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Assessing the Impact of the Soil health Card Scheme on Agricultural Practices: A Study of Amravati district

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Abstract:

The Soil Health Card Scheme was introduced by the Government of India to promote soil-health assessment and provide farmers with recommendations for appropriate nutrient management. The present study examines the accessibility and use of the Soil Health Card Scheme, with special reference to Amravati district, Maharashtra. The study adopts a descriptive and analytical research design based on primary data collected from 75 farmers through a structured questionnaire, supported by secondary data from official government sources and relevant research publications. The finding reveals those 66 respondents (88%) reported not having a Soil Health Card, while 61 respondents (81.33%) stated that they did not check soil quality during sowing. This indicates that farmers have a limited approach towards soil testing before sowing crops. There may be several reasons behind this. One of the important reasons could be the relatively slow adoption of innovations among farmers. The annual income of farmers also suggests that the cost of soil testing may not be affordable for some of them. Furthermore, 70 respondents (93.33%) reported that soil-testing laboratories were not available near their farms or at the village level. This shows that soil testing laboratories are very limited at the village level, making it difficult for farmers to access soil testing services conveniently. The study emphasizes the importance of examining farmers' practical experiences alongside administrative integrity on scheme implementation. It suggests that improving access to soil-testing services and strengthening farmers' understanding of soil-health recommendations need further attention. The findings are limited to the surveyed respondents and cannot be generalized to the entire district without an appropriate sampling design.

Keywords: Soil health card, Soil testing laboratory, Perception, Awareness, digital divide.

Introduction:

Agricultural Economics is an applied field of economics which analyses the principles of choice applied to the use of scarce resources such as land, labour, capital and management in the farming and allied agricultural activities. As a social science in agricultural Economics, we study farmers' activities, decisions and functioning which are greatly influenced by society. The society in turn is equally affected by the farmers decisions. To the extent farmers' decisions are affected by his own psychology, social institutions

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and other religious taboos, their activities cannot be measured in such a precise manner as are possible in a laboratory experiments.

Agriculture remains the primary source of livelihood for approximately 58% of India's population. Agriculture and allied activities continue to play a stabilising role in India's growth cycle by supporting rural demand and income security. According to the official Press Information Bureau data, the Gross Value Added (GVA) of India's agriculture and allied sector for 2025-26 is estimated at Rs. 52,08,800 crores, registering a growth rate of 2.4%. The sector is estimated to grow by 3.1% in FY26, supported by a favourable monsoon during H1 FY26. Agricultural GVA expanded by 3.6% in H1 FY26, higher than the 2.7% growth recorded in H1 FY25, reflecting improved crop performance. India has the second largest arable land area globally, covering 141.1 million hectares, second only to the United States. However, with a growing population, the demand for higher food production continues to exert immense pressure on soil resources.

Soil health is a critical for sustainable agricultural productivity. In order to achieve a land that is truly "Sujalam, Suphalam," it is necessary to nurture the soil. The Soil health card scheme is a step towards fulfilling this dream. The Soil Health Card Scheme was launched by PM Narendra Modi on 19 February 2015 at Suratgarh, Rajasthan. The scheme has been introduced to assist State Governments to issue soil health cards to all farmers in the country. The Scheme provided farmers with printed reports detailing the nutrient status of their land and recommended fertilizer dosages. The Core objective of scheme is to promote judicious use of chemical fertilizers, reduce soil degradation, and improve crop yields through integrated nutrient management. Each card tests for 12 specific parameters, including macronutrients (Nitrogen, Phosphorous, Potassium, Sulphur), micronutrients (Zinc, Iron, Copper, Manganese, Boron), and physical-chemical properties (pH, Electrical Conductivity, Organic Carbon). Soil Samples are taken generally two times in a year, after harvesting of Rabi and Kharif Crop respectively or when there is no standing crop in the field.

Maharashtra has recorded substantial activity, collected 5,10,255 soil samples and completed 3,24,316 tests/cards generated under current cycle metrics. (2026 – 27 Cycle) The initiative helps local farmers in Maharashtra adjust fertilizer inputs based on black and mixed soil profiles typical of the region, curbing excess urea application and lowering input costs. India's Soil Health Card scheme has reached hundreds of millions of farmers but simplified soil health into limited set of standardized measurements, a study shows. Providing information alone was not enough to change farmer fertilizer practices or encourage widespread adoption of recommendations. Stronger farmer engagement and local input are needed to make government led soil health programs more effective. In this context, the present study analyses the Soil Health Card Scheme in Amravati District which confined to 75 farmers.

Objectives:

1. To know responsiveness of farmers towards soil nutrient profiling while sowing land.
2. To analyse perception of farmers in Amravati district regarding utility of soil health card scheme.
3. To identify the need for continued efforts to enhance the impact of Soil health card scheme.

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Methodology:

The Study was conducted in Amravati District, Maharashtra. Agriculture is an important economic activity in the district, and the effective management of soil fertility is essential for sustainable agricultural development. A descriptive and analytical approach has been adopted for this study.

The Study is based on primary data collected from 75 farmers from Amravati district using convenience sampling. The primary data focus on farmers' possession of soil health cards, their reported access to soil-testing laboratories near their villages, their soil-testing practices before sowing season. The study also seeks to understand the potential barriers to the use of soil-health information in agricultural decision-making. A well-structured interview questionnaire was administered to the farmers through Google forms. The collected primary data were obtained using non-probability convenience sampling method. The sample intentionally included both economically well-off and economically disadvantaged farmers.

It also incorporates elements of Secondary data collected from agricultural department websites, Krishi Vigyan kendra Websites, academic publications, other reports published by reputed newspapers.

Discussion:

Soil is the lifeblood of agriculture, and its health directly impacts crop productivity. For farmers, understanding soil fertility and composition is crucial to achieving optimal yields. One of the most effective ways to understand soil quality is through soil testing. By utilizing professional soil testing labs, farmers can gain insights into the nutrient levels, pH, and other critical properties of their soil. Soil testing is a scientific process that involves collecting soil samples and analysing them in a soil testing laboratory. This analysis helps farmers understand the soil nutrient content, pH levels, and the presence of harmful substances. For any farmer looking to enhance soil health and improve crop productivity, soil testing is an essential practice. The pH level of the soil influences nutrient absorption, and testing helps farmers determine whether adjustments are required for optimal plant growth. It also helps detect excessive levels of salts and heavy metals that may adversely affect crops.

Furthermore, soil testing provides information about soil texture and composition, including sand, silt, and clay content, which influence water retention and root growth. Thus, soil testing provides valuable information for informed agricultural decision-making, enabling farmers to improve crop yields, maintain soil fertility, and ensure the efficient use of agricultural resources. Additionally, soil testing supports environmental protection by reducing the excessive use of fertilisers and improper irrigation practices that may cause pollution and land degradation. It promotes cost-effective farming by helping farmers minimise unnecessary expenditure and manage their agricultural budgets more efficiently. Regular soil testing also helps identify early signs of soil fertility problems and degradation, enabling farmers to take corrective measure in time. Thus, soil testing plays an important role in improving agricultural productivity, reducing cultivation cost, protecting the environment, and promoting sustainable farming practices.

Soil Testing Labaratory in Amravati: The Government of India were undertaking a pilot project on School Soil Health programmes in collaboration with state government in 20 schools (10 Kendriya Vidyalaya & 10 Navodaya Vidyalaya) in rural areas. Till now the school soil health programme is to be launched in 1000 schools list of 400 Ekalavya Model Residential Schools (EMRS), 200 Kendriya Vidyalaya and 300 Navodaya Vidyalaya have been received. In 200 Kendriya

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Vidyalaya nearest to Krishi Vigyan Kendra (KVKs) for Soil Testing, Maharashtra have only 4 testing centre each one at Raigad and Ahilya nagar (Then Ahmednagar), 2 at Pune. In 300 Navodaya Vidyalaya, Maharashtra have total 32 Navodaya Vidyalaya selected for soil testing lab, among those Navodaya Vidyalaya, Amravati was also there. For out of 400 EMRS, 37 selected from Maharashtra among which Chikhaldara and Dharni were selected for the soil testing lab. Amravati have several soil testing facilities such as, District Soil survey soil testing laboratory in Amravati city, Soil laboratory at KVK Ghatkhed, Soil lab at KVK Durgapur, Parikshit Biotech at Camp in Amravati city, J. K. Marketing Soil testing lab in MIDC, Amravati. But this cannot confirm soil testing laboratory at very grassroot level. If we need effective implementation of the scheme, it is necessary to have accessibility of soil testing lab at Gram Panchayat level or mobile soil laboratory.

In Institutional structure, Soil health card had three level committee namely, National Advisory Committee, State level steering Committee, and Role of Panchayati Raj Institutions (PRIs). Active participation of PRIs is essential for core implementation of the scheme. PRIs may also be involved in publicizing the demonstrations and training of farmers and in ensuring participation of farmers from nearby areas for widespread dissemination of technology. However, its effective implementation at the grassroots level in rural areas does not appear to be adequate.

Another issue which needs to be highlighted is digital divide in rural areas. We incorporate intensive use of ICT for data base management in Soil testing laboratory but still there is persistent digital divide in rural areas. According to the latest National Sample Survey Office (NSSO) data, only 24% of rural Indian households have access to the internet, compared to a 66% penetration in cities. Furthermore, 14% of rural citizens actively use the Internet especially for Social Media handling purpose, in contrast to 59% of urban adoption.

Jose et al (2024) analysed the constraints faced by beneficiaries of Soil Health Card Scheme from Vidarbha region, especially Amravati district. They found that there was a long-time gap between soil sample collection and issuance of Soil Health card. Beneficiary farmers faced difficulties in understanding the information and following the recommendations provided in Soil Health Cards. They also identified a lack of effective training and demonstrations for farmers regarding soil health, along with a limited number of soil testing laboratories.

The present study focused on assessing the constraints faced by farmers in term of implementation of Soil health card and their responsiveness towards the scheme and awareness about soil health. The study was confined to 75 farmers of Amravati district in Maharashtra due to constraints related to time, funding and other resources in this research paper, which restricted study's scope. Consequently, 75 respondents were chosen, and the results cannot be generalized. The findings are based on the opinions expressed by the respondents, limiting the objectivity of data to their personal perspectives. Furthermore, the accuracy of the study relied on the respondents' ability to recall information and their honesty in sharing details, which imposed additional limitation on the objectivity of the results.

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Findings:

The present study was conducted in Amravati district to identify status of Soil health card scheme and farmers responsiveness towards scheme. Total 75 farmers are being taken for sample survey due to time constraint. The survey covers the respondents' occupation, annual income from agriculture, farming method, possession of soil health card, whether they check soil quality before sowing, accessibility of soil health laboratory near their farmland or in village, awareness of agricultural research and information regarding government agricultural development schemes.

The survey results reveal that 64% of the respondents (48 farmers) were engaged only in agriculture, while the remaining respondents reported agriculture along with other occupations or activities. In terms of annual income from agriculture, 61.33% of the respondents (46 farmers) reported an annual income below ₹1 lakh. Regarding landholding, 44% were farmers with 2.5 to 5 acres of land, 38.67% were farmers with less than 2.5 acres, and 17.33% were large farmers with more than 5 acres.

The survey also revealed that 66.67% of the respondents reported having no other source of income, while 33.33% reported having another source of income. Regarding Below Poverty Line (BPL) status, 53.33% reported belonging to the BPL category, whereas 46.67% reported that they did not belong to this category. With respect to farming methods, 45.33% of the respondents reported following mixed farming methods, while 30.67% practised chemical farming. Natural farming was reported by 13.33% of the respondents, organic farming by 8%, and a combination of chemical and organic farming by 2.67%. Black soil was the most frequently reported soil type, accounting for 46.67% of the respondents, followed by medium black soil at 24%.

Regarding possession of Soil Health Cards, 88% of the respondents (66 farmers) reported that they did not possess a Soil Health Card, whereas 12% (9 farmers) reported that they possessed one. The survey also revealed that 81.33% of the respondents (61 farmers) did not check soil quality at the time of sowing, while 18.67% (14 farmers) reported that they checked soil quality. Furthermore, 93.33% of the respondents (70 farmers) reported that soil-health laboratory facilities were not available near their farms or villages, whereas 6.67% (5 farmers) reported that such facilities were available.

The findings concerning awareness of agricultural research indicate that 76% of the respondents (57 farmers) were unaware of new scientific research conducted by agricultural universities, while 24% (18 farmers) reported awareness of such research. Regarding information about government agricultural development schemes, 58.67% of the respondents (44 farmers) reported receiving such information, while 41.33% reported not receiving it.

Overall, the survey findings show that most respondents reported not possessing a Soil Health Card and not checking soil quality at the time of sowing. A large proportion also reported the unavailability of soil-health laboratories near their farms or villages. The responses further indicate differences in income, landholding, farming methods, and awareness of agricultural research and government schemes among the surveyed farmers.

These findings describe the responses of the 75 farmers included in the study. They provide a descriptive account of Soil Health Card possession, soil-testing practices, reported laboratory availability, and awareness of agricultural information among the respondents. The results should be interpreted within

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the scope of the survey and do not, by themselves, establish a causal impact of the Soil Health Card Scheme on agricultural practices across Amravati district.

Conclusion:

The present study examines the Soil Health Card Scheme with special reference to Amravati district, Maharashtra, using primary data collected from 75 farmers. The survey reveals that 88% of respondents reported not having a soil health card, 81.33% reported that they did not check soil quality during sowing, and 93.33% reported that soil testing laboratories were not available near their farms or villages.

These finding highlight concerns regarding card possession, soil testing practices and perceived access to soil testing facilities among the surveyed respondents. They also indicate the importance of examining the practical accessibility of soil testing services alongside administrative indicators of scheme implementation. However, the findings do not establish the level of awareness across the entire district or demonstrate that the scheme has failed to achieve its objectives.

Meanwhile, Agriculture is a state subject under the Seventh Schedule of the Constitution of India. Therefore, effective implementation of agricultural and farmer-welfare schemes requires coordination between different levels of government, along with decentralized planning that considers local agricultural conditions and farmers' needs. A robust bottom – up approach, rather than an exclusively top-down approach, can provide farmers with opportunities to express their opinions identify local challenges and participate in the planning and implementation of schemes. Farmers' involvement is important for making schemes more responsive to their actual needs and improving their practical implementation.

Improving farmers' access to soil testing facilities, communicating the availability and purpose of soil health cards, and providing practical guidance on interpreting and using soil health recommendations are potential areas for further investigation policy attention. Involving farmers in identifying barriers and suggesting locally appropriate solutions may also help make the scheme more accessible and relevant. The effectiveness of these measures would need to be assessed through additional evidence.

The study concludes that evaluating the soil health card scheme requires attention not only to administrative implementation but also to farmers' reported access to and use of soil-health information. A larger, appropriately selected sample, verified district- level administrative data and greater consideration of farmers' perspective would strengthen future assessments of the scheme in Amravati district.

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