Evaluation of Physical and Climatic Characteristics of Agricultural Monitoring Purposes: A Model Research on Ananthapur District

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Abstract— The paper demonstrates that around for paper each are relating to water balance, climatic arrangement, water equalization and dry spell studies and water parity. This kind of concentrate would be helpful to the specialist to think experimentally in the field of water balance. Cropping design implies the extent of the zone under different yields at a point of time. A board comprised by the Government of India in 1960 under the Agricultural Commission decided the editing design as indicated by the relative average of different yields in Anantapur locale in a zone. Trimming design likewise was dictated by the spread of yields communicated as a level of all out region, of vital crops. It incorporates the recognizable proof of most effective yields of the area which is considered as a homogeneous of soils and climatic belt. Remembering above focuses chose to contemplate the water balance and editing example of the Anantapur district.

I. INTRODUCTION

The great water balance components are precipitation, potential evapotranspiration, actual evapotranspiration, water deficiency, water excess, dampness sufficiency, Aridity Index and Moisture Index.

Water, satisfactory use and conservation of it has ended up being fundamental noteworthiness wherein water equalization assumes a easy job. It is by means of and by using settled in that the water deliver to an area is largely thru precipitation and water disaster is a end result of dispersal and evapo-transpiration. The wetness and dryness of an opening is restricted by manner of the overall sizes of precipitation and capability evapotranspiration. The actual water stability segments are precipitation, capability evapotranspiration, actual evapo-transpiration, water insufficiency, water overabundance, sogginess adequacy, Aridity Index and Moisture Index.

BOUNDARIES AND TOPOGRAPHY:

The region was isolated into 3 characteristic divisions. They are :

1. Northern mandal of Rayadurgam, Kanekal, Beluguppa, Gooty, Guntakal, Vajrakarur, Urvakonda, Vidapanakal, Yadiki, Tadipatri, Putlur, and Yellanur containing lager districts of dull cotton soils

2. Kalyanadurgam, Kambadur, Settur, Brahmasamudram, Ramagiri,Kanaganapalli, Chinnakothapalle, Dharmavaram, Bathalapalle, Tadimarri, Mudigubba, Anantapur, Kudair, Pamidi and Peddavadugur in the center which are generally contained completely dry treeless, cost of poor red soils

3. Anomalous state place that is known for Penukonda, Roddam, Somandepalle, Hindupur, Lepakshi, Chilamathur, Madakasira, Rolla, Gudibanda, and Agali which interfaces with the Mysore level at higher tallness whatever remaining parts of the district. This part has ordinary sandy red soils of run of the mill benefit.

II. OBJECTIVES

The principle targets of the investigation are

1. To ponder the dispersion of month to month, occasional and yearly precipitation, precipitation power, precipitation inconstancy and precipitation proportion,
2. To depict the physical attributes fixation and land use proficiency
3. To bring at the connection between the water balance components physical qualities .
4. To give ends/surmising's dependent on examinations

III. . METHODOLOGY

Information pertaining to month to month precipitation has been gathered frame Anantapur area stations. The precipitation information is investigated to portray the precipitation power, precipitation changeability and precipitation proportion.

1. The temperature information has been gathered for the investigation zone for accessible stations. The information is investigated to think about the warm effectiveness. In view of accounting technique of Thorn Thwaite and Mather (1955) strategy the month to month potential evapotranspiration, genuine evapotranspiration, water shortage and the water surplus are worked out. In light of the estimations of PE, AE and WD the dampness ampleness, Aridity Index and Moisture Index are worked out and mapped on the month to month, occasional, yearly premise of the Rayalaseema region. Water parity of the investigation territory is worked out.

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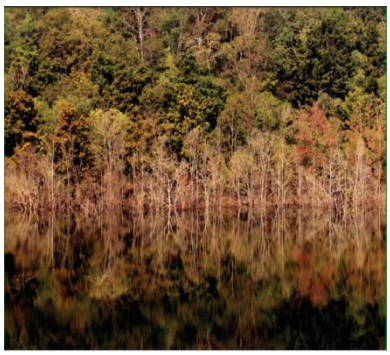
2. The physical attributes information has been made for the investigation territory It is utilized to dissect the grouping of various land employments of the examination region and worked out the land utilize effectiveness taking positive factors like net sown region, the region sown more than once, complete trimmed zone, force editing example and the power of water system.
3. The water system information has been gathered to investigate the water system, fixation and power.
4. The editing design information has been gathered and examined to contemplate the yield fixation, trim expansion, force of trimming example and harvest blend. At long last dependent on water , balance components arrive use, the water system and trimming design, the product appropriateness of concentrate territory is readied.
5. The water accessibility days and date-book is worked out dependent on the month to month estimations of PE and AE. In the event that PE=AE, it is called muggy period. In the event that the estimation of AE is half of the PE esteem or more than it is called as wet period. On the off chance that the estimation of AE is 1/fourth of the PE esteem or more than, it is considered as decently dry period and if the estimation of AE is1/eighth of the PE or more than, it is named as dry period. In light of the above-said characterization the water balance accessibility days and schedule are worked out for the investigation zone.

IV. RESULT&DISCUSSION

Physical characteristics:

FORESTS

There are various segregated pinnacles and rough groups which are without any vegetation. The tallness of a portion of these slope ranges are given underneath:



The Geographical Area of the Division and the District is 19132 Km2 . The Division's northern and focal parts are a high level, by and large undulating, with huge stone shakes or low slope ranges transcending its surface. In the southern segment of the region the surface is all the more uneven, the level there rising 0.61 m above MSL. Six waterways stream inside the locale: Penna, Chithravathi, Vedavathi, Papagni, Swarnamuki, and Thadakaleru.

The atmosphere of this Division is commonly dry with temperatures extending from 29.10 C to 40.30 C and the yearly precipitation is about 553.00 mm, getting from Southwest storms (338 mm) and the North East rainstorm (156.0 mm). The disappointment of downpours in this South West storm time of June to September drives the District to dry spell by disappointment of yields. The District might be separated into 3 Natural Divisions. They are 1) Northern bit of Black Cotton soils (2) Central segment mostly made up of parched district with poor Red Soils comprising (3) High Level Land associating with Mysore level at higher rise having sandy red soils of typical profitability. The dirts in the Anantapur District are prevalently red soils (76%) and dark soils (24%) happen in specific territories. The complete populace of the Division and District is 3.640 million (2001 Census). The populace thickness is 190 people for every squarekm . The domesticated animals populace is 8.25 million.

RIVERS:

JAYAMANGALA

River origins in Karnataka state, enters this region in Parigi mandal and joins Pennar River at Sangameswarapalli of Parigi mandal.

CHITRAVATHI

Every different centrality conduit territory is "CHITRAVATHI". Its starting stage is in the Karnataka kingdom. This conduit enters the district near Kodikonda city of Chilamathur mandal and streams north over harsh and difficult uplands of Gorantla, Puttaparthi, Bukkapatnam, Kothacheruvu, Cennekothapalle, Dharmavaram, Bathalapalle, Tadimarri, and Yellanur mandalas and falls into Pennar movement at Gandikota in Kadapa area.

VEDAVATHI or HAGARI

This circulate is in like way a fundamental one within the locale and has its start within the Karnataka state and travels through Gummagatta, Brahmasamudram, Beluguppa, Kanekal and D.Hirehal mandals and enters Bellary district of Karnataka nation. Bhairavavithippa journey created in this pass. A section from these streams like KUSHAVATHI in Chilamathur mandal, SWARNAMUKHI in Agali mandal, MADDILERU in Nallamada, Kadiri and Mudigubba mandals, PANDAMERU in Kanaganapalli, Raptadu, Anantapur, B.Good enough.Samudram and Singanamala mandalas, PAPAGNI in Tanakal mandal are primary water supply sources to various huge and medium

water framework tanks within

the sector. There may be one water framework adventure T.B.P.H.L.C., and 6 medium and different water framework adventures. 1. Pinnacle Pennar adventure, 2. Bhairavanithippa adventure, three.Chennaraya Swamy Gudi adventure, four.Pennar kundvathi adventure 5.Yogi Vemana maintain and 6.Pedaballi corporation.

TABLE - 4.1
IRRIGATION PROJECTS IN ANANTAPUR DISTRICT

Sl No.	Name of the Project	Irrigated area	% of Irrigated land
1	TBPHLC	51771	74.39
2	Upper Pennar	4066	5.84
3	Bhairavani Thippa	4856	6.98
4	Chennarayaswamy Gudi	445	0.64
5	Pennar Kumudvathi	2639	3.79
6	Yogi Vemana Reservoir	5212	7.49
7	Pedaballi	607	0.87
	TOTAL	69596	

V. RAINFALL AND CLIMATE:

The locale of Anantapur has a sincerely now not too awful stature which offers the place broadly attractive air reliably. Anantapur has a consistent tumble from the south north towards the valley of the Pennar in Peddavadugur, Peddapappur and Tadipatri Mandals. There may be a nonstop growing in Hindupur, Parigi, Lepakshi, Chilamathur, Agali, Rolla and Madakasira Mandals in the south to enroll inside the Karnataka Plateau where the standard ascent is round 600 meters is over the endorse sea stage. It is round 335 meters at Anantapur and the most decreased 274 meters is at Tadipatri. The land spots of the Peninsula render it, the driest little little bit of the state and in this manner, cultivating conditions are even more often unsteady. Rainstorm furthermore avoid this detail due to its tragic vicinity. Being a long way from the East , it doesn't no longer welcome the complete factors of hobby of the higher east tempests and being reduce off by means of the use of the high Western Ghats, the southwest rainstorm is furthermore saved from moving into and punching the thirst of these dry soils. It is thusly positioned; the district is avoided from securing both the tempests and presented to droughts in moderate of awful seasons. The run of the mill precipitation of the region is 553.Zero mm with the useful resource of which it grapples least precipitation while stood out from Rayalaseema and numerous portions of Andhra Pradesh. The conventional precipitation of the southwest rainstorm time span is 338.Zero mm. Which casings approximately 61.Three% of the whole scale precipitation for the three hundred and sixty five days. The disappointment of the downpours in this southwest rainstorm time of June to September will lead the locale to dry spell by the disappointment of the harvests.

Table 4.2: Rainfall Distribution in the Rayalaseema districts of Andhra Pradesh during the period 2014-15.

District	South-west monsoon (1-6-2014 to 30-9-2014)			North-east monsoon (1-10-2014 to 31-12-2014)			Winter period (1-01-2015 to 28-02-2015)			Hot weather period (1-03-2015 to 31-05-2015)			Total period (1-06-2014 to 31-05-2015)		
	Actual	Normal	% dev.	Actual	Normal	% dev.	Actual	Normal	% dev.	Actual	Normal	% dev.	Actual	Normal	% dev.
Anantapur	263	338	-22	81	156	-48	9	3	200	84	56	50	437	553	-21

Table 4.3: Rainfall distribution in the Rayalaseema districts of Andhra Pradesh during the period 2014-2015.

(Rainfall in mm)

District	South-west monsoon (1-6-2014 to 30-9-2014)			North-east monsoon (1-10-2014 to 31-12-2014)			Winter period (1-01-2015 to 28-02-2015)			Hot weather period (1-03-2015 to 31-05-2015)			Total period (1-06-2014 to 31-05-2015)		
	Actual	Normal	% dev.	Actual	Normal	% dev.	Actual	Normal	% dev.	Actual	Normal	% dev.	Actual	Normal	% dev.
Chittoor	374	434	-13	186	398	-52	13	14	0	131	83	54	706	938	-23

Source: Directorate of Economics and statistics, Govt. of Andhra Pradesh, Hyderabad

Table 4.4: Rainfall distribution in the Rayalaseema districts of Andhra Pradesh during the period 2014-2015.

(Rainfall in mm)

District	South-west monsoon (1-6-2014 to 30-9-2014)			North-east monsoon (1-10-2014 to 31-12-2014)			Winter period (1-01-2015 to 28-02-2015)			Hot weather period (1-03-2015 to 31-05-2015)			Total period (1-06-2014 to 31-05-2015)		
	Actual	Normal	% dev.	Actual	Normal	% dev.	Actual	Normal	% dev.	Actual	Normal	% dev.	Actual	Normal	% dev.
Cuddapah	333	394	-16	98	246	-61	2	2	0	53	51	12	492	691	-29

Source: Directorate of Economics and statistics, Govt. of Andhra Pradesh, Hyderabad

Table 4.5: Rainfall distribution in the Rayalaseema districts of Andhra Pradesh during the period 2014-2015.

(Rainfall in mm)

District	South-west monsoon (1-6-2014 to 30-9-2014)			North-east monsoon (1-10-2014 to 31-12-2014)			Winter period (1-01-2015 to 28-02-2015)			Hot weather period (1-03-2015 to 31-05-2015)			Total period (1-06-2014 to 31-05-2015)		
	Actual	Normal	% dev.	Actual	Normal	% dev.	Actual	Normal	% dev.	Actual	Normal	% dev.	Actual	Normal	% dev.
Kurnool	365	455	-20	98	149	-34	4	5	-20	76	61	25	543	670	-19

Source: Directorate of Economics and statistics, Govt. of Andhra Pradesh, Hyderabad

Table 4.6: Area irrigated by different sources in the districts of Rayalaseema (Andhra Pradesh during 2014-2015).

(Area in hectares)

Districts	Net area irrigated by						Area irrigated More than once	Gross area irrigated
	Canals	Tanks	Tube wells	Other wells	Other sources	Total		
Anantapur	23249	940	75071	11696	1191	112147	29604	141751

Source: Directorate of Economics and Statistics, Govt. of Andhra Pradesh, Hyderabad

Table 4.7: Area irrigated by different sources in the districts of Rayalaseema (Andhra Pradesh during 2014-2015).

(Area in hectares)

Districts	Net area irrigated by						Area irrigated More than once	Gross area irrigated
	Canals	Tanks	Tube wells	Other wells	Other sources	Total		
Chittoor	45	16878	71737	37850	24	126534	37340	163874

Source: Directorate of Economics and Statistics, Govt. of Andhra Pradesh, Hyderabad

Table 4.8: Area irrigated by different sources in the districts of Rayalaseema (Andhra Pradesh during 2014-2015).

(Area in hectares)

Districts	Net area irrigated by						Area irrigated More than once	Gross area Irrigated
	Canals	Tanks	Tube wells	Other wells	Other sources	Total		
Cuddapah	21553	1462	93392	6425	1241	124073	32952	157025

Source: Directorate of Economics and Statistics, Govt. of Andhra Pradesh, Hyderabad

Table 4.9: Area irrigated by different sources in the districts of Rayalaseema (Andhra Pradesh during 2014-2015).

(Area in hectares)

Districts	Net area irrigated by						Area irrigated More than once	Gross area Irrigated
	Canals	Tanks	Tube wells	Other wells	Other sources	Total		
Kurnool	63876	9938	57495	31933	8459	171701	32161	203862

Source: Directorate of Economics and Statistics, Govt. of Andhra Pradesh, Hyderabad

VI. POPULATION :

There are 929 had towns or towns, out of 964 supreme Revenue towns of the District. The amount of towns in size get-together of 500 to 1999 structures 36.71% of irrefutably the involved towns. The size social event of 2000 to 4999 structures 38.64% and the size get-together of 5000 to 9999 structures 12.81% figuratively speaking. Out of complete towns, 84 towns of hard and fast involved towns are having the people under 500. There are 26 towns with more than 10000 masses excepting towns. The thickness of the masses of the district is 190 for each km2 against (277) of the state. The quantity of occupants in common and urban to the full scale people of the District works out to be 75% and 25% in 2001 Census as against 76.5% and 23.5% of 1991 Census. The working force in the total people of District outlines 48.83% as indicated by 2001 Census out of which 26% are in the Agriculture division.

Table 4.10: District-wise number of the operational holdings and area operated by size classes 2010-11(P)

(Number in Figures and Area in hectares)

Size of Holdings	Anantapur	
	Number	Area
Below 0.5	91755	27922
0.5-1	114669	86077
1-2	186005	272841
2-3	112663	249377
3-4	33685	116492
4-5	20546	91376
5-7.5	22060	133179
7.5-10	8738	75876
10-20	7879	103189
Above 20	1190	34540
Total	597672	1187966
Average Size		2.00

Source: Directorate of Economics and Statistics, Govt. of Andhra Pradesh, Hyderabad

Table 4.11: District-wise number of the operational holdings and area operated by size classes 2010-11(P)

(Number in Figures and Area in hectares)

Size of Holdings	Chittoor	
	Number	Area
Below 0.5	248748	62299
0.5-1	152846	115222
1-2	135386	191000
2-3	47448	106528
3-4	13916	47556
4-5	6381	28125
5-7.5	5822	34151
7.5-10	1731	14775
10-20	1361	17743
Above 20	195	7351
Total	607696	618135
Average Size		1.02

Source: Directorate of Economics and Statistics, Govt. of Andhra Pradesh, Hyderabad

Table 4.13: District-wise number of the operational holdings and area operated by size classes 2010-11(P)

(Number in Figures and Area in hectares)

Size of Holdings	Cuddapah	
	Number	Area
Below 0.5	111001	30782
0.5-1	98863	71764
1-2	109857	157317
2-3	48421	123630
3-4	16514	57076
4-5	8136	36267

5-7.5	7397	44213
7.5-10	2107	17818
10-20	1252	15736
Above 20	104	3327
Total	402862	548339
Average Size		1.36

Source: Directorate of Economics and Statistics, Govt. of Andhra Pradesh, Hyderabad

Table 4.14: District-wise number of the operational holdings and area operated by size classes 2010-11(P)
(Number in Figures and Area in hectares)

Size of Holdings	Kurnool	
	Number	Area
Below 0.5	90351	28430
0.5-1	111209	83798
1-2	151200	201516
2-3	73358	176775
3-4	34152	117754
4-5	19714	88150
5-7.5	21210	124131
7.5-10	9313	78815
10-20	8305	110115
Above 20	1517	38606
Total	512228	1055257
Average Size		2.07

Source: Directorate of Economics and Statistics, Govt. of Andhra Pradesh, Hyderabad

OCCUPATIONAL DISTRIBUTION OF WORKERS, ANANTAPUR

Sl.No.	Classification of workers	1971	1991
1	Cultivators	3,26,992	4,62,992
2	Agricultural Labour	3,46,090	4,89,286
3	Dependents on agriculture	6,73,082	8,76,089
4	Mining, Quarrying etc.	27,575	42,095
5	Household industry	45,197	86,179
6	Trade & Commerce	41,827	2,38,127
7	Transport, Storage and Communications	16,237	96,932
8	Other Services	52,348	1,59,348

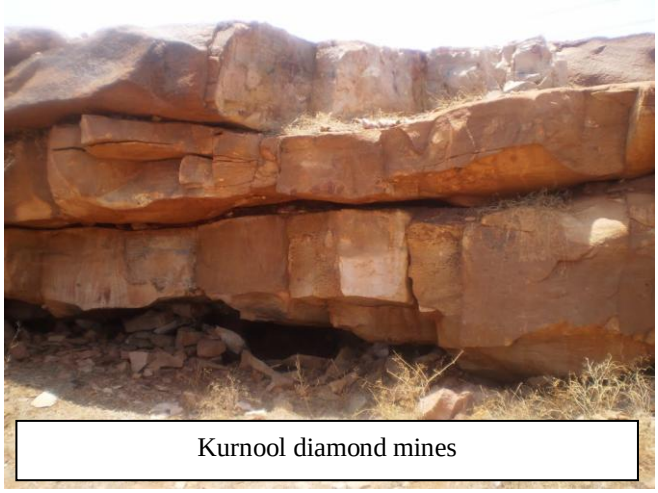
VII. LAND UTILIZAITION:

The full land an area of the area is 19.13 lakh hectares. The land use structure as helpful inside the region reveals that the net region planted is 10.80 3 lakh hectares. The entire cut domain is 11.Fifty four lakh hectares. The district planted more prominent than when is 0.Seventy one lakh hectares. The created region of-the region is eleven.Fifty 4 lakh hectares. Out of which nine.Ninety eight lakh hectares is under Kharif and 1.Fifty five lakh hectares, is underneath Rabi season in the midst of a year 2008 – 2009. The region comprises of the most least job as to water gadget workplaces with simply 12.Sixty two% of the gross altered zone in the midst of 2008-2009. Out of the gross-overflowed zone of one.46 lakh hectares in the midst of 2008-2009 channels spoke to 14.Sixty six%, tanks 6.12%, tube wells 70.87%, wells 6.77% and various resources 1.Fifty eight%. All the rule assets separated from channels are non-unstable.

VIII. MINERAL RESOURCES:

GOLD: The place stretches over a length of 14 km. Exploratory mining in the zone is pruned around 467 meters of metal shoots with a normal width of 100cm tone. Mining tasks are relied upon to be directed by Bharat Gold Mines Limited.

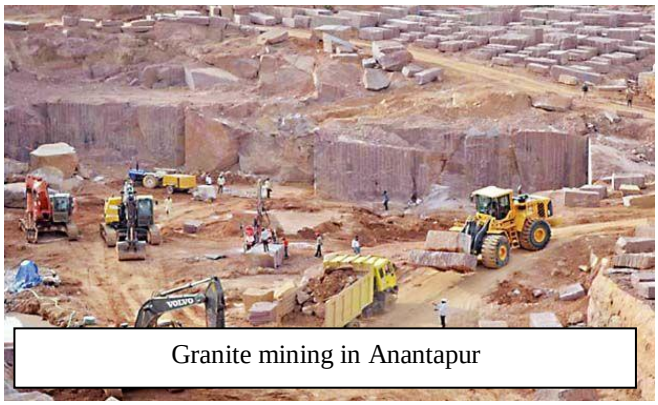
DIAMONDS: Diamonds are known to be available near Vajrakarur. They mainly occur in pipe rocks and famous mining areas.



Kurnool diamond mines

Miners operating in Adoni

Granite quarrying in Chittoor



Granite mining in Anantapur

5.1: Estimates of compound growth rates (CGR) of area of groundnut in the districts of Rayalaseema (Andhra Pradesh) in different seasons and periods (2003-04 and 2013-14)

Period 1 refers to 2000-01 to 2010-11.
Period 2 refers to 2002-03 to 2012-13.
Period 3 refers to 1999-01 to 2008-09.
Total period refers to 1999-01 to 2013-14.

IX. CONCLUSION

It might be assumed that there are not many or no assortments in the transport of month to month, ordinary and yearly precipitation. Over 75% of the land was used by close-by people for advancement. It was also observed that there are satisfactory resources of water and forest for the district under examination. It will in general be prescribed to approach makers to structure crucial progression strategies for the improvement of the zone under examination.

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