



Soil testing lab established by the Foundation for Ecological Security (FES) in Mandla, Madhya Pradesh, India (Santosh Gupta)

Dissemination of Soil Test Results to Farmers through a Participatory Approach (Índia)

Mitti ki namuna

DESCRIÇÃO

A systematic approach has been developed under the project for collecting soil samples, conducting the soil test results, issuing soil health cards, building the capacity of farmers to interpret the soil health card and apply the required nutrients to the soil based on the soil test result

Soil testing is a pre-cultivation activity that gives a good idea about soil structure and mineral composition ratios. The essential nutrients required for various crop growths can be estimated during soil testing. The Foundation for Ecological Security (FES) has established a state-of-the-art soil testing laboratory for testing soil samples in India's Mandla District of Madhya Pradesh. The soil test lab was established in 2016 with a capacity to test 1500-2000 soil samples every year. Based on a soil sampling process, it takes around 2 days to generate the soil test results for 20 soil samples. Collected soil samples are tested for 12 parameters. These parameters include Soil Ph, Soil organic carbon (SoC), electrical conductivity (EC), major nutrients like nitrogen(N), phosphorus (P), potassium (K), secondary nutrients like sulphur, magnesium, iron, boron, zinc, manganese, and copper. Based on the soil test report, farmers are issued a soil health card with crop-specific recommendations for additional chemical and organic inputs into the soil.

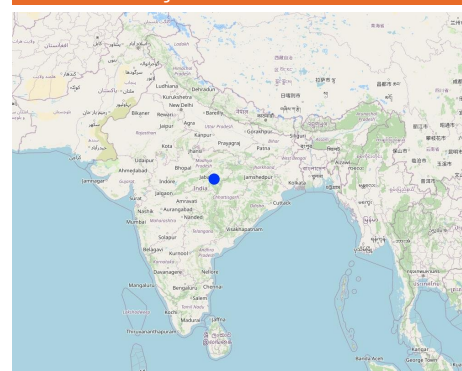
To ensure the accuracy of the sampling process and proper dissemination of generated results among the farmers, FES has developed a very systematic process which consists of:

- the collection of soil samples
- the analysis of collected soil samples in an FES lab
- the issuance of soil health cards
- the interpretation of soil test results
- noticing of test results to farmers
- farmers are able to implement practices, recommended by the test result

The entire process, from soil sampling to dissemination, is briefly mentioned below:

- Developing the grids for a random collection of soil samples: The first step is to develop a geographical grid for collecting random samples based on predefined parameters. In the irrigated areas, samples are drawn in a grid of 2.5 ha, while in rainfed areas, samples are drawn from a grid of 10 ha. While developing the grid, farmers' fields are categorized into the following parameters. Each of the parameters is assigned a specific score, and based on the obtained score, each farmer's land is given a specific number for easy identification on soil maps. These include the a) type of soil, b) type of field, e.g., upland, medium land, or low land, c) crop cycle (Single crop, multiple crops) d) The slope of the field. This entire exercise is a soil survey exercise used to develop soil maps for each geographical unit village, block, district.
- Collection of soil samples: From each classified grid, soil samples are collected from 5 different locations between the harvest of one crop and the sowing/planting of another crop

LOCALIZAÇÃO



Localização: Mandla, Madhya Pradesh, Índia

Geo-referência de locais selecionados

- 80.37213, 22.59756
- 80.37213, 22.59756

Data de início: 2018

Ano de término: n.a.

Tipo de abordagem

- Tradicional/Indígena
- Iniciativa/Inovação local recente
- Baseado em projeto/programa

when fields are vacant. The soil samples are collected at a depth of 5 to 15 cm. All the collected soil samples are mixed repeatedly, and a portion of the collected soil is kept aside each time. The mixing process is followed 5-6 times to ensure collected soil samples represent the entire area. Finally, around 500 gm of soil is packed in plastic polythene based on the above grid parameters.

•Soil sample analysis: Collected soil samples are transported to the centralized soil test lab in Mandla (MP) for testing and analysis. The samples are analyzed by qualified lab personnel. The analysis process for the above mentioned 12 parameters takes around 2 days (considering 8-9 working hours in a day).

•Issuance of soil health card: Based on the results obtained from the analysis, soil health cards are issued to farmers. The soil health card contains the following information in the local language (Hindi) so that farmers understand the test results and their implications:

a. Basic details of the farmer: name, address, soil grid, GPS coordinates, field identification number, etc.

b. Soil test results for above mentioned 12 parameters: results of the soil test in their respective units, standard numbers, grading of the obtained result (acidic/saline for PH., high, medium, low for other parameters)

c. Crop-wise soil correction recommendations for major crops: recommendations for synthetic fertilizers, biofertilizers, and compost

d. Pre-printed information with photos for identification of nutrient deficiency in the crops.

•Dissemination of soil health card to farmers: To ensure that farmers understand the results and implement the practices at their field, local community resource persons reach out to every farmer to make them understand the soil test results and closely monitor their farmers' practices across the crop stages. Farmers are also encouraged to maintain farm diaries for their practices. They are also trained in the preparation of various bio-inputs and compost for application in their field.

मृदा नमूना विवरण	
मृदा नमूना कार्ड संख्या	4589
नमूना एकत्र करने की तिथि	04/06/2019
ग्रिड क्रमांक	127
खसरा सं./Dag No.	177(B)
खेत का क्षेत्रफल	1.04 हेक्टर
भू-स्थिति (GPS)	अक्षांश
सिंचित भूमि/असिंचित भूमि	सिंचित
खेत की पहचान	
प्रयोगशाला का नाम	मि.परी.प्रयो.एफ.ई.एस.मण्डला

मृदा परीक्षण परिणाम				
पैरामीटर	परिणाम	मानक स्तर	इकाई	आकस्म
पी एच (PH)	6.05	अम्लीय 6.5 से कम सामान्य 6.5 - 8.2 तक क्षारीय 8.2 से अधिक		अम्लीय
ई सी (EC)	0.18	सामान्य 1 से कम मध्यम 1 से 3 तक हानिकारक 3 से अधिक	मिली मोने	सामान्य
जैविक कार्बन (OC)	1.00%	निम्न 0.5 से कम मध्यम 0.5-0.75 तक उच्च 0.75 से अधिक	प्रतिशत	उच्च
उपलब्ध नाइट्रोजन (N)	261.6	निम्न 250 से कम मध्यम 250 से 400 उच्च 400 से अधिक	कि.ग्र./हे.	मध्यम
उपलब्ध फॉस्फोरस (P)	12.5	निम्न 28 से कम मध्यम 28 से 56 उच्च 56 से अधिक	कि.ग्र./हे.	निम्न
उपलब्ध पोटेशियम (K)	154.6	निम्न 140 से कम मध्यम 140 से 280 उच्च 280 से अधिक	कि.ग्र./हे.	मध्यम

Sample of the soil health card (Santosh Gupta)

2	पक्का	मध्यम	रुमकोपी 42 किगा/हे छरिया 218 किगा/हे डी.ए.पी 136 किगा/हे रुमकोपी 50 किगा/हे	पमी डम्पोस्ट रुजैटोवेक्टर पी.एस.वी पमी डम्पोस्ट राज्जो वियम	16 किगा/हे 5 किगा/हे 5 किगा/हे 5 किगा/हे 11 किगा/हे
3	अरहर		डी.ए.पी 163 किगा/हे रुमकोपी 67 किगा/हे	पी.एस.वी पमी डम्पोस्ट रुजैटोवेक्टर	5 किगा/हे 5 किगा/हे 32 किगा/हे
4	कोदो		डी.ए.पी 163 किगा/हे रुमकोपी 67 किगा/हे	पी.एस.वी पमी डम्पोस्ट रुजैटोवेक्टर	5 किगा/हे 5 किगा/हे 32 किगा/हे
5	कुटकी		डी.ए.पी 163 किगा/हे रुमकोपी 67 किगा/हे	पी.एस.वी पमी डम्पोस्ट रुजैटोवेक्टर	5 किगा/हे 5 किगा/हे 32 किगा/हे

Soil health card with recommendations (Santosh Gupta)

OBJETIVOS DE APROXIMAÇÃO E AMBIENTE PROPÍCIO

Principais metas / objetivos da abordagem

1. Ensure judicious usage of fertilizers and micronutrients based on the requirement of the soil
2. Ensure quality soil testing and dissemination of results
3. Build farmers' capacity for interpretation of soil health cards
4. Develop soil maps based on the in-house results from the soil test lab

Condições que permitem a implementação da Tecnologia(s) aplicada(s) sob a Abordagem

- **Quadro institucional:** The entire dissemination methodology is done through community-based organizations
- **Colaboração/coordenação de atores:** Several stakeholders, such as FES, farmers, equipment suppliers, the scientific community, and soil scientists, are involved in the project
- **Políticas:** Soil test results are an excellent input for the agricultural policies around fertilizers, farming practices, and soil health-related policies
- **Governança da terra (tomada de decisões, implementação e aplicação):** A soil health card is an excellent tool for farmers to decide on the usage of fertilizers and the kind of farming practices to implement
- **Conhecimento sobre GST, acesso a suporte técnico:** Soil health cards inform the farmers and the project management team so to decide on required interventions and farming practices
- **Mercados (para comprar entradas, vender produtos) e preços:** Very much relevant as soil test results quantify the number of farm inputs to be applied to the farm

Condições que dificultam a implementação da Tecnologia(s) aplicada(s) sob a Abordagem

PARTICIPAÇÃO E PAPEL DAS PARTES INTERESSADAS ENVOLVIDAS

Partes interessadas envolvidas na abordagem e seus papéis

Que partes interessadas/órgãos de implementação estavam envolvidos na abordagem?	Especifique as partes interessadas	Descreva o papel das partes interessadas
Usuários de terra/comunidades locais	Farmers from the project area	Soil samples were collected from the field of farmers. They have actively participated in the projects for managing the soil samples, participating in the capacity building programs, and implementing the recommended practices.
Organizações comunitárias	FES, the implementing NGO, have formed the Villages Environment Committee (VEC) in their project villages as community-based organizations	VECs facilitated the implanting of a project by mobilizing the communities as and when needed. FES reached farmers through the VECs, to collect the soil samples or disseminate the information. VECs also facilitated community-level implementation activities.
Especialistas em GST/ consultor agrícola	SLM Specialist	Documentation of the activities
Organização não governamental	Foundation for Ecological Security (FES) is a well-known NGO registered in India. It focuses on ecology-related issues and works closely with farmers and forest-based communities.	FES played an essential role in the project. Primary activities were as follows: 1. Establishment of soil testing laboratory and hiring the technical team to conduct the soil test lab 2. Collection of soil test samples and building the capacity of farmers on soil sample collection 3. Conducting soil test results and issuance of soil health cards to farmers 4. Developing a soil health map for the project areas 5. Capacity building of farmers for the interpretation of soil health cards and ensuring the implementation of recommended practices
Organização internacional	GIZ, India	Funding of the project

Agência líder

Foundation for Ecological Security

Envolvimento do usuários de terra/comunidades locais nas diferentes fases da abordagem

	Nenhum	Passivo	Apoio externo	Participativo	Automobilização	
Iniciação/motivação	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The FES led the initiation of discussions with its donor organizations. Discussions with communities to understand the challenges and opportunities.
Planejamento	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Local community institutions played a significant role in the entire process of planning and execution
Implementação	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Farmers and community-based institutions were actively involved in implementing multiple activities under the project, such as collecting soil samples, supplying them to the soil test labs, and Implementing the recommended practices.
Monitoramento/avaliação	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Community-based institutions played an important role in monitoring individual farmers for implementing the recommendations provided to farmers. They also monitored the results regarding crop progress, crop productivity, and improvement in soil health status.

Fluxograma

Tomada de decisão sobre a seleção da Tecnologia GST

As decisões foram tomadas por

- Somente usuários da terra (iniciativa própria)
- Principalmente usuários da terra, apoiados por especialistas em GST
- todos os atores relevantes, como parte de uma abordagem participativa
- Principalmente especialistas em GST, após consulta com usuários da terra
- Somente especialistas em GST
- Políticos/líderes

As decisões foram tomadas com base em

- Avaliação de conhecimento bem documentado de GST (tomada de decisão baseada em evidências)
- Resultados de pesquisa
- Experiência pessoal e opiniões (não documentado)

SUPORTE TÉCNICO, REFORÇO DAS CAPACIDADES E GESTÃO DO CONHECIMENTO

As seguintes atividades ou serviços têm sido parte da abordagem

- Reforço das capacidades/ formação
- Serviço de consultoria
- Fortalecimento da instituição (desenvolvimento organizacional)
- Monitoramento e avaliação
- Pesquisa

Reforço das capacidades/formação

Foi fornecido treinamento às seguintes partes interessadas

- Usuários de terra
- Equipe de campo/consultores

Tipo de formação

- Em exercício
- Agricultor para agricultor
- Áreas de demonstração
- Reuniões públicas
- Cursos

Assuntos abordados

1. Importance of soil testing for the judicious use of fertilizers
2. Methods for soil sample collection
3. Interpretation of soil health card
4. Dissemination of soil test results and ways and means for implementing the recommended practices following organic and non-organic implementation practices

Serviço de consultoria

Foi prestado um serviço de consultoria

- nas áreas dos usuários da terra
- Em centros permanentes

FES has a team of community-based resource persons from the local community and villages to provide advisory services to farmers

Fortalecimento institucional

As instituições foram fortalecidas / estabelecidas

- Não
- Sim, pouco
- Sim, moderadamente
- Sim, significativamente

no seguinte nível

- Local
- Regional
- Nacional

Descreva instituição, papéis e responsabilidades, membros, etc.

Village-level environment committees were formed to discuss the issues related to environmental concerns, livelihoods, and other social problems at the village level. These committees consist of male and female members representing the entire village.

Tipo de apoio

- Financeiro
- Reforço das capacidades/ formação
- Equipamento

Mais detalhes

These committees were provided financial support to implement the identified activities based on the provision under the project and proposals submitted by the local committees. FES regularly provides training and handholding support to these committees.

Monitoramento e avaliação

The soil health report card is very useful in monitoring of the status of soil health and measuring the impact of various practices and intervention

Pesquisa

As pesquisas trataram dos seguintes tópicos

- Sociologia
- Economia/Marketing
- Ecologia
- Tecnologia

FINANCIAMENTO E APOIO MATERIAL EXTERNO

Orçamento anual em USD para o componente GST

- < 2.000
- 2.000-10.000
- 10.000-100.000
- 100.000-1.000.000
- > 1.000.000

Externally funded projects (GIZ)

Precise annual budget: n.a.

Os seguintes serviços ou incentivos foram fornecidos aos usuários de terras

- Apoio financeiro/material concedido aos usuários da terra
- Subsídios para insumos específicos
- Crédito
- Outros incentivos ou instrumentos

Parcialmente financiado
Totalmente financiado

Equipamento: Maquinário

Different equipment used for testing the soils

Equipamento: Maquinário: Ferramentas

Different tools are used for collecting soil samples and for soil testing

A mão-de-obra dos usuários da terra foi

- Voluntário
- Comida por trabalho
- Pago em dinheiro
- Recompensado com outras formas de apoio material

ANÁLISE DE IMPACTOS E DECLARAÇÕES FINAIS

Impactos da abordagem

	Não	Sim, pouco	Sim, moderadamente	Sim, significativamente
A abordagem propiciou a tomada de decisão baseada em evidências? Soil health card-based changes in soil management and developing the evidence for soil health monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A abordagem melhorou a coordenação e a implementação economicamente eficiente da GST? Reduced the cost of applying fertilizers and other inputs through a result-based application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A abordagem aprimorou o conhecimento e as capacidades dos usuários da terra para implementar a GST? Training and handholding by the team of implementing partners have helped land users to interpret the result of soil health card, collection of soil samples and following the recommended practices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A abordagem aprimorou o conhecimento e as capacidades de outras partes interessadas? Other stakeholders such as implementing team got information about the outcome of their practices. More importantly, the soil health card was helpful in providing precise information on the application of fertilisers and bio-inputs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A abordagem encorajou os jovens/as próximas gerações de usuários de terra a se envolverem na GST? Youths were greatly involved in collection of soil samples	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Principal motivação dos usuários da terra para implementar a GST Atividades de sustentabilidade de abordagem

- Produção aumentada
- Lucro (lucrabilidade) aumentado, melhora da relação custo-benefício
- Degradação do solo reduzida
- Riscos de desastre reduzido
- Carga de trabalho reduzida
- Pagamentos/subsídios
- normas e regulamentos (multas)/aplicação
- Prestígio, pressão social/coesão social
- Afiliação a movimento/projeto/grupo/rede
- Consciência ambiental
- Costumes e crenças, moral
- melhoria dos conhecimentos e aptidões de GST
- Melhoria estética
- Atenuação de conflitos

Os usuários da terra podem sustentar o que foi implementado através da Abordagem (sem apoio externo)?

- Não
- Sim
- Incerto

Yes. The benefit in both reduced cost and improved soil health are the triggers to sustaining the practices. Also, the involvement of local community institutions will also ensure the sustainability of interventions.

CONCLUSÕES E EXPERIÊNCIAS ADQUIRIDAS

Pontos fortes: visão do usuário de terra

- Judicious use of fertilizers and pesticides based on the nutrient requirement of soil, as mentioned under the soil health report
- Separate recommendations for both chemical and organic (bio-inputs) are a good way for land users to make informed decisions
- Tracing the improvement in soil health status based on the land users' agricultural practices

Pontos fortes: a visão do/a compilador/a ou de outra pessoa capacitada

- Developing the soil maps for the entire area to design appropriate interventions for the project
- Instead of general recommendations for input application, the soil health card helped develop farmer/village-centric extension services for the farmers
- Understand the impact of various interventions through periodic soil testing to document what has worked and what has not. Even this evidence can be used to monitor the soil organic carbon content for designing carbon-based projects and/or to access national or international carbon reduction credits.

Pontos fracos/desvantagens/riscos: visão do usuário de terracomo superar

- Farmers are still unaware of the soil test facility and its benefits Regular awareness programs along with a demonstration of soil sample collection

Pontos fracos/desvantagens/riscos: a visão do/a compilador/a ou de outra pessoa capacitadacomo superar

- Farmers' strong belief in the application of a certain quantity of fertilizers to ensure better production This requires specific behavior change campaigns through local demonstration and documentation
- Government authorities also conduct the soil test and issue the soil health card. However the farmers' experience with such system has not been outstanding. Put efforts into conveying the difference between both approaches by promptly issuing the soil health card
- The soil test lab is in the District capital, so farmers in far-away areas may face difficulties in accessing the facility Explore the option of establishing soil test labs near farmers' locations

REFERÊNCIAS

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Pessoas capacitadas

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Descrição completa no banco de dados do WOCAT

https://qcat.wocat.net/pt/wocat/approaches/view/approaches_6698/

Dados GST vinculados

n.a.

A documentação foi facilitada por

Instituição

- Alliance Bioversity and International Center for Tropical Agriculture (Alliance Bioversity-CIAT) - Quênia
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
- Ecociate Consultants (Ecociate Consultants) - Índia

Projeto

- Soil protection and rehabilitation for food security (ProSo(i))

Links para informação relevante que está disponível online

- Operational Guidelines for implementation of CENTRALLY SPONSORED SCHEME SOIL HEALTH CARD:
<https://agricoop.nic.in/sites/default/files/GSHC3.pdf>

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