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**Anamika Singh**  
College of Home Science  
C.S. Azad University of  
Agriculture and Technology,  
Kanpur, Uttar Pradesh, India

**Neelma Kunwar**  
College of Home Science  
C.S. Azad University of  
Agriculture and Technology,  
Kanpur, Uttar Pradesh, India

**Shalini Gupta**  
College of Home Science  
C.S. Azad University of  
Agriculture and Technology,  
Kanpur, Uttar Pradesh, India

**Correspondence**  
**Anamika Singh**  
College of Home Science  
C.S. Azad University of  
Agriculture and Technology,  
Kanpur, Uttar Pradesh, India

### Role of women in soil testing technique and effect of good soil quality

**Anamika Singh, Neelma Kunwar and Shalini Gupta**

#### Abstract

Soil conservation is important because soil is crucial for many aspects of human life as it provides food, filters air and water and helps to decompose biological waste into nutrients for new plant life. Soil conservation involves working to reduce contamination and depletion. Certain human activities can result in the erosion of soil, such as land being cleared for farming or timber. These practices can also affect the quality of the soil. One way to help increase quality is to rotate crops frequently or to add materials back into the soil. Soil conservation is the essence of soil management. To conserve means to protect from loss and harm. Hence soil conservation means to protect the soil from both loss and harm. Organic farming practices propagate soil conservation by reducing both soil loss and soil harm.

**Keywords:** Testing, techniques, effect

#### Introduction

Soil conservation refers to various management strategies that are put in place for protecting soil from various factors. For instance, soil conservation helps to avoid soil erosion or damage to soil by salinization, acidification or overuse. By conserving soil, the following rewards are gained. Soil conservation practices are tools the farmer can use to prevent soil degradation and build organic matter. These practices include: crop rotation, reduced tillage, mulching, and cover cropping and cross-slope farming. Soil is the most important resource on which agriculture is based. Proper management of this valuable resource is vital to sustain long-term agricultural productivity. Unfortunately, soil erosion is usually only identified as a problem when channels are cut through fields that are so deep they restrict cultivation practices. In fact, soil erosion occurs at unsustainable levels when small rills are recognizable in a field. Soil loss is not only a problem for the farmer, with the loss of organic matter and fertility; it is also an environmental problem. Sediment entering streams can destroy fish habitat and water quality especially when soil particles contain contaminants such as pesticides or nutrients. Soil conservation is important because soil is crucial for many aspects of human life as it provides food, filters air and water and helps to decompose biological waste into nutrients for new plant life. Soil can be drained away or contaminated, destroying it for use. Soil conservation involves working to reduce contamination and depletion. Certain human activities can result in the erosion of soil, such as land being cleared for farming or timber. These practices can also affect the quality of the soil. One way to help increase quality is to rotate crops frequently or to add materials back into the soil. Soil Conservation Techniques such as Contour Farming, Mulching, Crop rotation, Strip cropping, contour strip cropping, field strip cropping, Dry farming Method, Basin Listing, Sub Soiling, Contour trenching, Terrace outlet, Gully Control, Ponds, Stream bank protection etc.

#### Objectives

1. To study the Socio economic status of farm women on the basis of land owned.
2. To study the effect of good soil quality on production, environment and healthy human life.
3. To suggest suitable soil conservation techniques for food security and our sustainable future.

## Methodology

The study was conducted in Faizabad district of Uttar Pradesh. Two blocks were randomly selected (Masoddha and Bikapur). 10 villages were randomly selected from both blocks. Total sample size 300 farm women were selected. Dependent and independent variables were selected in this study such as age, caste, education, religion, income, land holding, family type etc. and dependent variables were such

as soil, soil testing, organic farming, crop production, farm inputs, awareness, knowledge, environment, healthy human life, soil conservation etc. The statistical tools were used such as percentages, mean score, weighted mean, rank, paired 't' test and correlation coefficient.

## Results

**Table 1:** Distribution of farm women according to their education N=300

Education level	Frequency	Per cent
Illiterate	-	-
Primary	110	36.7
High School	65	21.7
Intermediate	40	13.3
Graduate and above	85	28.3
Total	300	100.0

Education is the most important factor in agricultural development. Educational level of women is the main carrier in modern agricultural practices such as transplanting, seed treatment, use of seed drill and modern grain storage methods. The lack of knowledge and education render the majority of women in India vulnerable, as dependents on the growth and stability of the agricultural practices. Generally most of the women working in agriculture areas are uneducated but now days this situation change dramatically. The level of education in women increases gradually. Educated women have done agricultural operations more scientifically as compared to uneducated women. All educated women were easily understood and adopt farming technologies. Education level of women plays a key role in soil conservation and agriculture sustainability also. Illiteracy was the main barrier in adopting new farming technologies. Uneducated women do not easily understand and adopted new technologies of improving soil quality. They are more rigid about their traditional technologies.

**Table 2:** Distribution of farm women according to soil testing N=300

Sl. No.	Soil testing	Frequency	Per cent
1.	On own farm	255	85.0
2.	Laboratory	45	15.0
	Total	300	100.0

Soil test to one or more of a wide variety of soil analyses conducted for one of several possible reasons. Possibly the most widely conducted soil tests are those done to estimate the plant-available concentrations of plant nutrients, in order to determine fertilizer recommendations in agriculture. In agriculture, a soil test commonly refers to the analysis of a soil sample to determine nutrient content, composition, and other characteristics such as the acidity or pH level. A soil test can determine fertility, or the expected growth potential of the soil, which indicates nutrient deficiencies, potential toxicities from excessive fertility and inhibitions from the presence of non-essential trace minerals. The test is used to mimic the function of roots to assimilate minerals. Tap water or chemicals can change the composition of the soil, and may

need to be tested separately.

**Table 3:** Distribution of farm women according to number of soil testing in a year N=300

Sl. No.	Year wise soil testing	Frequency	Per cent
1.	Every year	165	55.0
2.	Alternate year	95	31.7
3.	Before 5 year	40	13.3
	Total	300	100.0

Soil testing is a management practice that helps identify the variability of nutrient content within a field and among different fields on a farm. Soil analysis is a valuable tool for farm as it determines the inputs required for efficient and economic production. A proper soil testing was helping ensure the application of enough fertilizer to meet the requirements of the crop while taking advantage of the nutrients already present in the soil. Soil testing is also a requirement for farms that must complete a nutrient management plan. Every year soil testing combined with a good record-keeping system for each field serves as a gauge to indicate whether soil fertility is increasing, decreasing, or remaining constant. Soil tests were is completed every 2-3 years for most crops. For crops grown on very sandy soils particularly if the crops remove large quantities of potassium such as corn, farmers was done soil test every 1-2 years. Soil testing is one of the most important practices for crop production in the new millennium. When soil testing done at alternate year it allowing to future productivity and portability. Farmers were support to use soil testing as a tool for making scientifically sound management decisions about their soil fertility. Soil testing benefits the farmer in many ways. Soil testing was ideally done every 4-5 years, and the best one to take a soil sample is in the fall, but anytime the soil is dry work. When soil testing done at 5 years interval it is important that several sample cores are collected, often more than what is typically the norm in row crops. The reason variability across a pasture can be extreme. Animal activities and habits present a huge source of variation in pastures. Areas around winter feeders, shade trees and water source have higher soil test level.

**Table 4:** Distribution of farm women according to use of organic and inorganic fertilizers/manures

Sl. No.	Fertilizers/manures	Always	Sometimes	Never	Mean score	Rank
1.	Organic fertilizers					
	(a) Compost	300(100.0)	-	-	3.00	I
	(b) Vermi compost	120(40.0)	30(10.0)	150(50.0)	1.90	VI
	(c) Enriched farm yard manure	240(80.0)	15(5.0)	45(15.0)	2.65	II
	(d) Oil meal	135(45.0)	45 (15.0)	120(40.0)	2.05	III
	(e) Peat	120(40.0)	30(10.0)	150(50.0)	1.90	VI
	(f) Sewage sludge	120(40.0)	60(20.0)	120(40.0)	2.00	IV
	(g) Animal waste	90(30.0)	45(15.0)	165(55.0)	1.75	VII
	(h) Plant waste	120(40.0)	45(15.0)	135(45.0)	1.95	V
2.	Inorganic fertilizers					
	(a) Urea	300(100.0)	-	-	3.00	I
	(b) DAP	300(100.0)	-	-	3.00	I

(Figures in parenthesis indicate the percentage of respective value)

Organic farming is useful and it is a practice of cultivating crops that involves various methods that are eco-friendly in nature. It is a form of agriculture that depends on techniques such as crop rotation, green manure, compost and biological pest control. Compost is beneficial to plant growth. Compost bears little physical resemblance to the raw material from which it originated. Compost is an organic matter resource that has the unique ability to improve the chemical, physical, and biological characteristics of soils. Vermi-culture is the side issue of the breeding of common earthworms for use in vermicomposting. The use of worm farms for vermicomposting is becoming a favorite way of converting waste to a valuable product while also growing more worms to increase the capacity of the worm farms. Manures are plant and animal wastes that are used as sources of plant nutrients. They release nutrients after their decomposition. Major sources of manures such as cattle shed wastes dung, urine and slurry from biogas plants, human habitation wastes night soil, human urine, town refuse, sewage, sludge and sullage, poultry jitter, droppings of sheep and goat, slaughter house wastes bone meal, meat meal, blood meal, horn and hoof meal, fish wastes, byproducts of agro industries oil cakes, bagasse and press mud, fruit and vegetable processing wastes etc. Oil is extracted from oilseeds, the remaining solid portion is dried as cake which can, be used as manure. Peat moss is very common in gardening so it is important to understand what it is, how it works and how to use it to make our crop plants thrive. Peat moss is a highly absorbent material. It can retain water much better than other types of soils. This is a great

agent to include in our farm soil. Peat moss provides a sterile medium, which is ideal for planting and growing crop. Careful use of sewage sludge is necessary to ensure pathogens, nutrients and heavy metals do not contaminate ground water. Typically, farmers use sewage sludge to grow crops and crops for animal feed. Food crops that do not touch the ground and are harvested at least six months after application, such as wheat, also may be grown with sewage sludge. Sewage sludge can be composted by mixing sludge cake with other organic bulking agents such as straw, bark or green waste, in an aerobic composting plant. They have been advocated as useful amendments in horticultural and agricultural applications in the India. Animal waste contains many beneficial constituents that if recycled effectively, can be used as fertilizer for crops, fodder for animals and to produce energy. Animal manure is rich in nitrogen, phosphorus and potassium. In addition to providing supplemental nutrients for crop growth, manure has several beneficial effects on soil properties. Plant wastes are basically unusable substances, which may be either liquid or solid produced as result of cultivation processes such as fertilizers, pesticides, crop residues and animal waste. Plant waste is part, of the ecological cycle in which everything is cycled and recycled such that an interdependent relationship is maintained in the eco-system. Inorganic fertilizers are also sometimes referred to as chemical or synthetic fertilizer because their plant providing nutrients have been synthesized or manufactured in a laboratory or refinery. One advantage inorganic fertilizers offer is that they are fast acting.

**Table 5:** Distribution of farm women according to effect of healthy soil on production

Sl. No.	Effect on production	Yes	No	Mean score	Rank
1.	Increasing production of crop	300(100.0)	-	2.00	I
2.	Improving quality of crops	300(100.0)	-	2.00	I
3.	Agriculture sustainability	210(70.0)	90(30.0)	1.70	V
4.	Controlling plant diseases insects and weed pests	240(80.0)	60(20.0)	1.80	IV
5.	Produce chemicals that stimulate plant growth	255(85.0)	45(15.0)	1.85	III
6.	Reduce the crop damage	285(95.0)	15 (5.0)	1.95	II

(Figures in parentheses indicate the percentage of respective value)

The benefits of healthy soil in sustaining crop production are most evident when growing conditions are less than ideal. Healthy soils increase the capacity of crops to withstand weather variability, including short term extreme precipitation events and intrapersonal drought. Increasingly highly variable weather condition present increased risks to crops and require more careful attention on conservation planning to mitigate impacts on soil health and crop productivity. Soil health is the level to which it is able to continually provide multiple

functions to sustain plants, animals and humans' lives. The complex biological, physical and chemical interlink of a healthy soil can influence plant water availability under dry condition, off field nutrient losses to nearby streams during rain events, and the availability of nutrients through nutrient cycling for food and fiber production. Healthy soil maintains or enhances water and air quality through the improvement of soil carbon and water infiltration and support human health and wildlife habitat.

**Table 6:** Distribution of farm women according to used soil conservation techniques

Sl. No.	Conservation techniques	Always	Sometime	Never	Mean score	Rank
1.	Contour farming	-	6(2.0)	294(98.0)	1.02	IX
2.	Mulching	240(80.0)	30(10.0)	30(10.0)	2.70	III
3.	Crop rotation	300(100.0)	-	-	3.00	I
4.	Strip cropping	300(100.0)	-	-	3.00	I
5.	Contour strip farming	-	3(1.0)	297(99.0)	1.01	X
6.	Field strip cropping	30(10.0)	9(3.0)	261(87.0)	1.23	VII
7.	Dry faring method	-	3(1.0)	297(99.0)	2.30	X
8.	Basin listing	105(35.0)	15(5.0)	180(60.0)	1.75	V
9.	Sub soiling	292(97.3)	6(2.0)	2(0.7)	2.97	II
10.	Contour trenching	-	3(1.0)	297(99.0)	1.01	X
11.	Terrace outlet	-	6(2.0)	294(98.0)	1.02	IX
12.	Gully control	12(9.0)	15(5.0)	273(91.0)	1.13	VIII
13.	Ponds	105(35.0)	45(15.0)	150(50.0)	1.85	IV
14.	Stream Bank protection	30(10.0)	15(5.0)	255(85.0)	1.25	VI

(Figures in parentheses indicate the percentage of respective value)

Soil conservation is the preventing of soil loss from erosion or reduced fertility caused by over usage, acidification, Saltinization or other chemical soil contamination. Slash and burn and other unsustainable methods of subsistence farming are practiced in some lesser developed areas. A sequel to the deforestation is typically large scale erosion, loss of soil nutrients and sometimes total desertification. Techniques for improved soil conservation include crop rotation, cover crops, conservation tillage and planted windbreaks and affect both erosion and fertility. When plants, especially trees, die, they decay and become part of the soil. Soil techniques are essential for growing all types of crops. Some techniques are useful for cropping pattern.

### Conclusion

Soil testing is very important methods for farmers and helps to farmers and farm women in determine fertilizers requirement for soil. Soil test results taken over time also allow farm women to follow changes in soil properties over time. Soil testing assesses the capacity of the soil to support plant growth and establish current soil nutritional status. Diagnose plant nutrient deficiencies/toxicities and make informed decisions for soil management and fertilizer applications to maximize yields and profits. It indicate the ameliorants required to correct physical or chemical soil imbalances and monitor soil fertility; ensure we are not mining soil, building soil health and fertility. Woman plays a vital role in agricultural activities such as sowing, transplanting, weeding, irrigation, fertilizer application, plant protection, harvesting, winnowing, storing etc. Women play an important role in growing crop; the preparation of the land consists of manually cleaning the soil and burning the remaining weeds. After the burning, the stubble and the ashes are turned into the soil. Women participate in various agriculture practices such as preparation of soil, cleaning of soil, burning the remaining weeds, loosening of soil, ploughing, levelling and manuring etc. farm women used organic fertilizers such as compost, plant manure, animal manure at household level and improve soil quality. Rural women combine traditional and modern forms of farming so that the specific results are shown. Women play a huge role in preparation of soil for a healthy crop production.

### Recommendations

1. Government should established soil testing laboratory at village level and give information of soil testing benefits to farm women.
2. Promote the use of chemical fertilizers would remain the

mainstay of agriculture production in future as well given the increasing food demand of growing population but at the same time balance proportion is required for use in an integrated manner.

3. Government should provide pesticides free of cost to lower income group of farm women and give information about use of pesticides to better agriculture results.

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