CHAPTER- TWO

CHAPTER II

AN ECONOMIC PROFILE OF SOLAPUR DISTRICT ,WITH PARTICULAR REFERENCE TO ITS AGRICULTURAL SECTOR .

II-1 . LOCATION

The district of Solapur is bounded by $17^{\circ}10'$ north and $18^{\circ}32'$ north latitudes and $74^{\circ}42'$ east and $76^{\circ}15'$ east longitudes.The district lies entirely in the Bhima-Sina-Man river basin.The adjoining districts are Sangli to its south-west, Satara to its west ,Pune to its north west,Ahmadnagar to its north, Bhir and Osmanabad to its east and Bijapur district in Karnataka state to its south .

The total geographical area of the district amounts to 15,017 sq.kms.It forms 4.88 per cent of the total geographical area of Maharashtra.Out of the total geographical area of the district 2.26 per cent (338.8 sq.kms.)is classified as urban area and 97.74 per cent (1,4678.2 sq.kms.)as a rural area. The whole district has been divided into three divisions namely Solapur ,Madha and Pandharpur.There are 1104 villages and 6 are deserted villges in the district.

II-2 CLIMATE

Solapur district comes under the dry tropical climatic area.On the whole ,there is an adequate warmth and bright sunshine throught the year to provide ripening conditions of

2.2 crops.The mean daily maximum temperature in Solapur city is 40.7°C and the mean daily minimum is 17.1°C .The daily range of temperature seems to be wide.The climate on the whole is characterised by general dryness in the major portion of the year.The change from warm season to cold season is important feature of the climate and the agricultural operations are closely associated with the different season of the year. There are three seasons in the district 1) hot season 2) rainy season and 3) cold season .In Solapur district the fast increase in the temperature starts from March onwards . The hottest months of the year are March ,April and May with a mean maximum temperature of 37.0°C ,40.7°C and 39.5°C respectively. During the summer season the heat is intense and the maximum temperature ,sometimes goes upto about 44°C or 45°C. June to September is regarded as a rainy season and the rainfall during this period amounts to about 74 per cent of thetotal annual rainfall.The normal period of season of the onset of the south west monsoon in the district is the first week of June. But from the experience of recent years the first week of June cannot be considered as a period during which south west monsoon normally begins in the district.Of all the weather elements rainfall is dominant single weather parameter and climatic factor that affect plant growth and crop output because of its insecurity ,variability and for major parts its meagreness[1] The average annual rainfall in the district is 584mm.The rainfall

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1. Singh Jasbir -1974 An agricultural atlas of India ageographical analysis .Vishal Publications,Kurushetra India p.1

2.3 in the district varies from 448.8 mm at Akluj near the western border to 689.2 mm at Akkalkot near the south eastern border of the district.Some rainfall in the form of thunders showers do occur during the months of April and May.The isohyets particularly run from north to south and about half the per cent portion of district receives more than 500 mm rain annually.Irrigation is necessary particularly in Karmala, Madha, Mangalwedha, Mohol and southern part of Sangola talukas. In these talukas rainfall is very low and irregular .The total annual rainfall varies from year to year and the deviation of annual rainfall from the normal during the period under study can reveal the uncertainty and ill distribution of rainfall.

The seasonal distribution of rainfall in the district is uneven.The main rainy season is from June to September and very large percentage ie.70 to 80 per cent of annual total rainfall over the district is received during this south west monsoon season.September is relatively the month of maximum rainfall throughout the district.By the end of September the south west monsoon loses it's strength and gives way to the north east monsoon.During the month of December and February there is some rainfall and it is nearly uniform normally be 1 to 2 per cent of the annual rainfall. In hot season 2 to 4 per cent rise in rainfall is useful for agriculture but is greatly limited by the normal concentration into a few months. The rainfall is not sufficient to meet the annual water need

2.4 for successful agricultural production.It is not well distributed and received at the time when required most.

The reliability of the rainfall is measured by the coefficient of variability .The annual co-efficient of variability indicates the reliability of and irregularity of rainfall .The higher co-efficient of variability ,the lower is the assurance of rainfall.Figure No.II-1 shows the average annual rainfall variability in the district .It is over 26 per cent in the north west middle part of the region and so is the low reliability of the rainfall.(not assured)on the otherhand rain reliability is greater in eastern part where the co-efficient of variability is below 18 percent (assured), areas of medium degree of reliability of rainfall is with 18 to 26 per cent of co efficient of variability generally assured. In general the degree of reliability of rainfall is more in eastern part than in the middle western part and middle northern part of the district .(see the map)

II-3. TYPES OF SOIL

On the whole ,soil constitutes the physical basis of our agricultural enterprise[2] (Bennet ,1939).Farming is a business and good soil is a part of the farmers stock in trade. Spatial distribution of soil types and fertility are presented in the map no.II.2 .Since the little data on the soils of Solapur

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2. Bneen Jugh (1939 soil conservation Nwe York Grow Hill p.5)

2.5 district is available ,the present discussion of soils is mainly based on the district Gazetteer ,the district census handbook and under ground water survey agency report only. The part of Solapur district occupies mainly the basins of Nira, Bhima ,Man and Sina rivers and consequently it consists of undulating planes intercepted with a few scattered hills in Malsiras ,Karmala ,and Barsi talukas .Most of the areas consists of low uplands separated by valleys .The soil in the district is mainly derived by deccan trap.The soils are practically underlain by decomposed basaltic rocks ,locally known as murum.On the whole the soils of the district can be divided broadly into three major groups based upon the physical characteristics.They are 1)shallow soil 2)Medium black and 3) Deep black soil.

i) Shallow soil :

The murumad soils are shallow and coarse and contain partially decomposed parent material.They occur on hill slopes and are severely eroded.These are brick red in colour ,ferrugenous and clayey in nature and indicates the present of resicular or zeolitic trappean units immediately below them.Shallow soils is mostly found on the border of north and western part of the district i.e.Barsi ,Karmala ,Malsiras ,and Sangola talukas above 3 per cent .In the middle part of the district there is medium shallow soil viz.Madha ,Pandharpur, Mohol and Akkalkot talukas 2.5 per cent to 3 per cent .Rest of the talukas have below 2.5 per cent area covered by shallow soil.The total area

2.6 covered by shallow soil is 4,403 sq.kms. and this constitute about 30 per cent of the total soil cover of the district.

ii) Medium black soil :

Medium black soil are developed along the secondary drainage system of district and also along the intermediate areas. It is also located along the small plateau regions located in isolated patches in various parts of the district.The capacity of the iternal drainage of such soils is fairly good.The total area occupied by such soil is about 6776 sq.kms. and constitutes about 45 per cent of the total soil cover of the district. This type of soil is found in every taluka ranging from below 3.5 per cent to above 4.5 per cent. northern and western talukas particularly are under this soil cover.

iii) Deep black soil :

The deep black zone generally developed along the lowest reaches of the valleys and are found along the banks of Bhima, Sina ,Man and other important drainage systems .These are developed in the form of narrow streeps .The total area covered by such soil is about 3842 sq.kms.constituting about 25 per cent of the total soil cover.Such type of soil have considerably greater capacity for the retention of moisture.

An isolated 8 to 20 metre thick alluvial patches are found on the bank of Bhima in Pandharpur taluka and 10 to 20 metre thick along the bank of Man in Sangola and Pandharpur talukas.

2.7 This type of soil is mainly found in Barsi, Karmala, Madha , Malsiras and Sangola (above 2.5 per cent) in Mohol , Pandharpur and Akkalkot , there is 2 to 2.5 per cent of the total soil cover of the region. The rest of the talukas record below 2 per cent of the total soil cover of the district. Deep black and medium black soil is found in the western part of the region . This soil of the district is deficient in nitrogen and have low to medium result of phosphorus and potash . The soils of river valleys are most fertile and have considerable potentials for crop growth.

II. 4 SOIL FERTILITY IN THE DISTRICT .

Soil fertility refers to the nutrients present in the soil. The crops in fact require a number of nutrients for their usual growth and yield, out of them , Nitrogen , Phosphrous, and Potash (NPK) are of much importance and their quantities in soils normally determine fertility. The black soil of the district are poor in nitrogen content and as such the response to the nitrogenous chemical fertilizers is good . On the other hand laterite soils are relatively rich in nitrogen content . In case of phosphorours most of the soils are fairly rich. But the shallow soils are relatively poor in the phosphorous content . Hence their response to phosphorous fertilizers is always good. All the balck soils are rich in potash content , paticularly in the brown soils. In laterite soil potash content is relatively very low. The western part of the district has

2.8 shallow soil cover which is generally infertile,and poor in potash content but fair in nitrogen and phosphorous content. Medium and deep black soils mainly found in the level ground and along the river valleys ,are fertile in phosphrous and potash content but poor in nitrogen .These soils have considerable potentials for the agricultural production . Lastly the soils of district are clavey ,moderately alkline in reaction and cotain moderate amounts of calcium carbonate, They are well supplied with nitrogen but are low in phosphorus and potash.

II.5 LAND UTILISATION PATTERN OF THE DISTRICT .

Of the total geographical area of the district - 1503700 hectares , 2.17 per cent is under forest ,4.05 per cent is under grazing land and pastures ,5.55 per cent under uncultivable land and 12.22 per cent under waste land of which 6.08 per cent area is under current fallows.In the year 1984-85 the net cultivated area in the district worked out to be 1131800 hectares .Out of which 93800 hectares under cultivation more than once in a year.The gross cropped area of the district in the same year amounts to 1225600 hectares.

II.6 STRUCTURE OF LAND HOLDINGS.

According to the agricultural census of 1977 there

2.9 are 243947 agricultural holdings having an area of 13,05,000 hectares.Of these 97 per cent holding are individual holdings (peseant farms) having 96 per cent of the total cultivated area.The rest of the holdings are either jointly owned or owned by other institutions.

Details regarding the distribution of holdings by size can briefly be outlined.

TABLE NO.II-1.

THE DISTRIBUTION OF HOLDINGS BY SIZ E .

Sr.No.	Size group of Holdings	%of Holdings to the total number.	%area of Holdings to the total
1	less than 2 hect.	30	6
2	2 to 5 hect.	32	2
3	5 to 10 hect.	23	30
4	10 to 20 hect.	12	33
5	More than 20 hect.	3	29
	TOTAL	100	100

The above table reveals that the large number of holdings having less than 5 hectares or upto 5 hectares amounts to 62 per cent of the total number of holdings . Whereas the area possessed by them amount to just 8 per cent

2.10 of the total cultivated area.As against this 38 per cent of holdings above 10 hectares possess 92 per cent of the total cultivated area of the district.The point to be noted is that in drought prone area 62 per cent of agricultural families share among themselves,just 8 per cent of the cultivated area. Only one can imagine the average size of the holding of this class of the farmers,whose size of holding could be considered as totally uneconomic for cultivation .In the context of theme of our study the impact of vagaries of the monsoon especially on this class of farmers,would be much greater.The rest of the farmers having holdings above 5 hect. with some irrigated lands will be having comparatively larger capacity to sustain the adverse impact of the drought.

II.7 INCIDENCE OF DROUGHT

If we accept the definition of drought given by Indian Meteorological Department (IMD) 1971 ,only two years between 1950 and 1985 -i) 1952-53 ii) 1972-73 would be regareded as the drought years .IMD defined drought as 'a deficiency in per cent of normal rain fall'.The years with 50 per cent or less rainfall than the normal rain fall are called drought years.The annual normal rainfall of the district is 584 mm.If we go by this criterion then district was subjected only twice to the hardships of drought during 35 years under study. Apart from other criteria based on

2.11 rainfall in socio economic abstract ,drought is a period of intense economic stress,resulting from growing agricultural unemployment, acute shortage of water and fodder for live stock and decline in cropped area.

The social scientist and ecologist defined the drought in the context of the water balance of the soil and reduction in natural pastures.To the farmer the drought is a period during which his normal farm operations hampered and farm production suffers adversly to varying degrees.In our present study rainfall is used as a criterion for identifying the years of drought,instead of adopting other criteria for determining the years of drought.The low rainfall zone i.e. less than 750 mm. per year has been adopted as a scarcity zone. By using this standard we can have 28 years as drought or scarcity years of the 35 years period under reference.The scarcity condition refers to crop failure due to scanty rainfall. Therefore it is clear that scarcity conditions referred to crop failure on account of moisture deficiency.[3] By and large the rainfall in the district is meagre,precarious and unevenly distributed.The climate is usually hot and the potential evaporation is far in excess of precipitation.The normal rainfall is less than 750 mm.

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3 . Jatta Dixit -1984 -Identification of drought prone areas and production of crop expectation in Maharashtra ; Geographical Review of India Vol.No.45 ,Dec.1984 .

2.12 Therefore the district is classified as semi arid .Besides one can come across number of prolonged breaks in the monsoon season which is also responsible for poor harvest of crops.

The drought prone district of Solapur has been a subject of study by different disciplines.Most of the studies have focussed their attention on the delineation of the drought prone areas and the quality to determine the degree of drought proneness.The delineations ,however ,are based mainly on the inadequacy of rainfall .At the cost of repetition we say that the district has been recognised as drought prone. The fact finding committee known as Sukhatankar Committee(1972) has classified the whole district with exceptionof areas covered by major and large irrigation projects as the drought prone areas.,see map II.3 .Thus scarcity conditions affect about 92 per cent of gross cropped area of the district. Incidentally the Revenue Department of the Govt.of Maharashtra generally follow the evidence method for identifying the scarcity conditions as below.They perceive droughts in termsof crop conditions and villge life.The village Talathi makes a report about the crop conditions to the district officials (District Collector)through the Revenue Inspector and Tahsildar .The prospectus of current crops standing in the field is estimated by field and spot inspection in the 'Anewary system '.The Anewari method need not be discussed here.

2.13 After having selected this district for our study we make an assessment of the area ,productivity and production growth rates of the major food crops and cash crops grown in the district,over short periods -

i) 1950-51 to 1965-66 (Pre HYVs period)

ii) 1967-68 to 1984-85 (Post HYVs period) and

iii) 1950-51 to 1984-85 reasonably long period of 35 years for calculating the short term and long term growth rates ,we have adopted the method of computing the annual compound growth rates of area under ,productivity and production of each major crop of the district.For computation we use the following formula .

$$Y = A(1+r)^t .$$

RAINFALL VARIABILITY

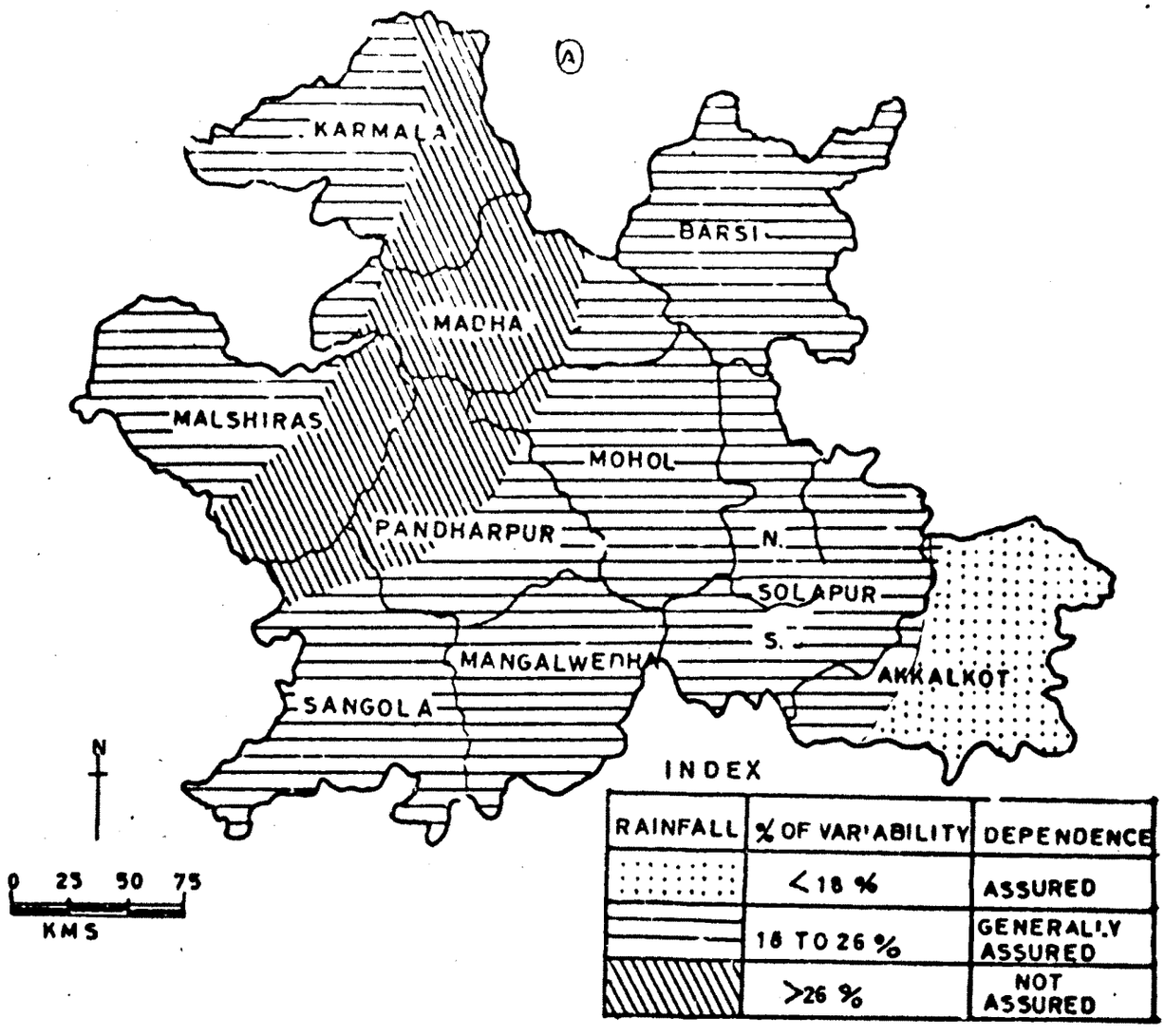

FIG. 2.1

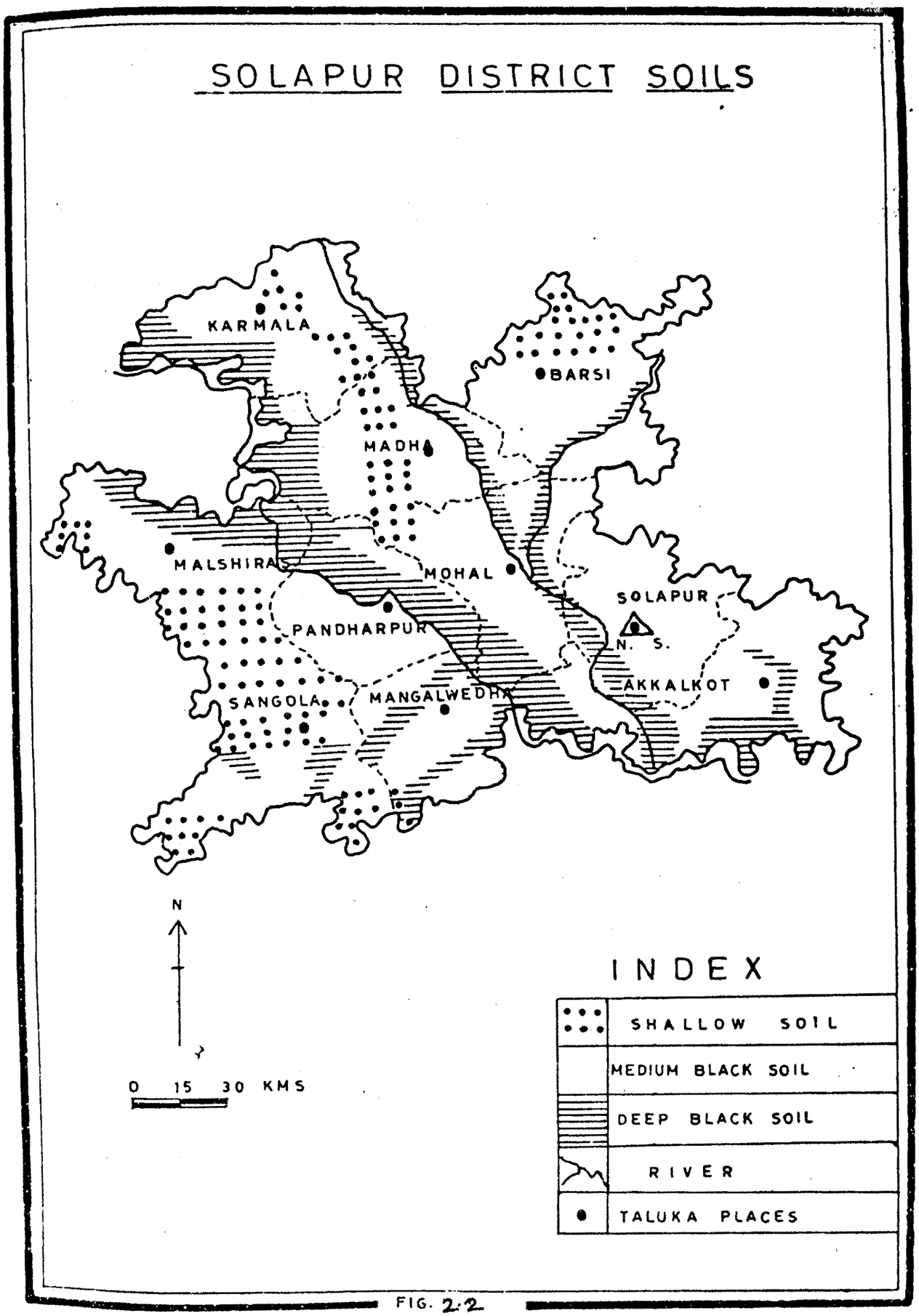
SOLAPUR DISTRICT SOILS
KARMALA
BARSI
MADHA
MALSHIRAS
MOHAL
SOLAPUR
PANDHARPUR
N. S.
AKKALKOT
SANGOLA
MANGALWEDHA
N
0 15 30 KMS
INDEX
SHALLOW SOIL
MEDIUM BLACK SOIL
DEEP BLACK SOIL
RIVER
TALUKA PLACES

FIG. 2.2

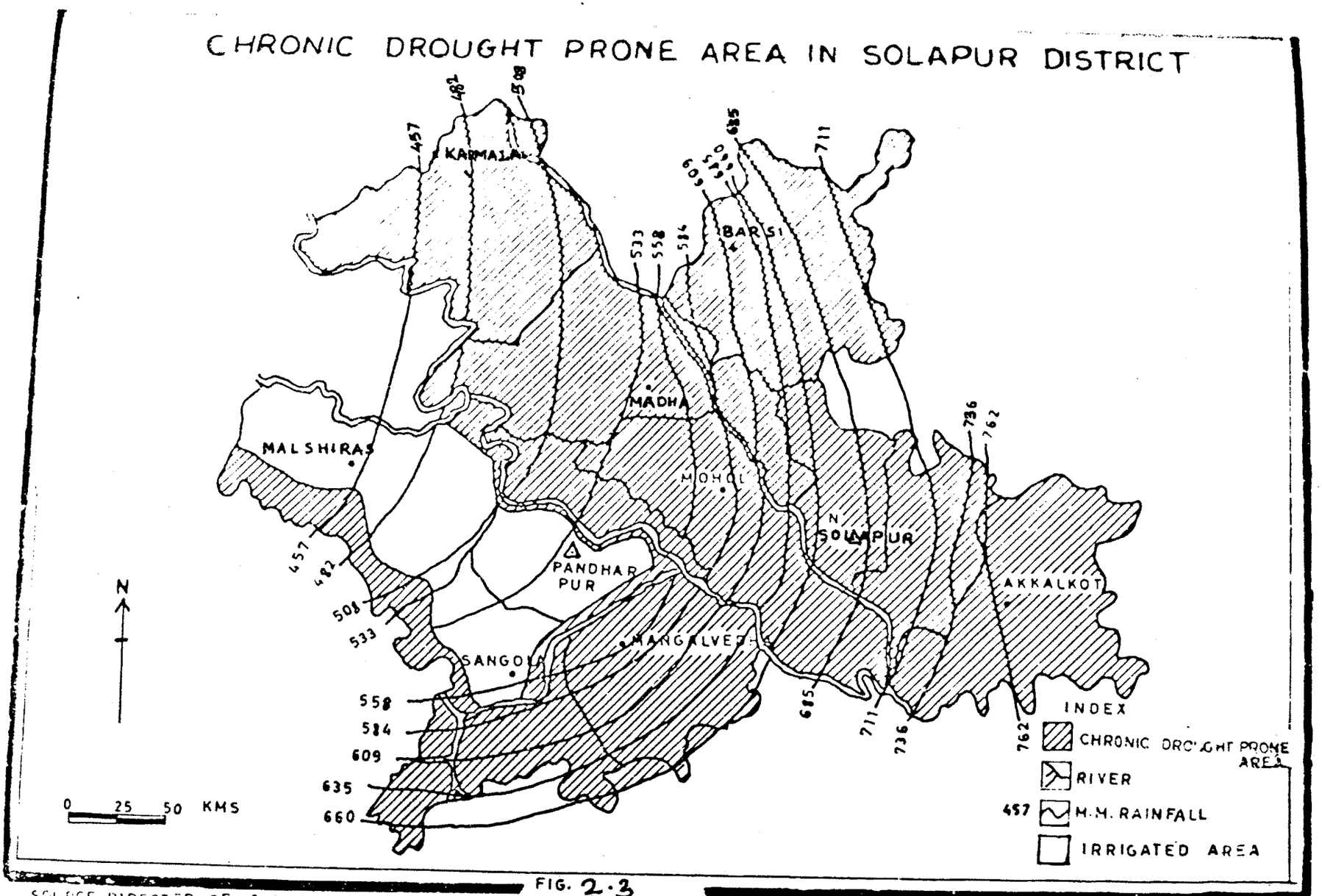

FIG. 2.3

SOURCE-DIRECTER OF G.S. AND DEVELOPMENT AGENCY, GOVT. OF MAHARASHTRA.