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ANALYSING THE RAINFALL PATTERN IN THE ARKAVATHY CATCHMENT AREA

Rekha H. V
Guest Teaching Faculty, Centre for Geoinformatics ,
DOS in Geography, MGM, UOM , Mysuru.

ABSTRACT

Rainfall is the source of water, which influences on the surface and ground water. This study will help to understand the rainfall pattern in the Arkavathy catchment area. The result of this study helps to identify the normal rainy years as well as excess and below normal rainy years of the Arkavathy catchment area.

KEYWORDS :*Rainfall Pattern , Arkavathy Catchment Area , normal rainy years .*

LOCATION OF THE STUDY AREA

The Arkavathy is a tributary which flows through Bangalore Urban and Bangalore Rural in the general direction from north to south. The Arkavathy Catchment lies between latitudes 12° 55' 44.505" N and 13° 22' 47.346" N and longitudes 77° 19' 26.11" E and 77° 41' 16.047" E. cover the area of 987.58 km^2.

OBJECTIVE: To Analyse the Rainfall pattern in the Arkavathy Catchment Area.

METHODOLOGY

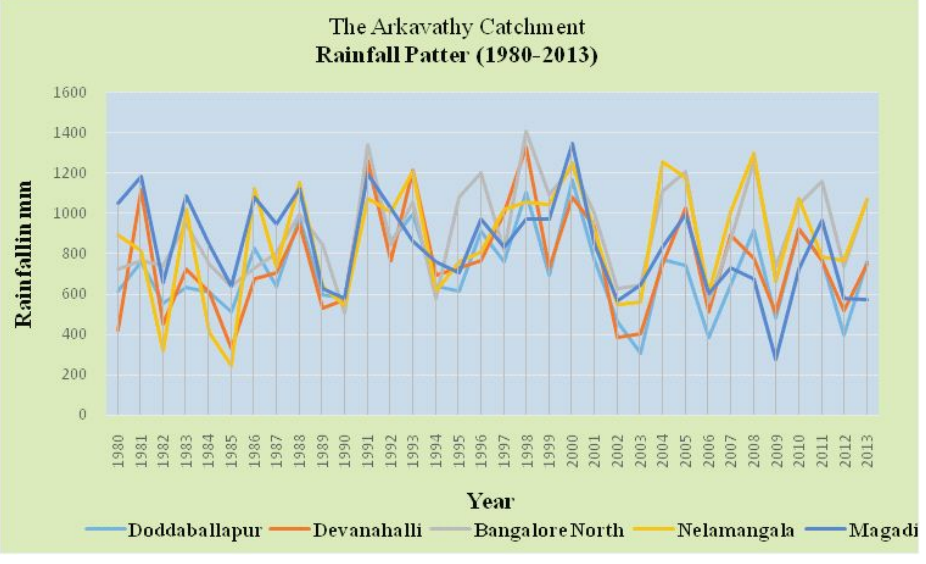
Rainfall pattern analysis has been carried out for the period 1980-2013, with reference to average rainfall of each station and the percentage of deviation has then been calculated and the result has been classified into three ranges, as shown below:

Rainfall Class	Range
Excess (E)	>+20 per cent
Normal (N)	Minus 20 per cent to plus 20 per cent
Below Normal (B)	<-20 per cent

Source: IMD

Annual rainfall of the five stations is shown in Figure and it is evident that the rainfall received at different stations has not been uniform during most of the years. Variation and percentage deviation with respect to average rainfall for the period of 1980-2013 in each station.

Rainfall pattern has been evented that there has been a below normal rainfall in the following years: 58 per cent (2003), 47 per cent (2006), 45 per cent (2012), 36 per cent (2002), 34 per cent (2009), 29 per cent (1985) and 23 per cent (1982). They have been classified hence as deficit years. Only a total of 8 years fall under this category in Doddaballapur. Excess rainfall has been recorded at **Doddaballapur** in as many as 7 years: 70 per cent (1991), 62 per cent (2000), 52 per cent (1998), 38 per cent (1993), 35 per cent (1982), and 27 per cent (2008 and 2010). The remaining years (18 years) have recorded normal rainfall and hence in normal category.



In the case of **Devanahalli**, deficit years are: 56 per cent (1985), 49 per cent (2002), 47 per cent (2003), 44 per cent (1980), 40 per cent (1982), 33 per cent (2009), 30 per cent (1989), 32 per cent (2006), 31 per cent (2012), and 25 per cent (1990). The years of 1998 (75 per cent), 1991 (66 per cent), 1993 (60 per cent), 1981 (47 per cent), 2000 (42 per cent), 2005 (35 per cent), 1997 (32 per cent), 1988 (25 per cent), 2001 (23 per cent), and 2010 (21 per cent) have been identified as the excess rain years. The remaining years (14 years) fall under the normal class.

Bangalore North has experienced deficit rainy years and their percentage deviation, in the order of deficit, are as follows: 1990 (44 per cent), 2006 (39 per cent), 1994 (37 per cent), 2002 (31 per cent), 1985 (30 per cent), 2003 (29 per cent), 1980 (21 per cent). The year 1986 recorded a record deficit of 75 per cent. The excess rainy years for Bangalore North are: 1988 (54 per cent), 1991 (46 per cent), 2008 (37 per cent), 2002 (34 per cent), 2005 (32 per cent), 1996 (31 per cent), 2011 (27 per cent), and in 2004 (21 per cent) and the remaining 18 years have experienced normal rainfall.

Nelamangala has had 10 deficit years, 12 excess and 12 normal rainy years: Deficit years: 1985 (72 per cent), 1982 (63 per cent), 1984 (53 per cent), 1990 and 2002 (37 per cent), 2003 (36 per cent), 2006 (30 per cent), 1994 (29 per cent), 1989 (26 per cent), and 2009 (23 per cent). Excess rainy years: 2008 (50 per cent), 2004 (45 per cent), 2000 (44 per cent), 1993 (39 per cent), 2005 (36 per cent), 1998 (33 per cent), 1986 (30 per cent), 1991 and 2010 (24 per cent), 2013 (23 per cent), 1998 (22 per cent), and 1999 (21 per cent).

Magadi has been identified with 10 deficit years, 8 excess years and 16 normal years. The deficit

years are: 2009 (67 per cent), 2002 and 2013 (32 per cent), 1990 and 2012 (31 per cent), 2006 (28 per cent), 1989 (25 per cent), 1985 (24 per cent), 2003 (23 per cent), and 1982 (21 per cent). The excess years are: 2000 (61 per cent), 1991 (42 per cent), 1981 (41 per cent), 1988 (34 per cent), 1983 (30 per cent), 1986 (29 per cent), 1980 (25 per cent), and 1992 (22 per cent). The remaining years have been the normal rainy years.

Table indicates to the classes and frequencies of the rainfall pattern for the period 1980-2013. This table indeed shows the normal, excess and deficit years discussed above.

Rainfall Pattern: Classes and Frequencies (1980-2013)

Class & Stations	N	E	B	Total Years
Nelamangala	12	12	10	34
Bangalore North	18	8	8	34
Doddaballapur	18	8	8	34
Devanahalli	14	10	10	34
Magadi	16	8	10	34

Source: Source: Scholar's Computation.

CONCLUSION

The study reveals that the rainfall patter in the Arkavathy catchment is normal and excess rainy yeas are more compare to the below rainy years. Study result shows that out of 34 years 12 years experiences the normal rain, 12 years experiences the excess rain and 10 years' experience the below rainy years.

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Rekha H. V
Guest Teaching Faculty, Centre for Geoinformatics , DOS in Geography, MGM, UOM , Mysuru.