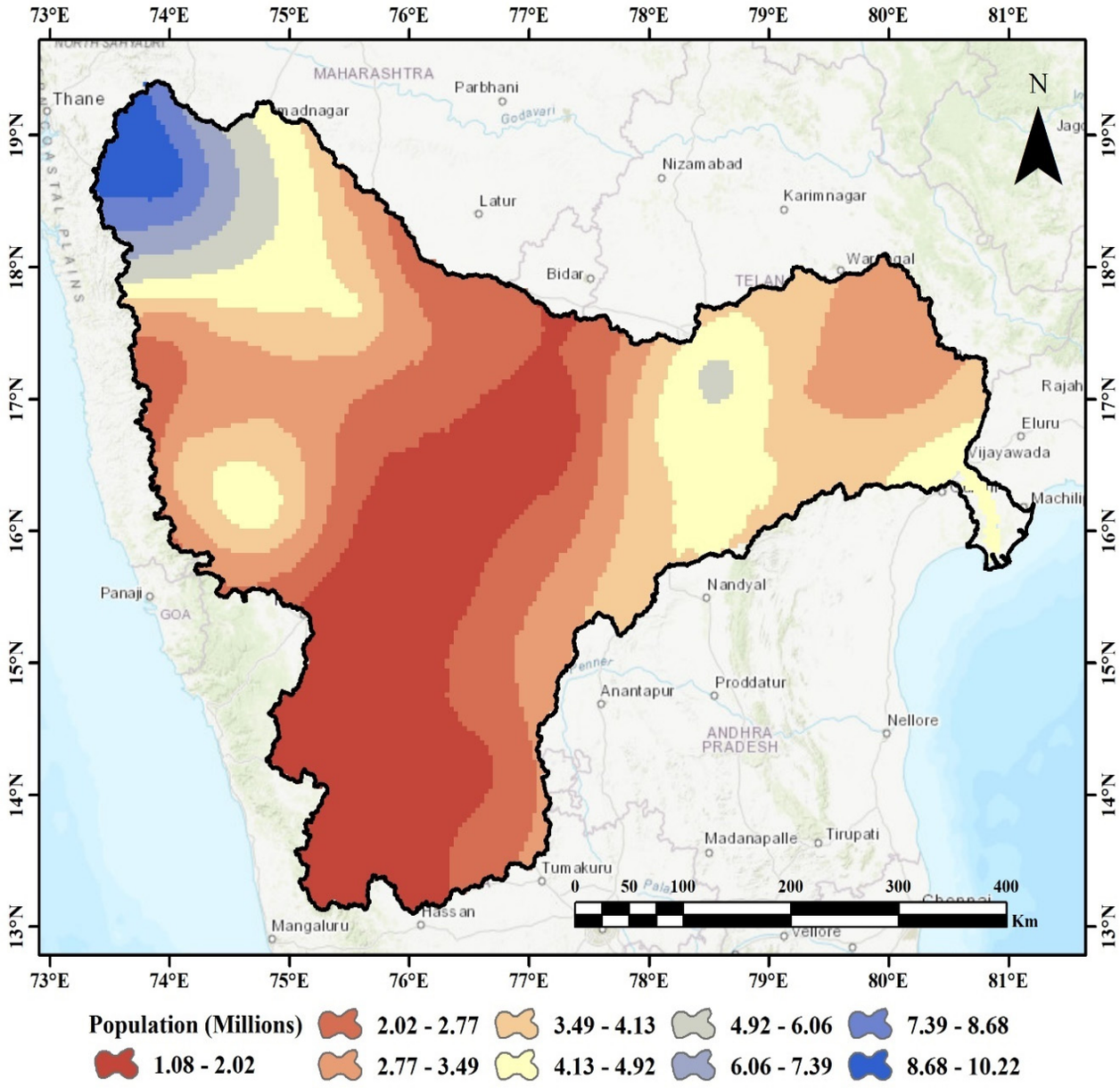


Figure 7. Population Spread and major Urban areas in the Krishna Basin

In all three states (Andhra Pradesh, Maharashtra and Karnataka), the rural population significantly outweighs the urban population. This is especially prominent in Karnataka, where 61.3% of the population resides in rural areas. Across all three states and the Krishna River Basin, the gender ratio is relatively balanced, with males slightly outnumbering females. For instance, Andhra Pradesh shows a male population of 12.27 million and a female population of 12.18 million. Karnataka has the highest total population (36.88 million) among the three states within the Krishna River Basin, and its rural population makes up 61.3% of its total, suggesting a more agrarian society compared to the other states. Maharashtra has the highest urban population percentage (45.2%) of the three states, indicating a higher level of urbanization compared to Andhra Pradesh and Karnataka.

Table 3. Demographic patterns of rural and urban areas over the Krishna River Basin

State	Total /Rural /Urban	Population (Millions)			% Males	% Females
		Persons	Males	Females		
Andhra Pradesh	Total	24.46	12.28	12.19	50.18	49.82
	Rural	16.30	8.17	8.13	50.11	49.89
	Urban	8.16	4.11	4.05	50.32	49.68
Maharashtra	Total	26.33	13.65	12.68	51.83	48.17
	Rural	14.42	7.39	7.03	51.24	48.76
	Urban	11.91	6.26	5.65	52.55	47.45
Karnataka	Total	36.89	18.70	18.19	50.69	49.31
	Rural	22.62	11.43	11.19	50.52	49.48
	Urban	14.26	7.27	7.00	50.95	49.05
Krishna Basin	Total	87.68	44.62	43.06	50.89	49.11
	Rural	53.35	26.99	26.36	50.59	49.41
	Urban	34.33	17.63	16.70	51.35	48.65

3.2. Population Distribution

The Krishna Basin population, being a region encompassing parts of these states, grew at a fast pace, reflecting the overall population growth in the southern and western parts of India. It grew by more than 60 million people between 1941 and 2011. The variation of total population in Decadal-wise over Krishna Basin is represented in Figure 8. Variation of percentage increase in population since the preceding census (Decadal-wise) in Krishna Basin is represented in Figure 9. Table 4. represents the demographic data for states in the Krishna Basin for census years (1941 to 2011).

Table 4. Demographic data for states in the Krishna Basin for census years (1941 to 2011)

State	Year	Population (Millions)	Variation since the preceding census		Male (Millions)	Female (Millions)	Sex Ratio
			Increase in population (Millions)	% Increase			
United Andhra Pradesh	1941	7.89	0.89	11.31	3.99	3.91	980
	1951	9.00	1.11	12.30	4.53	4.47	986
	1961	10.41	1.41	13.53	5.25	5.15	981
	1971	12.58	2.17	17.28	6.36	6.22	977
	1981	15.49	2.91	18.76	7.84	7.65	975
	1991	19.23	3.75	19.48	9.75	9.48	972
	2001	22.04	2.81	12.73	11.14	10.90	978
	2011	24.46	2.42	9.90	12.27	12.19	993

State	Year	Population (Millions)	Variation since the preceding census		Male (Millions)	Female (Millions)	Sex Ratio
			Increase in population (Millions)	% Increase			
Maharashtra	1941	6.29	0.67	2.81	3.23	3.06	949
	1951	7.50	1.21	4.51	3.86	3.63	941
	1961	9.27	1.77	5.53	4.79	4.48	936
	1971	11.81	2.54	6.43	6.12	5.69	930
	1981	14.71	2.90	5.75	7.59	7.12	937
	1991	18.49	3.78	6.03	9.57	8.93	934
	2001	22.70	4.20	5.33	11.81	10.89	922
	2011	26.33	3.63	3.75	13.65	12.68	929
Karnataka	1941	9.81	0.98	6.69	5.01	4.81	960
	1951	11.71	1.90	11.69	5.96	5.76	966
	1961	14.24	2.53	13.02	7.27	6.97	959
	1971	17.69	3.45	14.62	9.04	8.65	957
	1981	22.42	4.73	16.15	11.43	11.00	963
	1991	27.16	4.73	12.75	13.86	13.30	960
	2001	31.91	4.75	10.57	16.24	15.67	965
	2011	36.89	4.98	9.42	18.70	18.19	973
Krishna Basin	1941	23.99	2.55	10.61	12.22	11.77	964
	1951	28.21	4.22	14.95	14.35	13.86	966
	1961	33.92	5.70	16.82	17.31	16.61	959
	1971	42.08	8.17	19.41	21.52	20.56	955
	1981	52.62	10.54	20.02	26.86	25.76	959
	1991	64.89	12.27	18.91	33.18	31.71	956
	2001	76.65	11.76	15.35	39.19	37.46	956
	2011	87.68	11.03	12.58	44.62	43.06	965

Karnataka shows the largest population among the three states by 2011 (36.8 million), while Maharashtra and United Andhra Pradesh have similar populations (26.3 million and 24.4 million, respectively).

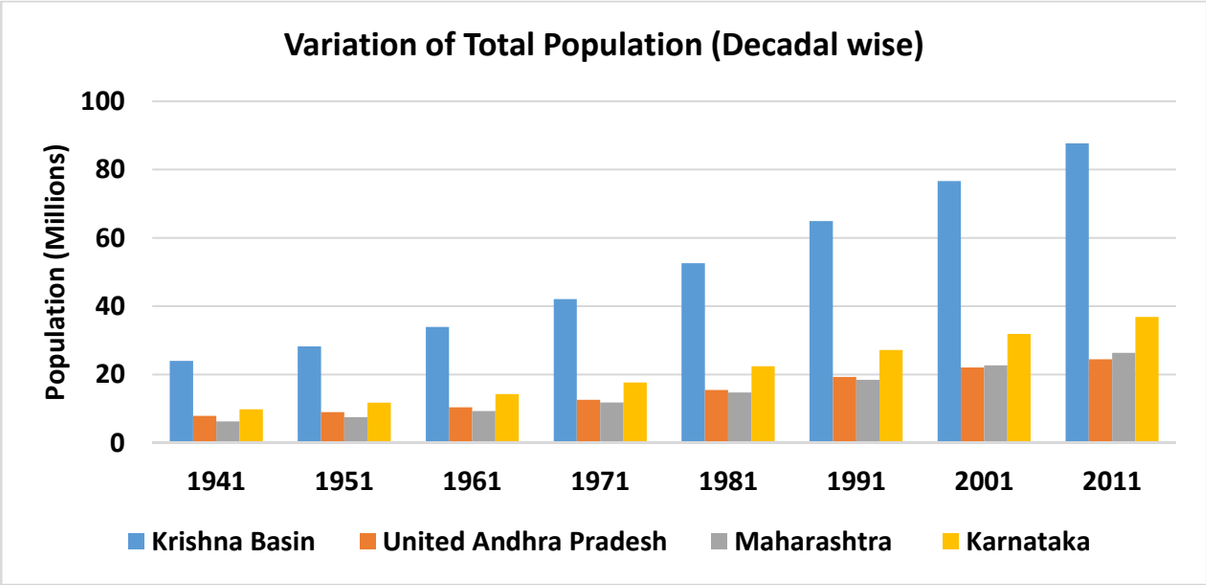


Figure 8. Variation of Total Population (Decadal-wise) in Krishna Basin

3.3. Population Growth Trends

Maharashtra's population increased steadily from 6.2 million in 1941 to 26.3 million in 2011. The largest percentage jumps occurred between 1951 and 1971, and growth slowed down between 1991 and 2011. Karnataka's population increased almost fourfold over the 70 years, from about 9.8 million in 1941 to 36.8 million in 2011. The largest increases were between 1961 and 1981. Overall, in the Krishna Basin, which spans across multiple states, saw its population nearly quadruple from 23.9 million in 1941 to 87.6 million in 2011. The largest percentage increase occurred between 1951 and 1971, and growth continued at a high rate into the 2000s.

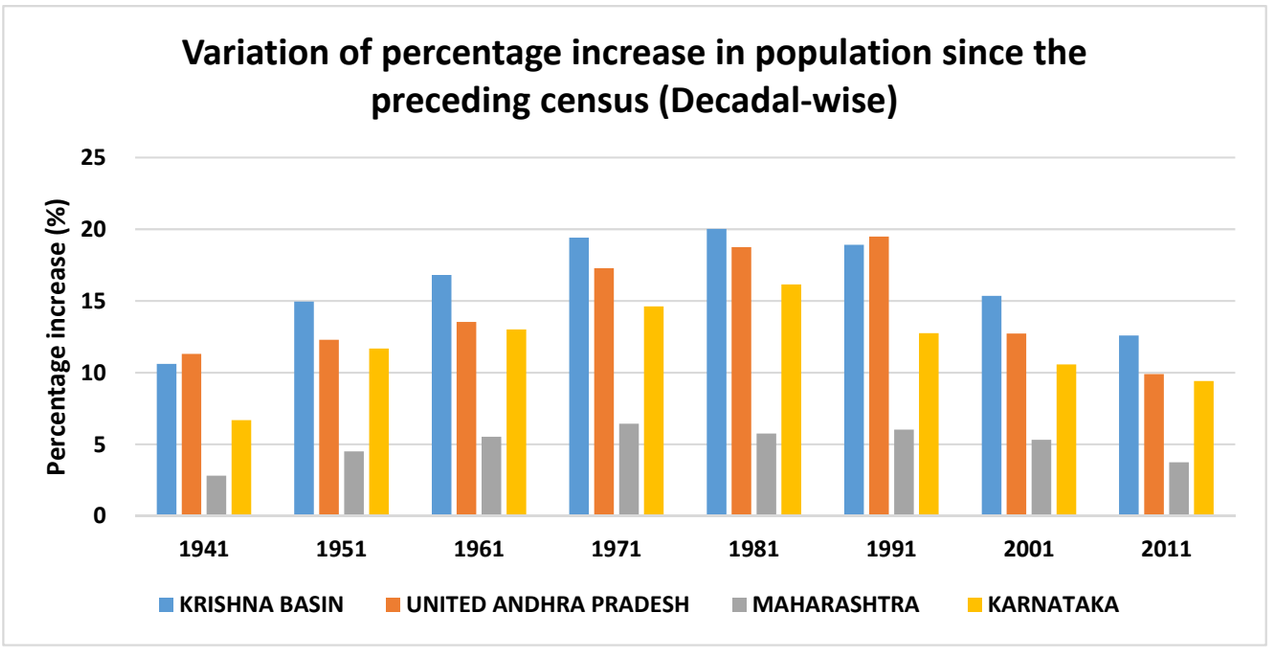


Figure 9. Variation of percentage increase in population since the preceding census (Decadal-wise) in Krishna Basin

The key observations for each state as follow:

United Andhra Pradesh:

- Steady increase in population over each decade, with the highest percentage growth between 1951 and 1961 (13.53%).
- The population almost tripled from 7.8 million in 1941 to 24.46 million in 2011.
- Noticeable slowdown in the rate of population growth by 2011 (only 9.90% compared to previous decades).

Maharashtra:

- Relatively modest population growth until the 1970s, after which the state sees significant increases in population, reaching 26.3 million by 2011.
- Similar to United Andhra Pradesh, the percentage increase in population slowed down significantly post-1991 (5.33% in 2001 and only 3.75% in 2011).

Karnataka:

- Experienced continuous growth, with significant jumps especially between 1961 and 1971 (14.62% growth).
- The state's population almost quadrupled from 9.8 million in 1941 to 36.8 million in 2011.
- However, the percentage increase starts to slow down after the 1980s.

Krishna Basin:

- The Krishna Basin, a geographical region covering multiple states, also shows significant population growth, with the highest percentage increase between 1951 and 1971 (19.41%).
- The population of the Krishna Basin grew from 23.99 million in 1941 to 87.6 million by 2011.
- The population of United Andhra Pradesh nearly tripled between 1941 and 2011, from about 7.9 million to 24.4 million. The largest jumps were between 1971–1981 and 1981–1991.

4. Demographic Characteristics

4.1. Age Structure

Variation of Age Structure over Krishna River Basin as per 2011 census are represented in Figure 10. The population of children aged 0-9 is the highest for both males (7.98 million) and females (7.72 million), indicating a significant proportion of the population is in the early stages of life.

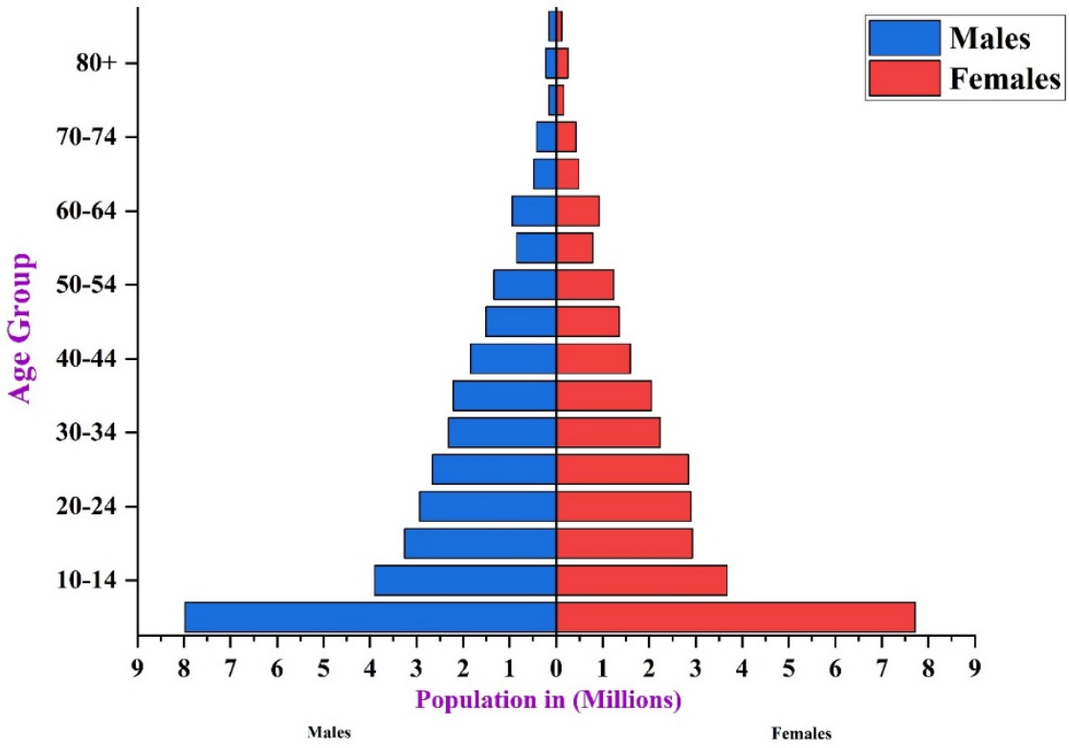


Figure 10. Variation of Age Structure over Krishna River Basin as per 2011 census

The age groups between 20-49, typically considered the working age, constitute a large portion of the population. This suggests a considerable proportion of the population is of working age, crucial for economic and labour force considerations. In most age groups, males slightly outnumber females. However, in the oldest group (80+), females surpass males, with 250,239 females compared to 222,112 males. This aligns with the general trend of higher life expectancy for women. The age group 10-19 years makes up a substantial part of the population, with 3.90 million males and 3.68 million females, reflecting the upcoming generation that will soon enter the workforce. This distribution highlights a demographic with a broad base of youth and working-age individuals, while the older population also remains significant, indicating the need for balanced social and economic planning across age groups in the Krishna River Basin.

4.2. Sex Ratio

The Variation of Sex-Ratio (Decadal-wise) shows changes in the number of females per 1,000 males for the regions of Krishna Basin, United Andhra Pradesh, Maharashtra, and Karnataka across the census years from 1941 to 2011. For Krishna basin, the sex ratio remained relatively stable over the decades, hovering between 955 and 966. It saw a slight dip to 955 in 1971 but recovered slightly in the later years, ending at 965 by 2011. For United Andhra Pradesh, the sex ratio was initially higher, starting at 980 in 1941, peaking at 986 in 1951. It fluctuated slightly but showed consistent improvement in the 21st century, reaching 993 in 2011, indicating a balanced female-to-male ratio by the end of the period. Maharashtra consistently had one of the lower sex ratios, starting at 949 in 1941 and dropping to 929 by 2011. The

lowest ratio was recorded in 2001, at 922, showing a steady decline in the female population relative to males over the years. Karnataka's sex ratio started strong at 960 in 1941 and saw a steady rise in the decades to follow. The ratio peaked at 973 in 2011, showing a healthy and increasing proportion of females compared to males. United Andhra Pradesh and Karnataka showed overall improvements in their sex ratios by 2011, with a more balanced or even favourable ratio of females to males. On the other hand, Maharashtra's sex ratio experienced a consistent decline, with fewer females relative to males, a trend concerning from a demographic perspective. The Krishna Basin, encompassing parts of these states, displayed relative stability but did not witness significant improvement. The variation of Sex-Ratio (Decadal-wise) is represented in Figure 11.

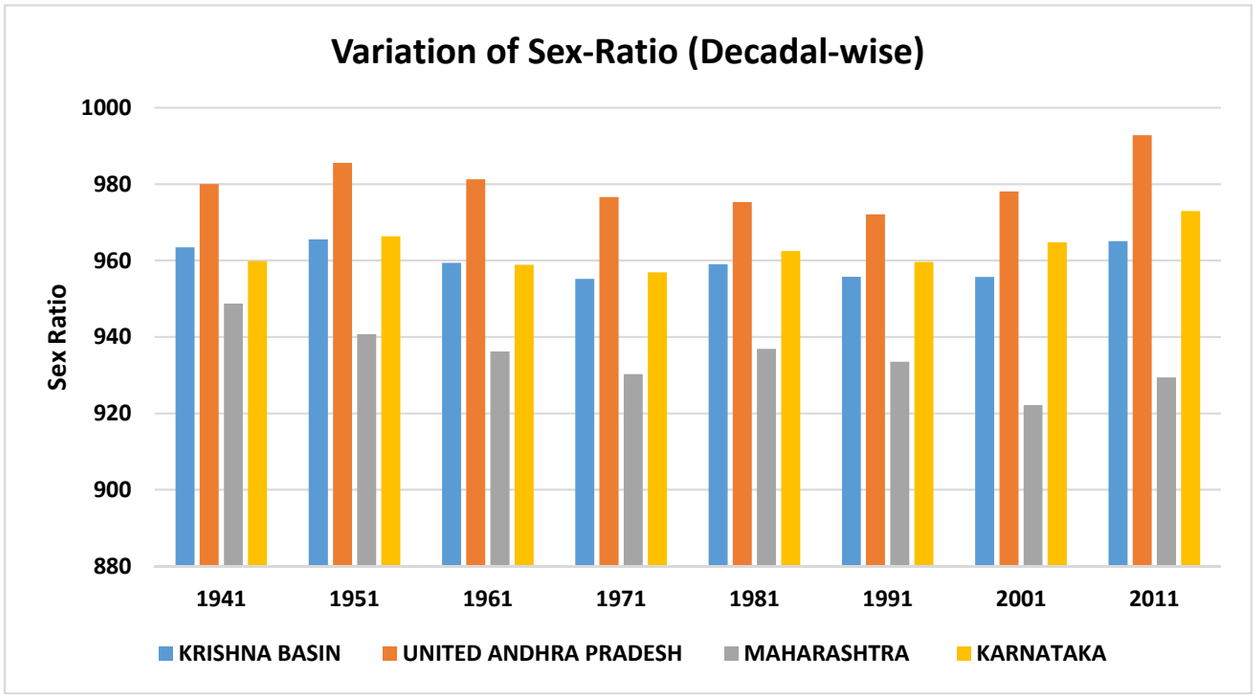


Figure 11. Variation of Sex-Ratio (Decadal-wise)

4.3. Household Composition

The variation of normal households as per the 2011 Census refers to the changes in the number of households over time in various regions. These variations provide insights into population growth, urbanization, and rural household trends. The variation of normal households as per 2011 census are represented in Figure 12. Karnataka leads in the number of households, while the Krishna Basin, which spans multiple states, has the highest overall total household count due to its broader geographical coverage. Rural households are prominent in all regions, reflecting the agricultural and rural-based economies that dominate these areas. Karnataka, with over 8.5 million rural households, shows a significant rural presence, while the Krishna Basin has the largest share of rural households across all regions due to the large agricultural communities in its expanse. Urbanization trends are visible, with urban households forming a significant portion of the total. Karnataka has the highest urban household count, likely driven by major cities like Bengaluru, while Maharashtra also has a considerable urban household number due to cities like Mumbai and Pune.

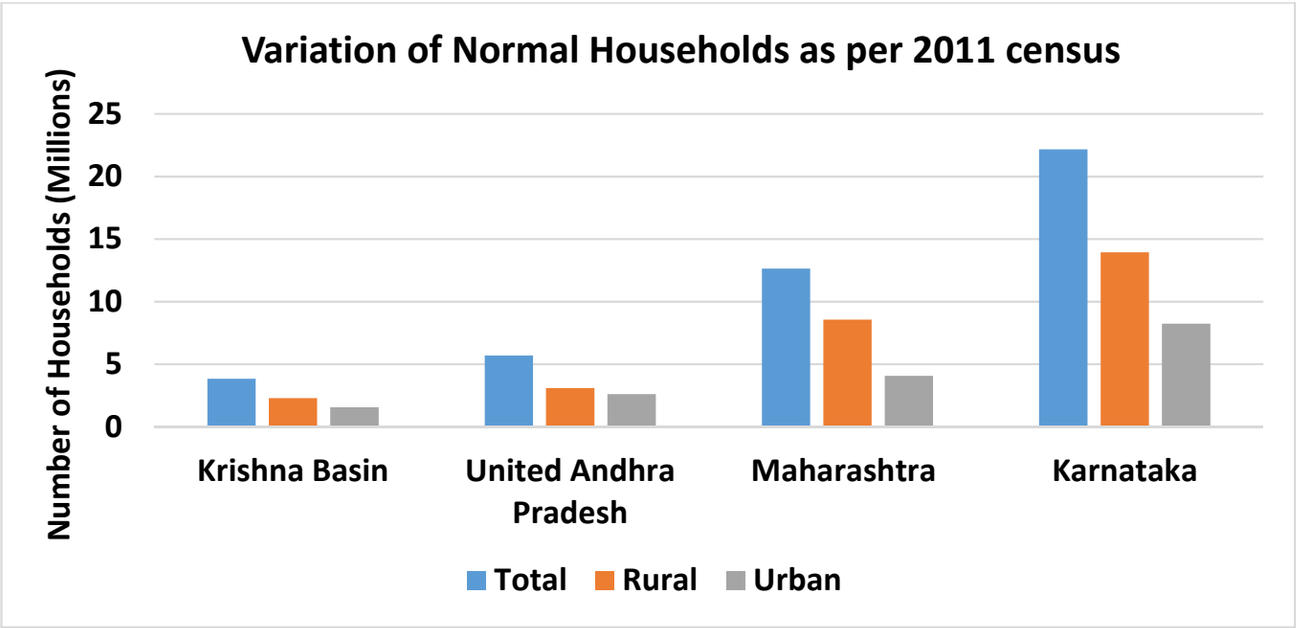


Figure 12. Variation of Normal Households as per 2011 census

The 2011 Census data indicates a clear growth in urban households across all regions, driven by migration and the expansion of urban areas. Rural households remain dominant in regions like Karnataka and the Krishna Basin, but their growth is slower compared to urban areas. Maharashtra and Karnataka display higher urbanization trends, while the Krishna Basin reflects the integration of both rural and urban dynamics. This household distribution is a reflection of broader socio-economic changes, with cities growing rapidly due to economic opportunities while rural areas maintain traditional livelihood patterns. The variation of mean household size as per 2011 census are represented in Figure 13.

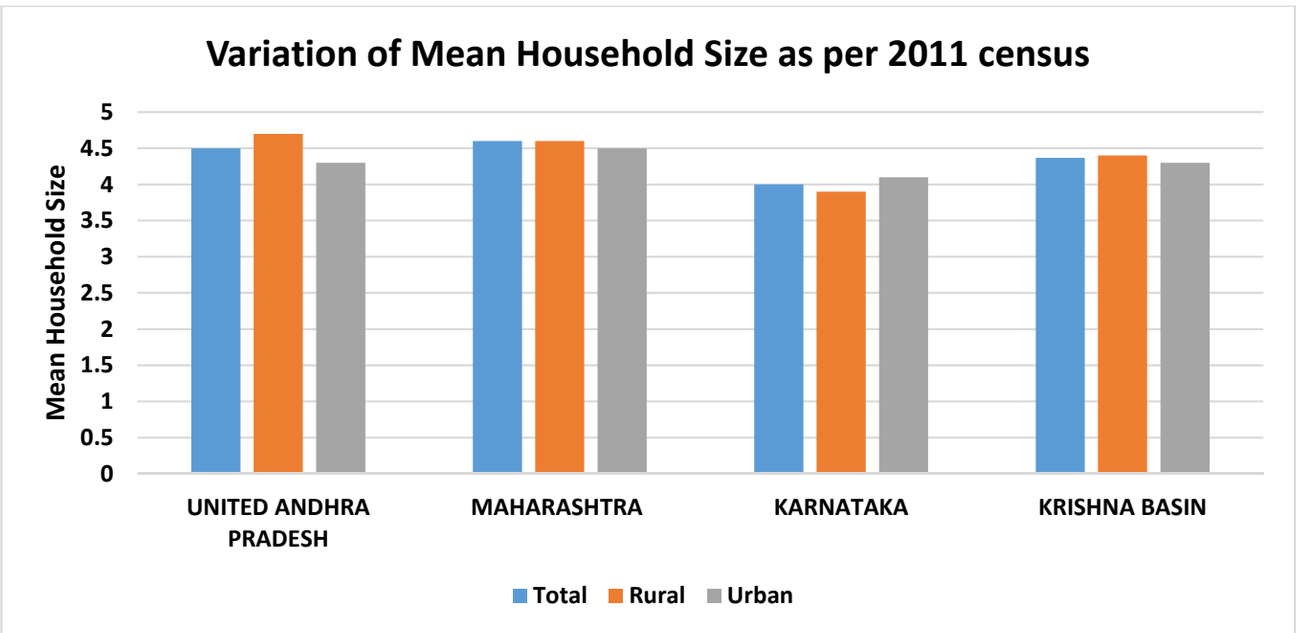


Figure 13. Variation of Mean Households as per 2011 census

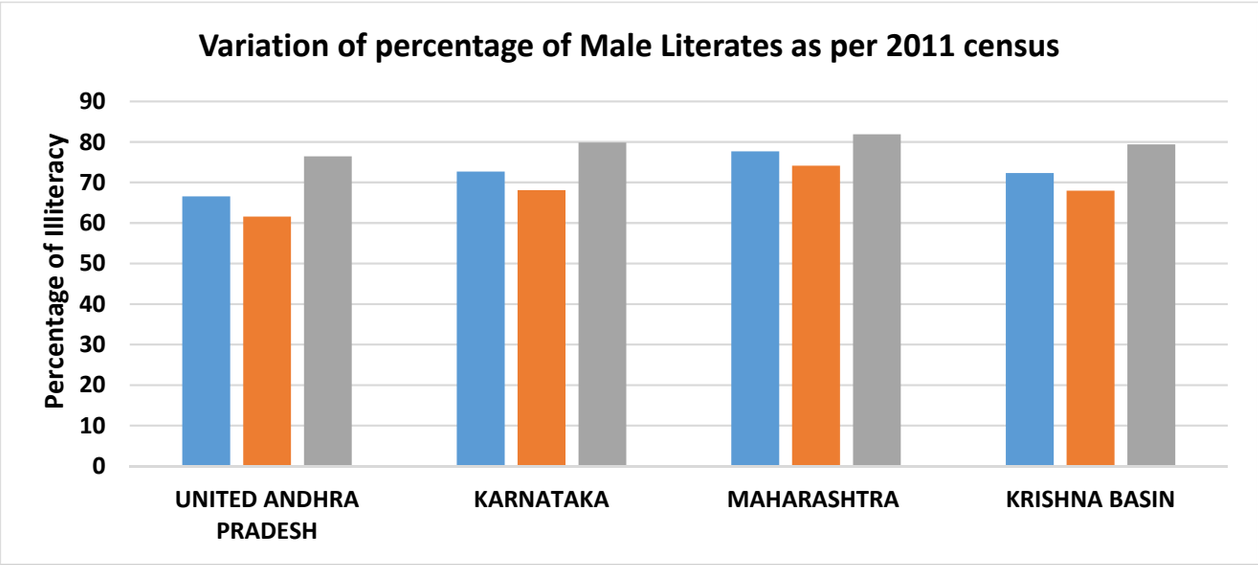
In Krishna Basin, the mean Household size is 4.4 members per household, reflecting a balanced household size across the region. The rural (4.4) and urban (4.3) household sizes are very close, indicating uniform household characteristics throughout the basin. The rural households generally larger than urban households, particularly in regions like United Andhra Pradesh, reflecting traditional joint family systems. The urban households tend to be smaller across all regions due to factors like nuclear family structures, migration, and urban housing constraints. Karnataka has the smallest average household size overall, possibly due to the more advanced urbanization and smaller family units prevalent in the state. This variation in mean household size provides a snapshot of family structures and living conditions across both rural and urban settings in these regions, highlighting demographic trends and differences in lifestyle.

5. Socio-Economic Characteristics

5.1. Education Levels

The percentage of male literacy and illiteracy across United Andhra Pradesh, Karnataka, Maharashtra, and the Krishna Basin based on the 2011 Census are represented in Figure 14. The Krishna Basin, a composite region spanning parts of these states, reflects similar trends to Karnataka, with a total male literacy rate of 72.3% and an illiteracy rate of 27.7%. Maharashtra stands out with the highest male literacy rate (77.7%) and the lowest illiteracy rate (22.3%). This reflects better educational attainment in this state compared to the others. Rural regions consistently show lower literacy rates and higher illiteracy rates compared to urban areas. The Krishna Basin's rural male literacy rate is 68.0%, while the illiteracy rate is 32.0%, showing a significant rural education challenge across the basin. Karnataka and the Krishna Basin exhibit similar urban literacy rates, around 79.9% and 79.4% respectively, with relatively low illiteracy rates of 20.1% and 20.6%. There is a marked disparity between rural and urban male literacy rates in all regions, highlighting that rural areas face greater challenges in terms of access to education and literacy programs. This divide is most significant in United Andhra Pradesh, with a 14.9% gap between rural and urban literacy. The Krishna Basin's overall male literacy and illiteracy rates (72.3% and 27.7%, respectively) reflect a balanced mix of the states it spans, with rural areas posing greater challenges.

Variation of percentage of Female Literates and Illiterates as per 2011 census over Krishna Basin is represented in Figure 15. Maharashtra has the best female literacy performance, with 67.1% of females literate and the lowest female illiteracy rate at 32.9%. Karnataka follows with 60.2% female literacy and 39.8% illiteracy, indicating a stronger focus on female education than in United Andhra Pradesh. United Andhra Pradesh has the lowest female literacy rate at 52.9%, with a concerning illiteracy rate of 47.1%, reflecting a significant gender gap in education. The Krishna Basin, spanning parts of all these states, as similar as Karnataka's trends with 60.1% female literacy and 39.9% illiteracy.



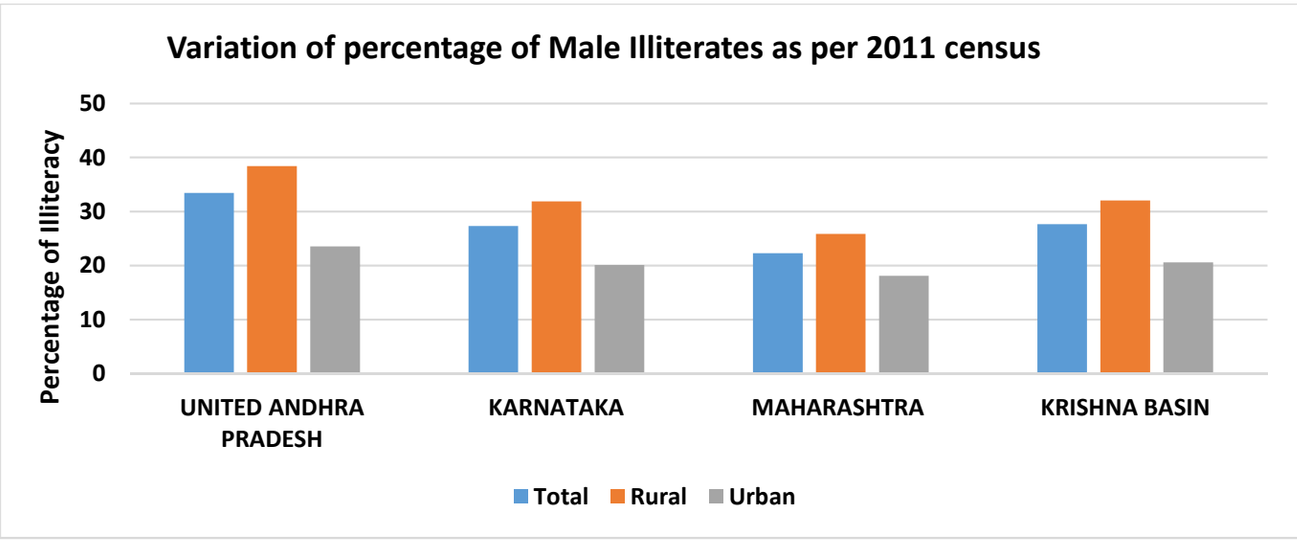
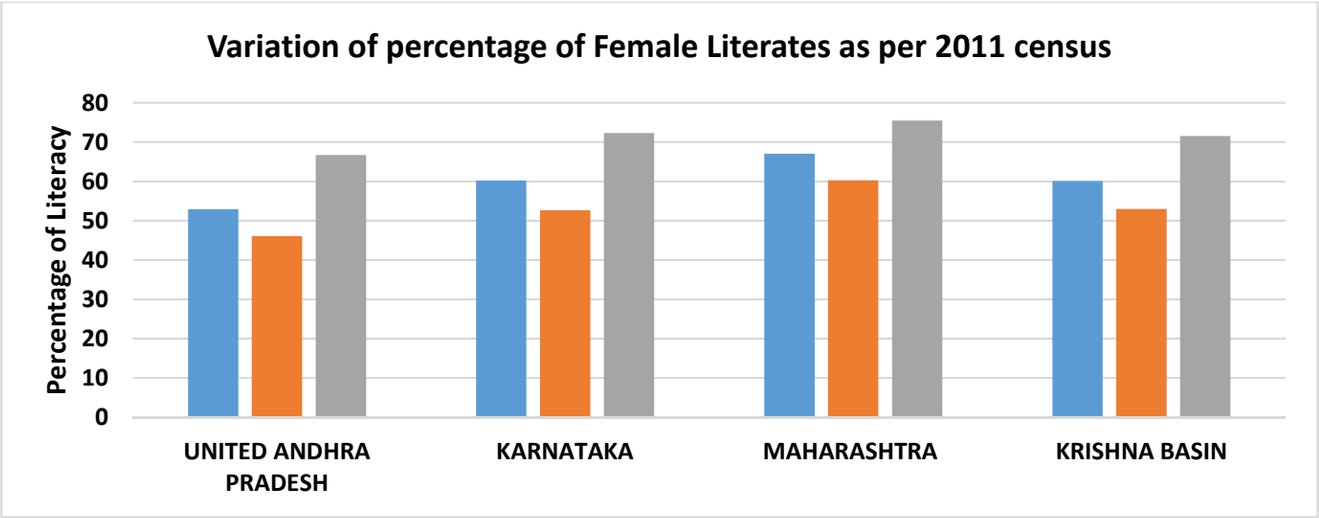


Figure 14. Variation of percentage of Male Literates and Illiterates as per 2011 census over Krishna Basin

The Krishna Basin's rural female literacy rate is 53.0%, with 47.0% of rural females being illiterate, indicating significant educational gaps in non-urban areas. Karnataka and the Krishna Basin exhibit similar urban female literacy rates, around 72.3% and 71.5% respectively, with illiteracy rates of 27.7% and 28.5%. Female education in United Andhra Pradesh lags behind the other states. Its rural female literacy rate is the lowest at 46.1%, while urban literacy is also behind at 66.7%. This indicates a pressing need for focused educational policies and interventions, especially in rural areas. The Krishna Basin's female literacy rates closely reflect those of Karnataka, with 60.1% literacy and 39.9% illiteracy. There is still a notable difference between rural and urban female literacy within the basin, highlighting the need for improved educational infrastructure in rural areas.



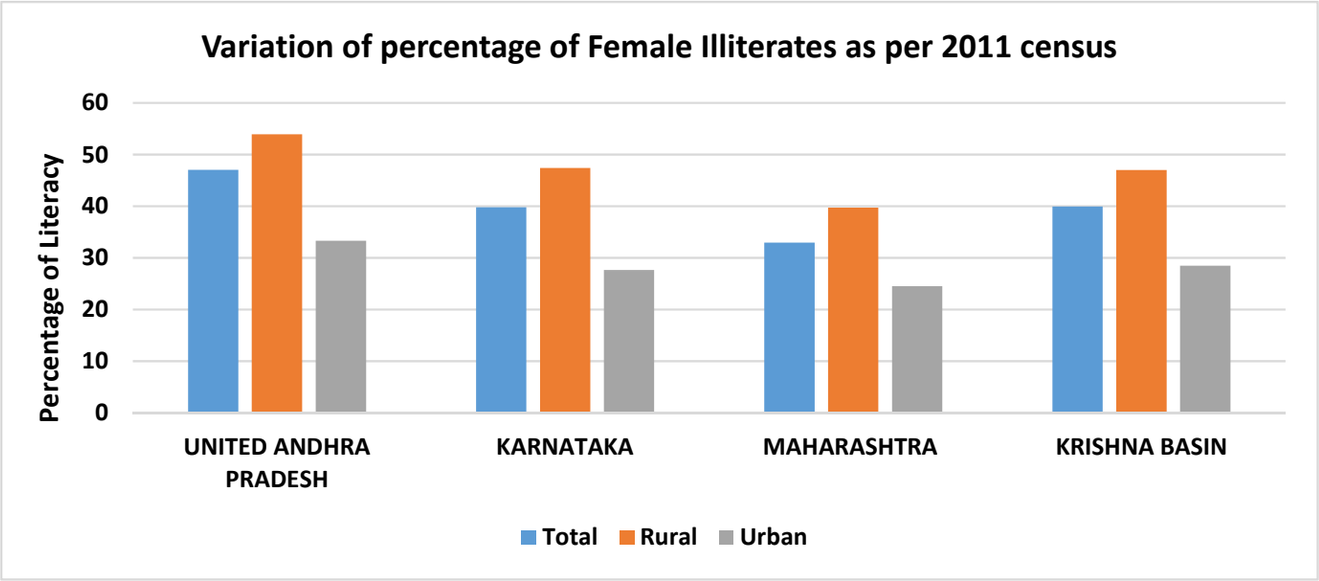


Figure 15. Variation of percentage of Female Literates and Illiterates as per 2011 census over Krishna Basin

5.2. Employment and Occupation

Workforce distribution is observed in various sectors over the Krishna Basin. Variation of working population in different categories as per 2011 census in Krishna Basin are presented in Table 5. Classification of Main workers by category as per 2011 census in Krishna Basin is represented in Figure 16. Agriculture remains the dominant sector in terms of employment in the Krishna Basin, with a strong presence in manufacturing and trade. Urban-based service sectors like education, health, and government administration also account for a significant portion of employment.

Table 5. Variation of working population in different categories as per 2011 census in Krishna Basin

Sl. No.	Sector	Population (Millions)
1	Agriculture, Forestry and Fishing	18.36
2	Mining and Quarrying	0.16
3	Manufacturing	3.81
4	Electricity, Gas, steam and Air conditioning Supply and Water Supply	0.14
5	Construction	1.76
6	Wholesale and Retail Trade (Repair of motor vehicles and motor cycles)	2.39
7	Transportation and Storage	1.42
8	Accommodation and food service activities	0.40
9	Information and Communication	0.46
10	Financial and Insurance activities, Real Estate activities, Professional, Scientific and Technical activities	0.59
11	Administrative and support service activities, Public Administration and Defence, Compulsory Social Security	1.25
12	Education, Human Health and Social Work activities	1.36
13	Arts, Entertainment and recreation, Other Service Activities	1.84

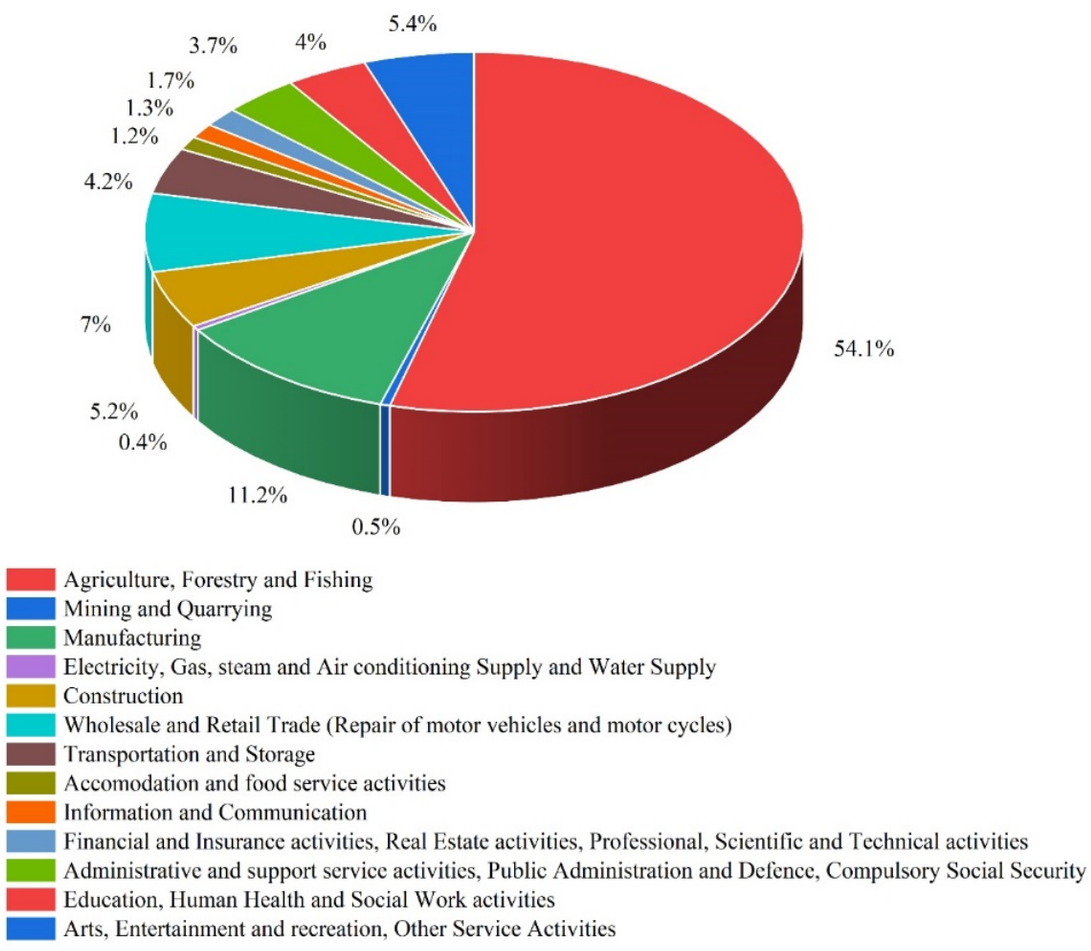


Figure 16. Classification of Main workers by category as per 2011 census in Krishna Basin

5.3. Total Working Population

The percentages of the working population over Krishna Basin are represented in Table 6. The total working population percentage across all regions is fairly consistent, ranging from 38.30% (Karnataka) to 39.06% (Andhra Pradesh). This indicates that, overall, just under 40% of the population is actively part of the workforce across these regions. In the Krishna Basin, which spans multiple states, the total working population is 38.70%, reflecting an average participation rate similar to the individual states. Males have a significantly higher participation rate in the workforce compared to females across all regions and in both rural and urban areas. Rural areas generally have a higher working population percentage than urban areas. This trend is likely due to a higher reliance on agriculture and manual labour in rural settings, where more of the population is involved in daily economic activities. In the Krishna Basin, rural female workforce participation is 31.25%, which is significantly higher than the 15.54% in urban areas. This indicates that in rural areas, women are more actively involved in economic activities, particularly in agriculture.

Table 6. The percentages of the working population over Krishna Basin

State/Basin	Total /Rural /Urban	Total (%)	Males (%)	Females (%)
Andhra Pradesh	Total	39.06	50.56	27.47
	Rural	42.83	51.64	33.98
	Urban	31.52	48.42	14.41
Maharashtra	Total	38.94	51.49	25.44
	Rural	43.06	51.33	34.38
	Urban	33.96	51.69	14.32
Karnataka	Total	38.30	52.79	23.41
	Rural	40.20	52.84	27.29
	Urban	35.29	52.71	17.19
Krishna Basin	Total	38.70	51.78	25.16
	Rural	41.78	52.06	31.25
	Urban	33.93	51.35	15.54

5.4. Total Workforce Participation

The total workforce participation in the Krishna Basin, combining main and marginal workers, stands at 45.4% of the total population. This includes both those who are fully employed and those who work for part of the year (marginal workers). Rural areas have a significantly higher workforce participation rate of 50.2%, driven primarily by agricultural and manual labour. In contrast, urban areas show a much lower workforce participation rate of 38.0%, reflecting the lower engagement in manual or seasonal work in these regions. Males dominate the workforce across the Krishna Basin, with 51.8% of males participating in the workforce, compared to only 25.2% of females. This gender disparity is present across both rural and urban areas, with rural areas having higher female participation rates (31.2%) compared to urban areas (15.5%). Main workers account for 38.7% of the population in the Krishna Basin,

representing those who are employed full-time. Marginal workers, who work for less than six months a year, make up an additional 6.7% of the population (0.9% worked for less than 3 months, and 5.8% worked for 3-6 months). About 54.6% of the total population in the Krishna Basin are classified as non-workers, meaning they do not participate in the labour force, including students, homemakers, elderly, and unemployed individuals. The percentage of non-workers is higher in urban areas (62%) compared to rural areas (49.8%), further highlighting the rural reliance on labour-based activities. The variation of total work force participation ratio over Krishna Basin is represented in Table 7.

Table 7. Total Work Force Participation Ratio over Krishna Basin

State/Basin	Total /Rural /Urban	Main workers			Marginal workers						Non-workers		
					Worked for less than 3 months			Worked for 3 to 6 months					
		Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
Andhra Pradesh	Total	39.1	50.6	27.5	1.0	0.8	1.2	6.6	5.6	7.5	53.4	43.0	63.8
	Rural	42.8	51.6	34.0	1.2	0.9	1.5	7.5	5.9	9.2	48.5	41.6	55.4
	Urban	31.5	48.4	14.4	0.6	0.7	0.5	4.6	5.0	4.2	63.2	45.9	80.9
Maharashtra	Total	38.9	51.5	25.4	0.7	0.7	0.8	4.3	3.8	4.8	56.0	44.0	68.9
	Rural	43.1	51.3	34.4	1.0	0.8	1.2	5.7	4.6	6.9	50.2	43.3	57.5
	Urban	34.0	51.7	14.3	0.4	0.5	0.4	2.6	3.0	2.1	63.1	44.8	83.2
Karnataka	Total	38.3	52.8	23.4	0.9	0.8	1.0	6.4	5.4	7.5	54.4	41.0	68.1
	Rural	40.2	52.8	27.3	1.1	0.9	1.3	8.1	6.0	10.2	50.6	40.2	61.2
	Urban	35.3	52.7	17.2	0.6	0.7	0.5	3.8	4.4	3.2	60.3	42.2	79.2
Krishna Basin	Total	38.7	51.8	25.2	0.9	0.8	1.0	5.8	5.0	6.7	54.6	42.5	67.2
	Rural	41.8	52.1	31.2	1.1	0.9	1.3	7.3	5.6	9.0	49.8	41.5	58.4
	Urban	33.9	51.4	15.5	0.5	0.6	0.5	3.6	4.0	3.1	62.0	44.0	81.0

5.5. Income Levels

The Krishna Basin region benefits from a mixed economy of agriculture and industry. Urban centres within the basin, like those in Karnataka and Maharashtra, contribute to the higher NSDP (Net State Domestic Product) in comparison to the rural agricultural economy. Maharashtra had the highest per capita NSDP due to its strong industrial and financial sectors, while Karnataka and Andhra Pradesh showed significant improvements, largely from growth in services and manufacturing. The Krishna Basin's performance reflects the broader trends of these states, with steady growth spurred by improvements in infrastructure, agricultural productivity, and industrial development. The region’s economic trajectory mirrors the overall development patterns of these states, with increasing urbanization and diversification of the economy contributing to rising per capita NSDP. Per capita NSDP at current prices over Krishna Basin are represented in Table 8.

Table 8. Per Capita Net State Domestic Product at Current Prices in Rupees

Sl. No.	State	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
1	Andhra Pradesh	25321	28539	33135	39727	46345	51114	62148
2	Karnataka	26882	31239	35981	42419	48084	51364	62251
3	Maharashtra	36077	41965	49831	57760	62234	69765	84858
Krishna Basin		**28892**	**33325**	**38863**	**45746**	**51371**	**56230**	**68289**

6. Future Projections and Scenarios

Based on past decadal trends, the population scenarios for the Krishna Basin reflect a steady increase. The minimum population increase can be 96,980,307, maximum population can be as 105,235,780 and the average Population as 101,778,191 for the year 2021.

7. Findings and Summary

The findings and summary of the demographic report of the Krishna Basin as follows.

- The Krishna River Basin encompasses with nearly 87.7 million people, of which 60.8% live in rural areas.
- The basin's rural population is approximately 1.55 times larger than the urban population
- In all three states (Andhra Pradesh, Maharashtra and Karnataka), the rural population significantly outweighs the urban population
- Maharashtra has the highest urban population percentage (45.2%) of the three states
- The population of children aged 0-9 is the highest indicating a significant proportion of the population is in the early stages of life over KRB
- A considerable proportion of the population is of working age (20-49), which is crucial for economic and labor force considerations
- United Andhra Pradesh and Karnataka showed overall improvements in their sex ratios by 2011, with a more balanced or even favorable ratio of females to males
- Rural households are prominent in all regions, reflecting the agricultural and rural-based economies that dominate these areas
- This household distribution is a reflection of broader socio-economic changes, with cities growing rapidly due to economic opportunities while rural areas maintain traditional livelihood patterns
- In United Andhra Pradesh and parts of Karnataka, need greater educational investment to reduce the illiteracy rates
- Maharashtra serves as a model for better literacy outcomes, both in rural and urban areas

- Krishna Basin reflects the general trend across the states, with significant room for rural educational improvement
- The gender gap in education will require targeted policies, particularly focusing on rural female literacy, where the highest illiteracy rates are observed
- Male workforce participation is relatively consistent across regions, around 51-53%
- Female workforce participation is much lower across all regions, with urban females showing the least participation

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Centres for Krishna River Basin Management Studies
(cKrishna)

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Centre for Ganga River Basin Management and Studies
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