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Spatial and temporal variation of rainfall and rainwater harvesting potential for Kutch district - A case study

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Abstract
Daily rainfall data of 1975-99 for nine talukas (Anjar, Bhachau, Bhuj, Lakhpat, Mandiv, Mundra, Nakhtrana, Naliya and Rapar) have been statistically analysed to study various aspects related with their spatial and temporal variation in the district. A critical look at study the onset of effective monsoon in the district showed that the mean date of effective monsoon varied during Jul 11(Mandvi) to Jul 27 (Rapar) with earliest on set of effective monsoon (p=0.68) during Jun 22 (Mundra) to Jul 3 (Bhuj). In general, for the entire district, the average onset of effective monsoon may occur during Jun 16 to Jul 12 with standard deviation of 26 days and it may cease around Sep 2. High standard deviation of 17 days (Bhachau, Mandvi) to 30 days (Rapar) showed inconsistent variation in daily rainfall of the stations. Mean date of withdrawal of monsoon ranged from Aug 20 (Lakhpat) to Sept 28 (Rapar). On an average each taluka experiences at least two critical dry spells (Table 2) during the monsoon period. The first critical dry spell of 23 days (Lakhpat, Rapar) to 38 days (Bhuj) is expected to start in second fortnight of July. Second critical dry spell ranging from 16 (Naliya) to 38 days (Nakhtrana) is expected to start mostly in August. In general the entire district may experience critical dry spells of 61 days duration comprising 29,28 and 20 days starting on Jul 13, Aug 5 and Aug 20 respectively. It indicates acute necessity of storing runoff water for the region to tackle the imminent water shortage problems of the crops. On an average rainfall during the three to four wet spells ranged in the district from 387 mm at Nakhtrana to 553 mm at Rapar. The first wet spell of the order of 186.4 mm at Rapar to 330.2 mm at Mundra may be harvested and stored in rain water harvesting structure. In general, for the entire district, about 523 mm of rain water can be harnessed and stored in water harvesting structures. Inconsistent variation in these talukas necessitate proper harvesting of rain water in the structure and its use in agricultural production. The paper also presents harnessable runoff based on USDA-SCS Curve Number method for the region which can be duly considered for improved agricultural water management strategies.

INTRODUCTION

The Kutch district (45,652 km^2) located in north-western region of the Gujarat state stretches between $22^o41'11"$ to 24^o 41' 47" north latitude and $68^o09'46"$ to $71^o54'47"$ east longitude. The crescent district shares its north and north-west border with Sind (Pakistan) whereas the Arabian sea lies in the west and south-west. Administratively the

district is divided into nine talukas; Naliya (Naliya), Anjar, Bhachau, Bhuj, Lakhpat, Mandvi, Mundra, Nakhtrana and Rapar (Fig). Kutch falls in the arid tracts and has a tropical monsoon climate. It receives much of its rainfall from the south-west monsoon. The annual average rainfall (based on 1975-99) is 425 mm, which varies from 371 mm (Lakhpat) to 502 mm (Mundra) and is classified as arid district. The distribution of the meager rainfall (average 425 mm based on 1975-99 data) is highly variable and erratic, leading to protacted droughts. Six severe, three moderate and five mild meteorological droughts were recorded within a span of 23 years (1972-94). The Indian arid zone accounts for approximately 12% of the country's geographical area. Gujarat state has second largest arid and semi-arid land in our country. Drought and drought relief are common features and a large number of villages in the Kutch district are particularly affected by the drinking water problem. Also, the surface water and ground water resources have been receding all over the state due to over exploitation and increasingly deficient recharge. Total number of land holdings in the district increased by 48% between 1971 and 1991, mainly due to the increase in marginal and small holdings. About 4,77,200 ha of cultivated area has been affected by salinity problem. Maximum salt affected cultivated area was recorded in Anjar taluka (86%), followed by Bhachau (59%), Lakhpat (48%), Mandvi (40%), Naliya (23%), Mundra (23%), Bhuj (12%), and Rapar (11%). There are 20 medium irrigation schemes with a total live storage capacity of about 281 MCM and 162 minor irrigation schemes with a total live storage of about 252 MCM. However, only 28% of the potential created (533 MCM) was utilized annually by these schemes (1984-85 to 1994-95) to irrigate 14,068 ha (minor 7857 ha and medium 6211 ha).

Human and Livestock Population

The district has population of about 12.625 lakhs (1991 census) with an average density of 65 persons km^{-2} as against 4 persons km^{-2}.in most arid regions of the world. The population increase for the period between 1901 and 1991 was only 159% as compared to to the Gujarat state (354%) and the country as a whole (252%). In the initial five decades the population growth was a meager 16.3%. However the rapid increase (122%) occurred during the last four decades The rural and urban population increased by 56% and 187% with a decimal growth rate of 16 % and 43% respectively. Livestock population also increased from 9.40 lakhs (48 animals km^{-2} in 1962) to 14.13 lakhs (73 animals km^{-2} in 1992) showing an increase of 50% within a span of 30 years.

Soils

Main geological formations contributing to the soil formations in the Kutch district include sedimentary rocks of marine and non-marine origin, basaltic trap, latentes, limestone and alluvium formed under different geological situations. Soils of Kutch can be broadly classified into : sandy soil which covers a vast area of the district, coastal alluvial soils that are located along the coast of Mundra and Mandvi talukas, black soils in the central part of Kachhch, shallow and skeletal soils developed on the slopes of the hilly areas in Anjar, Rapar, Mandvi, Mundra , Bhuj and Nakhtrana talukas and the mud soils located in the coastal belt formed under the influence of sea water. The soils in the Kutch district generally have low nitrogen, medium phosphorus and potash and in 96% of the soils have low iron and high lime contents.

Surface Water

In Kutch district the availability of surface water depends on the intensity, duration and amount of rainfall. Because of arid climate the reservoirs are not filled up to the capacity for several years at a stretch. Due to non-availability of proper stream gauging data, it is difficult to establish rainfall runoff relationship. The runoff coefficient were worked out on the basis of the designed inflow data of medium dams in different talukas Anjar-0.2082, Bhachau-0.2164, Bhuj-0.2299, Lakhpat-0.2092, Mandvi-0.2370, Mundra-0.2294, Nakhtrana-0.2193, Naliya -0.1854 and Rapar-0.1952 (Singh and Kar, 1996). Out of the total 1482.71 MCM man runoff estimated 847.38 MCM water is being stored in different irrigation storage reservoirs and village tanks. Thus nearly 57.15% of runoff is surplus which goes as waster into the sean and the Ranns.

Groundwater

Fresh groundwater resources are limited in Kutch district, mainly due to scanty rainfall and also because the district has nearly 60% saline area. Among the 166 wells examined, about 9% wells tapped water at less than 30 m depth, 43.4% tapped water at 10-20 m depth and 27.1% had it at less than 10 m depth (Singh and Kar, 1996). Excessive with-drawal of groundwater has led GWRDC (1991) to categorise Anjar and Bhachau under over –exploited talukas,Mandvi under dark category and Naliya, Nakhtrana, Mundra and Rapar under gray category. Only two talukas; Bhuj and Lakhpat were considered as safe areas with regards to ground water availability. Rate of depletion of 1.2 m per year in Bhuj and Nakhtrana an d0.8m per year in Mandvi and Mundra talukas resulted in consid-erable decline(10-15 m) in water table during 1980-91 (GWRDC, 1995).

Agriculture

The total cultivated area in Kutch district increased by 15% during 1961-62 to 1992-93. At taluka level, the increased was recorded in all except Naliya and Anjar, where the cul-tivated land decreased by 17% and 29% respectively. Major crops jowar, bajra, pulses, groundnut and cotton accounted for 78% of the total cultivated area during 1961-62 which decreased to 72% during 1992-93. Groundnut, a salinity sensitive crop was culti-vated mainly in Nakhtrana and Mandvi (56% and 20% of total groundnut cultivation) during 1961-62. Groundnut cultivation shows a significant decrease of 33% in Nakhtrana taluka during 1992-93. Cotton was mainly cultivated in saline tracts of Anjar, Bhachau, Rapar Mandvi and Mundra talukas in 1,06,684 ha during 1961-62 which decreased to 55,288 ha during 1992-93.

METHODOLOGY

Daily rainfall data of 1975-99 for all nine taluka were collected from Kutch District Panchayat Office, Bhuj (Gujarat). Details on agricultural statistics were collected from Office of the Joint Director (Agriculture), Ahmedabad (Gujarat). Information on other aspects has been collected from printered literatures. Computer programme by Ashokraj (1977) has been used to study various aspects related to onset of effective monsoon, criti-cal dry spells and rainfall during wet spells.

RESULTS AND DISCUSSION

Rainfall Depth Duration Relationship

Average rainfall during different storm periods (Table 1) shows that average 1-day annual maximum rainfall ranged from 105 mm (Bhachau) to 154 mm (Naliya) with district average at 85 mm. On the other hand maximum of one-day annual rainfall ranged from 375 mm (Bhachau, Mandvi) to 683 mm (Naliya). Maximum one day annual rainfall in order of 265.2 mm (Nakhtrana) to 467.9 mm (Bhuj) reported by Singh and Kar (1996) falls within the above limit. Analysis of longest possible duration rainfall data will help in establishing statisitcal parameters.

Table 1. Average of 1-7 day continuous moving maximum rainfall for different taluka in Kutch district.

Code and Name of Raingauge station	Average rainfall (mm) during different storm period (day)						
Taluka	1	2	3	4	5	6	7
ANJ(Anjar)	109	153	169	176	199	183	189
BHA (Bhachau)	105	135	149	162	165	168	176
BHU(Bhuj)	110	152	170	177	181	184	188
LAK(Lakhpat)	125	165	189	193	198	202	203
MAN(Mandvi)	109	144	168	184	201	211	218
MUN(Mundra)	136	180	196	210	219	227	236
NAK(Nakhtrana)	122	162	179	191	197	202	209
NAL(Naliya)	154	194	215	221	228	234	243
RAP(Rapar)	113	153	169	199	181	187	203
DISTRICT	85	126	149	162	169	176	183

Table 2. Regression coefficient of 2-7 day continuous moving maximum rainfall on 1-day annual maximum for different taluka in Kutch district.

Code	Rain storm duration (day)					
Taluka	2	3	4	5	6	7
ANJ	1.33	1.45	1.46	1.50	1.55	1.62
BHA	1.42	1.67	1.73	1.72	1.70	1.71
BHU	1.28	1.40	1.44	1.43	1.46	1.50
LAK	1.36	1.58	1.61	1.65	1.66	1.66
MAN	1.23	1.38	1.49	1.59	1.67	1.69
MUN	1.28	1.36	1.37	1.37	1.46	1.65
NAK	1.39	1.51	1.62	1.63	1.62	1.62
NAL	1.12	1.11	1.12	1.11	1.11	1.13
RAP	1.29	1.32	1.34	1.37	1.49	1.65
DIST	1.51	1.84	1.94	1.97	1.96	2.00

Analysis of 1-7 day continuous moving maximum annua rainfall showoed that average 1-day annual maximum rainfall ranged from 176 mm to 243 mm for the same talukas with district average at 183 mm. Regression of 2 to 7 day continuous moving maximum rain-

fall on 1 day annual maximum rainfall for all the nine talukas and the district as a whole (Table 2) showed that rain during 2-7 day duration increased gradually with regression coefficieny varying from 1.12 to 1.13 (Naliya) to 1.42 to 1.71 (Bhachau). For the entire district, regress coefficient ranged from 1.51 to 2.00, which clearly shows an inconsistent trend, between the talukas. Correlation of 2 to 7 day continuous maximum rainfall on 1-day annual maximum rainfall (Table 3) showed that the coefficient of determination in general decreased with increase in duration of rainstorms, which is mainly due to inconsistent rainfall magnitudes over the years. Coefficient of determination varied from 86.28 to 67.58% (Bhachau) to 93.59 to 79.85%(Rapar). In general 93.56 to 80.12% coefficient of variation for the district as a whole helps in determination of expected rainfall depth during the desired rainstorm periods.

Table 3. Coefficient of determination (%) for continuous maximum rain of 2 to 7 day duration with one day annual maximum rainfall for Kutch district.

Code	Rain storm duration (day)					
Taluka	2	3	4	5	6	7
Anjar	89.60	86.56	84.57	85.21	85.28	86.21
Bhachau	86.28	71.02	69.98	69.05	68.03	67.58
Bhuj	92.61	87.96	83.50	82.99	83.35	83.19
Lakhpat	92.89	86.45	87.42	88.18	88.63	88.31
Mandvi	91.44	80.95	76.60	72.54	68.98	68.41
Mundra	92.94	87.54	79.16	77.88	78.85	80.39
Nakhtrana	91.91	88.90	82.31	82.23	81.31	80.54
Naliya	92.83	83.57	82.82	81.24	79.46	75.83
Rapar	93.59	89.59	87.84	87.80	85.76	79.85
District	93.56	91.55	86.58	83.78	81.43	80.12

Table 4. Distribution of 'F-ratio' for correlation of continuous maximum rain of 2 to 7 day duration with 1-day annual maximum rainfall for Kutch district.

Code	F Ratio for different rain storm duration					
Taluka	2	3	4	5	6	7
Anjar	189.5	141.7	121.6	126.8	127.4	137.5
Bhachau	138.3	53.9	51.3	49.1	46.9	45.9
Bhuj	275.5	160.7	111.4	107.4	111.1	118.1
Lakhpat	287.6	140.4	152.8	164.1	171.5	166.2
Mandvi	235.1	93.5	72.0	58.1	48.9	47.6
Mundra	289.5	154.6	83.6	77.4	82.0	90.2
Nakhtrana	250.1	167.5	102.3	101.8	95.7	91.0
Naliya	285.0	111.9	106.2	95.2	85.1	69.0
Rapar	321.0	189.1	158.9	158.3	132.5	87.2
District	319.5	238.3	142.0	113.7	96.5	88.7

Regression and correlation analysis of 2 to 7 day continuous maximum rainfall on 1-day annual maximum rainfall showed that 'F-ratio' (Table 4) also decreased with increase in rainstorm duration. For regression and correlatiion of 2-day annual maximum rainfall on

1-day annual maximum rainfall, the 'F-ratio' varied from 138.3 (Bhachau) to 321.0 (Rapar). But for regression and correlation of 7-day annual maximum rainfall on 1-day annual maximum rainfall, the 'F-ratio' varied from 45.9 (Bhachau) to 166.2 (Lakhpat), which shows a different trend than the above. A high value of 'F-ratio' clearly shows variatiion of annual maximum rainfall with duration of rainstorm over the years (1975-99).

Table 5. Distribution of different types of monsoon during 1975-99 period.

Station	No. of monsoon years (%)with Respect to mean annual rainfall (mm)					Rainfall (mm)			CV
Taluka	<0.50 X	0.50 <X< 0.75	0.75 <X< 1.25	1.25 <X< 1.50	>1.50 X	MIN	AVG	MAX	(%)
ANJ	7 (29)	2 (8)	9 (36)	1 (4)	5 (21)	77	426	1143	62
BHA	5 (21)	6 (25)	8 (33)	-	5 (21)	445	413	1055	64
BHU	6 (25)	4 (17)	5 (21)	4 (17)	5 (21)	80	395	965	63
LAK	6 (25)	6 (25)	8 (33)	-	4 (17)	19	371	1234	79
MAN	8 (33)	2 (8)	6 (25)	2 (8)	6 (25)	43	426	1028	64
MUN	6 (25)	4 (17)	7 (29)	1 (4)	6 (25)	49	502	1196	59
NAK	6 (25)	3 (13)	10 (42)	1 (4)	4 (17)	40	423	1060	60
NAL	4 (17)	5 (21)	6 (25)	4 (17)	5 (21)	37	420	946	56
RAP	5 (21)	6 (25)	7 (29)	-	6 (25)	94	448	1594	73
KUT	5 (21)	5 (21)	8 (33)	2 (8)	4 (17)	93	425	986	55

Distribution of Monsoon Rains

Annual rainfall of 1975-99 (except 1987, extremely drought year) showed that on an average the district experienced drought and below normal rains in 5 each of 24 years (21%). It receives normal rain only in 8 out of 24 years (33%). Likewise, above normal and surplus rains are experienced in 2 years (8%) and 4 years (17%) respectively out of 24 years (Table 5). Pooled data of 1901-9 (Singh et al., 1990) and 1975-99 period showed that the district experienced drought, below normal, normal, above normal and surplus rains in 17,24,28,14 and 15 out of 98 years respectively (Table 6). These two separate inferences (Tables 5 and 6) establish that the district expereinced drought and below normal rainfall to the extent of 41-42%. Hence there is need to study more critically on onset of effective monsoon and related aspects for better agricutlrual water management aspects in the district. Minimum annual rainfall ranged from 19 mm (Lakhpat) to 115 mm (Bhachau) with district average of 93 mmm. Similarly annual maximum rainfall ranged from 965 mm (Bhachau) to 1594 mm (Rapar) with district average at 986 mm. Similarly the coefficient of variation of annual rainfall ranged from 56% (Naliya)to 79% (Lakhpat). Singh and Kar (1996) also reported that coefficient of variation ranged from 56.1% (Anjar) to 80.7% (Naliya).

Onset of Effective Monsoon

The result on analysis of onset of effective monsoon (Ashokraj, 1977) presented in Table 7 shows that that earliest onset of effective monsoon (Table 7) in the district varied from

Jun 22 (Mundra) to Jul 3 (Bhuj) with district average estimated as Jun 16. Similarly average date for onset of effective monsoon varied from Jul 11 (Mandvi) to Jul 27(Rapar) with district average estimated as Jul 12. Standard deviation of onset of effective monsoon varied from 14 days at Bhuj to 30 days at Rapar. However withdrawal of monsoon rains from Aug 20 (earliest) in case of Lakhpat to Sep 13 (latest) in case of Naliya and Rapar talukas. Such dates of onset of effective monsoon and withdrawal of monsoon rains are useful for sowing/irrigating crops and other farm practices.

Table 6. Distribution of different types of monsoon during 1901-99 period.

Station	Data	No. of monsoon years (%)with respect to mean annual rainfall (mm)					Rainfall (mm)			CV
Taluka	Period	<0.50X	0.50 <X< 0.75	0.75 <X< 1.25	1.25 <X< 1.50	>1.50 X	MIN	AVG	MAX	(%)
ANJ	97	18 (19)	23 (24)	25 (26)	15 (15)	16 (16)	52	346	1143	60
BHA	42	7 (17)	10 (24)	12 (29)	2 (5)	11 (26)	110	345	1055	77
BHU	97	22 (23)	21 (22)	23 (24)	13 (13)	18 (19)	61	346	1311	69
LAK	41	11 (27)	6 (15)	9 (22)	6 (15)	9 (22)	19	312	1234	96
MAN	43	14 (33)	7 (16)	6 (14)	4 (9)	12 (28)	43	391	1028	79
MUN	44	8 (18)	13 (30)	7 (16)	5 (11)	11 (25)	49	414	1196	70
NAK	43	10 (23)	5 (12)	13 (30)	5 (12)	10 (23)	40	366	1060	73
NAL	39	10 (26)	5 (13)	12 (31)	3 (8)	9 (23)	22	386	1280	78
RAP	98	18 (18)	25 (26)	27 (28)	13 (13)	15 (15)	26	369	1594	66
KUT	98	(17)	(24)	(29)	(14)	(15)	60	360	986	56

Table 7. Onset of effective monsoon in Kutch district.

Taluka Station	Onset of Effective Monsoon (p=0.68)			Devi Ation (days)	With drawl Of rain
	Earliest	Mean	Latest		
ANJ	Jun 24	Jul 12	Aug 30	18	Sep 13
BHA	Jul 1	Jul 17	Aug 3	17	Sep 7
BHU	Jul 3	Jul 16	Jul 31	14	Sep 10
LAK	Jun 23	Jul 17	Aug 10	24	Aug 20
MAN	Jun 24	Jul 11	Jul 29	17	Sep 8
MUN	Jun 22	Jul 17	Aug 11	25	Sep 9
NAK	Jun 26	Jul 20	Aug 14	24	Sep 13
NAL	Jul 2	Jul 26	Aug 20	24	Aug 28
RAP	Jun 28	Jul 27	Aug 26	30	Aug 28
DIST	Jun 16	Jul 12	Aug 7	26	Sep 2

Critical Dry Spells

On an average the entire district experiences at least one critical dry spell (Table 8) in each year. Duration of the critical dry spells varied from 41 (Naliya, Rapar) to 79 (Anjar) days with a district average of 61 days. The first critical dry spell commenced mostly in July and with duration ranging from 23 days (Lakhpat, Rapar) to 35 days (Anjar). Simi-

larly the second critical dry spell occoured mostly in August with duration ranging from 16 days (Naliya) to 38 days (Nakhtran, Lakhpat, Rapar) to 35 days (Anjar).

Table 8. Distribution of critical dry spells (CDS) in Kutch district.

Taluka	First CDS		Second CDS		Third CDS		Total
Station	Date	Length	Date	Length	Date	Length	Length
ANJ	Jul 18	35	Jul 31	26	Aug 16	18	79
BHA	Jul 26	29	Aug 8	30	Aug 26	17	66
BHU	Jul 25	38	Aug 20	23	---------	--------	61
LAK	Jul 17	23	Jul 25	20	Jul 27	20	63
MAN	Jul 24	27	Aug 24	25	Sep 6	23	75
MUN	Jul 24	31	Aug 19	22	Sep 1	13	66
NAK	Jul 17	26	Aug 7	38	Aug 30	23	87
NAL	Jul 29	25	Aug 21	16	---------	--------	41
RAP	Jul 31	23	Aug 25	18	---------	--------	41
Dist	Ju113	29	Aug 5	28	Aug 27	20	61

Table 9. Rainfall during wet spells at different talukas in Kutch district.

Taluka	Rainfall (mm) during Wet Spells				
Station	First	Second	Third	Fourth	Total
ANJ	236.9 (Jul 12-28)	64.2 (Aug 24-27)	87.9 (Aug 27-29)	32.0 (Sep 4-5)	421.0
BHA	248.2 (Jul17-Aug2)	64.0 (Aug26-29)	128.4 (Sep 8-15)	110.0 (Sep 13-14)	550.6
BHA	237.1 (Jul 16-25)	95.0 (Sep 2-6)	73.0 (Sep 14-18)		405.1
LAK	280.3 (Jul 17-29)	176.4 (Aug 11-16)	31.5 (Aug 15-17)	38.0 (Aug 17)	526.2
MAN	287.5 (Jul 11-Aug2)	120.8 (Aug 21-26)	21.8 (Sep 19-20)	17.0 (Oct 7)	447.1
MUN	330.2 (Jul 17-31)	124.3 (Aug 25-31)	47.7 (Sep 12)	41.5 (Sep 15)	543.7
NAK	241.0 (Jul 20-Aug 7)	50.0 (Aug 13-15)	96.1 (Sep 15-17)		387.1
NAL	234.0 (Jul 26-Aug 4)	101.4 (Aug 24-29)	17.3 (Sep 7)	45.0 (Aug 30-31)	397.7
RAP	186.4 (Jul 27-Aug 8)	196.3 (Aug 25-30)	55.4 (Sep 13-15)		552.8
Dist	197.5 (Jul12-26)	162.6 (Aug 12-22)	61.8 (Sep 3-6)	102.0 (Sep 17-22)	523.9

Rainfall during Wet Spells

On an average total of rainfall during the wet spells (Table 9) ranged from 338 mm (Nakhtrana) to 553 mm (Rapar). It is estimated that a totoal of nearly of 524 mm could be retained during the four wet spells occurring in the district and it can be suitably harnessed and harvested for use for agricultural production. It is estimated that rainfall in order of 186 mm (Rapar) to 330 mm (Mundra), 50 mm (Nakhtana) to 196 mm (Rapar) and 22 mm (Mandvi) to 96 mm (Nakhtrana) during the first, second and third wet spells in months of July, August and September can be harnessed/harvested. Iti gives useful information on harnessable rainfall during the different wet spells for nine talukas, which can be well utilized.

Table 10. Periodic average rainfall (mm) and coefficient of variation (%) in Kutch district.

Mean rainfall (mm) and CV (%) based on 1975-99						
Taluka		Jun	July	Aug	Sept	Annual
ANJ	Anjar	69 (130)	145 (88)	127 (132)	57 141)	423 (62)
BHA	BHAhau	55(123)	143 (78)	135 (110)	57 (168)	413 (64)
BHU	Bhuj	48 (174)	130 (116)	120 (125)	62(125)	395 (63)
LAK	Lakhpat	38 (158)	137(138)	116 (160)	55 (272)	371 (79)
MAN	Mandvi	68 (167)	173 (108)	117 (118)	47(179)	426 (64)
MUN	Mundra	78 (154)	191(104)	147 (93)	52 132)	502 (59)
NAK	Nakhtrana	49 (169)	141 (115)	125 (137)	64 (166)	423 (60)
NAL	Naliya	38 (208)	163 129)	134 (129)	40 (173)	420 (56)
RAP	Rapar	71 (158)	125 (68)	152 (135)	70 (172)	448 (73)
KUT	Kutch	57 (135)	150 (92)	130 (118)	56 (152)	425 (55)

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