

**A Review**

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# Factors determining the soil health card adoption behaviour among farmers in Andhra Pradesh

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**Summary**

The soil health card (SHC) is used to assess the current status of soil health and when used over time, helps to determine changes in soil health that are affected by land management. A SHC displays soil health indicators and associated descriptive terms. The SHC carries crop-wise recommendations of nutrients / fertilizers required for farms, making it possible for farmers to improve productivity by using appropriate inputs. The Central Government is providing assistance to State Governments for setting up soil testing laboratories for issuing such SHCs to farmers. State Governments have adopted innovative practices like involvement of agricultural students, NGOs and private sector in soil testing, determining average soil health of villages, etc., to issue SHCs. Though quite a few states including Tamil Nadu, Gujarat, Andhra Pradesh and Haryana are successfully distributing such cards, the Centre plans to make it a pan India effort. According to a data, till November 15<sup>th</sup> 2017, over 9.72 crore soil health cards have been issued to farmers to make them aware about nutrient deficiencies in their fields.

**Key words :** Soil health card, Behaviour among farmers

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**Adoption of soil health management practices:**

Sathyanarayanan (1991) indicated that about two-thirds of the respondents (63.33%) were medium level adopters of *Azospirillum*, followed by low adopters (20.00%) and the rest were high adopters (16.67%). Theodore (1998) in his study on contingency rice farming practices found that nearly half (45.0%) of the contact farmers were high level adopters, while it was less than one-third (30%) in case of other farmers. According to Woldeamlak (2007) and Tesfaye (2011), adoption of soil conservation structures is a difficult concept to measure. The structures can be considered as adopted if the land

users continue to utilize them after the external assistance is withdrawn. Although adoption of the new technologies can be effectively evaluated only after the termination of the project, it can also be assessed by analyzing farmers' attitudes, objectives and desires of whether they would like to use the technologies as a part of their farming enterprise.

**Factors determining the adoption of soil health management practices:**

Cramb *et al.* (1999) found that household-level cash flow, rather than access to labour, was considered to be

a more important explanatory factor for adoption of soil conservation practices. As per FAO (2001) and Pannell *et al.* (2006), adoption of agricultural technologies is usually influenced by several factors, among them, adopters own skill level and the abilities of farmers are critical determinant factors in adoption of agricultural technologies.

Long (2003) and Habtamu (2006) have opined that perceiving the soil erosion problem, and positive effect of soil conservation measures provide stimulus to and shapes opinions about adoption of conservation practices that stops the problem. In a study of programmatic approaches to successful adoption of soil and water conservation (SWC) practices in Southern Mali, Bodnár *et al.* (2006) found that farmers take several steps to learn about and accept innovations before they adopt them. First, they must have an awareness of particular problems affecting their land (*i.e.*, recognizing soil erosion symptoms or water quality impairments) and they must be willing to undertake measures to correct the root problem(s) that cause such problems. Farmers then need to recognize what the possible solutions are and be able to acquire the skills to install these corrective measures. Most importantly, they need to believe in the potential benefits of SWC practices implementation before any are undertaken.

Wubuneh and Sanders (2006) have mentioned shortage of livestock to be a constraint for the uptake of inorganic fertilizers and new cultivars. Further, they indicated that livestock is very crucial in a farming system as they are a major source of manure and draft power. Marennya and Barrett (2007) have reported that educational level as one of the factors immensely influencing adoption of ISFM. The main reason for this is that ISFM practices are knowledge-intensive and thus, require considerable management input. According to Dutta (2009) and Sabo (2007), ownership of livestock contributes to wealth status and wealthier farmers are likely to have more motivation to adopt ISFM and to continue to seek for and access relevant information using various channels so as to cater for their information needs.

Kibemo (2011) has opined that adoption of soil conservation technologies is considerably influenced by different factors. Among other influences, the characteristics of farmers such as age, education, household size, farm size and experience are some of the major influencing factors for the decision of

application of soil conservation practices. Bayard *et al.* (2006) studied the adoption and management of soil conservation practices in Haiti. In this study he identified the factors which played a significant role in the management of this land improvement technology. In their findings, it was discovered that age, education, group membership and per capita income negatively influence the adoption and management of soil conservation practices.

### **Constraints in adoption of soil health management practices:**

According to Wubneh and Sanders (2006), livestock is also very crucial in a farming system as they are a major source of manure and draft power. The more livestock a farmer has, the higher the possibility of the cost-effective use of manure to replenish soil fertility. Shortage of livestock has been mentioned as a constraint to the uptake of organic fertilizers and new cultivars. Damisa and Igonoh (2007); Odendo *et al.* (2006); Rege (2006) and Sanginga and Woomer (2009), have expressed that lack of access to reliable and current information coupled with wide communication gaps between researchers and farmers are presently a major impediment to adoption of ISFM by farmers in the Western Kenya region.

Ofooku *et al.* (2008) and Sanginga and Woomer (2009) have stated that the low level of literacy among smallholder farmers in Sub-Saharan Africa (SSA) has been identified as a major constraint to effective communication and dissemination of soil fertility information, thus, acting as a major impediment to its access by farmers. Bennett and Cattle (2014) identified series of statements concerning impediments for the adoption of soil health management plans. These statements were separated into six broad categories: education and training impediments; agency and extension organization-based impediments; land-use associated impediments; market impediments; economic impediments and personal and social impediments.

### **Suggestions to enhance adoption of soil health management practices:**

Adolwa *et al.* (2010) suggested that community-based and mass media channels were most suitable for conveying ISFM information and knowledge to farmers. Farmer field Odays and other community-based communication channels which have been used

extensively by stakeholders have their advantages and should continue to be promoted in the application of ISFM in Western Kenya. However, there is a need for researchers, extension workers and policy-makers to consider exploiting the use of community FM Radio Stations to promote the application of ISFM in the region as they have largely been utilized despite the numerous advantages of radio.

Bennett *et al.* (2014) suggest that there are three main areas for consideration in improving the adoption of structured soil health management programmes: ongoing communication and support; the initial cost of programme implementation and the availability and expense of appropriate machinery. Accordingly, targeting incentives and future efforts towards these three considerations would presumably increase the adoption and permanence of structured soil health management plans. A focus on providing ongoing technical and expert advice through future extension efforts should occur, while a central information portal, not unlike the soil health knowledge bank, would also be advantageous. The creation of a research register where scientists can upload information on current and completed research would allow other rural stakeholders the opportunity to remain in connection with current research.

Gwandu *et al.* (2014) in their research on factors influencing access to ISFM information and knowledge and its uptake among smallholder farmers in Zimbabwe, suggested that comprehensive training offered jointly to farmers and government extension officers through various iterative capacity building initiatives embraced in the learning-centred approach resulted in outcomes suggestive of successful involvement of farmers in knowledge and persuasive stages of the innovation-decision process. Thus, this study demonstrated the superiority of farmer access and use of ISFM information and attracting participation of different farmer categories.

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