



The Impact of Agriculture Development on Soil Degradation in Sangli District: A Geographical Study (MS)

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DOI - 10.5281/zenodo.10966463

Introduction:

'Agriculture' in Agricultural Geography implies the subject matter, and 'geography' gives the way of viewing or investigating the subject matter. Etymologically, Agricultural geography deals with "*The science or art of cultivating soil, growing and harvesting of crops, domestication of animals and raising of livestock is known as Agriculture*" (Majid Husain, 2008) pp17, Agricultural development in terms of the expansion of agricultural land through major land use changes, increase in agricultural productivity and net agricultural production. Through the application of modern scientific techniques and advanced technology, increased production; and use of agrochemicals, expansion of irrigation facilities and irrigated areas, and development of high-yielding varieties of seeds to meet the food requirement of the ever-increasing population of the country these factors helped to solve the food problem of India but it has also created hazardous environmental problems of serious concern. However, the place of agricultural development has to be

maintained if we do not want to let the teeming millions die of hunger. Meanwhile, Soil degradation should not be allowed to continue due to agricultural development because it would also cause irreparable loss to human society. (Savindar Singh, 2008, pp 56)

"Environmental Degradation is a term used to describe a situation in which a part of the natural environment is damaged". (Savindra Singh, 2008) pp 254. It can be used to damage the land, the water or the air. Environmental degradation can also mean a loss of biodiversity and a loss of natural resources in the area. Soil degradation is a current and burning issue, it has been witnessed all over the world. The problem is that it is now occurring at a much faster rate, therefore not leaving enough time for the environment to recover and regenerate. Ever ever-increasing demands of the increasing population put pressure on the environment i.e. natural resources like water, soil, vegetation; and air overall on the ecosystem around to us. Strain and drain on the earth's limited natural resources.

To minimize conflicts in the analysis, we shall use a combination of ecological thresholds as well as revealed preferences that are appropriate as indicators of environmental degradation.

Significance of Research Work:

The Present study is "Impact of agricultural development on Soil Degradation in Sangli District". Environmental degradation is a worldwide problem that has, threatened the world agriculture base. Well, environment management, protection from degradation, and conservation of degraded and degrading Environment are the keys to sustainable development.

Objectives:

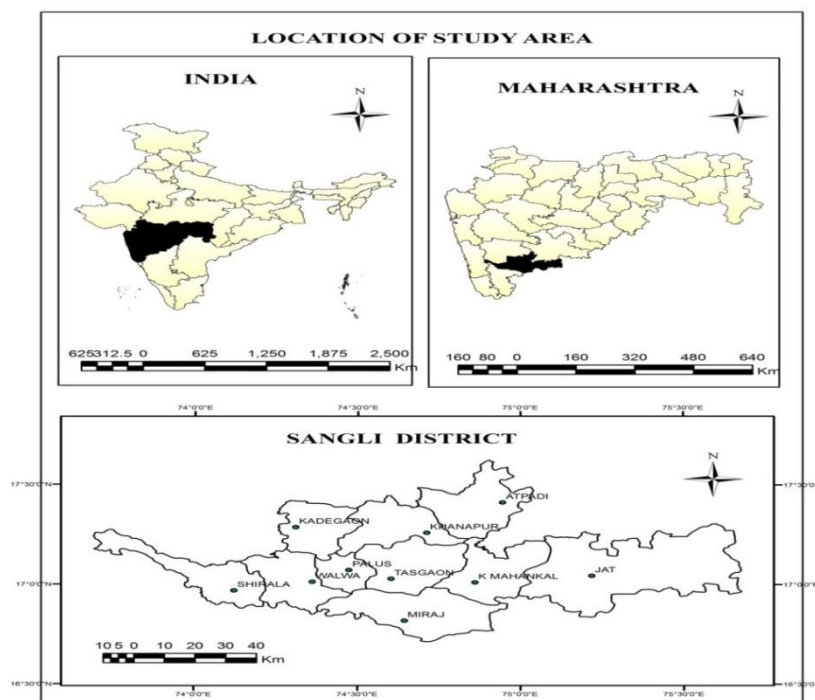
- 1) To examine soil degradation due to the modern agricultural practices in the study area.

- 2) To suggest appropriate measures for control of Soil degradation in the study area.

Study Area:

The Selected area for the present investigation is the Sangli district of Maharashtra state containing 10 tahsils in Sangli district such as Miraj, Tasgaon, Kavathe-Mahankal, Jat, Khanapur (Vita), Palus, Atpadi, Walwa, Kadegaon, Shirala. Sangli is one of the southern Districts of Maharashtra lying between 16°43' and 17°38' north latitude and 73°41' and 75°41' east longitude and has an area of 8,572 Sq. Km (2.78% of State) and a population of 28, 22,143, (2.51% of State (2011)). The district is bounded by the Satara district in the north side and Solapur district in the east. On the southern side, it is bordered by the Kolhapur district in the west, Belgaum and Bijapur districts in the center and east.

Map 1



Database and Methodology:**Primary Data:**

The present study is based on Primary data. Primary data regarding Environment quality, status etc. will be collected by conducting the intensive fieldwork. The Stratify random sampling technique would be used to select the samples. The sample of Bases of Irrigated Village- from 10 Tahsils - 20 Villages Sample selected of the soil non-Irrigated Village- 10 Thasil-20 Villages Sample have been selected for the 10 Tahsils are selected by study on the basis of the Agricultural Development concerning the indicators of average tahsil development in study area. The 10 tahsils considered on the basis of agricultural development.

Secondary Data:

The secondary data will be counted from related books, published and unpublished reports, journals, newspapers, published government reports, District census Handbook, District Statistical Abstract, socio-economic reviews, etc.

Methodology:

The present research work concentrates upon the analytic view to find out and measure the Impact of agricultural development on soil, water, and Vegetation resources in the study area. Quantitative techniques are further used to identify the agricultural regions and to bring out the correlation between Agricultural Development and Environmental Degradation on the one hand and physical, social, and economic variables on the other. Finally, sample villages were selected for an exhaustive

Dr. Suryawanshi U. N.

micro level with this effect of Agricultural and environmental study, and conclusions were drawn.

Selection of Soil Samples:

From each irrigated area and non-irrigated area of 10 tahsils 2 villages are randomly selected for the analysis of soil contents. A total of 40 samples of soil 20 from irritated areas and 20 samples from non-irrigated areas are tested. Overall, 5 Major components and 4 micronutrient contents are selected and analyzed in the research work related to sampling of soil.

Agricultural Activities Leading To Soil Degradation InSangliDistrict:**Excessive use of Water:**

The Sangli District is a North Eastern Part is the Drought Prone region but the Western Part of the Sangli District is highly developed and well irrigation and soil fertility is high but some part of the district are the walwa, Miraj, Palus, and Shirala these are Developed tahsil and use of water is highest for agricultural Purpose, some crops are concentration in Tahsil sugarcane is main crop these tahsil effects of soil degradation in that tahsil. Excessive use of water Purposed for agriculture.

High and Imbalanced Fertilization:

The some tahsil are developed than walwa, Miraj, Palus, Shirala, the kadegaon and Tasgaon Tahsil use of fertilizers is high and more in the agricultural because the high production is main object of that Tahsil people and impact of the soil and soil degradation in tahsil is witnessed.

Excessive Tillage and Use of Heavy Machinery:

Sangli district has 10 tahsil and in western part of it, use of machinery and tractor is highest of till ageing the agricultural in some parts of district modern agricultural and traditional agriculture practices are found of and its impact is seen on soil fertility and Crop intensity in Sangli district.

Crop Residue Burning and Inadequate Organic Matter Inputs:

The use of crop residue burning and inadequate of organic matter are used in this used. In this study region in the TahsilJat, Kavathemhankal, Khanapur, Kadegaon, and Atpadi use of crop residue burn-in and supply of inadequate organic matter and impact of soil fertility are low and production is low so all of the soils degraded in the district.

Poor Crop Rotations:

Not proper crop rotation is found in some Tahsil in which walwa, Tasgaon, Miraj, Palus, kadegaon, and Shirala one of the crops continuously gets sown that is sugarcane, there is no proper rotation of wheat and rice impact due to the NPK and pH value. The production is lower than in any other district there is overall impact of soil degradation in the study region is recorded.

Mono-culture:

There are two parts in Sangli district i.e. western and eastern. The western part is well irrigated and the eastern part is drought-prone so it affects the cultivation of crops in the study region in western part of its sugarcane crop is highly produced it is also concentrated by *Dr. Suryawanshi U. N.*

sugarcane, wheat, Jowar is a monoculture crop of the eastern part; there is hardly crop importance in this district is recorded. Growing in the district; so impact of soil sugarcane crop is the percolate content of soil and the impact of the NPK and pH or Electrical Conductivity of the soils observed.

Pesticide Overuse and Soil Pollution:

Many pesticides are used in this study region purposed at highest production of fruits and vegetables, whereas some pesticides are used for the protection of crops. Indented to increase growth of crops chemical pesticides are highly in quantity used so it has adverse impact on the fertility of soil. Organic carbon and phosphorus, potash and the biotic factors are greatly affected by pesticides ultimately soil is degraded vastly.

Soil Content and Micro Nutrient Analysis of Irrigated Villages-2015-16:

Soil Content analysis of randomly selected 20 villages from 10 tahsils for soil study and to check out the NPK, Ph value, and electrical Conductivity of soil content analyzed through the irrigation bases in Sangli District.

1. Miraj Tahsil:

Kasbe Digraj and Dudhagaon are the two villages selected from Miraj tahsil on the basis of the irrigation facilities available in these two villages. Nitrogen is recorded in Kasba Digraj is low i.e. 190 kg/hectare. Phosphorus quantity is moderate which is 13 kg/hect. The content of potash is high i.e. 290kg/hect. So the impact is seen on Agricultural Productivity in the village and salinity is increased Ph

Value of soil in Digraj is Alkaline which is very high 9.2; Electrical Conductivity is 2 ds/m is high. Its impact is seen on soil health, the micronutrient status of the villages is; copper is 0.10 Ppm is moderate; iron is low i.e. 0.70 Ppm; manganese is low which is 0.60 Ppm and zinc is 0.50 it is good, and another village is Dudhagaon. Nitrogen available in soil is 380 kg/hect that are moderate. Phosphorus is moderate i.e.14 kg/hect. And the content of potash is 280 kg. /hect, pH value of soil in Dudhagaon village is very high i.e. 9.8. Electrical conductivity is high i.e. 1.9 ds/m and copper is 0.2 Ppm; iron is 0.50 Ppm it is low and manganese is moderate which is 1.1 Ppm; zinc is 0.55. Here is the highest intensity of irrigation, so it causes soil degradation in the village. Total saline intensity is high and in Miraj tahsil, it is increased.

2. Walwa Tahsil:

Walwa Tahsil is one of the developed tahsils in Sangli District but it has adversely impacted the natural resources in the study area. Irrigation facilities are very strong and Agricultural Productivity is highest so it results in the highest rate of fertility in walwa tahsil. Junekhed and Borgaon Village these two villages are selected by the researcher as sample villages; nowadays these two villages are facing the problems of soil salinity, which results in a decrease in agricultural production. It decreases in the village. The content of nitrogen in the soil of Junekhed is 480 kg/hect. i.e. of moderate level. The content of Phosphorus is moderate.e.17 kg/hect. Potash is medium winch is 270 kg/hectare. And pH

Dr. Suryawanshi U. N.

value is indicated alkaline i.e. 9.1, Electrical Conductivity is 2ds/m found in soil. And copper is 0.3 Ppm which is of a high degree. Iron is 0.10 Ppm which is very low, manganese is 1.2 Ppm is good and zinc is 0.80 Ppm which is very high in samples of Borgaon; it adversely affects soil fertility in the sample village. Nitrogen in village samples of Borgaon is 510kg/hect. Phosphorus is 19 kg / hectare. i. e. Moderate, potash is 295kg/hect, pH value is 9.9 i.e. very high EC is 1.9ds/m; copper is 0.20 Ppm is good, iron is 0.10 Ppm is very low, and manganese is at medium level which is 0.96 Ppm and zinc is 0.10 low found in walwa tahsil.

3. Shirala Tahsil:

The Shirala Thasil is second important tahsil of Sangli District there are two villages selected as sample villages; one is the Mangale and another is Chikurde these two villages are irrigated village form Shirala tahsil. Value of nitrogen in the soil content of mangle village is moderate i.e.320kg/hect; phosphorus is high which is 27kg/hect. And the content of potash is high i.e.290 kg/hect. pH value of soil is alkaline 8.6, EC is 2 ds/m it is high value, Copper is low i.e. 0.01Ppm, iron is low i.e.1.1 Ppm, manganese is of medium quantity i.e.0.98 Ppm, and zinc is medium i.e. 0.20 Ppm. Soil content in soil samples of village Chikurde; nitrogen is of high level i.e. 600 kg/hect. Phosphorous is of moderate level which is 19 kg/hect. And the content of potash is moderate i.e. 265 kg/hect. pH value of soil is alkaline it is very high i.e.7.9 and Electrical Conductivity is mischievous 1.9 ds/m; copper is of high

quantity i.e. 0.96 Ppm, iron is 0.90 Ppm, manganese is 1.1 Ppm, zinc is of moderate level i.e.0.45 Ppm, found in the sample village Chikurde.

4. Tasgaon Tahsil:

Kaulage and Waifale two villages are selected from Tasgaon tahsil; these two villages have irrigation facilities. Soil content like nitrogen is low i.e.190 kg/hect., phosphorus is moderate which is 16 kg/hectare, which is in medium quantity whereas potash is in the highest quantity i.e. 280 kg/hect., in the samples of soil of Waifale village pH value of soil is 8.1 which is very low i. e. alkaline and electrical Conductivity is high i.e. 1.2ds/m, copper is high i.e. 0.90Ppm,iron is at very moderate level i.e.1.1Ppm, manganese is found at medium level i.e.0.96 Ppm, and zinc is low i.e. 0.20 Ppm, Soil sample analysis of Kaulage village is as – nitrogen is at very low level i.e.119 kg/hect, phosphorus is of moderate level i.e. 15 kg/hect. Potash is of moderate level i.e. 230 kg/hect. pH is at very high level i.e.7.9, electrical conductivity is high i.e. 1.2dm/s, copper is at moderate level i.e. 0.10; iron is a very medium level i.e.1.3 Ppm, manganese is moderate i.e. 1.2 Ppm, zinc is low i.e. 0.20 Ppm.

5. Khanapur Tahsil:

Nagewadi and Bhendwade are two Villages listed as sample villages from Khanapur tahsil these villages are selected based on irrigation from water tanks. The content of nitrogen is moderate. I.e.310 kg/hect. Phosphorous which is of high quantity i.e. 26 kg/hect? Potash is also of medium-high quantity i.e.275 kg./hect. is recorded in soil sampling of Nagewadi

Dr. Suryawanshi U. N.

village. pH value of this soil is high i.e. 7.2 and electrical conductivity is critical i.e. high- 1.1 ds/m., copper is high which is 0.40 Ppm, iron is of medium level i.e. 1.3 Ppm, manganese is of moderate level which is 1.2 Ppm, zinc is 0.20 Ppm. Soil sampling of Bhendwade village is as follows- nitrogen is low i.e.188 kg/hect. Phosphorous is 20 kg / hect. Potash is of medium-high level i.e. 218 kg/hect. pH value of this soil is high i.e.7.9 and electrical conductivity is mischievous, which adversely affects crops i.e. salt susceptible crops are found which is 2 ds/m, copper is of medium quantity i.e. 0.10 Ppm, iron is of medium quantity i.e. 1.1 Ppm, manganese is of medium degree i.e. 1.1 Ppm whereas zinc is of moderate level i.e.0.40 Ppm.

6. Atpadi Tahsil:

Nimbawade and Dighanchi are the two villages selected from Atpadi tahsil on the basis of irrigation facilities available in these two villages well irrigation facilities are available in these two villages. The sampling of the soil of Nimbawade village is as follows nitrogen is at medium degree i.e. 328 kg/hect. Which is of medium level, phosphorous is of high degree i.e. 34kg/hect and it is high due to the excessive use of water and chemical fertilizers. Potash is high i.e.288 kg/hect. Which is of high level; pH value of this soil is high- 7.4 and it is the alkaline type. Electrical Conductivity is mischievous; i.e.1.9ds/m, copper is high- 0.87Ppm, iron is medium i.e.1.2Ppm, manganese is at a moderate level i.e.1.3Ppm, zinc is moderate which is 0.50 Ppm. Soil content analysis in Dighanchi is as follows-

nitrogen is moderate i.e. 270 kg/hect. Phosphorus is moderate means 17 kg/hect. And potash is of high degree i.e. 280 kg./hect. pH value of this soil is neutral i.e. 6.5 low and electrical conductivity is critical because it is 1.2 ds/m, copper is high i.e. 0.40 Ppm, iron is very medium which is 1.6 Ppm, manganese is moderate means 0.99 Ppm, zinc is moderate i.e. 0.1 Ppm

7. Kadegaon Tahsil:

Devrashtre and Sonkireis the two selected villages from Kadegaon Tahsil which has irrigation facilities. Soil Contents in the soil samples of Devrashtre are as follows-nitrogen is moderate i.e. 475 kg/hect. Which is of medium quantity, phosphorus is of also medium quantity i.e. 16 kg/hect. The content of potash is of medium quantity i.e. 189 kg/hect. pH Value is neutral low i.e. 6.5 and electrical conductivity is generally good meaning 1.2 ds/m, copper is very high i.e. 0.40 Ppm, iron is moderate which is 1.6 Ppm, manganese is medium i.e. 0.99 Ppm and iron is moderate level i.e. 0.20 Ppm, Soil contents in the soil of Sonkire are-nitrogen is of high quantity found i.e. 680 kg/hect, phosphorus is high i.e. 27 kg./hect. Potash is 201 kg/ hect. Both are of medium quantity. Ph value is neutral i.e. 7.4 and electrical conductivity is generally good i.e. 1 ds/m, copper is at moderate level i.e. 0.10 Ppm, iron is of medium degree i.e. 1.4 Ppm, manganese is 1.1 Ppm; the content of zinc is moderate 0.40 Ppm.

1. Palus Tahsil:

Palus is a one of developing tahsil but soil fertility is decreasing now. Selected village from Palus tahsil are *Dr. Suryawanshi U. N.*

facing the problem of soil degradation these are irrigated village though excessive use of water and chemical fertilizers affects agricultural production, in the sample village, Bhilwadi following is the content of soil analysis, nitrogen is at a degree i.e. high 591 kg/hect. Which is highest; phosphorous is very moderate, i.e. 11 kg/hect. But potash is at high level i.e. 285 kg/hect. pH value of this soil is very high i.e. 8.2 and, EC is high -2 dm/s, copper is 0.67 Ppm, iron is low i.e. 1 Ppm, manganese is good-1.4 Ppm, zinc is medium- 0.35 Ppm. Ankalkhop is another sample village from Palus tahsil, soil content of this village is nitrogen is of high level i.e. 670 kg / hect. Which is of low quantity phosphorous is of moderate level i.e. 13 kg/hect. But the content of potash is moderate it is above 265 kg/hect. pH value of this soil is alkaline i.e. 8.9 and electrical conductivity is medium-high which is 1.9 ds/m., copper is good i.e. 0.20 Ppm, iron is low -1.2 Ppm, whereas manganese is moderate-0.91 Ppm, zinc is low-0.20 Ppm found in soil samples.

9. Jat Thasil:

The Jat Tahsil is located at the eastern part of Sangli District; it is a drought-prone area and soil fertility is low, even irrigation facilities are also very poor. Soil content in the sample of village Sankh are as follows- nitrogen is low i.e. 178 kg/hect. Phosphorus is moderate- 19 kg/hect. And potash is moderate- 190 kg/hect. pH value of this soil is less than 6.2 i.e. Acidic and electrical conductivity is high- 1.1 ds/m., copper is at medium quantity i.e. 0.10 Ppm, iron is of moderate i.e. 2.9 Ppm, manganese is

1.01Ppm, zinc is 0.20 Ppm. Utagi is another sample village from Jat tahsil soil contents are as follows- nitrogen is low i.e. 211kg/hect. Phosphorus is 12 kg / hect, which is of medium quantity; the quantity of potash is moderate i.e.187 kg /hect. pH value of this soil is very high 7.9, i.e. alkaline. Electrical conductivity is high- 1.1 ds/m, copper is moderate which is 0.10 Ppm, iron is 3.1 Ppm, manganese is of moderate degree i.e.1.1Ppm, and zinc is 0.40 Ppm which is critical; irrigation facilities are in poor condition in both of villages.

10.Kavathemhankal Tahsil:

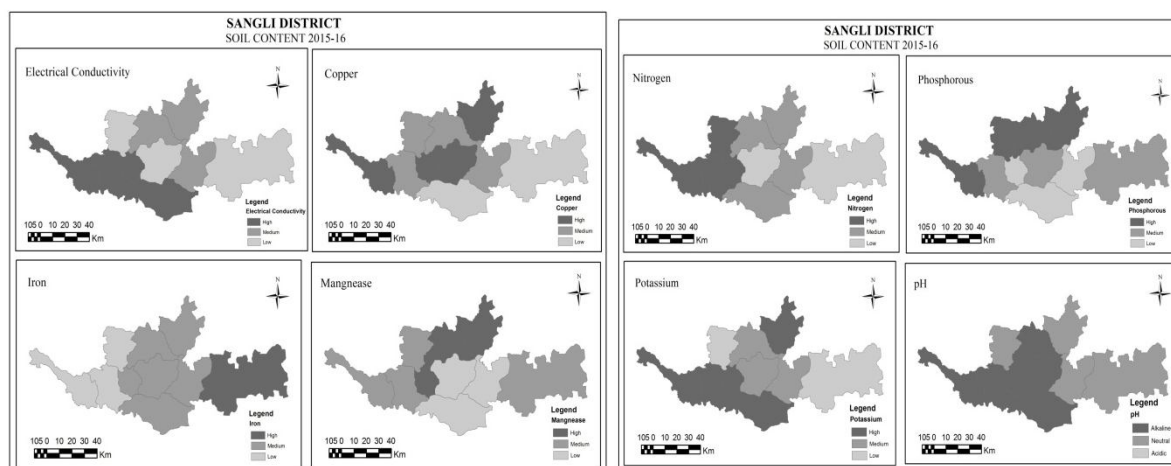
Kavathemhankal Tahsil is located in low rainfall and rain shadow region. Irrigation facilities are provided through the Moghamwadi tank. Basppawadi and Moghamwadi are two sample villages from this Tahsil. The soil analysis of Basppawadi is as follows- nitrogen is moderate level i.e. 367 kg/hect.

Phosphorus is of low quantity i.e. 9 kg/hect, and potash is at moderate level i.e. 198kg/hect. This is of medium quantity. pH value is neutral i.e. 6.9 but electrical conductivity is critical i.e. high 1.3 ds/m., copper is good; which is 0.20Ppm, iron is of medium level i.e.2 Ppm, manganese is very moderate level i.e. 0.78Ppm, zinc is of moderate level i.e.0.30Ppm. Moghamwadi village is another village from this tahsil, soil analysis of this soil is as follows- nitrogen is of low level i.e. 132 kg/hect, i.e. of low quantity, and phosphorous is of medium quantity i.e. 18 kg /hect. Potash is of medium quantity i.e. 245 kg/hect. pH value is very high i.e. 7.9 and electrical conductivity is mischievous i.e. 2.4 ds/m, copper is high i.e. 0.30 Ppm, iron is at medium degree i.e. 1.9 Ppm, manganese is at low degree i.e. 0.88 Ppm, zinc is high which is 1.1Ppm it is susceptible for crops.

Table 1: Soil Content Analysis 2015-16 Irrigated Villages in Sangli District

Sr. No	Tahsil	Name of Village	Nitrogen (280 to 560)	Phosphorous (10 to 25)	Potassium (120 to 280)	pH (6.5 to 7.5)	Electrical Conductivity (0 to 1.00)	Copper (0.20)	Iron (4.50)	Manganese (2.00)	Zinc (0.60)
			KG/Hect	Kg/hect	Kg/Hect		ds/m	Ppm	Ppm	Ppm	Ppm
1	MIRAJ	Kasbe Digraj	190	13	290	9.2	2.8	0.1	1.7	0.6	0.76
		Dudhagaon	380	14	280	9.8	2.7	0.2	1.5	1.1	0.65
2	WALAWA	Junekhed	480	17	270	9.1	2.9	0.3	1.1	1.2	0.98
		Borgaon	510	19	295	9.9	3	0.2	1	0.96	0.1
3	SHIRALA	Mangle	320	27	290	8.6	2.9	0.1	1.1	0.98	0.2
		Chikurde	600	19	265	7.9	2.1	0.96	0.9	1.1	0.96
4	TASGAON	Waifale	190	16	280	8.1	1.2	0.9	1.1	0.96	1
		Kaulage	119	15	230	7.9	1.4	0.1	1.9	0.4	0.3
5	KHANAPUR	Nagewadi	310	26	275	7.2	1.3	0.4	1.3	1.2	0.2
		Bhendvade	188	20	218	7.9	2.4	0.1	2.1	1.1	0.4
6	ATAPADI	Nimbawade	328	34	288	7.4	2.4	0.87	2	1.3	0.5
		Dighanchi	270	17	280	6.5	1.2	0.4	1.6	0.99	0.1
7	KADEGAON	Devrashtre	475	16	189	6.3	1	0.3	1.1	1.1	0.2
		Sonkire	680	27	201	7.4	1	0.1	1.4	1.1	0.4
8	PALUS	Bhilavadi	591	11	285	8.2	2.3	0.67	2	1.4	0.98
		Ankalkhop	670	13	265	8.9	2.9	0.2	1.7	0.91	0.3
9	JAT	Sankh	178	19	190	6.2	0.9	0.1	2.9	1.01	0.2
		Utagi	211	12	187	7.9	1.1	0.1	3.1	1.1	0.4
10	KMAHANKAL	Basppawadi	367	9	198	6.9	1.3	0.2	2	0.78	0.3
		Moghamwadi	132	18	245	7.9	2.4	0.3	1.9	0.88	1.1

(Source: Filed visit June 2017 to Dec. 2017)

Map 2: Soil Content Analysis 2015-16 Irrigated Villages

Soil Content and Micro Nutrient Analysis of Non - Irrigated Villages 2015-16:

The Soil Content Analysis of 201-11 has been taken from Sangli district. Through its comparison to the 2015-16 year, the properties of the table are noticed for analysis of change in both and how the content of the soil has been changed. In this table, there are 20 non-irrigated villages in 10 tahsils, which are showed concerned with the changes in the parameters of the G, pH, EC, NPK, Copper, Iron, Manganese, and Zinc.

1. Miraj Tahsil: -

Village Bedage and Sidhewadi these two villages are selected From Miraj tahsil where irrigation facilities are rare; some of the Rainfall and other irrigation Facilities are available. In the village, the Bedage Nitrogen is moderated.e.390kg/hect. Available phosphorus is moderate i.e.12kg / hect. And potash is moderate i.e. 160 kg / hect and pH value of this village are moderate which is 6.8 and Electrical conductivity is critical i.e. 0.98 ds/m.

copper is of high degree i.e. 0.30 Ppm, iron is low i.e. 1.5 Ppm, manganese is low which is 0.6Ppm, zinc is at high level i.e. 0.98 Ppm.

In Sidhewadi Village Nitrogen is low i.e.180 kg./hect, phosphorus is moderate which is 11kg/hect and potash is at moderate level i.e. 221 kg/hect and pH value is 6.6 and electrical conductivity is high means 1ds/m., copper is high i.e. 0.40 Ppm, iron is moderate which is 1.6 Ppm,, manganese is very high i.e.1.1 Ppm, zinc is at very high i.e.0.87 Ppm,

2. Walwa Tahsil:

Gatadwadi and Karve are two villages chosen as sample village. Where irrigation intensity is lower intensity and analysis of soil, In Gatadwadi village - Nitrogen is at moderate level i.e. 480 kg/hect, phosphorus is at medium that is 17 and potash is of moderate level i.e. 280 kg/hect and pH value is 7.4 and electrical Conductivity is high i.e.1 ds/m, copper is high which is 0.30Ppm, iron is 2 Ppm, manganese is of medium level i.e. 0.98 Ppm, zinc is at very high which is 1.1

Ppm. In village samples of Karve village, Nitrogen is low i.e.237 kg/hect; phosphorus is moderate which is 12 kg/hect. Potash is at a moderate level i.e. 270 kg/hect and pH value is alkaline i.e.7.6. Electrical conductivity is effective which is above 1.1 ds/m., copper is at a high level i.e. 0.30 Ppm, iron is of moderate level i.e. 1.9 Ppm, manganese is at moderate i.e.1Ppm, zinc is of high degree 0.30.

3. Shirala Tahsil:

Pachumbri and Nigadi are two sample villages from Shirala tahsil. In Pachumbri Nitrogen is at a very low level i.e. 120 kg/hect, phosphorus is at a moderate level it is 18 kg/hect. Potash is low i.e.137 kg/hect. Ph value is neutral high i.e. 7 and electrical conductivity is 1ds/m. Copper is 0.20 Ppm, iron is of medium degree it is 1.4 Ppm, manganese is of moderate level it is 1, and zinc is low i.e. 0.40 Ppm.

Another village is Nigadi; Nitrogen is low i.e.190, phosphorus is low that is 10 kg/hect. Potash is low i.e. 98 kg/hect. And pH value is acidic i.e.5.9 and electrical conductivity is 0.96 ds/m. Copper is 0.20 Ppm, iron is 1.1 Ppm, manganese is of moderate level i.e.1.1 Ppm and zinc is of very high level i.e. 1Ppm.

4. Tasgaon Tahsil:

Borgaon and Hatnur village are selected from the Tasgaon tahsil. In Borgaon village Nitrogen is moderate i.e. 320 kg/hect, phosphorus is of medium-high level i.e. 26 and potash is low i.e. 97, kg/hect. Ph value is acidic i.e. 5.6 and electrical conductivity is General it is 0.89 ds/m. Copper is at the high level that is 0.30 Ppm. Iron is of moderate level it is

Dr. Suryawanshi U. N.

2.1 Ppm. Manganese is of moderate level it is 0.96 and zinc is at very high quantity i.e.1.1 Ppm. In Hatnur nitrogen is at low degree it is 210 phosphorus is low means 6 kg/hect. Potash is at moderate level i.e. 141 kg/hect. And pH value is low i.e.5.3. Electrical conductivity is General good i.e. 0.99 ds/m and copper is of moderate i.e. 0.10 Ppm, iron is 1.9 Ppm, manganese is 0.40 Ppm, zinc is 0.60 Ppm.

5. Khanapur Tahsil:

From Khanapur Tahsil two villages selected first is kamlapur and another is Kusavade village. NPK, pH, and electrical Conductivity analysis of kamlapur are as- Nitrogen is of medium degree i.e. 290 kg/hect; phosphorus is at very moderate means 12 and potash is of medium degree i.e.232 kg/hect. pH value is neutral high means 7.2. Electrical conductivity is critical.e.1ds/m, copper is of medium level i.e. 0.10 Ppm, iron is of medium level it is of 1.3Ppm, manganese is at moderate level i.e. 1.3Ppm, zinc is at very high degree i.e. 0.70Ppm. And in kusavade Nitrogen is of medium degree i.e. 318kg/hect. Phosphorus is of moderate degree i.e. 17 kg/hect and potash is of medium level it is 230kg/hect and pH value is neutral high i.e.7.1 and electrical conductivity is critical high which is 0.95 ds/m., copper is 0.20 Ppm, iron at moderate level it is 2.1 Ppm, manganese is 1.5 Ppm, and quantity of zinc is high 0.80 Ppm.

6. Atpadi Tahsil:

Ghanewadi and Banpuri are two villages in Atpadi Tahsil soil Content are found in Ghanewadi Village areas Nitrogen is at very low i.e.111 kg/hect; phosphorus is of medium level it is 19 in

this village and potash is 270, pH value is acidic (less than 6.5) i.e.5.1 and electrical conductivity is 0.59 ds/m, it critically affects germination of crops. Soil contents of Banpuri are Nitrogen is low i.e.231. Phosphorus quantity is of medium level i.e. 16. Potash is of high degree that is 290 and pH value is acidic it is 4.9; and electrical conductivity is generally good which is 0.89. Micro-nutrients like Copper, Iron, Manganese and Zinc are also found in samples from these two villages respectively as- Content of copper are 0.3 and 0.4. Iron content is 2 and 1.9 while content of Manganese is 1.6 and 1.2; Zinc is 0.8 and 0.6.

7. Kadegaon Thasil:

Tondoli and Shalhgav these two villages are selected as sample villages from kadegaon tahsil. Soil analysis of Tondoli village is as follows Nitrogen is medium level that is 320. Phosphorous is of the medium quantity that is 13. And potash is of medium-high degree it is 230. Ph value is neutral it is 6.8 in this village. Electrical conductivity is critically affecting germination which is 0.98. Soil analysis of Shalhgav village is as follows is Nitrogen is at a low level i.e.260 as recorded in this village. Phosphorus is low; in this village, it is 9. And potash is high i.e. 280kg/hect. Recorded in Shalhgav pH i.e.7.2 found in this sample. The value of electrical conductivity is generally good that is 1.6ds/m. Micro-nutrients like Copper, Iron, Manganese, and Zinc are also found in samples from these two villages respectively as the Content of copper is 0.2 Ppm and 0.2 Iron content is 1.5 Ppm and 1.4 Ppm while Manganese is

Dr. Suryawanshi U. N.

1.03 Ppm and 1.8 Ppm and Zinc is 0.5 Ppm and 0.6 Ppm.

8. Palus Tahsil:

Bambavade and khandobachiwadi these two villages are selected from the Palus tahsil the sample analysis of the soil of Bambavade, Nitrogen is very low if it is <140kg/hect. In this village, it is 112. Phosphorus is low means it is 10. Potash is of medium quantity it is 255 and pH value is neutral which is 6.9. Electrical Conductivity affects the germination if it is above 1-2ds/m it is 1.57. The analysis of village khandobachiwadi is as follows - Nitrogen is of low i. e. quantity is 255. Phosphorus is 20, and potash is of the medium-high level which is 255. Ph value is acidic it is 6.9 means between 6.5-7.5 and electrical conductivity is generally good i.e.1.1ds/m. Micro-nutrients like Copper, Iron, Manganese, and Zinc are also found in samples from these two villages respectively as- Content of copper is 0.3 Ppm and 0.3 Ppm Iron content is 2 Ppm and 1.7 Ppm while Manganese is 1.6 Ppm and 1.1 Ppm and Zinc is 1.9 Ppm and 0.6 Ppm.

9. Jat Tahsil:

Jat Tahsil is low Rainfall and drought-prone region of the Sangli District two villages selected from Jat Tahsil are kumbari and Tikodi .In Kumbahri village soil content is as follows Nitrogen is at a low level i.e.116 phosphorus is of medium quantity it is 26 and potash is of medium Quantity it is 166 in this village and pH value is acidic if it is less than 6.5 in this village it is 5.2. Electrical conductivity is critical at 1-11ds/m. soil analysis of Tikodi village is Nitrogen Quantity is low; it is

255 recorded in this village. Phosphorus is medium-high in this village it is 27. Potash is medium-high quantity i.e.223 found in this sample and pH value is natural if it is between 6.5 7.5, it is 7.1 recorded in this village. Electrical conductivity is critically affects germination it is above 1-2 ds/m; It is 1.8. Micro-nutrients like Copper, Iron,

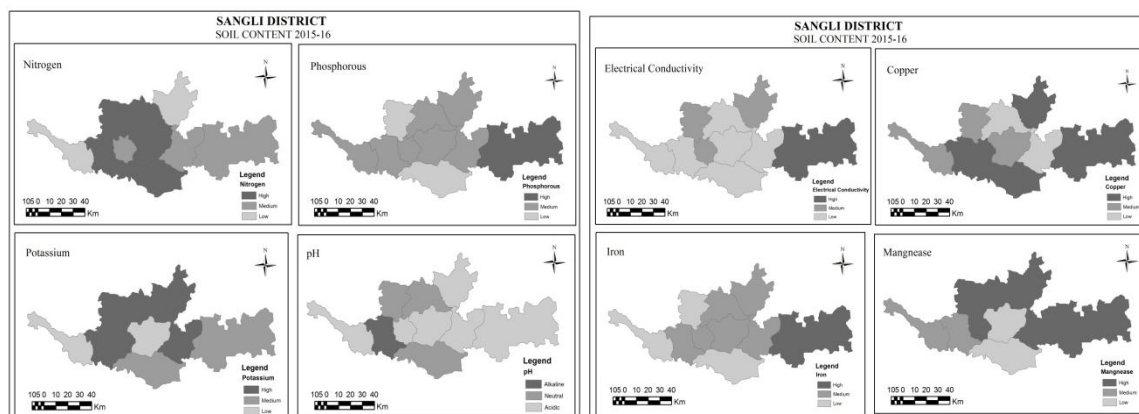
Manganese and Zinc are also found in samples from these two villages respectively as- Content of copper is 0.4 Ppm and 0.2 Ppm Iron content is 2.9 Ppm and 3.1 Ppm while Manganese is1.01 Ppm and 1.7 Ppm and Zinc is 0.7 Ppm and 0.9 Ppm.

Table 2: Soil Content Analysis of Non-Irrigated Village In Sangli District 2015-16

Sr. No.	Tahsil	Name of Village	No. of Sample	Nitrogen (280 to 560)	Phosphorous (10 to 25)	Potassium (120 to 280)	Ph (6.5 to 7.5)	Electrical Conductivity (0 to 1.00)	Copper (0.20)	Iron (4.50)	Manganese (2.00)	Zinc (0.60)
				KG/Hect	Kg/hect	Kg/Hect		ds/m	Ppm	Ppm	Ppm	Ppm
1	MIRAJ	Bedag	1	390	12	160	6.8	0.98	0.3	1.5	0.6	0.98
		Sidhewadi	1	180	11	221	6.6	1	0.4	1.6	1.1	0.87
2	WALAWA	Gatadwadi	1	480	17	280	7.4	1	0.3	2	1.2	1.1.
		Karve	1	237	12	270	7.6	1.1	0.3	1.9	1	0.3
3	SHIRALA	Pachumbri	1	120	18	137	7	1	0.2	1.4	1	0.4
		Nigadi	1	190	10	98	5.9	0.96	0.2	1.1	1.1	1
4	TASGAON	Borgaon	1	320	26	97	5.6	0.89	0.3	2.1	0.96	1.1
		Hatur	1	210	6	141	5.3	0.99	0.1	1.9	0.4	0.6
5	KHANAPUR	Kamlapur	1	290	12	232	7.2	1	0.1	1.3	1.3	0.7
		Kusavade	1	318	17	230	7.1	0.95	0.2	2.1	1.5	0.8
6	ATAPADI	Ghanewadi	1	111	19	270	5.1	1.53	0.3	2	1.6	0.8
		Banpuri	1	231	16	290	4.9	0.89	0.4	1.9	1.2	0.6
7	KADEGAON	Tondoli	1	320	13	230	6.8	0.98	0.2	1.5	1.03	0.5
		Shalhgav	1	260	9	280	7.2	1.6	0.2	1.4	1.8	0.6
8	PALUS	Bambavade	1	112	10	255	6.9	1.57	0.3	2	1.6	1.9
		Khandobachiwadi	1	255	20	242	5.9	1.1	0.3	1.7	1.1	0.6
9	JAT	Kumbahri	1	116	26	166	5.2	1.11	0.4	2.9	1.01	0.7
		Tikodi	1	255	27	223	7.1	1.8	0.2	3.1	1.7	0.9
10	K. MAHANKAL	Kokale	1	137	19	218	6.1	0.96	0.1	2	1.4	0.6
		Hingangav	1	269	17	290	6.7	1.06	0.2	1.9	1.3	1.2

(Source: - Filed visit June 2017 to Dec. 2017)

Soil Content Analysis of Non-Irrigated Village 2015-16



10. Kavathemhankal Tahsil:

From Kavathemhankal tahsil two villages are selected first in kokale and another is hingangav. The soil analysis of kokale is as follows Nitrogen is low means it is 137, phosphorus is at the medium-high level that is 19 and potash is of medium-high quantity.e.218 recorded in this village. Ph value is acidic that is less than 6.5 it is 6.1 found in the sample. And electrical conductivity is of general quantity i. e. 0.96 ds/m. The soil content in soil sampling of Hingangaon is as follows is Nitrogen is at low level that is 269 found in Hingangaon. Phosphorus is of medium quantity is between15-21kg/hect.; It is 17. Potash is of high251-230 kg/hect means 290; and pH value is neutral i.e. 6.7 recorded in this village whereas electrical conductivity affects germination adversely it is 1-06 ds/m. Micro-nutrients like Copper, Iron, Manganese and Zinc are also found in samples from these two villages respectively The content of copper is 0.1 Ppm and 0.2 Ppm; Iron content is 2 Ppm and 1.9 Ppm while Manganese is1.4 Ppm and 1.3 Ppm and Zinc is 0.6 Ppm and 0.1 Ppm.

Conclusion:

Sangli District is a Developed District of western Maharashtra. Soil Fertility is very good; Irrigation Facilities are well developed and all-over Development is found in Sangli District. Walwa, Miraj, and Palus these tahsils are well developed in Comparison to other tahsils in the district. So last 20 years district is agricultural development, it is *Dr. Suryawanshi U. N.*

increased within the last years. In this study region, black soil is found it result into high production so it is a reason of agricultural development in the Sangli district but within the last 20 years land degradation is also increased in Sangli district Jat, Atpadi, Khanapur, and Kavathemhankal are less developed tahsils, reason is that these tahsils are geographically located in drought-prone areas so its impact is seen on agricultural development of these tahsils the soil analysis of Sangli district recorded that there are two groups in which study region is divided one is irrigated and other is non-irrigated. The agricultural inputs ratio is high and it is the impact of irrigated tahsils villages the analysis of the soil testing department held a survey in the year 2015-16. As per sampling of 20 villages from irrigated areas and 20 others from irrigated area analysis the results the excessive use of water, use of fertilizers, pesticides and absence of proper tillage method, improper crop rotation had the reverse impact on the soil and NPK, and pH, EC in Irrigated village and NPK, pH, EC is the parameters used to analyses the soil fertility in the study region. These parameters are good and semi-good but the analysis pointed out that production of crops has been recorded growth in the study region finally analysis investigated that the soil degradation is highest in quantity in developed tahsils of the study region and in backward tahsils it is recorded that due to lowest agricultural development, soil degradation is also low in quantity.

The following steps have been suggested to control soil pollution. To help prevent soil erosion, we can limit construction in the sensitive area. If the three R's; i.e. reduce, reuse and recycle are adopted even the excessive use of fertilizers and pesticides is reduced; and the health of soil would be sustained This would give us less solid waste. The application of bio-fertilizers and manures helps to reduce the use of chemical fertilizers and pesticides. Even the use of biological methods of pest control could reduce the excessive use of pesticides which also reduces the pollution of soil.

Suggestion:

1. Soil plays a vital role in the productivity of crops, to sustain the health value of soil and increase its connate productivity capability, there is a need to implement the remedies. Firstly, the use of fertile soil and the river basins for the brick factories should be strictly prohibited by mandatory systems especially soil on the Krishna and Warna River basins are vastly used for brick industries in the study area.
2. Secondly, the field visits and analyzed samples of soil, indicate that excessive use of chemical fertilizers and water supply caused the soil salinity mainly in Walwa, Palus and Miraj tahsils so, so there is a need for awareness regarding Soil sample testing among the farmers. It should be possible for the Grampanchayator
3. *PanchayatSamiti* made available for the farmers with affordable prizes.
3. To reduce the soil salinity firstly the wide and reliable surveys should be conducted by *Panchayat Samiti* at tahsil levels and *Zilla Parishad* at district levels. To reuse such saline soil, digging of paddy alone in the fields reduces the alkalinity of such lands. It could be adopted and underground land would be used economically mainly in the western part of the tahsils. If farming is filled with supplementary wages, agricultural land cannot be tainted. Even soil can be released along with its natural base humus is the layer formed on soil. Due to the decomposition of dead plants and animals by microbes' humus also supplies nutrients to the soil. It is also important for aerating the soil and for holding water in the Soil. The proportion of them in the upper layer of good fertile soil is about 33% to 50 %. So, the decomposition of wastes in farms increases agricultural productivity.
4. Training Programmes for farmers To Overcome the Problems of soil, water, and vegetation degradation, the proper plans should be adopted and management needs to be taken on a priority basis. Systematic efforts made by the Government Agencies with the collaboration of NGO's (*Pani Foundation, Jal Yukt Shivar, Shatkoti Varuksh Lagvad*)

with voluntary Participation of locals, there is a large scope for prospects of the study area. Organization of training Programmes and seminars workshops would provide a Platform for farmers and researchers, efforts in the field of agriculture.

5. Massive awareness regarding organic farming in study area proves beneficial for agricultural productivity. The soil, water erosion should be stopped. The soil and water testing camps should be conducted in Walwa, Palus, Miraj, Shirala tahsils. If the farmers can understand the health of the soil, then implements such as the use of bio-chemicals inputs. It resulted in advancement in farming activates.
6. Recently Buldhana Urban Bank has launched a scheme 'Soil Doctor'. In this scheme, Bank will provide facility of soil and water sample testing to the farmers. Even bank would provide Weedicides, pesticides and proper solutions regarding problems related to soil and agriculture land. Bank would also provide economic assistance to farmers. Due to this scheme, income of farmers would raise by about 10000 to 12000. Such

schemes should be practiced by the co- operative banks from the study area.

7. The need of tahsil-wise agro-clinic is recommended and it should be implemented. It proves helpful for the farmers to deal with all concerns related to the physical agro needs.

References:

1. AOAC (1975), Methods of Soil Analysis, 12th Edn. Washington, DC: Association of Official Analytical Chemist.
2. APHA (1985), Standard Methods for the Examination of Water and Wastewater, 16th ed. American Public Health Association.
3. APHA (1998), Standard Methods for the Examination of Water and Waste Water? 20thedn. American Public Health Association.
4. Brund land, G. H. (1987), Our Common Feature. (Ed) Robin, B in the Poor and the Environment: Friends or Foes? 22, 210-329.
5. Black, C. A., Evans, D. D., White, J. L., Ensminger, L.B. & Clerk, F. E. (1965), Methods of Soil Analysis, 2. Chemical and Microbiological Madison: American Society of Agronomy.