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WOMEN'S ENGAGEMENT IN SOIL AND WATER CONSERVATION: A RESEARCH PERSPECTIVE

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ABSTRACT

The sustenance of life on earth relies heavily on essential natural resources such as soil and water, integral components of the environment. The conservation and management of these natural resources should be essential for survival of humankind. Women emerge as pivotal contributors to this conservation effort due to their traditional engagement with daily activities intimately connected to natural resources, fostering a reduction in waste and excessive consumption. Despite their significant role, governmental attention towards encouraging women's involvement in natural resource conservation remains disproportionately minimal. In response to this gap, the study investigates the extent of women's participation in soil and water conservation in Banaskantha district of Gujarat. A sample of 180 women respondents was randomly chosen for the study, and the quantitative data was carried out through the use of an interview schedule. The research indicates a moderate level of women's engagement in soil and water conservation practices. Notably, women demonstrate the highest participation during the execution phase of soil conservation, while their involvement in planning and decision-making stages remains largely invisible. Similarly, in water conservation, women's participation was notably lower not only during the planning phase but also in the execution phase. The study concludes by emphasizing the urgency for policy planners, government bodies, and other institutions to actively promote and encourage women's participation in policy-making and planning processes. This can be achieved through targeted efforts such as additional exposure, awareness campaigns, and training programs. By enhancing the role of women in these critical aspects, society can harness their valuable insights and contributions towards ensuring the productive and efficient use of natural resources for the benefit of current and future generations.Top of Form

Keywords*: women, natural resources, water and soil conservation, participation*

INTRODUCTION

Natural resources are nature's gift to humanity to help people to live a comfortable and peaceful life. Natural means a group of elements found in nature and not controlled by human. Any material termed as resources provided by the nature that can be transformed into more variable goods. Thus, Natural resources are the items that exist freely in nature for human use and do not require mankind's action for their generation or production. Soil and water are the necessary natural resources that support life in all forms and are crucial for sustainable agricultural production (Chaudhary et al. 2022; Parmar et al. 2022; Tankiwala et al. 2022)

India has abundant natural resources, and its economy depends mainly on the proper exploitation of these resources. Sadly, available natural resources are not harnessed to its optimum for development. These days, the biggest concern before us is the fast depletion of natural resources, such as forests, soil, water, wildlife, oil, petrol, etc. Deforestation, depletion of oil and gas, shortage of water and power, erosion resulting in lack of agricultural growth, are all contributing to environmental issues like heating and environmental pollution which ultimately threatened the economic and social security of individual, communities, and countries (Vinaya et al., 2022).

The main reason for this depletion is improper and excessive use of natural resources which puts a tremendous strain on them. Therefore, planned management and conservation of natural resource is exceptionally essential for the survival of humankind. Proper use, improvement and protection of natural resources in a wise manner are called conservation. It is defined as the protection, improvement and use of the natural resource with the condition that there should be maximum economic and social benefits. Conservation is achieved through alternative technologies, reducing waste and spoilage, implies consumption of the conserved resource, and derivation of a community's highest economic and social benefits on continuity or long-term basis.

Soil and water conservation is essential to control nutrients loss from agricultural land, prevent contamination of water bodies, reduce sedimentation rates in reservoirs, rivers, canals and ditches and limit crop damage by wind-blown deposits or burial beneath the water (Tantoand Laekemariam, 2019). Interest in controlling soil erosion and maintaining soil quality has been driven by renewed awareness that soil is vital for both food and fibre production and the global ecosystem.

To underscore the importance of natural resource conservation, "World Nature Conservation Day" is celebrated globally on July 28th, aiming to create awareness about the need for safeguarding natural resources. Recognizing the urgency of the situation, governments worldwide have made concentrated efforts to maintain and preserve the natural environment and its resources for the benefit of all humankind.

However, the success of any conservation program depends on the participation of local people and community, especially women who play a critical role in the conservation of natural resources. Women manage water, a source for fuel, food, and both forests and agriculture terrain. They are intimately connected to nature, have vast experience in using and managing natural resources. (Das, 2022). Despite their consistent efforts to protect and promote these resources for human survival, their needs and roles are often overlooked in conservation projects. Traditional gender relations result in the underestimation of women in natural resource decision-making processes and programs, rendering their roles invisible at all levels of planning and decision-making. Their role is still invisible at all level of planning and decision making in natural resource conservation. This study seeks to address this oversight by exploring and understanding the pivotal role of women in natural resource conservation, with a specific focus on soil and water conservation in the Banaskantha district of Gujarat.

OBJECTIVE

To study the role of women in soil and water conservation in the Banaskantha District.

METHODOLOGY

The research was conducted in the Banaskantha district of Gujarat, encompassing a total of 14 talukas. Through a multistage random sampling approach, three talukas—Dantiwada, Danta, and Vav—were randomly chosen for the study. Further, three villages were randomly selected from each taluka, resulting in a total of nine villages being included in the research. Within each village, 20 respondents were randomly selected, leading to a total of 180 respondents participating in the study. The respondents comprised rural women.

The data collection process involved the utilization of an interview schedule focused on gathering information about the role of women in soil and water conservation. The personal interview technique was employed for data collection. Following the collection, the data was meticulously categorized, coded, and analyzed in accordance with the research objectives. The analytical methods included computing frequency, percentage, mean, standard deviation, mean percent score, correlation and paired sample 't' test to comprehensively analyse the data.

RESULTS& DISCUSSION:

Role of women in soil conservation

The findings presented in Table 1 offer a comprehensive understanding of the varied levels of involvement exhibited by the respondents in diverse soil conservation practices. Notably, practices such as "growing different crops on the same pieces of land year by year" and "plantation of crops for covering the soil" stand out with an exceptionally high Mean Percent Score (MPS) of 96.94, positioning them at the forefront of the rank order.

A substantial portion of respondents, (MPS 91.94), engaged significantly in "cropping pattern and rotation," securing the third rank. Following closely, the practices of "planting trees/shrubs or tall grasses and intercultural operations" and "decomposing the wastage part of the crop into the field for soil conservation" attained the fourth rank, each with an MPS of 91.39, as reported by the respondents. This indicates a strong engagement of the respondents in these fundamental conservation activities, highlighting their awareness and commitment to sustainable agricultural practices.

Moving down the hierarchy, the role of the respondents in "*Compost preparation"* (87.50) and "*Planting windbreak on dry land"* (78.89) were holding sixth and seventh ranks, respectively indicating a commendable but slightly reduced engagement in these particular activities. The respondents found a reasonable degree of involvement in relation to "*Fencing for the protection of crop from animals" (*78.06) recorded in the eighth order followed by "*Sowing improved vegetable seeds/ crop in the field"* (77.78),"*Growing grazing field and erosion resistant plant*(75.83), *Selection of fruit plants or crop or seeds* (75.28), *Forming mulch attached to the soil* (68.89), *Implication of furrow method of sowing"* (61.67) and "*Making small clay barriers"* (55.28) which were awarded ninth, tenth, eleventh, twelfth, thirteenth and fourteenth ranks, respectively. These results suggest a

Table 1: Role of women in soil conservation (n= 180)

Sr. No.	Statements	MPS	Rank
1	Growing different crops on the same pieces of land year by year	96.94	1.5
2	Plantation of the crop for covering the soil	96.94	1.5
3	Involvement in cropping pattern and rotation	91.67	3
4	Planting trees/ shrubs or tall grasses and intercultural operations	91.39	4.5
5	Decompose the wastage part of the crop into the field for soil conservation	91.39	4.5
6	Compost preparation	87.50	6
7	Fencing for protection of crop from animals	78.89	7
8	Planting windbreak on dry land	78.06	8
9	Sowing improved vegetable seeds/ crop in the field	77.78	9
10	Growing grazing field and erosion resistant plant	75.83	10
11	Selection of fruit plants or crop/seeds	75.28	11
12	Forming mulch attached to the soil	68.89	12
13	The implication of the furrow method of sowing	61.67	13
14	Making small clay barriers	55.28	14
15	Estimation of tentative cost for soil conservation structure	04.72	15
16	Preliminary meeting organized before initiated work related to conservation of soil.	04.44	16
17	Formulation of a plan for soil conservation	01.94	17

diminishing but noteworthy participation in more specialized conservation activities.

Notably, the roles of respondents were found to be considerably meagre in certain practices such as *Estimation of tentative cost for soil conservation structure* (4.72), *Preliminary meeting organized before initiated work related to conservation of soil* (4.44) and *formulation of a plan for soil conservation* (1.94), occupying fifteenth, sixteenth and seventeenth ranks, respectively in the hierarchy. This suggests a potential gap in the understanding, planning, and financial aspects of soil conservation efforts among the respondents. This could be attributed to lack of a platform for women to express their need and perspectives, lack of interest in government programmes, coupled with inadequate training and limited policymaking capacity among women, contributes to their marginalized role in the planning aspects of soil conservation initiatives.

The findings above suggest that women had a more significant role in the execution activities for soil conservation, their involvement in planning remains negligible. This low participation may stem from factors such as illiteracy, cultural barriers, prejudices, traditional constraints, and a lack of confidence. The prevailing male dominance system and common myths about women's capabilities further contribute to their exclusion from the planning phase, resulting in their overall neglect in decision-making processes related to soil conservation.

These conclusions align with the findings of Bayu (2021), indicating that less women involved in decision -making process regarding soil and water conservation initiatives.

Role of women in water conservation

It is evident from the Table 2 that the respondents' overall role was found very high in "*Digging pond for collecting rainwater"* with (90.72) top rank. Women's active involvement in "*Constructing embankment across the land Slope*" (80.61) and *"Preliminary meeting organized before initiated work related to conservation"* (70.22) were accorded second and third ranks, respectively. The role in "*constructing bunds/dams or barriers on small streams and long gullies*" (30.89), "*Making fencing around the catchment area"* (30.61) and "*Digging trenches, collecting stones, and tying the stone upright"* (20.78)were ranked fourth, fifth and sixth respectively by the respondents. However, when it comes to the *formulation of the plan, Estimation of tentative cost for water conservation structure* (01.94),*Constructing water tank for storage of rainwater*, *site selection for water conservation,* the role of women was significantly lower (01.56) with seventh, eighth, ninth and tenth ranks respectively. This suggests a noticeable disparity in women's participation in strategic planning aspects related to water conservation initiatives.

Table 2: Role of women in water conservation (n=180)

Sr. No.	Statements	MPS	Rank
1	Digging pond for collecting rainwater	90.72	1
2	Constructing embankment across the Land Slope	80.61	2
3	Preliminary meeting organized before initiating work related to conservation	70.22	3
4	Constructing bunds/dams or barriers on small streams and long gullies	30.89	4
5	Making fencing around the catchment area	30.61	5
6	Digging trenches, collecting stones, and tying the stone upright	20.78	6
7	Formulation of plan	01.94	7.5
8	Estimation of tentative cost for water conservation structure	01.94	7.5
9	Construction of water tank for storage of rainwater	01.56	9.5
10	Site selection for water conservation	01.56	9.5

The above findings conclude that women's involvement in the execution activities of water conservation is relatively low, influenced by the sandy soil nature of the region, limiting rainwater storage capabilities for over half of the winter season. Similarly, women's participation in the planning phase of water conservation, including tasks like plan formulation, cost estimation, tank construction, and site selection, was also observed to be less prominent. This diminished engagement in planning activities can be attributed to factors such as limited confidence in public speaking, lower levels of education, a lack of recognized authority, restricted opportunities for participation, and the tendency to disregard their opinions.

These observations align with the outcomes of Bayu (2021), indicating a consistency in the challenges faced by women in actively contributing to both the execution and planning stages of water conservation initiatives.

Distribution of the respondents based on their role in soil and water conservation

Table 3: Distribution of the respondents based on their role in soil and water conservation (n= 180)

Sr. No.	Role	*F*	%
1	**Low level** (< 19.45 score)	62	34.7
2	**Medium level** (19.45 – 27.71 score)	96	53.1
3	**High level** (> 27.71 score)	22	12.2
Mean= 23.58		SD= 4.13	

To get an overview of the women's participation in soil and water conservation, the respondents were classified into three levels: low, medium, and high based on mean score and standard deviation.

A closer look at the data (Table 3) reveals that the majority of respondents, accounting for 53.1%, fell into the medium category, signifying a moderate level of involvement. Meanwhile, 34% of women were reported to have a low role, suggesting a lesser degree of engagement in natural resource conservation. On the other hand, 12% of women were observed to have a high role, indicating a more substantial contribution to the conservation efforts.

This distribution highlights the diversity in the level of women's engagement in soil and water conservation initiatives within the studied population. Overall, it is concluded that a significant proportion of women exhibited a moderate level of involvement in soil and water conservation. This finding could potentially be attributed to factors such as limited literacy, lack of awareness about conservation practices, and a restricted role in decision-making processes at various societal levels, all of which contribute to a diminished status in society. Moreover, the insufficient rainfall in the Banaskantha district emerged as an additional deterrent for the adoption of soil and water conservation practices. These findings align with the observations made by Mago and Gunwal (2019) in their study.

Correlations between women's involvement in soil conservation and water conservation practices

The Table 4 illustrates that the correlation coefficient between soil conservation and water conservation practices (r=0.651) is non-significant (p=0.651), Therefore, it can be inferred that there is no discernible relationship between women's involvement in soil conservation and water conservation.

Table 4: Correlations between Women's Involvement in Soil Conservation and Water Conservation Practices

Correlations Coefficient	Soil Conservation	Water Conservation
Pearson Correlation	1	0.034
P value		0.651
n	180	180

Interestingly, women highly engaged in soil conservation practices appear to be less involved in water conservation practices.

Paired Samples t in Soil Conservation practices and Water Conservation practices

The Table 5 presents the results of a paired samples t-test comparing soil and water conservation practices. The mean for soil conservation practices and water conservation practices are 13.39 and 0.82 respectively.

Table 5 : Paired Samples t-test Comparing Women's Involvement in Soil Conservation and Water Conservation Practices

Variables	Mean	N	Std. Deviation	Std. Error Mean	Mean difference	t	P value
Soil Conservation	13.39	180	2.286	0.170	12.58	65.217	P < 0.001
Water Conservation	0.82	180	1.292	0.096			

The Table revealed that a p-value between soil conservation practices and water conservation practices found to highly significant. Consequently, it can be concluded that a highly significant difference exists between women's involvement in soil conservation and their participation in water conservation practices.

CONCLUSION

In nutshell, women actively contributed to soil conservation compared to water conservation, with maximum involvement seen in the execution stage and minimum participation in the planning stage for soil conservation. Conversely, women had relatively less involvement in both planning and execution stages for water conservation. To address this, it is crucial for policymakers, governments, and institutions to take deliberate steps in promoting women's participation in decision-making processes for the efficient use of natural resources.

RECOMMANDATIONS

Based on the study findings, it is recommended to establish a mandatory quota for women's representation in user committees, allowing their active involvement in site selection, plan formulation, and meeting organization related to soil and water conservation. Furthermore, there is a need to educate women on water conservation practices through training and interactive media. Implementing strategies such as targeted awareness programs, skill-building initiatives, and community-based planning could contribute to fostering a more comprehensive and sustainable approach to soil and water conservation in the studied population.

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CONFLICT OF INTREST

The authors declare that there are no conflicts of interest regarding the publication of this paper.

REFERENCES

Bayu E.K. (2021). Determinant Variables for Women's Participation in Soil and Water Conservation (SWC) Practices in North Western Ethiopia,*Air, Soil and Water Research*, 13: 1-16.

Chaudhary, R. H., Patel, J. K. and Trivedi, R. R. (2022) Relationship between selected characteristics of the farmers and their level of knowledge regarding the soil health management practices. *Guj. J. Ext. Edu.* 34(1):38-45.

Das U. (2022).Role of women in Environment protection, *Int. J. Polit. Sci. Gov.*, 4(2): 125-128.

Mago P. and Gunwal I., (2019), Role of women in environment conservation, *Journal of Social Science Research network*, 8**.** https://doi.org/10.2139/ssrn.3368066

Parmar, R. S., Mehra, V. I. and Kamani, G. J. (2022) Analyzing soil fertility using data mining techniques. *Guj. J. Ext. Edu.*, 34(2):47-50. https://doi.org/10.56572/gjoee.2022.34.2.0011.

Tankiwala, A. K., Naik, R. M. and Patel, M. J. (2022) Farmers awareness level about soil related issues and its causes. *Guj. J. Ext. Edu.*,34(2):120-123. https://doi.org/10.56572/gjoee.2022.34.2.0026.

TantoT.and LaekemariamF. (2019). Impact of soil and water conservation practices on soil property and wheat productivity in Southern Ethiopia, *Env. Syst. Res.*, 13(8): 1-9.

Vinaya Kumar, H. M., Aishwarya P. and Patel, J. B. (2022). Gender, Climate Change, Food and Nutritional Security: A Nexus Approach. Conference: SEEG National Seminar on "Synergetic Extension Approaches for Livelihood Improvement and Agricultural Development"At: Junagadh Agricultural University, Junagadh (Gujarat), India. 57-66.

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