

## A Review

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# Importance of soil health card to sustain the living dynamic system

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It is a Government of India's scheme promoted by the Department of Agriculture and Co-operation under the Ministry of Agriculture. It will be implemented through the Department of Agriculture of all the State and Union Territory Governments. A SHC is meant to give each farmer soil nutrient status of his holding and advice him on the dosage of fertilizers and also the needed soil amendments, that he should apply to maintain soil health in the long run.

Soil health card (SHC) is a printed report that a farmer will be handed over for each of his holdings. It will contain the status of his soil with respect to 12 parameters, namely N,P,K (Macro-nutrients); S (Secondary- nutrient); Zn, Fe, Cu, Mn, Bo (Micro - nutrients) and pH, EC, OC (Physical parameters). Based on this, the SHC will also indicate fertilizer recommendations and soil amendment required for the farm.

The soil health card evaluates the health or quality of a soil as a function of its characteristics, plant and other biological properties. The card is a tool to help the

farmer to monitor and improve soil health based on their own field experience and working knowledge of their soils. Regular use will allow them to record long term trends in soil health and to assess the effects of different soil management practices. It provides a qualitative assessment of soil health. Its purpose is to use indicators that assess each soil's ability to support crop production within its capabilities and site limitations. The card, which will carry crop-wise recommendation of fertilizers required for farm lands, will help farmers identify health of soil and judiciously use soil nutrients. Farmer wise/land parcel wise soil health card with the information consisting of slope, erosion, soil depth, colour, texture, organic carbon, pH, electrical conductivity, macro and micro-nutrients, degradation type, etc. can guide the farmers, planners and executors for selecting right land use, right agro-techniques on well-defined parcel of land.

The card will contain an advisory based on the soil nutrient status of a farmer's holding. It will show recommendations on dosage of different nutrients needed.

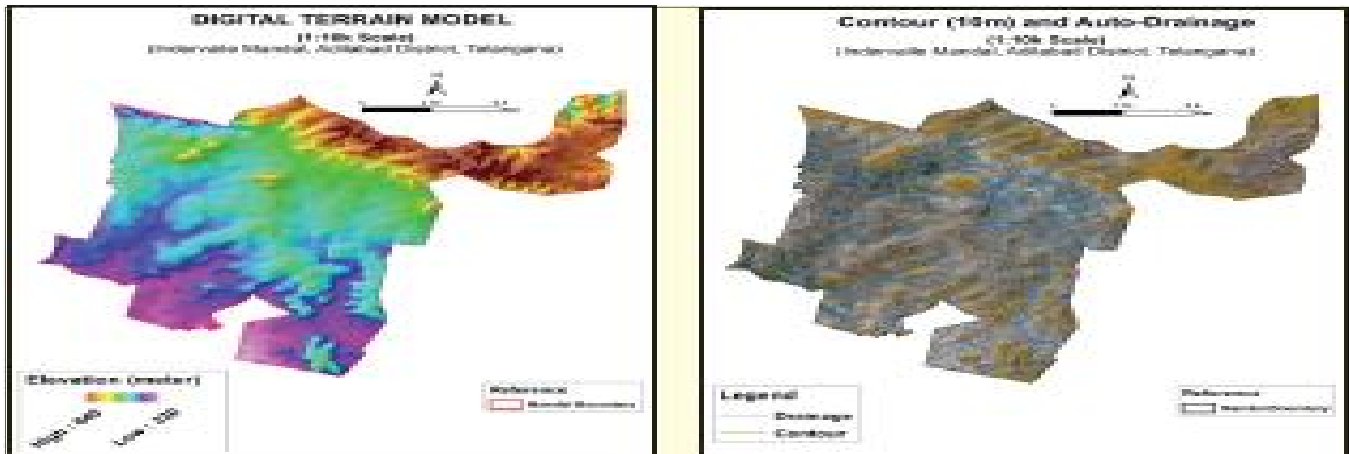


Fig. 1 : Generating DTM, contour and drainage map

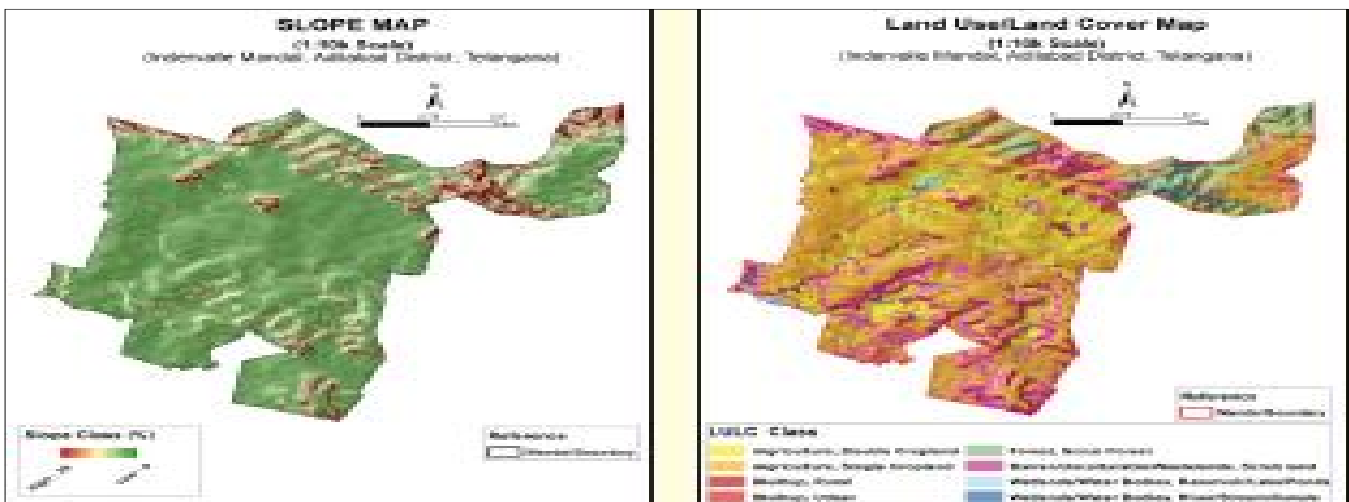


Fig. 2 : Developing slope and land use/ land cover map

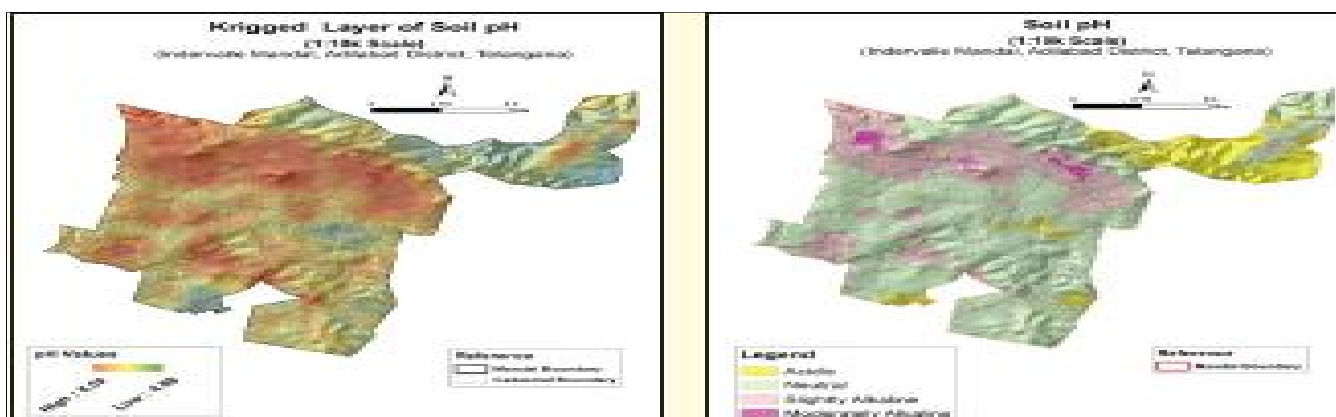


Fig. 3 : Designing sampling scheme (DAC, GOI)



-One sample for every 10 hectare area under rainfed condition, -Portable digital assistance (NBSS and LUP Mrida Sangrah) based sample collection  
 -One sample for every 2.5 hectare area under irrigated condition -Laboratory analysis for pH, EC, organic carbon, macro (N, P, K and S) and micronutrients (Fe, Mn, Zn Cu and B)

Fig. 4 : Sample collection and analysis



-Primary level analytical data entry in MS-Excel format  
 -Geo-statistical interpolation technique (Krigging)  
 -Attaching cadastral information with the maps

Fig. 5 : Data entry and mapping in GIS

Parcel no	Village	Mian dal	District	Slope	Soil Type	Depth	Color	Texture	EC	LC	Organic carbon
/1	Ah madi pur	G ajwel	M edak	0-1	M ed ium	M e d iu m	Bro w n	Loa my	M es	4s	M ed iu m
/2	Ah madi pur	G ajwel	M edak	0-1	M ed ium	M e d iu m	Bro w n	Loa my	M es	4s	M ed iu m
/3	Ah madi pur	G ajwel	M edak	0-1	M ed ium	M e d iu m	Bro w n	Loa my	M es	4s	M ed iu m
/4	Ah madi pur	G ajwel	M edak	0-1	M ed ium	Deep	Dark Gray ish	Loa my	M es	4s	M ed iu m
1	Ah madi pur	G ajwel	M edak	0-1	M ed ium	M e d iu m	Bro w n	Loa my	M es	4s	M ed iu m
10	Ah madi pur	G ajwel	M edak	0-1	M ed ium	M e d iu m	Bro w n	Loa my	M es	4s	M ed iu m
100	Ah madi pur	G ajwel	M edak	0-1	M ed ium	Deep	Dark Gray ish	Loa my	M es	4s d	M ed iu m

pH	Calcium	Mit roge n	Pho spho rus	Po tassi um	Sul fur	Iron	Mang anese	Zinc	Copp er
Slight ly Alkal ine	Low	M ed iu m	High	M e d iu m	High	Suffi dent	Suffi dent	Suffi dent	Suffi dent
Slight ly Alkal ine	Low	M ed iu m	High	M e d iu m	High	Suffi dent	Suffi dent	Suffi dent	Suffi dent
Slight ly Alkal ine	Low	M ed iu m	High	High	High	Suffi dent	Suffi dent	Suffi dent	Suffi dent
Slight ly Alkal ine	Low	M ed iu m	High	High	High	Suffi dent	Suffi dent	Suffi dent	Suffi dent
Slight ly Alkal ine	Low	M ed iu m	High	M e d iu m	High	Suffi dent	Suffi dent	Suffi dent	Suffi dent
Slight ly Alkal ine	Low	M ed iu m	High	M e d iu m	High	Suffi dent	Suffi dent	Suffi dent	Suffi dent
Slight ly Alkal ine	Low	M ed iu m	High	High	High	Suffi dent	Suffi dent	Suffi dent	Suffi dent

-Data classification based on soil testing based crop response (STCR) thresholds  
 -Printing and distribution of soil health card

Fig. 6 : Farm wise soil database

Further, it will advise the farmer on the fertilizers and their quantities he should apply and also the soil amendments that he should undertake, so as to realize optimal yields.

It will be made available once in a cycle of 3 years, which will indicate the status of soil health of a farmer's holding for that particular period. The SHC given in the next cycle of 3 years will be able to record the changes in the soil health for that subsequent period.

Soil samples will be drawn in a grid of 2.5 ha in irrigated area and 10 ha in rainfed area with the help of GPS tools and revenue maps. The State Government will collect samples through the staff of their Department of Agriculture or through the staff of an outsourced agency. The State Government may also involve the students of local Agriculture/Science Colleges. 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. Soil Samples will be collected by a trained person from a depth of 15-20 cm by cutting the soil in a "V" shape. It will be collected from four corners and the centre of the field and mixed thoroughly and a part of this picked up as a sample. Areas with shade will be avoided. The sample chosen will be bagged and coded. It will then be transferred to soil test laboratory for analysis.

Soil testing laboratory is a facility for testing the soil sample for 12 parameters. This facility can be static or mobile or it can even be portable to be used in remote areas. The soil sample will be tested as per the approved standards for all the agreed 12 parameters in the following way:

–At the STLs owned by the Department of Agriculture and by their own staff.

–At the STLs owned by the Department of Agriculture but by the staff of the outsourced agency.

–At the STLs owned by the outsourced agency and by their staff.

–At ICAR Institutions including KVKs and SAUs.

–At the laboratories of the Science Colleges/ Universities by the students under supervision of a Professor/ Scientist.

#### Uses of soil health card :

– Using this report, farmers can increase the productivity of crops.

– Using the reports and support from the experts farmers can find out the exact type of fertilizers required.

– Using the required fertilizers only, the quality of soil will be better.

– Understanding the soil contents will help the farmers to cultivate the crop that suits the soil type the most.

– Ultimately this scheme will help the farmers to increase the productivity as well the quality of the crop.

–A soil health card is used to assess the current status of soil health and, when used over time, to determine changes in soil health that are affected by land management.

–A soil health card displays soil health indicators and associated descriptive terms. The indicators are typically based on farmers' practical experience and knowledge of local natural resources.

–The card lists soil health indicators that can be assessed without the aid of technical or laboratory equipment.

#### Methodology for generating soil health card :

– Generating DTM, contour and drainage map.

– Developing slope and land use/ land cover map.

– Designing sampling scheme (DAC, GOI).

– Sample collection and analysis.

– Data entry and mapping in GIS and

– Farm wise soil database

This methodology deals with the method for generating Soil Health Card for three blocks of state of Telangana namely, Gajwal, Medak district, Thimajipet, Mehboobnagar district and Indervelle, Adilabad district.

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