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Restoration of Soil Health for Sustainable Growth in Agriculture

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Abstract:
The indispensable aim of the present research is to observe the restoration of soil health for sustainable growth in agriculture. The data was collected from 300 respondents. The sample consists of the respondents from the two areas Multan and Bahawalpur. In which 150 samples were collect from Multan and 150 samples were collect from Bahawalpur. It is to analyze in this research how soil health is sustainable for agriculture growth. After the study of the whole circumstance we analyze the poor health of soil is affectation a serious danger to the maintainable growing in farming. Land squalor is one of the thoughtful problems that are opposite in Pakistan. Different kinds of land degradation are water sorting, salinity and sodicity, wind and water corrosion. Due to this problem the agriculture productivity in Pakistan is very low. When agree production is decrease the farmer income and employment also decrease. Therefore we suggest that the good soil health play very important role for any country, because when the soil health condition is beater the agriculture productivity is also increase. Sustainable soil management increases the agriculture production and decrease the risk of agriculture falling.

Keywords: *Soil health, land degradation, water logging, salinity and sodality*

1. Introduction

In Pakistan total graphical area is 79.61 million hectares in which only 5.34 is properly useful for agriculture. The major part of agriculture land have facing many different types of problems such as water cataloguing, salinity and sodicity, slow permeability and breeze and water corrosion. Thus the major parts of agriculture land in Pakistan are in deprived health. The productive capacity of the land in Pakistan is permanent decline. Therefor poor soil is affectation thoughtful danger for maintainable growing in farming.

The main impartial of biological farming is the crop production sustainable for maintain long term soil abundance in agreement with natural system. Therefor the primary concern of all stockholders of agriculture development should be to maintain the agriculture output and ecological quality soil health organization. Improved growth and progress of crop foremost to higher production depend on the better soil health. The sustained capability of soil to functional as an energetic living system is defined soil health. Biological element sustains the value of immediate environment and sustains the biological productivity of soil plant, animal, and human health ultimately promote due to biological elements. The lowers present and upcoming ability of soil to yield goods and services is the process of soil degradation. The main cause of soil degradation is unnecessary biological manures excessive nutrient organization and soil population. The somatic organic and organic properties of soil is maintains the biological farming.

Soil is resource which provides a number of environmental economic and social services land usage alteration and agro ecosystem management performs derived the major short term effect on soil function. However soil processes over the long term may be expected to have effect climate change. The impact of different management practice on ecological function may be important to determine the sustainability of agriculture system. To alleviate climate change on option may be to excess the level of soil organic matter (SOM). Raising the refusal and understanding its accessibility is testing for agriculture sustainability. This rises is due to a higher amount of c-rich macro aggregates and a decrease macro aggregate turnover rate which develop micro aggregate stabilization.

In the scientific literature the concept of soil health describes frequently. A soil index should be depending on soil biological somatic and organic possessions. The soil health general notion involve the soil impact on the surrounding which is the basic for the soil management assessment framework (SMAF) and to take measures sit specific interpretation of soil health quality indicators.

- Soil maintains the progress of greatest food and fibre and participation to the prosperity of Canadians and financial constancy.
- Healthy soil is necessary element of a healthy atmosphere, is the founding upon which maintainable agriculture is constructed.
- Soil health also called soil superiority, is defined in agriculture limit as the soil sustainable to maintain crop growth without attractive contaminated or otherwise reparations the atmosphere.
- The management practices and the role of land use improving the soil quality.

The unity of microorganism and there often uncertain countryside and biosynthetic competences assumed a particularly definite established of culture condition and ecological has complete them explaining particularly tough glitches in the life science and other arenas as well. Bacteria have been used in variance methods ended the previous 50 years to progress medicinal machinery animals and social fitness, food safety, food development and superiority, environmental protection, hereditary manufacturing, agriculture biotechnology and extra impressing conduct of agriculture and public wilds give a greatest effective record completion. Most of these technical developments would not have been suitable using frank biochemical and bodily manufacturing method. Bacterial skills have been used to different agriculture and ecological glitches. Bacteria are impressive only when they are obtainable with possible and optimal condition for absorbing their substrates counting obtainable water, ph, oxygen and infection. Those problems which related with the use of biochemical, manures and insecticides, microorganism are useful for these problems. In natural farming and organic farming they are widely applied. Increases soil erosion and the related conveyance of residue biochemical manures and insecticides to superficial liquids and groundwater reason of environment pollution. Indecorous action of humanoid and physical wilds has produced thoughtful environment and communal glitches through the creation.

Sustainable agriculture is depending on ecological principal who uncertain that production system are not only economically workable but also do not to reduce to tower rant the environment and at the same time bring about social quality in the long run. For the sustainability of society agriculture also participate such as by helping urban areas to control wastes e.g. by recycling urban sewage slued and in rural areas by reducing unemployment and increase the employment opportunities and sharing to agro industrial sector. The food and the cultivation association of the United States end of 2015 is adopt a set of 17 sustainable progress aims which instills a higher sense of prosing necessary a task in which soil scientists have a big rate play.

"Neutral resource management" is greater than ever before for the need to ensure sustainable production of in food the rising demand of food, climate changing biotic pressure raised and productivity decreasing with only 2.4% land area of the world. 17.5% of world human population lived in India. In 2012- 2013 per capital land availability soil heath is 0.12 heaters. Soil health is the key factor participating to agriculture productivity sustainable. Maintaining a soil quality is necessary for maintain greater crop productivity with quality produce under intensive quality produce.

Health of soil is a period which is mostly used within discussion and maintainable farming to define the overall situation or superiority of the earth resources. Soil organization is necessary to all agriculture system, get in soil management there is indication for extensive deprivation of agriculture soil in the kind of evasion, damage of biological substance , compaction , improved salinity contamination and other problems sometime degradation occur firstly for example when poor soil lead to ravine erosion. Frequently deprivation is subtler and only impacts an agriculture manufacture and the broader setting ended years. The concept of soil health has been considered in two ways "reductionist" or "integrated". This reductionist approach is very common in conventional quality assessment in other field. The combined method creates the statement the soil health is only the quantity of the contribution from a usual of exact component.

Health of soil is resulting as of a setting we receive necessary feature of maintainable farming. A fit agriculture earth is one that is accomplished of helping the manufacture of food and fiber, an excellence satisfactory to encounter humanoid necessities composed with sustained distribution of other ecology facilities that are necessary for equilibrium of the life quality for human and the preservation of biodiversity.

Maintainable farming began to make features interest in the 1980. The situation has labeled not only various usual of skills to conservative farming but a substitute confidence scheme as well. In his essay most of the books listed deliberate how problematic it is to describe maintainable farming exactly. It has a canopy period for alternate cultivation, short contribution farming, permaculture, organic cultivation, agro ecology, reformative farming and biological farming. Maintainable farming is a confidence scheme, the view of the word as a global village emphasized decrease chemical use, admiration for landscape and household and crowd self- relicense. Sustainable agriculture has a three-goal economic profitability, environmental health, and social and economic equality. Sustainable agriculture also began to describe features interest in the 1980 as a consequence of universal the effect of deforestation. When maintainable agriculture start not only the agriculture production increase the farmer income also increase. Therefore soil health is very important role for sustainable agriculture growth.

2. Review of Literature

This study was examined by Ahmad et al. (1998) They worked on the restoration of soil health for achieving sustainable growth in agriculture .The experimental data was used for this purpose were generated by the department of soil science university of agriculture Faisalabad during the period (1980-81) to (1984-85). In this study partial budgeting technique was used. The variable was used input, output and income. We concluded that land deprivation is important and thoughtful problematic in Pakistan water cataloguing and salinity, nutrient reduction, soil compaction, soil corrosion are numerous forms of land deficiency the reason of the problem is that incompetent use of different procedures of contributions and decline in harvesting and land use power harvest yields agriculturalist revenue employ etc.

Aparan et al. (2014) analyzed the organic amendments as ecosystem engineers' microbial biochemical and genomic evidence of soil health improvement in a tropical arid zone field site. The supplementary data was used in this study. The crowded plat technique was used in this study. The variable was used sand, silt and clay. We concluded that biological - manures, may this be applicably involved in the collection of environment causes that selectively adjust the atmosphere and brand soil bionetwork more maintainable.

Pardo et al. (2014) proposed the evaluation of the phytostablishation efficiency in trace elements contaminated soil using soil health indicators. The experimental data was used in this study. Data were subjected to anova analysis and difference between mean were determined using Tueky's test. The variable was used heavy metals, arsenic, organic amendments, Eco toxicological bioassays, soil

functional diversity. We concluded that the usage of compos and glutton slurry with a halimus is an operative phytostablishation policy to develop health of soil of nutrients poor soil by in height TES awareness by refining the custom purpose of the soil ecology the recrudescence of the biogeochemical cycle of vital nutrients and the decline of Tec distribution and their atmosphere effect.

Farrarini et al. (2014) discussed the development of soil health index based on the ecological soil function of organic carbon stabilization with application to alluvial soil of northeastern holy. The (EC-MDS) and (PCA-MDC) data was used in this study. The non-linear transformation technique was used in this study. The variable was used soil health index, soil ecological functions, soil carbon stabilization, climate change, mitigation and vegetable production. We concluded that using the soil health index was a satisfactory method to define the most maintainable soil organization program based on soil C confiscation in order to moderate the effect of climate change. Biswas et al. (2014) stimulated the soil health sustainability and organic farming. Systematic reviews have widely been quantitative in nature recently qualitative systematic reviews have been used as useful methodology. The variable was used organic farming soil fertility and soil health. We concluded that to attain maintainable harvest and livestock manufacture the main constraint is the conservation of soil fruitfulness and soil fitness. The effect of biological performs on dissimilar facets of crop manufacture soil health and atmosphere envisions the potentiality of the biological agricultural in sustaining the soil fitness and soil richness.

Bileva et al. (2014) worked on the assessment of nematodes as bio indicators of soil health in agro ecosystems. The data was collected from literature recent and future research will be base to create soil health maps using GIS. Routine producers modified method of Cobb 1981 is used in this study. The variable was used soil health, nematodes, agro ecosystems, and vegetable crops. We concluded that the use of nematodes as bio pointers of soil health cannot be an only one measure for the purpose of soil health but should be an essential element of a combined system of measurement. Korthals et al. (2014) stimulated the long term effect on eight soil health treatment to control plant- parasitic nematodes and verticilliumdahliae in agro-ecosystem. The experimental soil sample data was used in this study. The variance of analysis was performed on the data per plot using genstat directive ANOVA. The variable was used composites, chitin, mrrigold, grass-clover, biofumigation, anearobic soil disinfection a physical control method. We concluded that the result of soil health management should be examine on the base of their long term result on productivity in communication with chemical biological and physical soil characteristics under field situation.

This study was examined Singh et al. (2014) they worked on the soil desurfacing .A potential threat to soil health productivity and fertility. The experimental soil sample data was used in this study. The statistical method was applied for analysis. The variable was used bulk density, desurfaced soil, hydroaulic conductivity, normal soil, soil organic carbon. We concluded that soil desurfacing by brick kilns for creating bricks is on exponential rise and possible risk to the soil health and soil productivity. Maintainable development of natural resource like soil should be the subject without modifying and worrying its unique make up and without imperiling ecology and environment. Technology needs to be raised in brick making process to evade use of fertile land for this purpose.

Ahmed et al. (2015) proposed the combining textile effluent wastewater with organic fertilizer for improved growth and productivity of wheat and soil health. The experimental data was used in this study. Various chemical and biological techniques were used in this study. The variable was used wastewater, wheat, cereals, microbial, populat*i*on, and soil health. We concluded that the submission of biological manures can service alleviate the bad effect of fabric waste water on the harvest growing and the bacterial inhabitants that eventually increases the yields of wheat. Joshua Abraheem (2015) worked on the soil health in different land use system in comparison to a virgin forest in a tropical region of Kerala. The soil sample method was used. The soil samples were collected in April (2015) five random sites under each of the land use system. Data for the different soil properties of different land uses and nature system subjected to one way analysis of variance (ANOVA) using SPSS and all comparison among the various soil parameters were conducted by last significant difference (LSD). The variable was used carbon, management index, forest, land use system, natural rubber, soil health, soil organic matter. We concluded that multi species under vegetation in neoprene based system as in teak system would be an option to recover soil health.

Ramirez and Gil (2015) examined the germination and growth for purple passion fruit seedling under per germination treatment and mycorrhizal inoculation. The experimental data was used in this study. The time period was used (2012-2013). The data was analyzed by Anova and means compared with the turkey test using the r commander software. The variable was used mycorrhizal, colonization, mycorrhizal dependency and folier p content. We concluded that the action with 961 of sulfuric acid for 20 minutes enhanced the average sprouting time of purple passion fruits seed.

Salahin et al. (2015) worked on the effect of green manure crops and tillage practice on maize and rice yields and soil properties. The experimental data was used in this study. These data was conducts at the Bangladesh agriculture research institute gazipur Bangladesh during (2010-2012) to observe the change in soil. The statistical analysis was applied in this study. The variable was used soil fertility, crop productivity, soil capasticity and climate. We concluded that green manure crops rises soil organic matter which has recovers soil health and crop growth. Soil aculeate made more biomass and superior likened to other two green manure crops. Therefore it was more helpful for refining soil physical and chemical possessions after its corporation.

Saikia et al. (2015) worked on the organic substitution in fertilizer schedule impact on soil health photosynthetic efficiency yields and assimilation in whet grows in alluvial soil. The experimental data was used in this study. The time period was used (2011-2013).The statistical analysis was used in this study. The variable was used soil carbon organic, soil carbon storage, farm yard manure, crop residual biomass and photosynthesis. We concluded that the use of biological and inanimate manure solicitation is necessary for effectual soil carbon storing and wheat efficiency plant photosynthesis plays a central role in biomass manufacture and soil biological carbon increase which also diverges by manure organization. Therefore, plant biomass harvest may play a significant role in improving SOC storing. Gupta et al. (2015) worked on the efficacy of indigenous plant growth promoting rhizobacteria on capsicum

yield on soil health. The experimental data was used in this study during the period (2010-2012) the variable was used capsicum, HCN, PGPR, inoculation, P-solubilization, siderphare. We concluded that the use of PGPR as inoculant bio-fertilizers. Therefore holds a great probable in constant crop manufacture of capsicum under mid hill situations of H.P India.

Prakashchaudahry et al. (2015) examined the effect of long term conservation tillage on soil physical properties and soil health under rice wheat cropping system in sub-tropical India. The experimental data was used in this study. The data was conducted during the period (2003-04) to (2009-2010). The statistical analyzed was carried out using the methods suggested by Gomez and Gomez. We concluded that straight piercing in zero tilled rice strip and wheat sown in zero tilled strips and wheat sown in zero tilled strips had significantly higher SOC and MBS contents while it was deepest in conservatively sown wheat and physically transplanted rice in puddled field. Deb et al. (2015) proposed the soil organic carbon towards better soil health productivity and climate change mitigation. Hardcopy research, articles, books monographs and project report were also used to collect as many as possible required databases. The variable was used soil organic carbon, carbon sequestration, pools of soil carbon, management practices, soil quality, environmental sustainability, climate change. We concluded that for a maintainable future a proper balance should always be preserved between C input into soil and export which create the stability and thus regulate the probable for soil to serve as ac sink.

This study was examined by William et al (2016) they worked on the soil functional zone management .A vehicle for enhancing production and soil ecosystem services in row crop agro ecosystem. This was associated with the time serious data. The zonal tillage technique was used in this study. The variable was used crop yield, ecosystem services, previses and precision tillage. We concluded that however new inducements were accumulated like rapidly growing interest is management system that improves soil health. Wani et al. (2016) discussed the sustainable use of natural resources for crop intensification and better livelihoods in the rained semi-arid tropics of central India. The soil sample method was used in this study. Soil sample were collected from farmer fields in target erosions by adopting participatory stratified soil sampling method. The variable was used soil fertility, nutrients nitrogen, phosphorus and potassium. We concluded that if the policy location by the individual governments to promote soil test based BN and landform organization practices to improve productivity and livelihood of smallholders in the semi-arid.

Jadwiga et al. (2016) analyzed the implication of zinc excess on soil health. The experimental was conducted in a greenhouse of the University Warmia and azury in Olsztyn paland. Soil samples were collected from the humus horizon in WUM'S experimental station in tomaszkowo. The result was analyzed statistically in the statistic a 12.0 software package. The variable was used organ trophic bacteria, antinomies, fungi, and dehydrogenase urease. We concluded that excessive attentiveness of zinc have an adverse effect on microbial growth and the activity of soil enzymes.

3. Conceptual and Theoretical Framework

3.1. Concept of Soil Health

Scientist of soil adopts a positive method to natural resource management. Scientist think about soil protection rather than destruction, soil fertility improvement rather than nutrient reduction and inequality, soil limitation rather than deprivation and desertification, and sensible use of input rather than low input system. This article was organized to help notify the soil and water management society continuing efforts to woodland the science and arts of soil management.

Long period sustainability and profitable feasibility of agriculture is important actual for sustainable management. Actual ecological organization of farming system is also the basis of it. The retroaction of soil value has become a significant approach for talking world food security. Certificate the state of the present science on the idea of making an element and useful structure for estimating the possible effect of organization and management performs on soil quality was the objective of this article. Both systematically sound and practical by creators and consultants who mention substitute organization and maintenance systems for their process is a long term aim of the structure. There is argument and disagreement in some accommodations concerning the theory of soil quality and its applicability to soil controlling. The possible subsists for the establishment of a structure or instrument that consents cultivators, managers, and investigators to observer and measure positive and negative changes in soil quality research on soil superiority has progressive to the degree. The number of soil instruments obtainable and approaching is large and make it possible to statement the experiments stood by spatial and progressive changeability in soil possessions and soil value. Although a whole agreement has not been stretched concerning explanations of soil quality or its dimension, sufficient information has accrued that general contract on a practicable tool can be recognized in the predictable future. Sensibly forecasts the effects of organization perform on the development or degradation of soil quality that is the objective to have a structure. Soil preservationists to mention changes in soil organization that will help achieve economic and ecological aims, as well as offer references that will stand or improve selections for upcoming group. A minimum set of soil function designated the organization should be involved because they intensely effect the capability to attain the goals indicated above; a minimum set of soil meters that are profound to changes in organization and intensely effect soil function; procedure models that can forecast at least the direction (and hopefully magnitude) of the change supplementary with changes in soil organization performs or structures; thresholds for soil organization meters required to attain, via their influence on soil function, the indicated goals; and an instrument or structure that suites necessary material to allow field workers to regularly calculate the positive and negative features of the soil organization and farming system recommendations they make. This method pursues to move outside an attitude or example that stresses maximum production at any cost to one that distinguishes the full set of purposes that soils offer in agro-ecosystems.

3.2. Theories of Soil Health

Bezdicek et al. (1996) note in an article relating to the significance of soil superiority to health and maintainable land organization to seeing soil superiority there are two methods. The main is to understand soil superiority as "an essential attribute of soils that can be incidental from soil physiognomies or unintended explanations. The next is to see soil superiority as an energetic typical or in standings of a soil's "capability to achieve sure production ecological and healthiness purpose." This method has its critics (e.g. Sojka and Upchurch 1999; Letey et al. 2003) who are worried that describing soils founded on their capability to purpose reductions humanity's aptitude to revolutionize and adjust, thus making a possible condition where lots of hectares of land will be uncontrolled to agriculture due to its susceptibility

The "useful" method to measuring soil superiority was clarified by Doran and Parkin (1994) and involves of seeing soil superiority through three main soil purposes. The first main purpose of a soil, one that most manufacturers are acquainted with, is in what way a soil sustains efficiency. The second main soil purpose that soils necessity achieves is ecological. Agrarian performs that optimize (short-term) output can improve or reduce the situation. The third soil purpose is the increase of herbal, physical, and social health.

A structure suggest by carter et al. (1997) for assessing soil superiority that involves of following process. The first define superiority is to be founded, on every soil purpose. The second choice oil possessions that affect the ability of the soil to offer each role. The third select pointers of features that can be dignified. The fourth use technique that offers perfect dimension of these pointers.

Doran (2005a, 2005b) specified that earth and land management implements are main causes of soil superiority and healthiness. So, pointers of soil superiority and healthiness essential not only classify the situation of the soil reserve but also describe the financial and ecological sustainability of land organization performs to contribution administrative activities in expressing truthful agrarian and land-use strategies. He planned a structure connecting agrarian and people desires by reserve preservation and ecological thoughts and a usual of useful pointers that might be used to measure the influence of soil and land organization.

4. Methodology

This study was related to the soil health primary data has been collected from 300. Respondent sample it was divided by two areas gated 150 sample of Multan district and 150 sample of Bahawalpur district are involved in this study. With the help of question solve the data and get the results. In this way we get the view of different people regarding soil health.

4.1. Elementary Analysis of the Data

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	100	66%	50	34%
Bahawalpur	150	130	86%	20	14%
Total	300	230	230%	70	70%

Table 1: Effect on Plant by Soil Increase

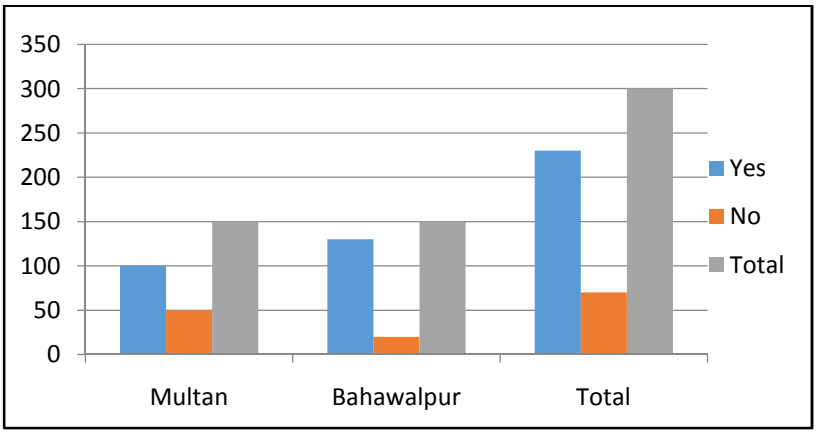

Figure 1: Effect on Plant by Soil Increase

We collect information when soil increase on the plant the effect on plant is better. For this purpose 300 respondents are used.150 respondent of Multan district and 150 respondent of Bahawalpur district .Multan positive response are 100 and their percentage is 66% and no response are 50 and their percentage is 34%. Bahawalpur yes responses are 130 and their percentage is 86% and no responses are 20 and their percentage is 14% .Total positive response of both district are 230% and negative response are 70%.

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	140	93%	10	7%
Bahawalpur	150	145	96%	5	4%
Total	300	285	285%	15	15%

Table 2: Effect of Microorganism on Plant

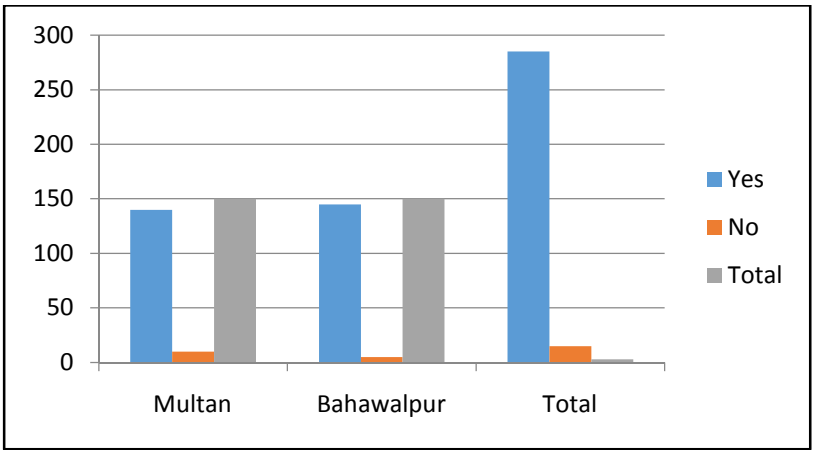

Figure 2: Effect of Microorganism on Plant

The data collect microorganisms are beneficial for plant. The numbers of positive responded in Multan district are 140 and their percentage is 93%, and negative response are 10 and their percentage is 7%.The numbers of positive responded in Bahawalpur district are 145 and their percentage is 96% and negative response are 5 and their percentage is 4%.Total positive response of both district are 285% and negative response of both district are 15%.

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	130	86%	20	14%
Bahawalpur	150	100	66%	50	34%
Total	300	230	230%	70	70%

Table 3: Effect of Fungi on Healthy Plant Growth

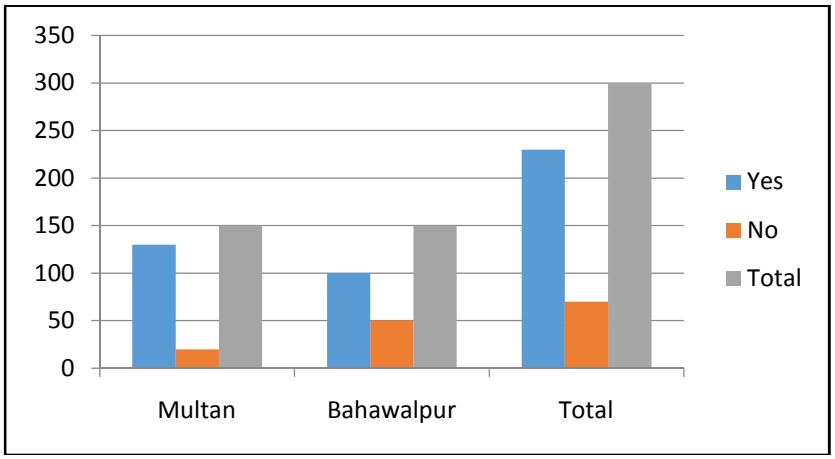

Figure 3: Effect of Fungi on Healthy Plant Growth

We collect data fungi are important for healthy plant growth. The numbers of positive responses in Multan district are 130 and their percentage is 86% and negative responses are 20 and their percentage is 14%. The numbers of negative response in Bahawalpur district are 100 and their percentage is 66% and negative response 50 and their percentage is 34%. Total positive response of both district are 230% and negative response are 70%.

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	100	66%	50	34%
Bahawalpur	150	90	60%	60	40%
Total	300	190	190%	110	110%

Table 4: Role of Organisms on Plant

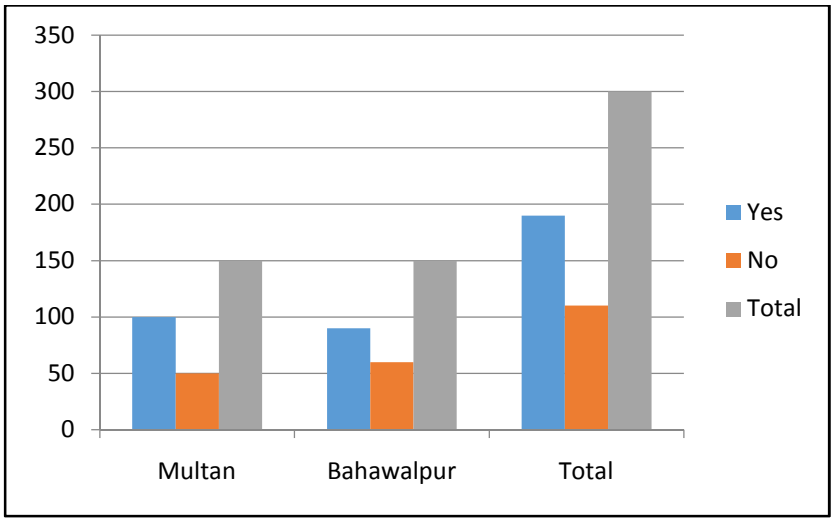

Figure 4: Role of Organisms on Plant

The data collects living organism play a critical role in plant. The numbers of positive response of district Multan are 100 and their percentage is 66% and negative responses are 50 and their percentage is 34%. The numbers of negative response in Bahawalpur district are 90 and their percentage is 60% and negative responses are 60 and their percentage is 40%. Total positive responses of both districts are 190% and negative response of both districts 110%.

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	100	66%	50	34%
Bahawalpur	150	100	66%	50	34%
Total	300	200	200%	100	100%

Table 5: Soil Water holding capacity increase by Soil organisms

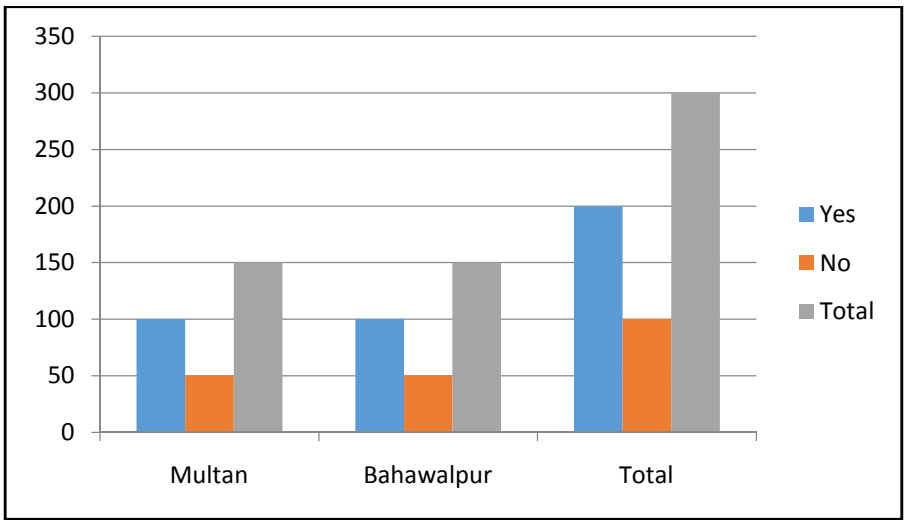

Figure 5: Soil Water holding capacity increase by Soil organisms

The data collects when soil organic matter increases the soil holding capacity also increase. The numbers of positive responses in district Multan are 100 and their percentage is 66% and negative response are 50 and their percentage is 34%.The numbers of positive response in Bahawalpur district are 100 and their percentage is 66% and negative response are 50 and their percentage is 34%. Total positive responses of both districts are 200% and negative response of both districts is 100%.

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	150	100%	0	0%
Bahawalpur	150	150	100%	0	0%
Total	300	300	300%	0	0%

Table 6: Effect of Poor Soil Health on Plants

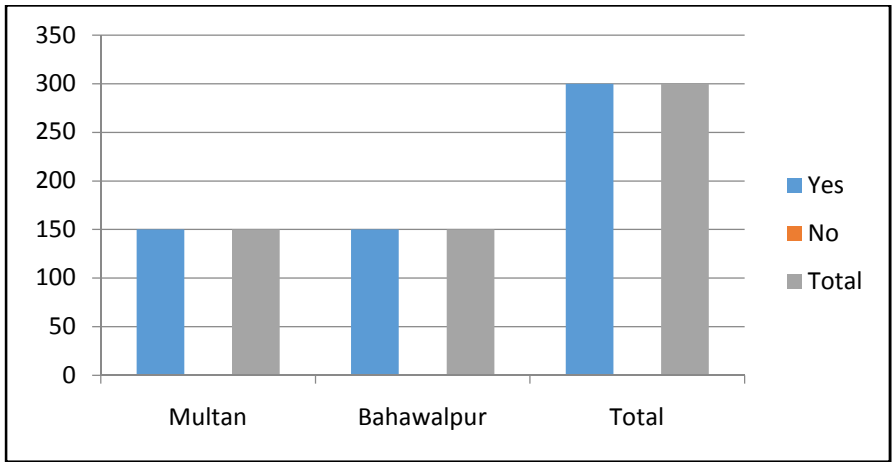

Figure 6: Effect of Poor Soil Health on Plants

The date collects poor soil health decrease the sustainable growth in agriculture. The numbers of positive response of district Multan is 150 and their percentage is 100% and no response 0. The numbers of positive response of district Bahawalpur 150 and their percentage is 100% and no response is 0. Total positive response of both districts is 300% and negative response of both districts is 0%

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	130	86%	20	14%
Bahawalpur	150	120	80%	30	20%
Total	300	250	250%	50	34%

Table 7: Effect of Water logging, Salinity and Sodicity on Production

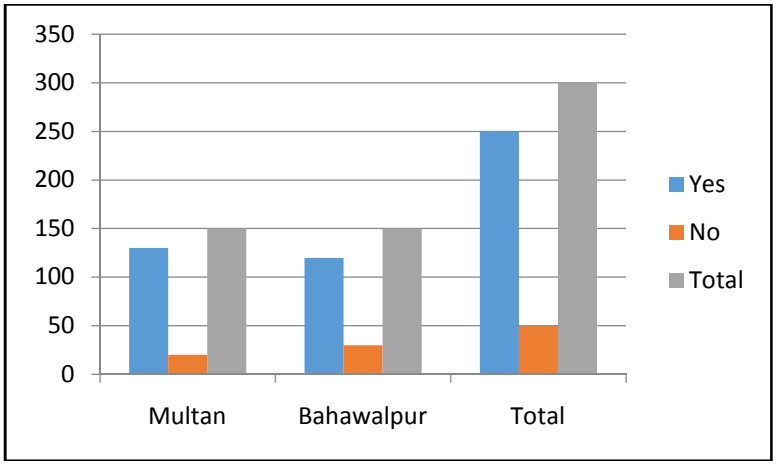

Figure 7: Effect of Water logging, Salinity and Sodicity on Production

The data collects water logging, salinity and sodicity and wind and water erosion effect the agriculture production. The numbers of positive response in district Multan is 130 and their percentage is 86% and negative response is 20 and their percentage is 14%. The numbers of positive response of district Bahawalpur 120 and their percentage is 80% and negative response is 30% and their percentage is 20%. Total positive response of both districts 250% and negative response of both districts 50%.

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	90	60%	60	40%
Bahawalpur	150	80	53%	70	47%
Total	300	170	170%	130	130%

Table 8: Problem of Land Degradation

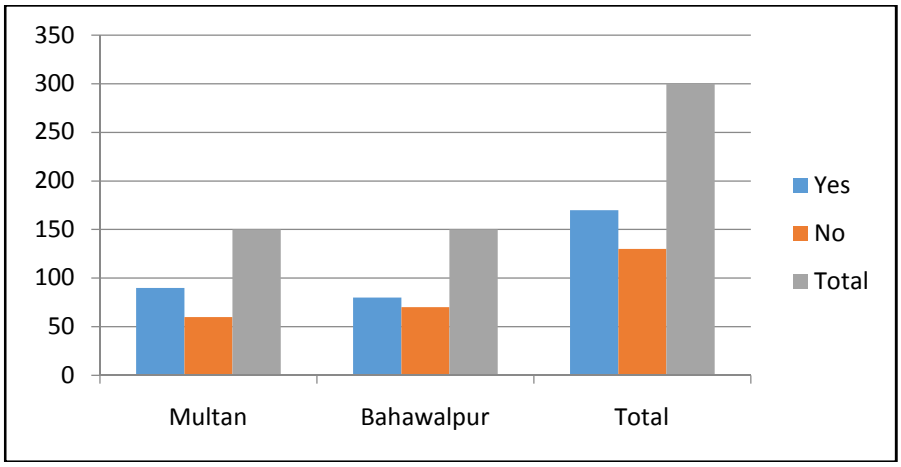

Figure 8: Problem of Land Degradation

The data collects land degradation is a serious problem of Pakistan. The numbers of positive response in district Multan 90 and their percentage is 60% and no response is 60 and their percentage is 40%. The numbers of positive response of district Bahawalpur 80 and their percentage is 53% and negative response is 43%. Total positive response of both district 170 and negative response is 130%.

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	100	66%	50	34%
Bahawalpur	150	120	80%	30	20%
Total	300	220	220%	80	80%

Table 9: Soil as a component of healthy environment

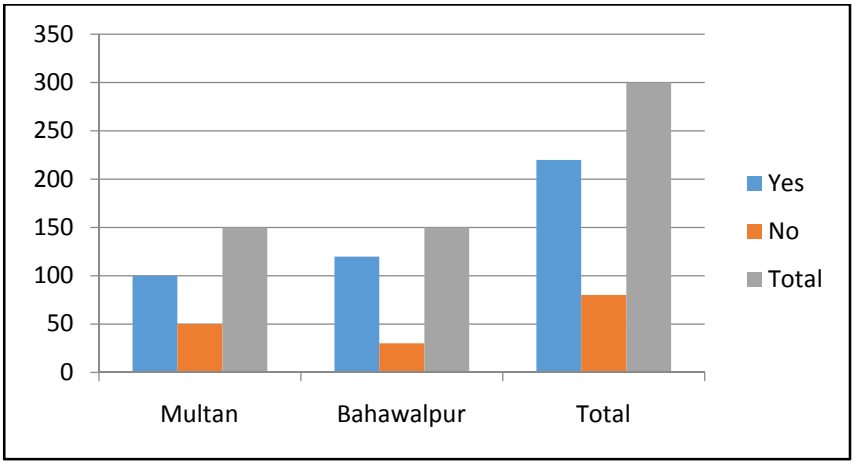

Figure 9: Soil as a component of healthy environment

In this table data collects healthy soil an essential component of healthy environment. The numbers of positive response in district Multan 100 and their percentage is 66% and no response is 50 and their percentage is 34%. The number of positive response of district Bahawalpur 120 and their percentage is 80% and no response is 30 and their percentage is 20%. Total positive response of both district 220% and negative response is 80%.

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	90	60%	60	40%
Bahawalpur	150	110	73%	40	28%
Total	300	200	200%	100	100%

Table 10: Sources of Organisms effect on Production

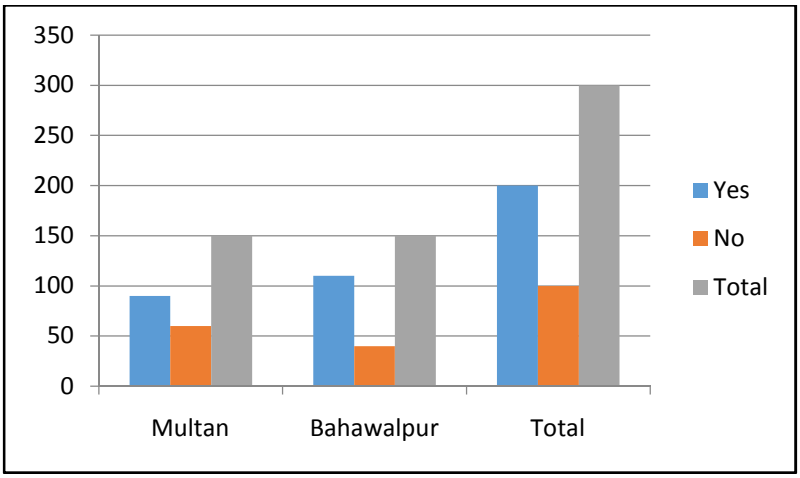

Figure 10: Sources of Organisms effect on Production

In this table data collect major source of organic matter are farms yards manure, green manure, and crop residues. The number of positive response of district Multan 90 and their percentage is 60% and no response is 60 and their percentage is 40%. The numbers of positive response of district Bahawalpur 110 and their percentage is73% and no response is 40 and their percentage is 27%.Total positive response of both districts 200% and negative response of both districts.

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	80	53%	70	47%
Bahawalpur	150	90	60%	60	40%
Total	300	170	170%	130	130%

Table 11: Effect of Earthworms in plowed soil

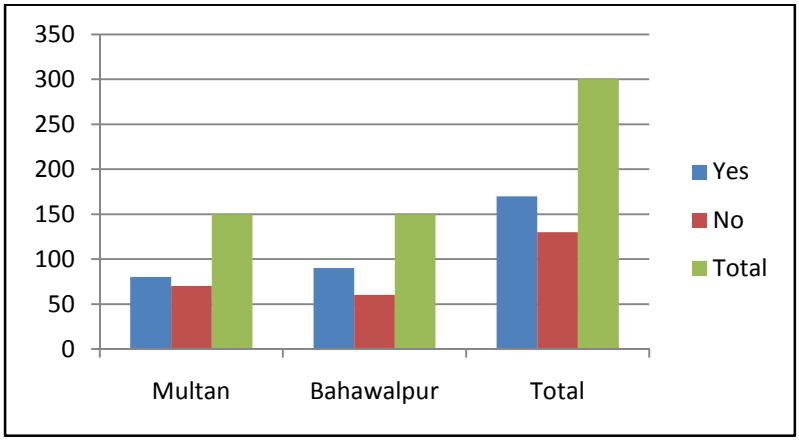

Figure 11: Effect of Earthworms in plowed soil

In this table collects data earthworm are more abundant in plowed soil. The numbers of positive response of district Multan 80 and their percentage is 53% and no response is 70 and their percentage is 47%. The numbers of positive response of district Bahawalpur is 90 and their percentage is 60% and no response is 60 and their percentage is 40%.Total positive response of both districts 170% and negative response of both districts 130%.

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	80	53%	70	47%
Bahawalpur	150	70	46%	80	54%
Total	300	150	150%	150	150%

Table 12: Land have space to gain, water, air and organisms

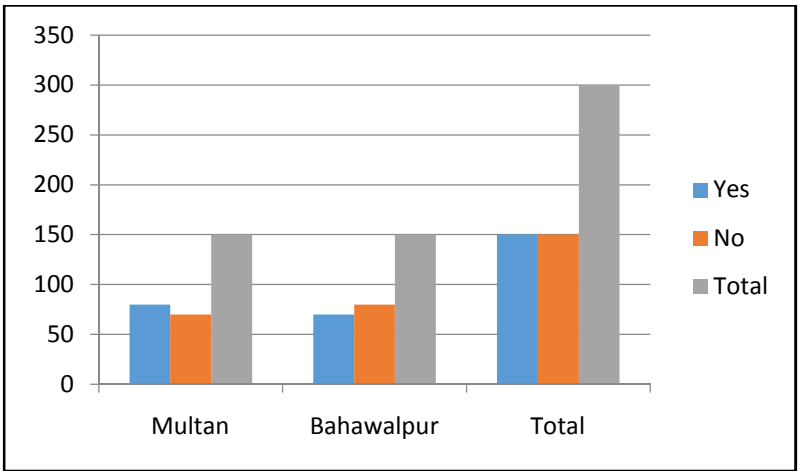

Figure 12: Land have space to gain, water, air and organisms

In this table collect data healthy land has to space gain water air and organism. The positive response of district 83 and their percentage is 53% and negative response 67 and their percentage is 47%. The positive response of district Bahawalpur 70 and their percentage is 46% and no response 80 and their percentage 54%.Total positive response of both districts 150% and negative response of both districts 150%.

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	5	3%	145	97%
Bahawalpur	150	10	6%	140	94%
Total	300	15	15%	285	285%

Table 13: Healthy Soil used for test in time to time

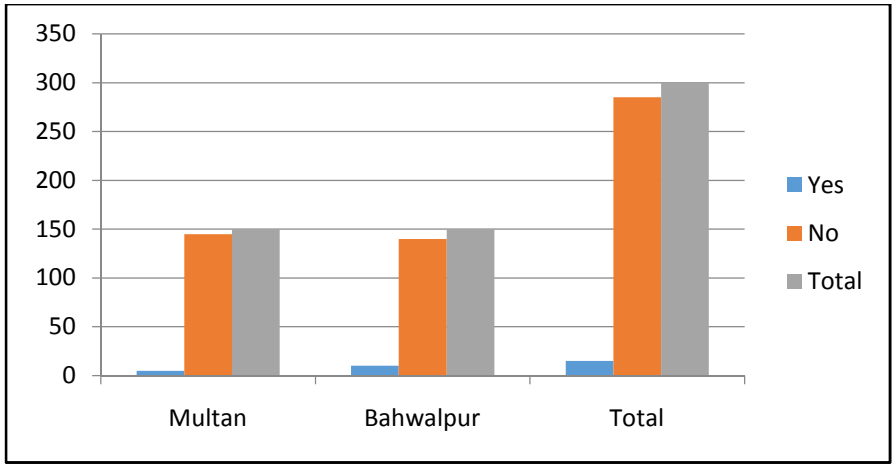

Figure 13: Healthy Soil used for test in time to time

In this table the data collects healthy soil should be allowed to rest from time to time. The numbers of positive response of district Multan 5 and their percentage 3%and no response 145 and percentage97%. The numbers of positive response of district Bahawalpur 10 and their percentage 6% and no response 140 and their percentage 94%. The total positive response of both districts 15% and negative response of both districts 285%.

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	120	80%	30	20%
Bahawalpur	150	110	73%	40	27%
Total	300	230	230%	70	70%

Table 14: Soil degradation serious effect on Production in long run

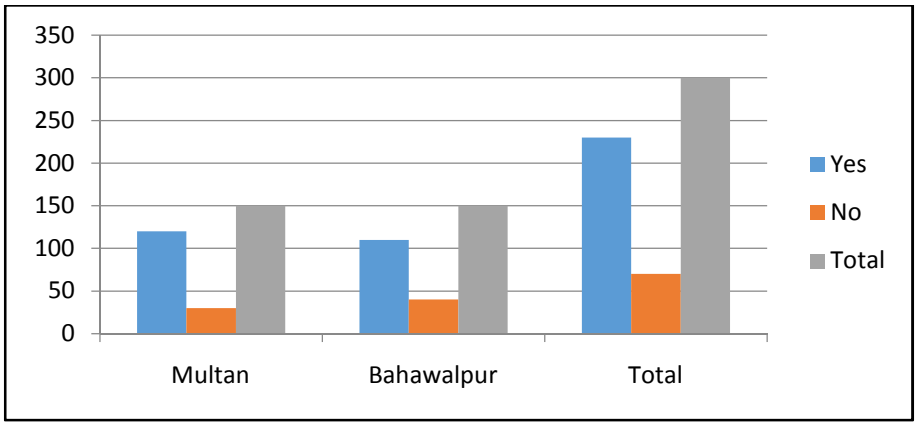

Figure 14: Soil degradation serious effect on Production in long run

In this table we collect data soil degradation is the most serious problem facing the agriculture industry in the long term. The numbers of positive response of district Multan 120 and their percentage 80% and no response 30 and their percentage 20%.The numbers of positive response of district Bahawalpur 110 and their percentage 73% and no response 40 and their percentage 27%. Total positive response of both districts 230% and negative response 70%.

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	70	46%	80	54%
Bahawalpur	150	100	66%	50	34%
Total	300	170	170%	130	130%

Table 15: Buffer effect on moisture and temperature

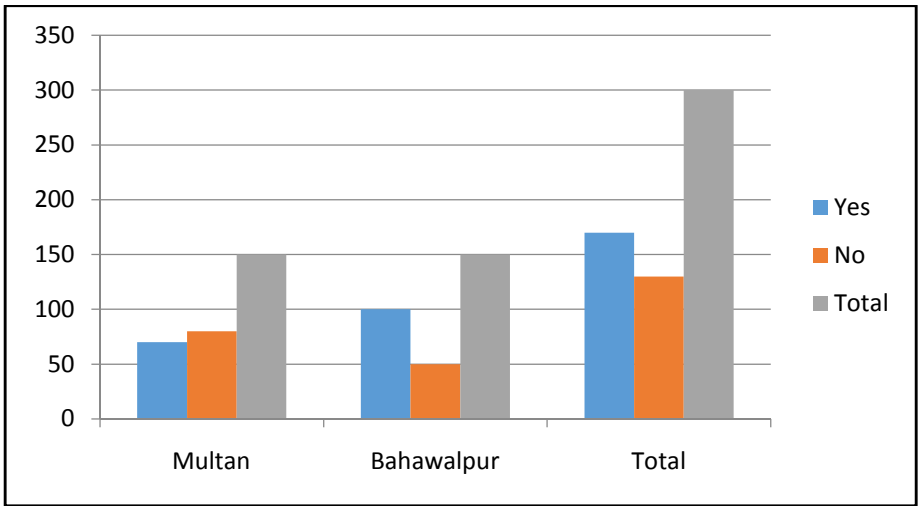

Figure 15: Buffer effect on moisture and temperature

In this table collect data organic matter buffers the big changes moisture and temperature. The numbers of positive response of district Multan 70 and their percentage 46% and no response 80 and their percentage 54%. The numbers of positive respondent of district Bahawalpur 100 and their percentage 66% and no response 50 and their percentage 34%.Total positive response f both districts 170% and negative response 130%.

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	100	66%	50	34%
Bahawalpur	150	90	60%	60	40%
Total	300	190	190%	110	110%

Table 16: Ecosystem services life on earth

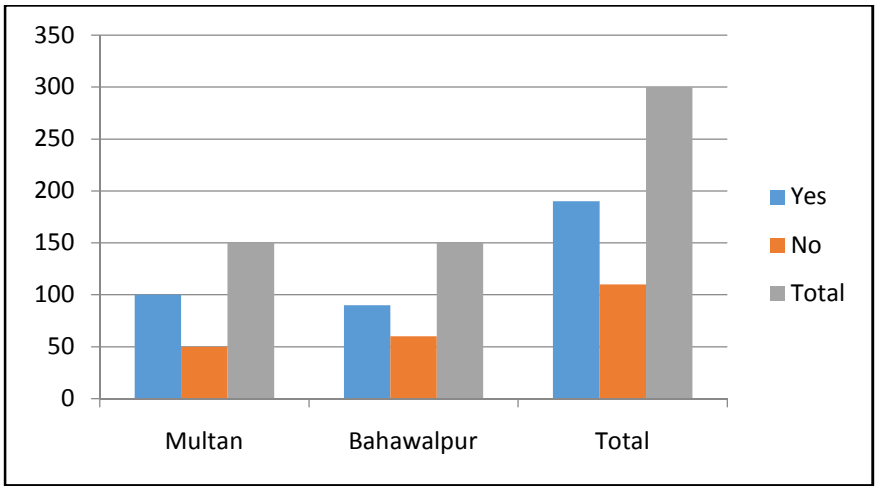

Figure 16: Ecosystem services life on earth

In this table data collect soil provides key ecosystem services that enable life on earth. The numbers of positive response of district Multan 100 and their percentage 66% and negative response 50 and their percentage 34%. The positive response of district Bahawalpur 90 and their percentage 60% and no response 60 and their percentage 40%.Total positive response of both districts 190% and negative response 110%.

Area of population	Sample	Response "Yes"	Percentage	Response "No"	Percentage
Multan	150	90	60%	60	40%
Bahawalpur	150	90	60%	60	40%
Total	300	180	180%	120	120%

Table 17: Soil effect on climate changes

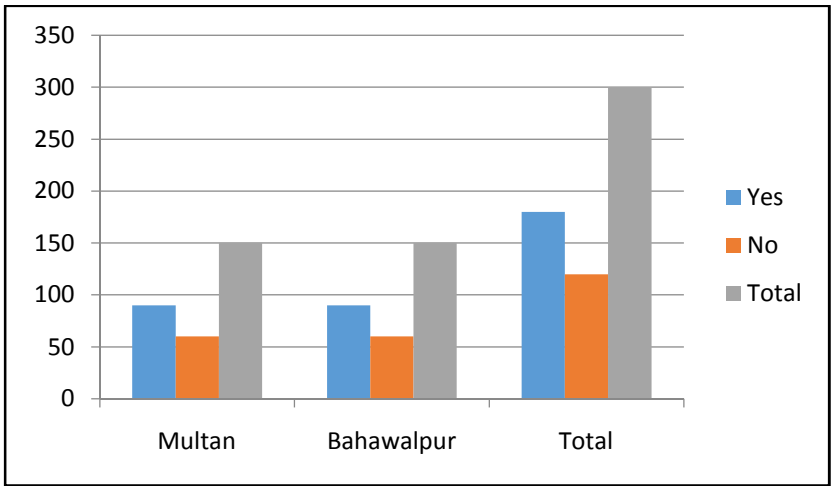

Figure 17: Soil effect on climate changes

In this table collects data soil health to combat and adapt to climate change. The numbers of positive response of district Multan 90 and their percentage 60% and no response60 and their percentage 40%. The numbers of positive response of district Bahawalpur 90% and their percentage 60% and negative response 60 and their percentage 40% .Total positive response of both districts 180% and negative response of both district 120%.

Area of population	Sample	Response "Yes"	Percentage	Response No	Percentage
Multan	150	145	96%	5	4%
Bahawalpur	150	140	93%	10	7%
Total	300	285	285%	15	15%

Table 18: Organic matter improved soil fatality

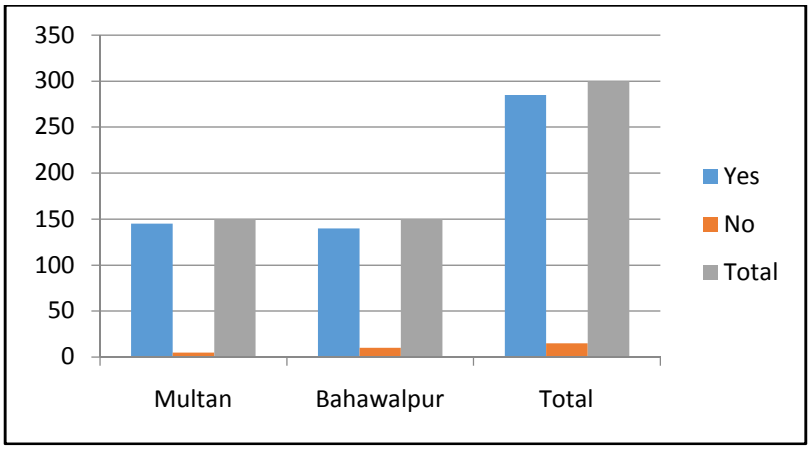

Figure 18: Organic matter improved soil fatality

In this table the data collect organic matter improved soil fatality. The of positive response in district Multan is 145 and their percentage is 96% and no response 5 and their percentage is 7%.The number of positive response in district Bahawalpur 140 and their percentage 93% and no response 10 and their percentage is 7%.The total positive response of both districts 285 and their percentage 285% and no response of both districts 15 and their percentage 15%.

Area of population	Sample	Response "yes"	Percentage	Response No	Percentage
Multan	150	120	80%	30	20%
Bahawalpur	150	130	86%	20	14%
Total	300	250	250%	50	50%

Table 19: Soil erosion affects organic matter in soil

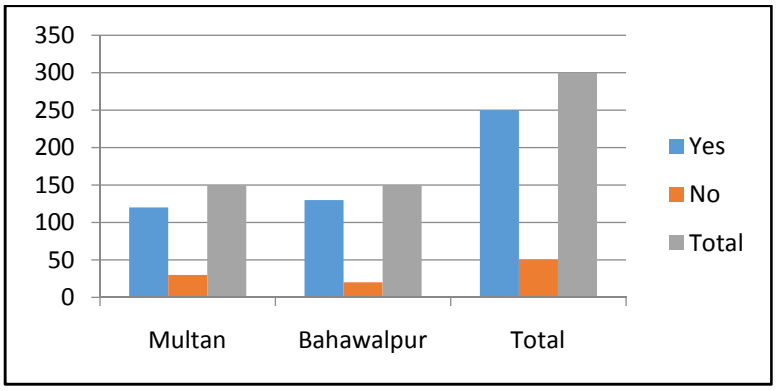

Figure 19: Soil erosion affects organic matter in soil

In this table the data collect soil erosion affects organic matter in soil. The number of positive response of district Multan 120 and heir percentage 80% and no response 30 and their percentage 20%. The number of positive response in district Bahawalpur 130 and their percentage 86% and no response 20 and their percentage 14%. The total positive response of both district 250 and their percentage 150% and no response of both district 50 and their percentage is 50%

Area of population	Sample	Response "Yes"	Percentage	Response No	Percentage
Multan	150	110	73%	40	27%
Bahawalpur	150	120	80%	30	20%
Total	300	230	230%	70	70%

Table 20: Organism involved in composting

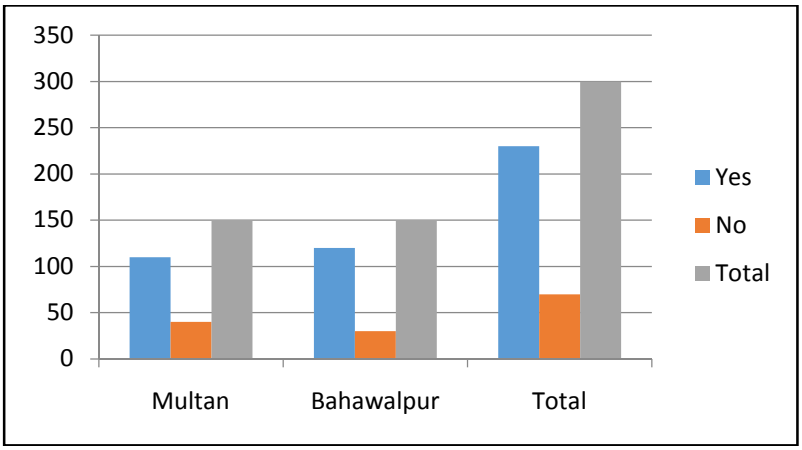

Figure 20

In this table the data collect organism involved in composting. The number of positive response of district Multan 110 and their percentage 73% and no response 40 and their percentage 27% .The number of positive response of district Bahawalpur 120 and their percentage 80% and no response 30 and their percentage 20%. The total positive response of both district 230 AND their percentage is 230% and no responses 70 and their percentage is 70%.

5. Conclusion and policy Implications

5.1. Conclusion

The cultivation area of Pakistan is 21.59 hectares of which small part is free from soil limitation. In Pakistan major part of cultivation land is not properly sustainable for agriculture growth. The major part of agriculture land is facing different types of problem. Land degradation is an important serious problem that is facing cultivation land of Pakistan. Physical chemical and biological are three types of land degradation process which effect soil quality. Different forms of land degradation are water logging and salinity soil compaction, soil erosion, nutrient depletion. These problems effect of our agriculture production because due to these problems our sustainable agriculture production is very low. When agriculture production low farmer income and employment also low. Soil is an important factor in the production of agriculture crop, forestry and horticulture. The capacity of a system that sustains productivity of agriculture defines the sustainability in agriculture. Sustainable soil management increases the agriculture production and decreases the risk of agriculture falling and minimizes land degradation.

Mostly developing country like Pakistan depend on agriculture sector, the importance of soil should not be ignored in these country. The developing country should be need to aware farmer about the impact of cultivation and soil uses on soil health. Farmer should be aware to use pointers values which linked to physical, chemical and biological health indicators. Green fertilizer crops raise soil biological matter which has enhanced soil health and crop growth. We concluded that the soil health play an important role in agriculture production because when the soil is free from the soil limitation such as water logging and salinity, soil erosion, and nutrient depletion the agriculture productivity is increase. Therefore soil health is very important for sustainable growth because when soil health is improved not only the agriculture production increases the farmer income and employment also increases. We should use the new technology better fertilizer and chemical for improving the soil condition. When these products are not use the soil health condition is not better and our production also remains low.

5.2. Policy Implications

Agriculture is very important for every country because agriculture production is use in every country. Most of the developing countries like Pakistan depend on agriculture. Mostly export of Pakistan consists of agriculture product. In Pakistan many policies making for improving soil health condition. We should make following policies for increasing agriculture productivity.

- The Govt should support farming people rising output in a maintainable method, and vend extra harvests, is the greatest operative method to decrease starvation and deficiency over the extended time. In Pakistan many institute established that help the poor farmer.
- The farmer should increase our agriculture production because when farmer produce more food there income also increase they feel improved able for our family. In Pakistan many agriculture institute established that guide the farmer about the agriculture
- The Govt should support agriculturist developing their crops necessities a comprehensive method that contains the practice of seeds that are additional resilient to illness, lack, and inundating; evidence since important limited foundations around extra creative agriculture methods and machineries; better contact to marketplaces; and management rules that help the benefits of agricultural family.

The Govt helping struggles to develop new and suitable tackles and agriculture performs into the hands of agriculturalist. This consists of better kernels and admittance to improved lands water and beef results. The Govt support agriculturalist association to support agriculturalist improve their commercial organization abilities increases salutation buying control and advertising influence and better

their harvests and reserve organization abilities. Extra imports comprise serving agriculturalists show their loadings and support farmer actions, encounter superiority and capacity pledges, relatives to extensive and dependable marketplaces, and found corporations by purchasers, computers, and agriculturalist association.

To attain the objective of maintainable cultivation efficiency our policy depends on robust corporation with contributor's nation, multifaceted organization, secluded substance and other association. While consolidation remaining corporation, we are construction fresh organization by nations which must established their individual cultivation part over technical and strategy invention and are progressively significant to farming development in the areas wherever we effort. Our general aim is to confirm that contributor and developing nation asset and rules provision maintainable smallholder's agriculturalist output.

6. References

i. Abawi, G.S., and Widmer, T.L. 2000. Impact of soil health management practices on soil borne pathogens, nematodes and root diseases of vegetable crops. Applied Soil Ecology 1

ii. Abraham, J. SOIL HEALTH IN DIFFERENT LAND USE SYSTEMS IN COMPARISON TO A VIRGIN FOREST IN A TROPICAL REGION OF KERALA.

iii. Agro ecosystem managemsent. Ecological Applications 11: 1573-1585.

iv. Ahmad, A., Mohd-Setapar, S. H., Chuong, C. S., Khatoon, A., Wani, W. A., Kumar, R., &Rafatullah, M. (2015). Recent advances in new generation dye removal technologies: novel search for approaches to reprocess wastewater.RSC Advances, 5(39), 30801-30818.

v. Ahmad, B., Ahmad, M., Gill, Z. A., &Rana, Z. Hs. (1998).Restoration of Soil Health for Achieving Sustainable Growth in Agriculture [with Comments]. The Pakistan Development Review, 997-1015.

vi. Andrews, S.S. and Carroll, C.R., 2001. Designing a soil quality assessment tool for sustainable

vii. Aparna, K., Pasha, M. A., Rao, D. L. N., &Krishnaraj, P. U. (2014). Organic amendments as ecosystem engineers: microbial, biochemical and genomic evidence of soil health improvement in a tropical arz

viii. Conant, R. T., Paustian, K., & Elliott, E. T. (2001). Grassland management and conversion into grassland: effects on soil carbon. Ecological Applications, 11(2), 343-355.

ix. Deb, S., Bhadoria, P. B. S., Mandal, B., Rakshit, A., & Singh, H. B. (2015). Soil organic carbon: Towards better soil health, productivity and climate change mitigation. Climate Change and Environmental Sustainability, 3(1), 26-34.

x. Ecosystems 14Saikia, P., Bhattacharya, S. S., &Baruah, K. K. (2015). Organic substitution in fertilizer schedule: Impacts on soil health, photosynthetic efficiency, yield and assimilation in wheat grown in alluvial soil. Agriculture & Environment, 203, 102-109

xi. Gupta, S., Kaushal, R., Kaundal, K., Chauhan, A., &Spehia, R. S. (2015).Efficacy of indigenous plant growth promoting rhizobacteria on capsicum yield and soil health. Research on Crops, 16(1), 123-132.

xii. Kamarudin, K. F., Tao, D. G., Yaakob, Z., Takriff, M. S., Rahaman, M. S. A., &Salihon, J. (2015). A review on wastewater treatment and microalgal by-product production with a prospect of palm oil mill effluent (POME) utilization for algae. Der PharmaChemica, 7(7), 73-89.

xiii. KORTHALS, G. W., Thoden, T. C., Van den Berg, W., &Visser, J. H. M. (2014). Long-term effects of eight soil health treatments to control plant-parasitic nematodes and Verticilliumdahliae in agro-ecosystems. Applied Soil Ecology, 76, 112-123.

xiv. Liste, H.H (2013). Soil-plant-microbe interactions and their implication for agriculture and environment 2Liste, H. H. (Doctoral dissertation, Habilitation thesis, Humboldt University, Berlin).

xv. Pardo, T., Clemente, R., Epelde, L., Garbisu, C., & Bernal, M. P. (2014). Evaluation of the phytostabilisation efficiency in a trace elements contaminated soil using soil health indicators. Journal of hazardous materials, 268, 68-76.one field site.Ecological Engineering, 71, 268-277.

xvi. Ramírez Gil, J. G., Agudelo, M. M., Bedoya, L. O., Osorio, N. W., & Osorio, J. G. M. (2015).Germination and growth of purple passion fruit seedlings under pre-germination treatments and mycorrhizal inoculation. PesquisaAgropecuária Tropical, 45(3).

xvii. Sharma, K. L., Sharma, S. C., Bawa, S. S., Singh, S., Chandrika, D. S., Sharma, V., ...&Ravindrachary, G. (2015). Combined effect of tillage and organic fertilization on soil quality key indicators and indices in alluvial soils of Indo-Gangetic Plains under rainfed maize–wheat system. Archives of Agronomy and Soil Science, 61(3), 313-327.

xviii. Singh, P., Devi, R., Hooda, R. S., &Grewal, M. S. (2014). Soil desurfacing: A potential threat to soil health, productivity and fertility. Research on Crops,15(3), 722-729.

xix. Wani, S. P., Chander, G., Sahrawat, K. L., Pal, D. K., Pathak, P., Pardhasaradhi, G., &Kamadi, P. J. (2016). Sustainable use of natural resources for crop intensification and better livelihoods in the rainfed semi-arid tropics of Central India. NJAS-Wageningen Journal of Life Sciences.

xx. Wyszkowska, J., Boros-Lajszner, E., Borowik, A., Baćmaga, M., Kucharski, J., &Tomkiel, M. (2016).Implication of zinc excess on soil health. Journal of Environmental Science and Health, Part B, 51(5), 261-270.

xxi. Xu, H., Su, H., Su, B., Han, X., Biswas, D. K., & Li, Y. (2014). Restoring the degraded grassland and improving sustainability of grassland ecosystem through chicken farming: a case study in northern China. Agriculture, Ecosystems & Environment, 186, 115-123.

Appendixes

Q 1: Effect on plant by soil increase
Q 2: Effect of microorganism on plant
Q 3: Effect on fungi on healthy plant growth
Q 4: Role of organism on plant
Q 5: Soil water holding capacity increase by soil organism
Q 6: Effect of poor soil health on plant
Q 7: Effect of water logging, salinity and sodicity on production
Q 8: Problems of land degradation
Q 9: Soil as a component of healthy environment
Q 10: Sources of organism effect on production
Q 11: Effect of earthworm in plowed soil
Q 12: Land has to space gain, water, air and organism
Q 13: Healthy soil should be used to test time to time
Q 14: Soil degradation serious effect on production in long run
Q 15: Buffer effect on moisture and temperature
Q 16: Ecosystem services life on earth
Q 17: soil effect on climate change
Q 18: Organic matter improved soil fertility
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Q 20: Organism involved in composting