

Vol II Issue V Nov 2012

Impact Factor : 0.1870

ISSN No :2231-5063

## Monthly Multidisciplinary Research Journal

# *Golden Research Thoughts*

Chief Editor  
Dr.Tukaram Narayan Shinde

Publisher  
Mrs.Laxmi Ashok Yakkaldevi

Associate Editor  
Dr.Rajani Dalvi

Honorary  
Mr.Ashok Yakkaldevi

**IMPACT FACTOR : 0.2105**

**Welcome to ISRJ**

**RNI MAHMUL/2011/38595**

**ISSN No.2230-7850**

Indian Streams Research Journal is a multidisciplinary research journal, published monthly in English, Hindi & Marathi Language. All research papers submitted to the journal will be double - blind peer reviewed referred by members of the editorial Board readers will include investigator in universities, research institutes government and industry with research interest in the general subjects.

### ***International Advisory Board***

Flávio de São Pedro Filho Federal University of Rondonia, Brazil	Mohammad Hailat Dept. of Mathematical Sciences, University of South Carolina Aiken, Aiken SC 29801	Hasan Baktir English Language and Literature Department, Kayseri
Kamani Perera Regional Centre For Strategic Studies, Sri Lanka	Abdullah Sabbagh Engineering Studies, Sydney	Ghayoor Abbas Chotana Department of Chemistry, Lahore University of Management Sciences [ PK ]
Janaki Sinnasamy Librarian, University of Malaya [ Malaysia ]	Catalina Neculai University of Coventry, UK	Anna Maria Constantinovici AL. I. Cuza University, Romania
Romona Mihaila Spiru Haret University, Romania	Ecaterina Patrascu Spiru Haret University, Bucharest	Horia Patrascu Spiru Haret University, Bucharest, Romania
Delia Serbescu Spiru Haret University, Bucharest, Romania	Loredana Bosca Spiru Haret University, Romania	Ilie Pinteau, Spiru Haret University, Romania
Anurag Misra DBS College, Kanpur	Fabricio Moraes de Almeida Federal University of Rondonia, Brazil	Xiaohua Yang PhD, USA
Titus Pop	George - Calin SERITAN Postdoctoral Researcher	Nawab Ali Khan College of Business Administration

### ***Editorial Board***

Pratap Vyamktrao Naikwade ASP College Devrukh,Ratnagiri,MS India	Iresh Swami Ex - VC. Solapur University, Solapur	Rajendra Shendge Director, B.C.U.D. Solapur University, Solapur
R. R. Patil Head Geology Department Solapur University, Solapur	N.S. Dhaygude Ex. Prin. Dayanand College, Solapur	R. R. Yaliker Director Managment Institute, Solapur
Rama Bhosale Prin. and Jt. Director Higher Education, Panvel	Narendra Kadu Jt. Director Higher Education, Pune	Umesh Rajderkar Head Humanities & Social Science YCMOU, Nashik
Salve R. N. Department of Sociology, Shivaji University, Kolhapur	K. M. Bhandarkar Praful Patel College of Education, Gondia	S. R. Pandya Head Education Dept. Mumbai University, Mumbai
Govind P. Shinde Bharati Vidyapeeth School of Distance Education Center, Navi Mumbai	Sonal Singh Vikram University, Ujjain	Alka Darshan Shrivastava Shaskiya Snatkottar Mahavidyalaya, Dhar
Chakane Sanjay Dnyaneshwar Arts, Science & Commerce College, Indapur, Pune	G. P. Patankar S. D. M. Degree College, Honavar, Karnataka	Rahul Shriram Sudke Devi Ahilya Vishwavidyalaya, Indore
Awadhesh Kumar Shirotriya Secretary, Play India Play (Trust),Meerut	Maj. S. Bakhtiar Choudhary Director,Hyderabad AP India.	S.KANNAN Ph.D , Annamalai University,TN
	S.Parvathi Devi Ph.D.-University of Allahabad	Satish Kumar Kalhotra
	Sonal Singh	

**Address:-Ashok Yakkaldevi 258/34, Raviwar Peth, Solapur - 413 005 Maharashtra, India  
Cell : 9595 359 435, Ph No: 02172372010 Email: ayisrj@yahoo.in Website: www.isrj.net**



**“A CASE STUDY OF QUALITY DISTRIBUTION OF SOIL  
CHEMICAL IN NIRA LEFT BANK CANAL AREA IN SELECTED  
VILLAGES OF BARAMATI DISTRICT PUNE. ”**

**GODASE B.P**

Shardabai Pawar Mahila Mahavidyalaya, Shardanagar, Baramati, Pune, Maharashtra.

**Abstract:**

*Soil pH, Electric Conductivity, Organic Carbon, NPK, Potassium, Sodium, Lime, are the essential nutrients, present in soil and helpful to growth of crops. Distribution of nutrients is unequal. In this paper, an attempt has been made to find out the level of nutrients and their distribution. It covers an area 75025 of hectares of agricultural land where 1 87, 937 population reside. Area covers 46, 683.87 sq hectars (34%) out of 138248.8 hectares of Baramati tahsil, where 76 % population are concentrated. Average village wise nutrient level of 400 soil samples from NLBC area of Baramati is calculated and presented graphically. It shows that NLBC area soil is Alkaline and indicates 11 % area are of high saline. Organic Carbon is high but there is not enough Nitrogen. Phosphorus and Potassium are in good condition. Villages Nimbut, Bajrangwadi and Late are in an excessive Alkaline condition of pH. Use of organic fertilizers, reducing excessive use of chemical fertilizers, green compost and wherever needed reclamation is recommended to maintain soil health.*

**KEY WORDS:**

Ph, Electric Conductivity, Organic Carbon, Nitrogen, Phosphorus, Potassium, Sodium And Lime, Nutrient.

**INTRODUCTION**

Soil is a natural resource in the field of agriculture because; it is a basic factor in the agriculture practices. Soil, shows the presences of nutritional elements on plant and gives good fertility. If the organic and chemical fertilizers are used in a balanced state as per requirement of soil and crop, it will help to maintain soil fertility. Wild, (1996) explained the purpose of fertilizer use is to remove the limitation of crop growth that could be caused by an inadequate supply of nutrient present in the soil. Nutrients are required after germination, rapid vegetation growth and fruiting of the crops. Now a day's farmers are using more chemical fertilizers in an injudiciously. Due to this, hazardous effects observed on crops and animals including human beings. Thus, soil testing is essential to manage the doses of fertilizers. The essential mineral elements like Nitrogen, phosphorus and potash, calcium, magnesium, ferrous, manganese, boron, leads, copper, molybdenum, chlorine, carbon, hydrogen and oxygen these factors affects on healthy growth of crop. Deficiency of any one of the elements as above-mentioned defiantly affects on the growth and development of plant. In soil testing process, physical as well as chemical properties of soil could analyze. To know the properties of soil series and soil types Teli and Khan (2012) studied the chemical properties of Solapur district with group of eleven soil series and presented in map. The chemical properties like Fe<sub>2</sub> Mg, CaCo<sub>3</sub>, Si, Al<sub>2</sub>, Na, SiO<sub>2</sub>, KAL<sub>2</sub>, CO<sub>3</sub> and K<sub>2</sub> has been added in the particular soil series of Solapur district.

**Problem:**

Over irrigation, excess doses of chemical fertilizers, use of pesticides, farms under continues cropping changed natural condition of soil and it becomes unfertile with leads to weigh down crop yields and income of farmers. This situation is the main problem and seen in irrigated area of the country.

**Significance of Study:**

This study will explain the critical situation of soil affected villages and useful to minimize the over use of water, fertilizers and pesticides. Better management and allotting the fertilizers quota at village and tahsil level planers and agricultural officers will became cautious and aware about using farm input. Soil reclamation program could be run on pinpoint area of nutrients deficiency to extension officers of agricultural department.

**Scope and Limitations:**

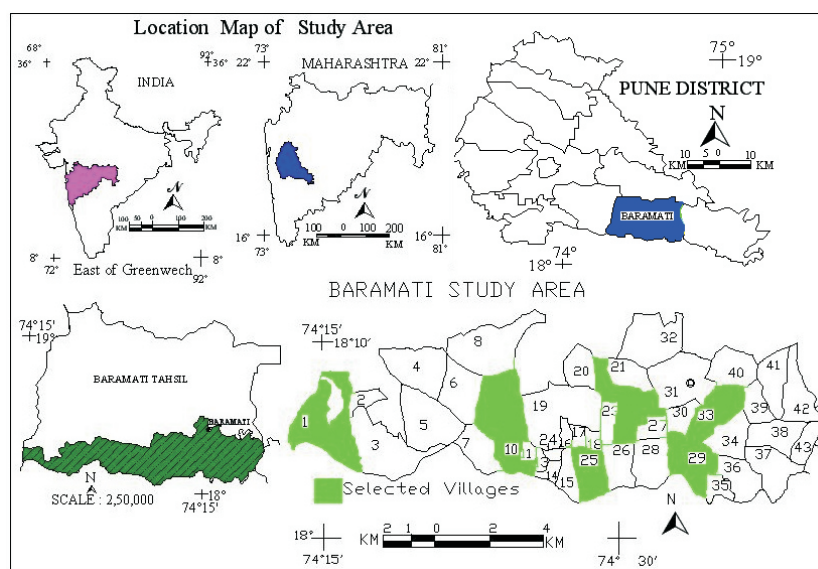
The result of this study is applicable only Nira Left Bank Canal irrigated area of Baramati tahsil, district Pune.

Objectives of Study: 1. To study the nutrient nature of soil.

- 2. To find the good and healthy soil area.
- 3. To find the unhealthy soil sample villages,
- 4. To give a suggestion to maintain soil nutrient,
- 5. To compare soil sample's quality of selected villages.

**STUDY AREA:**

Baramati is located at North East of Pune district in the state of Maharashtra. Nira Left Bank canal flows west east and it divides Baramati tahsil into two parts, first is north and second is south region. South region that is under irrigation of Nira Left Bank Canal (NLBCA) in the study area, which is surrounded by Satara district boundary towards south, Indapur tahsil east, remaining Baramati tahsil (North), Purandar is on west. This study region extends from 180 0 2' 48.48" to 180 10' 28.71" north latitude and 74 0 13' 6.22" to 74 40' 22." east longitude. Total geographical area is 46683.87 sq. hectares. Climatically this area is in temperate climatic condition hot in summer and mild cold in winter. This area is under rain shadow zone of the Western Ghat. The rainfall occurs in June to mid October month and receives 500 mm rainfall annually. (Fig. 01)



**Fig. 01**

Database and sampling: Out of 43 villages under canal irrigation, 9 villages were selected for the study of the soil quality distribution.

**SELECTION OF AREA:**

The study area was selected based on NLBC area irrigated land of Baramati tahsil in Pune district. 43 villages get NLBC water for irrigation. Quota sampling depending on the distance variation of 10, 20, 30 and 40 Km from tahsil headquarters is applied. Out of villages, 9 villages were selected for the study.

**Selection of the Soil tested Sample:**

To study the chemical nature of soil in study area, investigator collected secondary data from soil testing laboratory of Krishi Vidyan Kendra (KVK) Agricultural Development Trust, Baramati, soil testing laboratory of Someshwar Cooperative Sugar Factory, Shomeshwarnagar, Tal. Baramati, Dist. Pune and Government Soil Testing Laboratory Pune. The soil analysis data of 2005 to 2009 are taken from these laboratories. Total 400 samples of selected villages were taken for this study Table 1.

**Methodology and Statistics used:**

The present study is conducted with the help of farmers of Nira Left Bank Canal area in Baramati tahsil of Pune district. Village wise level of average samples of each nutrient categorized in specific unit. pH scale (Logarithmic) from 0 (Acidic) to 14 ( Most Alkaline) with 7 as a neutral value. EC is a measure of dissolved salt in soil, which is counted in decisiemens per meter (ds/m). Organic carbon is measured in percentage value per gram. NPK is measured in Kg/hectars.

**RESULT AND DISCUSSION:**

Name of Villages	Gunaw di	Khand aj	Male- Gaon Bk.	Sangyi	Pandar e	Korhal e	Late	Bajran -	gwadi Nimbu t	Total
No. of Samples	22	68	96	23	39	40	40	22	50	400
Percent	5.5	17	24	5.7	9.7	10	10	5.5	12.5	100%

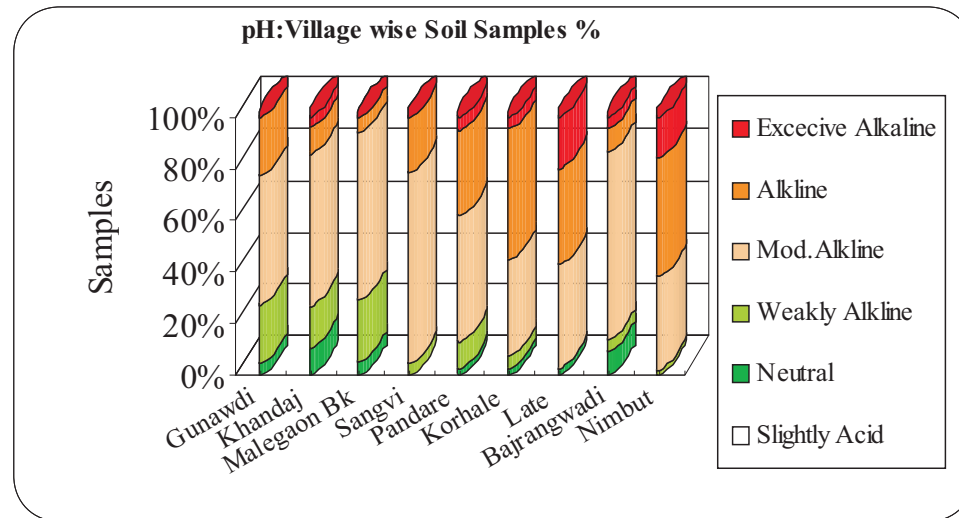
**Table 1 Source: Laboratories of KVK, Someshwarnagar Sugar Factory and Government Laboratory Pune.**

**SOIL TESTING TRENDS:**

Village Malegaon Bk Khandaj and Nimbut analyzed 24, 17 and 12.5 % of soil samples respectively (Table No.1). These villages have analyzed more soil samples because of the vicinity of soil laboratory (5 KM from Khandaj 4 KM from Malegaon and 4 KM from Nimbut village) . The Malegaon Sugar Factory and Someshwar Sugar Factories are located in this village area so it encourages farmers to analyzing the soil of their sugar cane farm for better yield of sugar cane.

**VILLAGE WISE SOIL QUALITY DISTRIBUTION:**

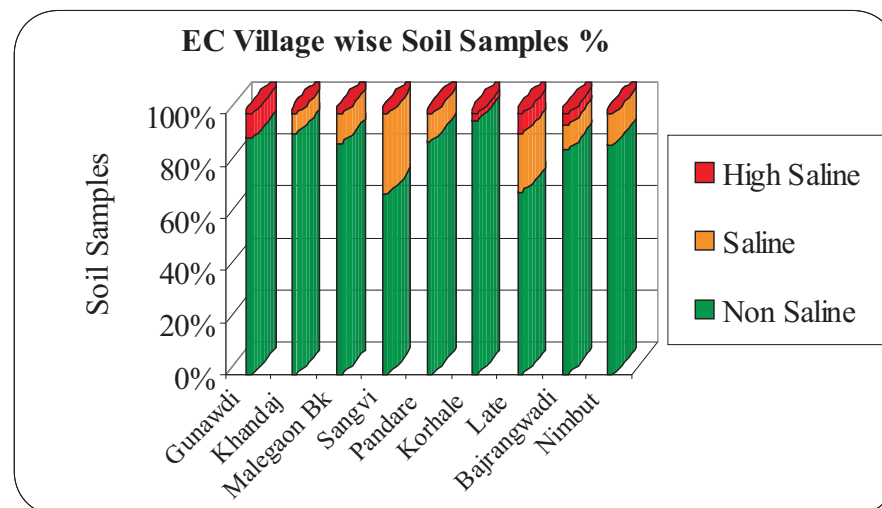
pH



Graph No. 1

In study area, a nature of soil is alkaline and not a single sample found in Acidic Nature. Khanadaj village has 10.29 % Neutral samples. In village, Sangvi and Nimbut there were not a single sample in neutral category. An average 4.08 % sample has found Neutral category of pH in study area. 23.96 % SS of village Malegaon Bk found highest pH percent in Weakly Alkaline (7.4 to 7.8 pH value) category. There was not a single SS Late village in Weakly Alkaline category. An average 9.89 % sample has found Weakly Alkaline category of pH in study area. 73.9 % SS of Sangvi village has found highest pH range category of Moderately Alkaline. In village Nimbut 36%SS was Moderately Alkaline and it was the lowest parent in this range. An average 53.59 % sample has found Moderately Alkaline category of pH in study area. Most of villages have a more than 50 percent SS in Moderately Alkaline category. 50 % SS of Korhale village that is the highest percentage of Alkaline SS. But Bajrangwadi has only 9.09 % of SS in Alkaline category. An average 26.33 % sample has found alkaline category of pH in study area. 20 % SS are found Excessive Alkaline in village Late. But village Malegaon Bk and Sangvi have not al single SS in this category. This is very serious to Late village that 20 % SS are Excessive Alkaline followed by Nimbut village. An average 6.12 percent sample has found Excessive Alkaline category of pH in study area.

**ELECTRIC CONDUCTIVITY**



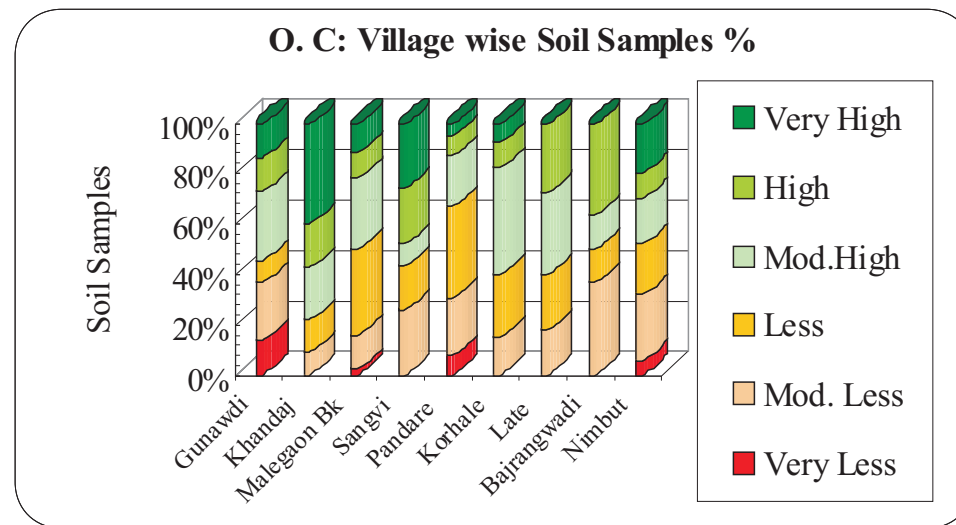
Graph No. 2



9.09 % SS in village Gunawadi followed by 7.50 % SS in village Late found High Saline soil Category. An average only 2.63 % sample has found High Saline category of pH in study area. 30.43 and 22.5 % SS are Saline in village Sangvi and Late respectively. An average 11.45 % sample has found Saline category of pH in study area. Village Gunawadi has not found a Saline category of SS. Village Korhale recorded 97.5 % of SS in Non Saline category. Most of villages are Non Saline category and found more than 88 to 97.5 % of SS in Non Saline category. An average 85.92 % sample has found Non Saline category of pH in study area.

**ORGANIC CARBON**

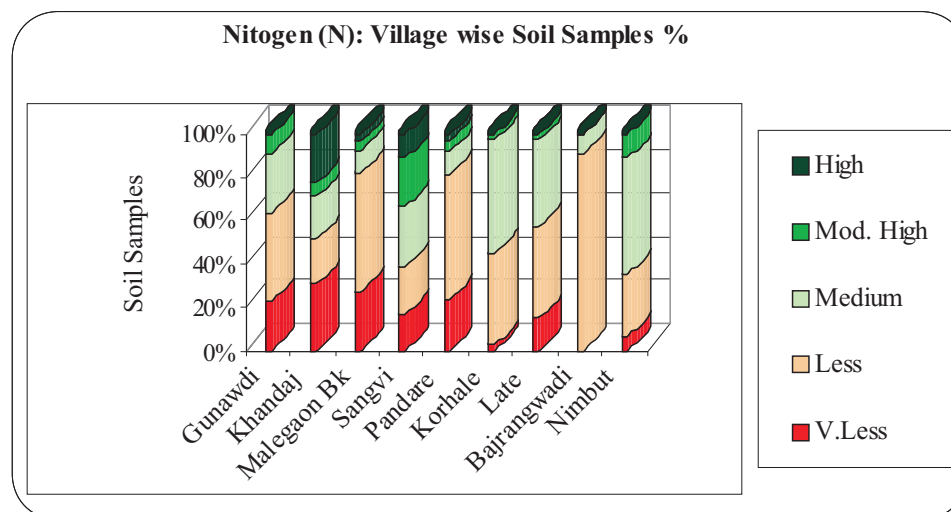
The condition of Organic Carbon in village Khandaj is very good. 78.48 % SS are found in Moderately High to Very High Organic Carbon. Village Late and Korhale both has 66 percent SS of Moderately High, High to Very High Organic Carbon. 66.67 % SS of Pandare is in the category of Less, Moderately Less and Very Less where the Organic Carbon found below 0.6 to less than 0.2 Decisiman /Meter. Village Khandaj, Sangvi, Korhale, Late and Bajrangwadi do not have any sample in very Les category of Organic Carbon.



Graph No. 3

**NITROGEN**

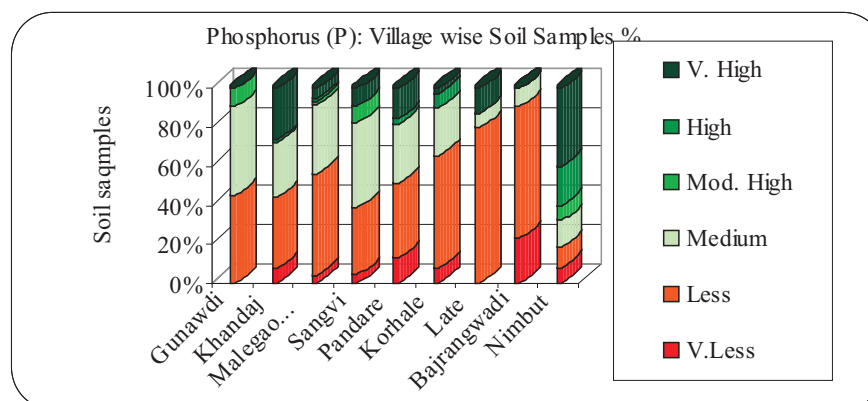
In village Khandaj 27.94 % of SS are found in Very Less ( Less than 140 Kg / Hector) Nitrogen followed by 27.08 %t SS in village Malegaon Bk. In village, Bajrangwadi there is not a single sample in this category. An average 15.67 % sample has found Very Less Nitrogen in study area. In Less Category of Nitrogen Bajranwadi followed by Pandare found 90 and 56.41 % SS where nitrogen is 140 to 280 Kg/ Hectors respectively. An average 43.98 % sample has found Less Nitrogen in study area. 52.50 % SS has Medium Nitrogen in Korhale village followed by 48 % SS in Nimbut village. There was not a single SS in Bajrangwadi in this Moderately High category. 22.22 % SS has Mo. High Nitrogen in Sanvi village followed by 10 SS in Nimbut village. There was not a single SS in village Bajrangwadi in Mod. High Category where Nitrogen has found 412 – 560 Kg/ Hectares. An average 6.83 % SS has found Moderately High Nitrogen in study area. In High (561- 700 Kg Nitrogen) category only 20.59 % SS found in Khandaj village, where it is the highest in this category , followed by 8.82 % of SS in village Sangvi. Korhale, Late, Bajrangwadi and Nimbut village has not a single SS in this category. An average 4.15 % SS has found High Nitrogen in study area. Highest 10 % followed by 8.82 and 2.56 %of SS has in Very High category of Nitrogen in village Nimbut, Khandaj and Pandare respectively. Except these three village there was zero villages in Very High Nitrogen category. An average 2.38 % SS has found Very High Nitrogen in study area.



Graph No. 4

**PHOSPHORUS**

22.73 % SS of Bajrangwadi has V. Less Phosphorus followed by 12.82 % SS of Pandare village. Gunawadi and Late have not any SS in this category. An average 7.44 percent SS has found Very Less Phosphorus in study area. 80 % SS of Late followed by 68.18 percent of Bajrangwadi has in category of Less Phosphors. An average 47.03 % SS has found Less Phosphorus in study area. In Medium Category of Phosphorous Gunawadi village has 45.45 %t SS in Medium category of Phosphorus. Most of village has 32 to 100 % SS in this category. An average 26.52 % SS has found Medium Phosphorus in study area. In Moderately High Phosphorus category only Gnuawadi (9.09 %.), Sangvi (8.7%and Nimbut (8 %villages are recorded Minimum SS. But all other villages has not a single SS in this category. An average 3.10 % SS has found Moderately High Phosphorus in study area. In High Phosphorous category Village Nimbut and Korhale recorded 20 and 7.5 % SS. In very High Phosphorus category village Nimbut and khandaj recorded 40 and 26.47 SS % respectively. Gunawadi and Bajrangwadi have not recorded a single SS in Very High category of phosphorus. An average 12.31 % SS has found Very High Phosphorus in study area.



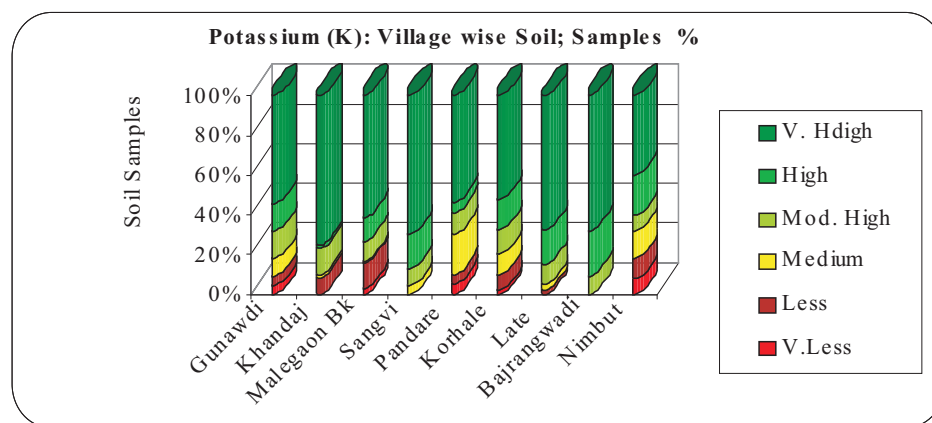
Graph No. 5

**POTASSIUM**

There was 8 % maximum SS in the Very Less (Less than 120 Kg/ Hectors) followed by 5.13 % SS in Pandare, 4.55 % in Gunawadi, 3.13 % in Malegaon Bk and 4.50% in Korhale village. In village Khandaj ,Sangvi,Late and Bajrangwadi not a single SS found in this category. 12.5% SS followed by 10% SSin Less



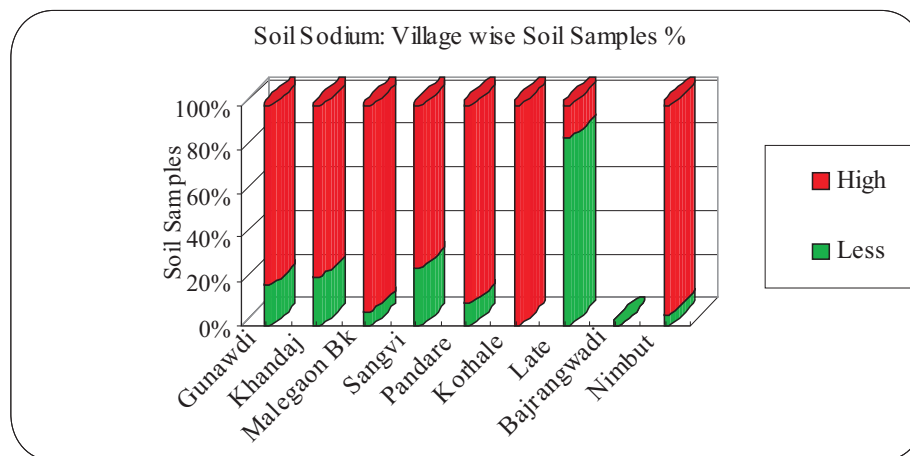
category found in village Malegaon Bk and village Nimbut respectively. An average 5.67 % SS has found Less category of Potassium in study area. 20.51 % SS followed 14 % SS category of Medium found in village Pandare and Nimbut respectively. In Bajrangwadi there was not a single SS in this category. An average only 7 % SS has found Medium category in study area. 13.64 followed by 13.24 % SS found in Moderetly High category in village Gunawadi and Khandaj respectively. An average 10.65 % SS has found in High category potassium in study area. 22.73 % followed by 20% SS found in High category in village Bajrangwadi and Late respectively. An average 13.81 percent SS has found in High Potassium in study area. 75 % SS has been recorded in Very High category of Potassium and other villages has recorded more than 40 % SS in this category. An average 60.29 percent SS has found in Very High Potassium in study area.



Graph No. 6

**SODIUM**

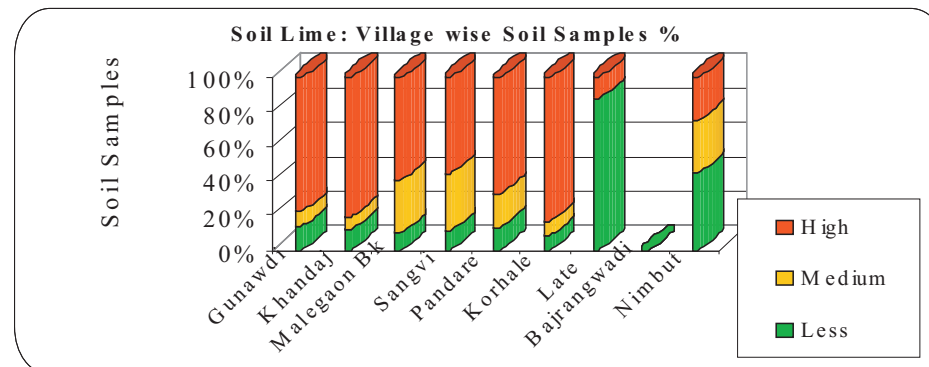
85 % SS of village Late has Less Sodium followed by 26.69 % in village Sangvi.95% SS has High range of Sodium. In Korhale village there are not a single SS in this category of Sodium in Baramati tahsil . In village Korhale 100 % soils SS was found High Sodium followed by 95 % SS in Nimbut.



Graph No. 7

**LIME**

87 % SS of Late village was Less category of Lime .33.33 % SS found in Sangvi as a Medium category of Lime. 83.33 % SS was found in High category of SS in Korhale village.



Graph No. 8

### CONCLUSION

1. Most of area (53.59 % Soil Sample) includes in Moderately Alkaline category and more than 26% soil samples are in category of Alkaline pH which is not shows a good soil condition of soil in Nira Left Bank canal irrigated area of Baramati district. Pune.
2. Maximum area of Nira Left Bank canal is Non Saline, but more than 11 % area is Saline and High Saline that shows bad condition of soil nature.
3. Organic Carbon of most of area is in good condition.
4. Most of area has not good condition of Nitrogen in soil.
5. Most of area has not enough Phosphorus in the soil.
6. Potassium of this soil is in very good condition.
7. Sodium in study area is high in all villages.

### RECOMMENDATION

1. Farmers of villages Late, Korhale, and Sangvi should reduce the Alkalinity of their farm soil.
2. Near about 15 percent, farmers of all villages must run the soil reclamation programme in their farm where soil is Saline and High Saline soil.
3. Village Pandare, Bajrangwadi, Nimbut Malegaon Bk has Less and Moderately less Organic Carbon is found so these farmer must use organic fertilizers and compost for their farm.
4. All farmer should grow the Nitrogen by organic manuring and with chemical fertilizers
5. All villages except Nimbut have to increase the phosphorus by using modern techniques.
6. Potassium condition must be maintained.
7. Sodium percentage of farm soil should bereduced.
8. Lime percentage of farm should be reduced by using minimum chemical fertilizers or by reclamation.

### REFERENCE:

1. Donahue R.L., Miller R.W. Shickluna J.C. (1958). "Soils; An introduction to soils and plant growth", Prentice-Hall, Inc., Englewood Cliffs, New Jersey.
2. Husain Majid (2002), 'Systematic Agricultural Geography', Rawat Publ. New Delhi. 3. Jasbir Shingh, Dhillon S.S. (2002), 'Agricultural Geography', 2nd Edi, Tata McGraw-Hill Publishing Co, Ltd., New Delhi.
4. Suravase M. N., Pore A. V. (2011) "Indian Streams Research Journal", Solapur, Voll .I, Issue V, June 2011.
5. Teli N. B. and Khan Y. S. (2012) " Properties of soil series and soil types in Solapur District ," Maharashtra Bhugol Shastra Sansodhan Patrica, Vol. XXIX. No. 1, Jan\_ June. pp.29-37
6. Wild Alan (1996). ' Soil and the Environment An Introduction', Cambridge University Press, CB2 RU, UK. pp.144
7. Walsh, L. M. & Beaton, J. D. (1973). Soil testing and plant analysis (Rev. ed.). Madison, WI: Soil Science Society of America, Inc.

# Publish Research Article International Level Multidisciplinary Research Journal For All Subjects

Dear Sir/Mam,

We invite unpublished research paper.Summary of Research Project,Theses,Books and Books Review of publication,you will be pleased to know that our journals are

## Associated and Indexed,India

- \* International Scientific Journal Consortium Scientific
- \* OPEN J-GATE

## Associated and Indexed,USA

- EBSCO
- Index Copernicus
- Publication Index
- Academic Journal Database
- Contemporary Research Index
- Academic Paper Databse
- Digital Journals Database
- Current Index to Scholarly Journals
- Elite Scientific Journal Archive
- Directory Of Academic Resources
- Scholar Journal Index
- Recent Science Index
- Scientific Resources Database

Golden Research Thoughts  
258/34 Raviwar Peth Solapur-413005,Maharashtra  
Contact-9595359435  
E-Mail-ayisrj@yahoo.in/ayisrj2011@gmail.com  
Website : www.isrj.net