

Ratio of Agriculture in Drought Prone Area And Indexing of Irrigation in Micro Area in Solapur District

Mr. A. G. Nimase

Assistant Professor

Department of Geography

Chhatrapati Shivaji College, Satara

Abstract

Drought is the basic event in the natural climatic system. When drought occurs there is an acute scarcity of water over the land surface. In extreme conditions the water-table is so-lowered that the wells/pumps sets are failed to discharge the water, as result not only the crops are suffered but the human being also face a crucial problem for drinking water. There is no operational practice to forecast the draught. One of the suggestions is to update mapping of draught prone areas developmental planning. Statistical analysis is very important in such planning.

The main aim of this research paper is, to analyze, region wise relative requirement of water for agriculture at village level. Regionalization of study area has been done on the basis of decadal population growth and density of population per square km. Thus, ultimately evolved the nine micro regions. Further it work out that "Index of Irrigation Requirement" (Ir.). There are 104 villages included in Mohol tahsil. Out of them 47 villages having very low (Ir. <0.15) requirement of water for agriculture, whereas 29 villages shows low (Ir. 0.15 – 0.30), 11 denotes medium (Ir. 0.30 – 0.45), 18 are high (Ir. 0.45 – 0.60) and 9 villages observed very high (Ir. 0.60 >) requirement of water for agriculture.

Key Words: Drought prone area, Index of irrigation requirement, Plateau.

Introduction

The basic requirement of human being is water and it is also the basis of all types of development. It is a transparent fluid which forms the streams, lakes, oceans and rain is the major constitute of the fluids of living things. Water is a so we can say it is a life. Water resource are the important for human being for agriculture, industrial, household, recreational and environmental purpose. The majority of man's uses require fresh water. It is also predicted that conflicts between various societies, villages, states, and nations arise due to water resources. In rain shadow area like Mohol tahsil of Solapur district experienced deficiency of water resources for agriculture and even for drinking purpose. So, a systematically region wise study of requirement of water is needed at micro level or say village level.

Study Area

Mohol tahsil is located at eastern part of Solapur district in the state of Maharashtra. Mohol is surrounded by N. Solapur to the east. Madha tahsil to the North. Pandharpur tahsil to the west. Mangalwedha tahsil to the south-west, S. Solapur tahsil to the south-east. The study region

cover 1408.40 hectors land and having population in 104 villages in 252526 as per 2011 Census. Mohol tahsil is located at the eastern part of Solapur district. It is too hot in summer. Mohol summer highest day temperature is in between 35°C to 43°C. Average temperatures of January is 26 ° C , February is 27 ° C , March is 31 ° C , April is 33 ° C , May is 35 ° C . Physiography, rainfall, soil, temperature, and drainage influences on agricultural land use pattern in this tahsil. Rainfall varies between 200 to 600 mms from east to west entire tahsil. The underline basalt on disintegration and decomposition brought varieties agencies had yielded three kinds of soils viz. Deep black, medium deep & shallow soils. Tahsil is provided with Neera and Man left bank canals. Similarly Sina and Bhogawati are two seasonal rivers at north side of the tahsil. The tahsil is divided in to 104 villages are as 51 Kharip and 49 villages are as Rabbi season. Including Eight centers of Revenue circle i.e. Penur, Shetphal, Begampur, Narkhed and Anagar. The rainfall is mainly due to rain shadow area in terms of amount of annual rainfall average receives low rainfall 60 to 65 millimeters, in north, south and eastern part of Tahsil

but western part of major villages are totally drought prone area. Therefore these villages are mostly unirrigated. The variation in amount of rainfall & type of soil exerts influence on the cropping pattern of the study region. The major crops namely cereals, cash crops, pulses, oil seeds, cash crops, fruit crops, vegetables; flower and fodder crops are cultivated in Mohol tahsil.

The topography soil and availability of water have significant effect on the population density and distribution. There are 104 inhabited revenue villages; all grouped into Eightzilhaperished circles (zpcircles). The Administrative headquarter of the tahsil is at Mohol which is rural in character. Study area is as rural in character, situated in rain shadow zone , poor soil, undulating hilly area. Main occupation is agriculture but there is no sufficiently available water source for irrigation. As per 2011, only 20.56 percent cultivated area have been irrigated. There is low possibility in development of agriculture.

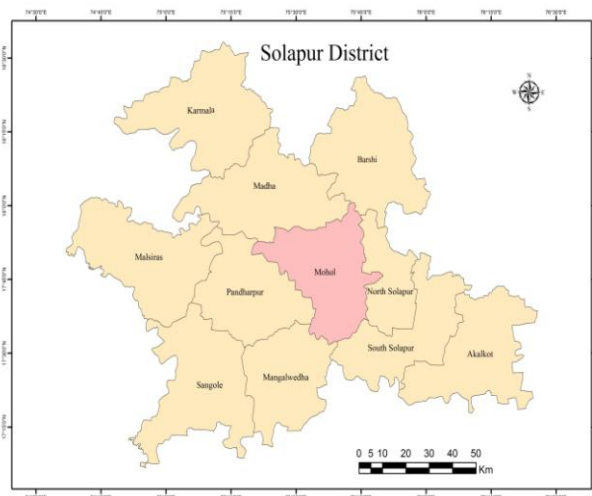


Fig.1

Objectives:

The main objective of this research paper is to highlight onagriculture in drought prone area and indexing of irrigation in Mohol tahsil in Solapur district.

Data Base Methodology

The present research paper is entirely based on secondary source of data. The required data has been collected from the District Census Handbook, Solapur-2011.The information regarding

physiography, drainage etc. obtained from SOI toposheets and gazetteers. Regionalisation of study area has been carried out on the basis of decadal growth of population

and density per sq. km. Thus the study area identified as low (dg.<15%), moderate(dg.15.01-30%) and high (dg.30>%) growth regions. Further each growth region has been divided into three sub-regions according to the density of population < 100, 100-200 and 200> persons per sq. km. for the tahsil. Thus study area is evolved into the nine micro regions.

There are one hundred four villages in Mohol tahsil. Out of them fifty four villages includes in low growth region, twenty four in moderate and twenty six in high growth region. Further, the formula adopted for the 'Index of Irrigation Requirement' (Ir.) for agriculture in each village is as given below.

Ir = Density of population per 100 hectares to TGA of that village

Annual Rainfall X Irrigation intensity or % of area under irrigation to TGA.

On the basis of index values of each villages of irrigation requirement, the study area have classified into five major groups as shown in the table no.1.

TABLE NO. 1
Classification of Villages According To
Irrigation Requirement

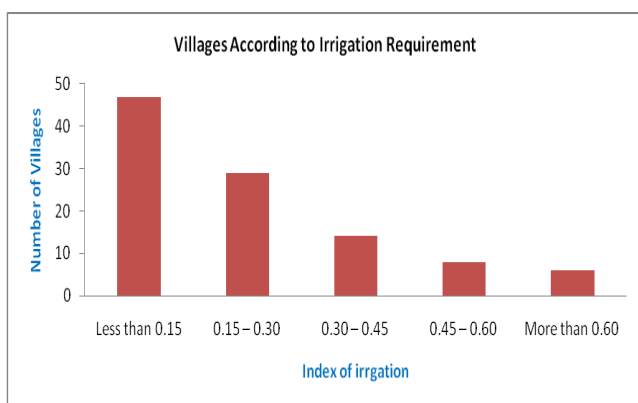
Sr.No	Index of irrigation requirement (ir)	Total Villages	Requirement of water for agriculture
1	Less than 0.15	47	Very Low
2	0.15 – 0.30	29	Low
3	0.30 – 0.45	14	Moderate
4	0.45 – 0.60	8	High
5	M	6	Very high

Source: Computed by Authors.

Mohol tahsil which circles like Penur ,Shetphal, Begumpur, Anagar and Narkhedand depend upon the socio-economic and physical conditions are the effect of land use and cropping pattern .With the use of agricultural equipment ,new technologies and are total cropping pattern of the tahsil get totally changed.(Nimase A.G.& Dr. Lokhande T.N. (Nov-2013).

Table no. 2 clearly reveals that number of villages consisted in each growth region with level of

requirement of water. It is investigated that 47 villages need very low requirement of water, 29 villages need low, and 14 need moderate, 8 needs high and 6 villages show need to very high requirement of waterfor agriculture. Detailed Information regarding these five categories is as below.



1. Villages having very low requirement of water:

There are forty seven Villages they need to be very low requirement of water are due to either low density of population on one hand and high proportion of irrigated area on the other hand. It is investigated from the obtained data that there are fourty seven villages need very low requirement of water. Out of them thirty four (50%) villages having low density ranges between 11 to 188 per hundred hectares to TGA and proportion of irrigated area ranges between 2.23 % to 28.06 % to cultivated area. Whereas, there are thirty four (50%) villages having high proportion of irrigated area ranges between 30.24 %to 96.37 % and density ranges 111 to 337 per hundred hectares to TGA. Villages of this category actually observed that index of irrigation requirement values having ranges between 0.02 to 0.15. Lowest index value of about 0.02 has been of Yewatiand Penur, whereas it is highest of about 0.15 for Narkhed and Savaleshwarkh. Other villages like, Morvanchi, Mirikh, Kothale (each 0.03); kamati, Lamboti, Kolegaon (each 0.04 Sarole, Begampur, Kurul, Degaon, and Khandali, Ashti (0.05) having very low requirement.

Table No. 2: Irrigation Requirements and Growth Region for Agriculture

Growth region	Number of villages included in each growth region and in each level of Ir					
	Very Low	Low	Moderate	High	Very high	Total villages
1	06	02	01	01	02	12
2	12	06	08	01	01	28
3	05	03	00	04	02	14
Low	23	11	09	06	05	54
4	04	06	02	00	00	12
5	05	00	01	01	00	07
6	03	01	00	00	01	05
Moderate	12	07	03	01	001	24
7	05	04	01	00	00	10
8	03	05	00	00	00	08
9	04	02	01	01	00	08
High	12	11	02	01	00	26
Total	47	29	14	08	06	104

Source: Computed by Authors.

of water for agriculture. Comparatively above, high index of requirement in this category shows in villages like sarole, wadwal and Yewati with warkute, Waluj, Taratgaon Harya, Kasare (each 0.14); Penur, Padali Pophali, Konheri, jamgaon, Nandgaon, Baburdi, Dhotrekh. , Diskal, Waghunde Bk., and Papari (each 0.13) etc. In short, very low requirement of water have due to either low density or high proportion of irrigation whereas, very high requirement of water have due to either high density or very low proportion of irrigation.

2. Villages having low requirement of water:

There are twenty nine villages they need to be low requirement of water. In this category of villages having low density of population ranges between 40 to 258 and area under irrigation between 4.15% to 28.4%. Ranges between 0.10 to 0.27 indexes value of irrigation is observed in this category. Village Ghorpadi shows as lowest 0.10 values and 0.27 as highest value found in Malikpeth and Takali. Other villages like that Warkute, Bk. Singoli Yenaki, wadval (0.16.); Khavani, Kamati Bk. (0.17); Pokharapur, Devadi, Gotewadi Kurul, (0.18) Sultanpur, Wadgaon Savtal (0.19) Bopale, Bitale, Ankoli (0.20); Ashti chgaon (0.22); Lamantanda, watwate, pawarwdi, waluj (0.23); Pimprijalsen, Mohol,

Tikhol(0.25) and they shown comfortably availability of water resources. These group of villagessituated undulating hilly area of some extent. It is observed from table no. 2 that there are twenty six villages need low requirement of water for agriculture.

3. Villages having Moderate requirement of water:

There are elevenvillages they need to be moderaterequirement i.e. 0.31 to 0.44 index value of irrigation requirement of water. It is 0.31 have lowest value ofirrigation requirement observed in villages like Palaspur, NandurPathar, Siddheshwarwadi, Loni Haveli, Mhasobazap etc. Whereas, it is 0.44 have highest value of IR found in Bhalwani of this moderatecategory. Other villages shows IR, as follows: Korawali, lamboti-0.33, Kharkhatane-0.34, Mangaoli-0.36 Kinhi-0.37, Pasalewadi 0.40, Hivare,Katewadi-0.42, Nandgaon etc. included in this category in ascending order.

4. Villages having high requirement of water:

Villages About eight villages facing a problem of high deficiency of water for agriculture. Index values of IR found in ranges 0.46 to 0.60. Here 0.46 is thelowest value of IR. found in villages like Dadapur,Degaon, Bahire, and Punewadi and 0.66 has a highest value observed in village Garkhindi. Others are as follows: Chikhali and Ghatane -0.48, Nalbandwadi andAdhegaon -0.50, Siddewadi -0.55, Wagholiwadi-0.59 etc. shows that high requirement of water.

5. Villages having very high requirement of water:

There are ninevillages they need to be moderaterequirement Villages having very high requirement of water areeither high density of population on one hand and very low proportion of irrigated area on the other hand.It is investigated from the obtained data that, there are twelve villages need very high requirement ofwater. It is observed in these villages that density of population ranges between 56 to 261 and proportionof irrigated area from 2.27 % to 10.65% to cultivated area. Of them, there are seven villages in whichdensity of population is very low (56to88) but area under irrigation is too much low (2.27 %to 6.16%) andfive villages shows comparatively high density (110 to

261)and low area under irrigation (2.92%to10.65%). In this category, villages show index value of IR. As follows: Hiradwadi-1.40 Galandwadi-1.32,Diksal-0.95,Bairagwadi-0.92,Aundhi-0.86Gatewadi-0.84Ajansond-0.82, Devadi, Hiware and Tambole-0.80 etc.They are facing very high deficiency of water for agriculture.

Concluding Remarks:

1. Villages situated nearer to canal irrigation, river basin and other minor rivers or odha etc. have experienced very low and low requirement of water due to availability of water.
2. Moderate requirement of water experienced in that villages which are situated either remotely from Main River or on plateau or on table land.
3. High and very high requirement of water are either high density of population on one hand and very low proportion of irrigated area on the other hand.
4. Mohol tahsil which circles like Penur ,Shetphal, Begumpur, Anagar and Narkhedand depend upon the socio-economic and physical conditions are the effect of land use and cropping pattern .With the use of agricultural equipment ,new technologies and are total cropping pattern of the tahsil get totally changed.
5. Further, it is also concluded that basically there are very low amount of rainfall and there is no big perennial river across the tahsil. Therefore, there is no available adequate and permanently source of water for irrigation to the development of agriculture.

Suggestions:

There is urgent need in Mohol tahsil to management and planning of utilization of water on onehand and conservation and protection of water resources to other hand. It is found that villages having moderate, high and very high requirement of water, and where low area under irrigation these villages can improve their irrigation Facilities through the below suggested measures.

1. Small works such as tanks, Bandhara, and dug wells, lakesconstruction constitute the most important source of irrigation. So that attention may

have to give towards construction of percolation tanks, and check dams on a watershed basis.

2. It has been realized that amelioration of this drought prone tahsil can only carried out effectively by transfer of water from adjacent more richly endowed basins i. e. Yeoti basin to the all over area of Mohol tahsil in Solapur district. Some of the villages it is only possible actually with the help of lift irrigation due to high altitude.

3. Today, it is experienced that farm ponds are useful for irrigation. Therefore, attention may have to given towards construction of these type of ponds at maximum numbers through the financial assistance by government wherever possible.

4. Attention may have given towards contour trenching, bench terraces, plantation of trees and grasses on slopes wherever suitable physical sites and operate programmes like various types of water harvesting etc.

References

1. Census of India - 2011 Solapur District Census Handbook.
2. Field Visit to Ralegan siddhi and Hivare Bajar Jan. 2012
3. Kadam, Avinash (2003): "Environmental Impact of Population Growth", Global Goals Institute, Pune. Pp.182-187
4. Nimase A.G. & Dr. Lokhande T.N. (Nov-2013): Cropping pattern and agricultural land use in Mohol tahsil of solapur district (ms) Indian Journal of Applied Research, Vol: 3 | issue: 11 | Nov 2013 | ISSN - 2249-555x, Publisher Dr.A.Kumar, pp-235-237.
5. Narake et al. (2012): "Methods of water conservation for rural development," SHODHANKAN, special issue PPNRSAD, Pp.16-21.
6. Report on Development of Drought Prone Areas (1981) :National Committee on Development of Backward Areas, Planning Commission Govt. of India, New Delhi. Pp. 7- 8
7. Sawant, S. B. (1994): "Population Geography", Mehta Publishing House, Pune.
8. Sen, Soumitra (1996): "Need for irrigation for its spatial pattern in East and West Singhbhum District, Bihar," Indian Journal of Landscape Systems and Ecological Studies,' Institute of Landscape, Ecology and Statistics, Kolkota(india), vol.: 19, No.:2, Dec. 1996, Pp. 80-91.
9. The Gazetteer of Solapur District, Gazetteers Department, government of Maharashtra, Mumbai.

