

# A study on Effectiveness of Issuing Soil Health Cards to Farmers across India

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Soil Testing is well recognized as a sound scientific tool to assess inherent power of soil to supply plant nutrients. The benefits of soil testing have been established through scientific research, extensive field demonstrations, and on the basis of actual fertilizer use by the farmers on soil test based fertilizer use recommendations. Soil testing was initiated in the country in the beginning of planning era by setting up of 16 soil testing laboratories during 1955. Government of India has been supporting this programme during different plan periods to increase the soil analyzing capacity in the country. The numerical strength does not, however, decisively indicate the quality and success of the programme. Planners and agriculturalists have recognized the utility of the service fully but it suffers due to inadequate scientific support in its execution. A study of the soil profile is important from crop husbandry point of view, since it reveals the surface and the sub-surface characteristic and qualities namely, depth, texture, structure, drainage conditions and soil moisture relationship which directly affect the plant growth. A study of soil profile supplemented by physical, chemical and biological properties of the soil will give full picture of soil fertility and productivity. Physical properties of the soil include water holding capacity, aeration, plasticity, texture, structure, density and colour etc. Chemical properties refer to the mineralogical composition and the content of the type of mineral such as Kaolinite, illite and montmorillonite, base saturation, humus and organic matter content. If a soil health card is issued to a farmer he may enrich his soil for productivity and thus earn more benefits but alas! The fact is that farmers' functional literacy rate in India is not in appreciable numerics. This paper aims at investigating the effectiveness of the issuing soil health cards to Indian farmers but what comes in the way is the lack of will in scheme implementers to reach to the set targeted growth.

Soil is a thin layer of earth's crust and is a living media, which is one of the important factors of crop production and serves as a natural nutrient source for the growth of plants. The components of the soils are mineral material, organic matter, water and air, the proportions of which vary and which together form a system for plant growth.

The soils are studied and classified according to their use, which is termed as "land capability classification". In this classification, inherent soil characteristics, external land features and environmental factors are given prominence. For this purpose soil survey is carried out to record the crop limiting factors such as soil depth, topography, texture and structure, water holding

capacity, drainage features followed by evaluation of soil fertility based on soil testing / soil analysis. According to their use the soils are classified into 8 classes, four of which are considered suitable for agriculture purpose and remaining are non-arable lands and can be used for silviculture and forest and need strong conservation measures. An effective linkage between soil testing and soil survey is useful to ensure formulation of a sound soil fertility evaluation programme. In the administrative set up, soil survey is generally kept under the discipline of natural resource management while soil testing remains a part of the discipline of fertilizer use and management.

Proper maintenance of the soil health, which is necessary from agricultural point of view, refers to the capacity of the soil to ensure proper physical, chemical and biological activities/processes for sustaining higher crop productivity. A productive soil would ensure proper retention and release of water and nutrients, promote and sustain root growth, maintain soil biotic habitat, respond to management and resist degradation.<sup>1</sup> Farmers all over the country endorse the government's Soil Health Card scheme that provides them with information about soils and the kind of crops to be grown in various regions. Around 37 lakh farmers in Gujarat, 20, 000 farmers in Haryana and farmers from around 100 villages in Maharashtra are benefiting from the government's unique Soil Health Card scheme, which helps farmers take major decisions about crops and fertilisers suitable for their land.<sup>2</sup> It goes on further to add, "Based on free in-depth soil studies, the Soil Health Cards list the vital components of a particular patch of land. They provide detailed information on various minerals present on the land, suitable crops, fertilisers to be used, and also whether the land is acidic or alkaline. The cards, which are based on the principles of the ration card, provide permanent identification and status of the land to farmers. They are made out after a detailed analysis of samples of soil collected from land held by individual farmers."<sup>3</sup> Goa government will issue farmers soil health cards under a new scheme, which will enable cultivators to know the best fertilizers to enrich their land to better yield. "Soils in the state are acidic in nature and require to be amended. They are also deficient in micronutrients. Soil sample collection and analysis to determine soil health is an integral part of soil improvement for increasing crop production, " the scheme states.<sup>4</sup>

## **1. TESTING OF THE VARIOUS PROPERTIES OF THE SOIL**

In order to strengthen the agriculture infrastructure, the state governments have decided to issue Soil Health Cards. It aims at helping the cultivators get better agricultural yield. These cards apprise the farmers of the various properties of the soil.

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<sup>1</sup> <http://agricoop.nic.in/imagedefault/Comsoilhealth28612.pdf>

<sup>2</sup> <http://infochangeindia.org/agriculture/news/farmers-benefit-from-soil-health-cards.html>

<sup>3</sup> Ibid

<sup>4</sup> <http://timesofindia.indiatimes.com/city/goa/Soil-health-cards-to-Goan-farmers/articleshow/25496837.cms>

The cards are distributed under the Soil Health Programme of the Agriculture Departments of the states. They are prepared after the soil is scientifically tested for various properties like productivity, mineral composition, water retaining capacity and others.

The cards contain information on what kind of pesticides, fertilisers, seeds and how much water should be used for getting better productivity from the land.

Goa government announced in November month of 2013 that it is going to issue farmers soil health cards under a new scheme, which will enable cultivators to know the best fertilizers to enrich their land to better yield. "Soils in the state are acidic in nature and require to be amended. They are also deficient in micronutrients. Soil sample collection and analysis to determine soil health is an integral part of soil improvement for increasing crop production," the scheme states. Soil samples from farmer's fields are collected and analyzed in the soil testing laboratories for major nutrients, free of cost. Soil health cards are issued with recommendation of fertilizers. Analysis of soil is also done for micronutrients on village basis and use of micronutrients is recommended.

The soil health card also provides soil pH for determining the nature of soils. The expenditure on collection of soil sample, chemicals, reagents and equipment is incurred by the agriculture department. The soil conditioners like rock phosphate, lime etc. are provided at 75% subsidy limited to Rs. 4, 500 per ha for maximum of 4 ha per farmer. ST/SC farmers are be provided 90% subsidy limited to Rs. 5400 per ha. The subsidy will be released to the farmer after the purchase and use by him of the soil conditioner. Micronutrients like zinc, boron, magnesium sulphate and other micronutrients are provided at 75% subsidy limited to Rs. 6000 per ha for maximum of 4 ha per farmer. ST/SC farmers are provided 90% subsidy limited to Rs 7200 per ha.<sup>5</sup>

## **2. SHCS BENEFITS TO FARMERS, AGRICULTURAL SCIENTISTS & DECISION TAKERS**

SHCs help farmers know the condition of his agriculture land and get crop-specific prescription for the amount of manure and fertilisers needed. The agriculture department had also started an SMS service to inform farmers to collect the cards after they were prepared.

The department has also undertaken measures to treat saline and alkaline land in the state, which is about 49, 000 hectares and 1.85 lakh hectares, respectively. Also, it has made soil-fertility maps for its entire agriculture land in the state. These maps are global positioning system enabled and are available with the state agriculture department. The soil-fertility maps reveal fertility condition of the land and disclose deficiencies of minerals and micro nutrients.

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<sup>5</sup> ibid

The Soil Health Card System contains agricultural information of all districts of each state which is used for the benefit of not only farmers, but also agricultural scientists and decision makers. The Soil Health Card System is an only one of its kind information project prepared and initiated by the Government of different states for the benefit of farmers at the grass-root level. A large database contains farmer details from the district/taluka/village levels. This project is able to provide specific type of output to the farmer, so that the farmers can get information easily and precisely when needed.

### **3. EFFECTIVENESS OF THE SOIL HEALTH CARDS SYSTEM:**

With about 12 crore farm holdings in the country, soil analyzing capacity of 4 crore samples annually is required to enable analysis of each holding once in three years. In Haryana renewal of SHC is required after every five years while soil fertility map is also being prepared This requires a massive expansion in soil testing programme in the States. Keeping this in view, a centrally sponsored scheme “National Project on Management of Soil Health and Fertility (NPMSHF)” was launched in 2008-09. In addition, States are availing substantial resources for soil testing programme under the “Rashtriya Krishi Vikas Yojana (RKVY)” and “Macro Management of Agriculture (MMA)”.<sup>6</sup>

There are clear indications that investment in expansion of soil testing facilities under various schemes has started to bear fruit. The number of soil testing laboratories increased to 1, 049 in 2010-11 from 715 in 2009-10 while annual analyzing capacity went up to 1.07 crore samples from 0.78 crore samples. As a result, 0.74 crore soil health cards were issued to farmers during 2010-11 compared to about 0.57 crore during 2009-10.<sup>7</sup>

Several States including Andhra Pradesh, Gujarat, Haryana, Karnataka and Uttar Pradesh have made commendable progress in soil testing programme in various ways such as expansion of soil testing facilities, popularization of the programme in campaign mode, development of soil fertility maps and use of information technology in delivering soil nutrient status and appropriate recommendation to farmers.<sup>8</sup>

### **4. CONSTRAINTS/CHALLENGES IN EFFECTIVELY IMPLEMENTING THE SHC SCHEME**

For effective implementation of the SHC project however there are certain hurdles putting bottlenecks on the way of the progress of this scheme. A few of such handicaps are given below:

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<sup>6</sup> <http://agricoop.nic.in/imagedefault/Comsoilhealth28612.pdf>

<sup>7</sup> ibid

<sup>8</sup> ibid

1. There is a severe shortage of trained/skilled manpower.
2. Many of the equipments in the soil test laboratories are old and non-functional and need immediate replacement.
3. There are one lakh hectares of saline soils in the Haryana State only which need reclamation. There is similar type of cases where soil is not worth agriculture productivity.
4. Frequent transfer of officers
5. Delay in transporting samples from collection centres to labs.
6. Interruption in power supply
7. Lack of availability of Funds for this purpose
8. Need of IT trained manpower for interpretation of analysis reports and preparation of recommendations and their online communication.
9. There is ban on creation of new posts.
10. Short term hiring and out sourcing is one of the ways to carry out work. Such persons would need intensive training before undertaking the task.
11. Most of STLs are functioning in Govt. buildings, many of which are in dilapidated conditions and need proper maintenance.

## **5. CONCLUSION**

To sum up despite constraints, the scheme is bearing fruit up to some extent with its limited resources however another major limitation is the illiteracy factor of the farmers for whom the entire scheme is dedicated.