SOIL FERTILITY CONSTRAINTS AND REMEDIATION FOR SUSTAINABLE CROP PRODUCTION IN KERALA

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"Upon this handful of soil our survival depends. Husband it and it will grow our food, our fuel, and our shelter and surround us with beauty. Abuse it and the soil will collapse and die, taking humanity with it"

(Vedas Sanskrit Scripture – 1500 BC)

Soil fertility and soil biology studies in Travancore –early beginnings

The year 1894 was a milestone in the history of scientific agriculture in the erstwhile Travancore - the present day Kerala. The first agricultural farm was opened in that year at Karamana to demonstrate to the farmers the advantages of improved methods of cultivation of root crops, coconut, pepper and paddy

An agricultural research laboratory was opened in 1911 at Kollam for chemical analysis of soils of Kuttanad, Vaikom and Cherthala regions and found that the soils were very acidic and had toxic substances which could be neutralized by liming. Bacteriology studies indicated sulphur oxidizing bacteria and the need for reclamation of peaty soils of Kuttanad for cultivation of crops

Source: Travancore State manual Vol. I(1901)

Kerala State

Geographical area – 38,86,400 ha

Divided into three distinct parallel physiographic zones:

High land (above 75 m from the msl)- (48% of Geographical area)

Mid land (between 7.5 m and 75 m above msl)- (41.8%)

Low land (below 7.5m from the msl)- (10.2 %)

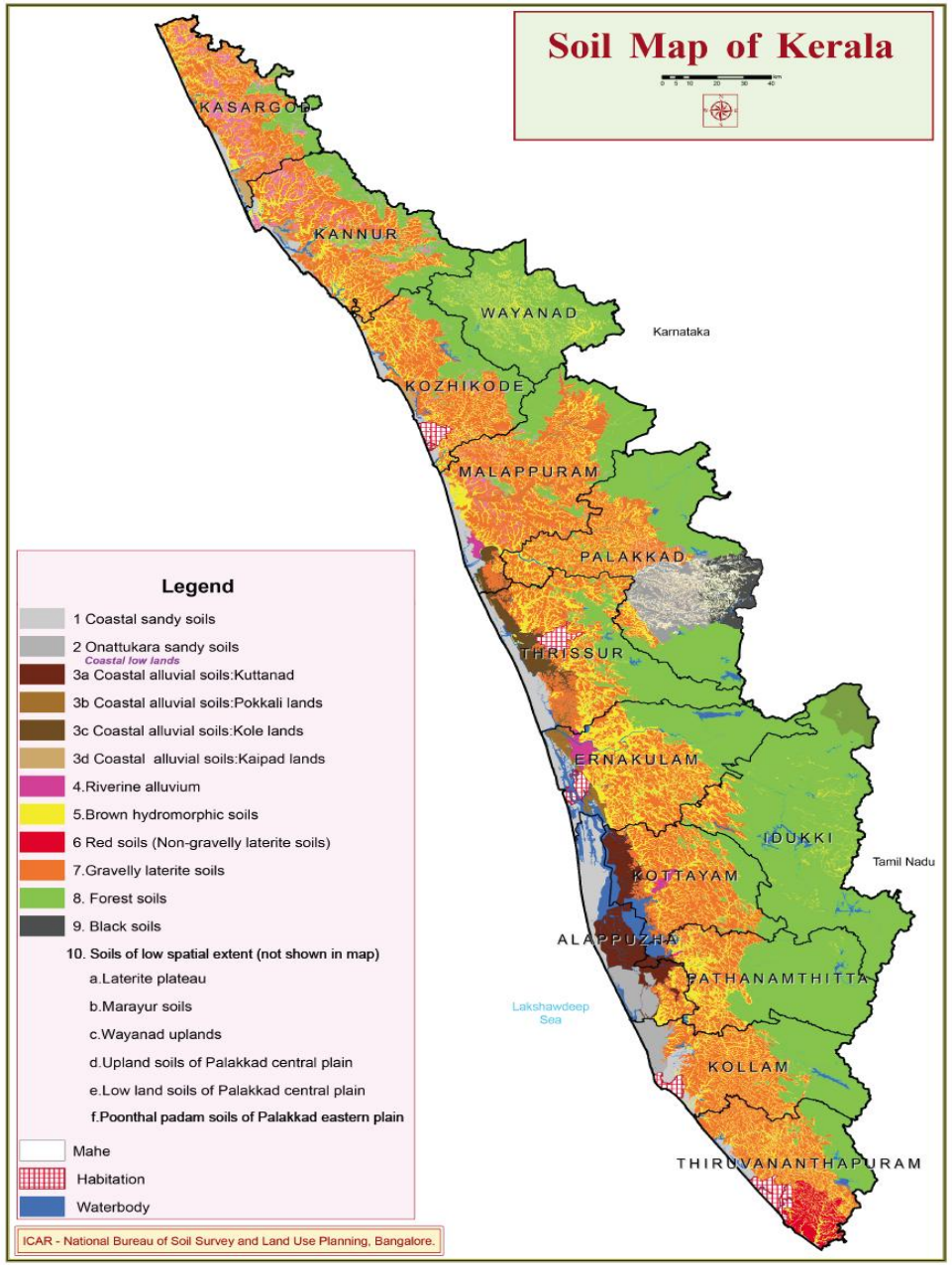
Cropped area (2017-18) - 25,65,024 ha (66 %)

Crops cultivated: Coconut, paddy, tapioca, banana, vegetables, rubber, coffee, cardamom, pepper, cocoa, ginger etc.

Soils of Kerala

Kerala has a landscape of great topographic diversity characterized by plains, erosional uplands, plateaus, high hills and mountains

The distinct variation in topography and the complex interplay of soil forming factors have resulted in the formation of different types of soils



Major Soil Groups of Kerala

1. Coastal sany soils (Coastal plains)
2. Onattukara sandy soils (Onattukara plains)
3. Coastal Alluvium (Potential Acid Sulphate)

3a. Kuttanad soils
3b. Pokkali soils
3c. Kole soils
3d. Kaippad soils

4. Riverine alluvial soils (River banks)
5. Brown hydromorphic soils (Valleys of midlands, foothills and highlands)
6. Red non Gravelly laterite soils (Southern midlands and highland plateaus of (Western Ghats)
7. Gravelly laterite soils (South, Central and Northern midlands and foothills)
8. Forest soils (Western Ghats and Escarpments)
9. Black soils (Palakkad eastern plain)
10. Special group (soils of limited spatial extent)

a. Laterite plateau
b. Marayoor soils (Lowhills and rolling lands)
c. Wayanad upland soils
d. Upland soils of Palakkad central plains
e. Low land soils of Palakkad central plain
f. Poonthal padams (Lowlands of Palakkad eastern plains)

General Characteristics of Soils of Kerala

❖The State of Kerala falls in the humid tropical belt with high rainfall and temperature conditions conducive to intense weathering processes

❖ It the *type locality* of laterite and over 90 % of geographic area is covered by highly weathered laterite soils

❖ In general, the soils are acidic, kaolinitic, gravelly with low cation exchange capacity, inherently poor in bases and plant nutrients, low water holding capacity and high phosphorus fixation

❖ Intensive agriculture and the use of high analysis fertilisers with greater purity resulted in depletion of secondary and micronutrients

❖ The continuous downward slide in production & productivity of various crops has been reported in the last decade due to various reasons

❖ Plant nutrient management based on soil fertility evaluation techniques has a crucial role in sustaining crop production

Soil fertility

It is a complex quality of soils that is closest to plant nutrient management. It is the component of overall soil productivity that deals with its available nutrient status, and its ability to provide nutrients out of its own reserves and through external applications for crop production

Soil fertility depletion in small holder farms in Kerala is currently recognized as the fundamental causes of declining productivity of crops

Soil fertility evaluation and need based nutrient management are very important in this context

❖ Soil testing is a proven diagnostic tool to evaluate the available nutrient status of a soil and evolve a balanced fertiliser recommendation

❖ Soil testing programme initiated in 1957 in Kerala was mainly intended to create an awareness on the use of fertilisers to maximise yield with thrust on major nutrients

❖At present 14 DSTL and 9 mobile soil testing laboratories are functioning under the Department of Agriculture

❖

❖The State Planning Board has coordinated a pilot project as part of Rashtriya Sam Vikas Yojana in 42 paddy growing Panchayats of Palakkad district during 2004-07

❖ More than 50,000 soil samples were collected and analyzed for major, secondary and micro nutrients

❖ Results indicated wide spread deficiencies of micro nutrients (Zinc and Boron) in a number of panchayats

❖ The need for the analysis of soil samples for secondary (Ca, Mg and S) and micro nutrients (Cu, Zn and B) covering the entire state has been realized

❖

❖ Based on the results from the pilot study, the State Planning Board initiated a project on "Soil Based Plant Nutrient Management Plan for Agro-Ecosystems of Kerala" in 2010

❖ The project implemented by the Department of Agriculture was organized as a multi-institutional Project of the State and Central institutions involved in agricultural research and development in the State under the leadership of NBSS & LUP, Bengaluru

❖ Kerala State Planning Board co-ordinated the project

Soil Based Plant Nutrient Management Plan for Agro-Ecosystems of Kerala

Objectives

- Collection of 2 lakhs soil samples from all the local bodies (1043) of the state representing the major land use systems
- ❖ Analysis of soils for pH, EC, macro, secondary and micro nutrients (13 parameters)
- ❖ Development of application software for data storage, management and retrieval
- ❖ Interpretation of soil analysis data, formulation of fertilizer recommendations and generation of soil health cards
- ❖ Preparation of Nutrient management plans for all the local bodies, Blocks and Districts
- ❖ Preparation of GIS maps
- ❖ Development of a portal on Kerala soil health information system incorporating the massive database and interpretations

Participating Institutions

- Department of Agriculture, Kerala
- DST laboratories, CSPHC

ICAR Institutes

- NBSS&LUP, Bengaluru,
- CTCRI, Thiruvananthapuram,
- CPCRI, Kayamkulam,
- IISR, Kozhikode
- Kerala Agricultural University (COA-V, COA-P,OARS-K,RRS-V, RRS-M, RARS-K,RTL,RARS-P, KVK-W.PRS-P)
- KFRI-Peechi
- ICRI (Spices Board)
- IIITM-Kerala
- NCESS,Thiruvananthapuram
- Kerala State Planning Board

Protocol for Development of Nutrient Management Plans

- The initial process was to capture the relevant data through an online interface for all collaborating laboratories and generate a unique sample code and farmer ID (eg. TVM/NYK/CKL/85-5/777)
- The collected data has been validated by expert soil scientists
- The processed data is passed on to generate fertilizer recommendation and nutrient management advisory in the form a soil health card for distribution to the farmers
- Soil analytical data were used to prepare Nutrient management plans for local bodies, block and district

Soil Health Card

ജൈവകൃഷി

- രാസവളങ്ങളും രാസകീടനാശിനികളും പൂർണ്ണമായി ഒഴിവാക്കി മണ്ണിന്റെ ആരോഗ്യവും പരിസ്ഥിതി സംരക്ഷണവും ലക്ഷ്യമാക്കിയുള്ള വിള പരിപാലനരീതിയാണ് ജൈവ കൃഷി
- കൃഷിയിടങ്ങളിൽ തന്നെയുള്ള വസ്തുക്കളെ ഉപയോഗപ്പെടുത്തിയും മണ്ണിന്റെ ഘടനയെ ബാധിക്കാത്ത രാസവസ്തുക്കളെ ഒഴിവാക്കിയുള്ള വളപ്രയോഗമാണ് ജൈവകൃഷിയിൽ നടത്തുന്നത്
- മണ്ണു പരിശോധനയുടെ അടിസ്ഥാനത്തിൽ മണ്ണിൽ സൂക്ഷ്മ മൂലകങ്ങൾ ആവശ്യത്തിൽ കുറവാണെങ്കിൽ ജൈവകൃഷിയുടെ ദേശീയപരിപാടി (NPOP) മാർഗ്ഗനിർദേശം അനുസരിച്ച് സൂക്ഷ്മ മൂലകങ്ങൾ അടങ്ങിയ രാസവളങ്ങൾ വിളപരിപാലനത്തിന് ഉപയോഗിക്കാവുന്നതാണ്

(വിശദ വിവരങ്ങൾക്ക് അടുത്തുള്ള കൃഷി ഓഫീസറുമായി ബന്ധപ്പെടുക)

പ്രധാനമൂലകങ്ങളുടെ അപര്യാപ്തത ചെടികളിൽ ഉളവാക്കുന്ന ലക്ഷണങ്ങൾ

പാക്യജനകം (നൈട്രജൻ)

- പ്രായമായ ഇലകളിൽ ഇളംപച്ചയോ മഞ്ഞയോ നിറവ്യത്യാസം. പിന്നീട് ഇലയാകെ മഞ്ഞ നിറമാകുന്നു
- പൂക്കളും കായ്കളും കുറയുന്നതുമൂലം വിളവ് കുറയുന്നു

ഭാവഹം (ഫോസ്ഫറസ്)

- കടുംപച്ചനിറം പ്രായമായ ഇലകളിൽ ആദ്യലക്ഷണമായി കാണുന്നു. ചെടിയുടെയും വേരുകളുടേയും വളർച്ച മുരടിക്കുകയും ശാഖാ മൂകുളങ്ങളുടെ വളർച്ച കുറയുകയും ചെയ്യുന്നു
- ഇലകൾ ചെമ്പിക്കുകയും അരികുകളിലും തുമ്പിലും നിറവ്യത്യാസവും കാണുന്നു

ക്ഷാരം (പൊട്ടാസ്യം)

- പ്രായമായ ഇലകളുടെ അരികുകൾ മഞ്ഞനിറമാകുന്നത് ആദ്യലക്ഷണം. പിന്നീട് അഗ്രഭാഗം തവിട്ടു നിറമായി കരിഞ്ഞ് ഉണങ്ങുന്നു
- കായ്കളും വിത്തുകളും ചുക്കി ചുളുങ്ങുന്നു

കേരള സർക്കാർ
കൃഷി വകുപ്പ്

മണ്ണിന്റെ ആരോഗ്യ സൂചികയും പരിപോഷണത്തിനുള്ള നിർദേശങ്ങളും

SOIL HEALTH CARD
And
NUTRIENT MANAGEMENT RECOMMENDATION

കർഷകന്റെ പേര്	: Venugopal T P
സാമ്പിൾകോഡ്	: ALP/CHR/PRB/48/19/230693

മേൽവിലാസം
Thottakathu Perumbalam P O
Perumbalam
Alappuzha

A multi-institutional project of Kerala State Department of Agriculture involving DST Laboratories, CSPHC, ICAR Institutes (NBSS&LUP, Bengaluru, CTCRI, Thiruvananthapuram, CPCRI, Kayamkulam, IISR, Kozhikkode), Kerala Agricultural University (COA-V, COA-P, OARS-K, RRS-V, RRS-M, RARS-K, RTL, RARS-P, KVK-W, PRS-P), KFRI-Peechi, ICRI (Spices Board), IIITM-Kerala and CESS- Thiruvananthapuram and Coordinated by Kerala State Planning Board.

വളപ്രയോഗ ശുപാർശ

വിള I.ചീര (കി.ഗ്രാം/ഏക്കർ)

	ജൈവവളം കി.ഗ്രാം	കമ്മായം കി.ഗ്രാം/ഏക്കർ	യൂറിയ	അമോ ഫോസ്	എം. ഒ. പി	മഗ്നീഷ്യം സൾഫേറ്റ്	സൾഫർ	ഫൊറസ് സൾഫേറ്റ്	ഇതിശ്	സിങ്ക് സൾഫേറ്റ്	മാംഗനീസ് സൾഫേറ്റ്	ബോറാക്സ്
ഒന്നാം ഗഡു	20000	54	-	25	31	32	-	6	-	-	-	4
രണ്ടാം ഗഡു	-	82	51	-	0	-	-	-	-	-	-	-
മൂന്നാം ഗഡു	-	-	51	-	0	-	-	-	-	-	-	-

വിള II.പടവലം (ഗ്രാം/ചെടി)

	ജൈവവളം കി.ഗ്രാം	കമ്മായം ഗ്രാം/ചെടി	യൂറിയ	അമോ ഫോസ്	എം. ഒ. പി	മഗ്നീഷ്യം സൾഫേറ്റ്	സൾഫർ	ഫൊറസ് സൾഫേറ്റ്	ഇതിശ്	സിങ്ക് സൾഫേറ്റ്	മാംഗനീസ് സൾഫേറ്റ്	ബോറാക്സ്
ഒന്നാം ഗഡു	10	54	-	12	16	32	-	6	-	-	-	4
രണ്ടാം ഗഡു	-	82	39	-	0	-	-	-	-	-	-	-
മൂന്നാം ഗഡു	-	-	39	-	0	-	-	-	-	-	-	-

വിള III.തക്കാളി (ഗ്രാം/ചെടി)

	ജൈവവളം കി.ഗ്രാം	കമ്മായം ഗ്രാം/ചെടി	യൂറിയ	അമോ ഫോസ്	എം. ഒ. പി	മഗ്നീഷ്യം സൾഫേറ്റ്	സൾഫർ	ഫൊറസ് സൾഫേറ്റ്	ഇതിശ്	സിങ്ക് സൾഫേറ്റ്	മാംഗനീസ് സൾഫേറ്റ്	ബോറാക്സ്
ഒന്നാം ഗഡു	1	5	-	2	1	3	-	1	-	-	-	0
രണ്ടാം ഗഡു	-	7	4	-	1	-	-	-	-	-	-	-
മൂന്നാം ഗഡു	-	-	4	-	0	-	-	-	-	-	-	-

ലഭ്യത അനുസരിച്ച് വളങ്ങൾ മാറ്റി ഉപയോഗിക്കേണ്ടി വരികയാണെങ്കിൽ അടുത്തുള്ള കൃഷി ഓഫീസറുമായി ബന്ധപ്പെടുക.

NB : മണ്ണ് പരിശോധന അടിസ്ഥാനത്തിൽ മാത്രമേ സൂക്ഷ്മ മൂലകങ്ങൾ (കോപ്പർ,സിങ്ക്,ബോറോൺ) അടങ്ങിയ വളങ്ങൾ മണ്ണിൽ ചേർക്കാവൂ.

മണ്ണ് പരിശോധനയുടെഫലം

നമ്പർ	പരിശോധന ഘടകം	ഫലം	നിലവാരം	നമ്പർ	പരിശോധന ഘടകം	ഫലം	നിലവാരം
1	പി എച്ച് മൂല്യം	5.4	അധികം അമ്ലത	8	ലഭ്യമായ സൾഫർ - mg/kg	13.8	പര്യാപ്തം
2	ലവണ മൂല്യം -dS/m	0.02	ക്രമം	9	സിങ്ക്-HCl - mg/kg	> 5	പര്യാപ്തം
3	ജൈവ കാർബൺ - %	.2	കുറവ്	10	മാംഗനീസ്-HCl - mg/kg	9.2	പര്യാപ്തം
4	ലഭ്യമായ ഭാവഹം -kg/ha	93	കൂടുതൽ	11	ഇരുമ്പ്-HCl - mg/kg	3.8	അപര്യാപ്തം
5	ലഭ്യമായ ക്ഷാരം -kg/ha	138	മധ്യമം	12	ചെമ്പ്-HCl - mg/kg	1.93	പര്യാപ്തം
6	ലഭ്യമായ കാൽസ്യം -mg/kg	226.2	അപര്യാപ്തം	13	ബോറോൺ -mg/kg	0.13	അപര്യാപ്തം
7	ലഭ്യമായ മഗ്നീഷ്യം -mg/kg	49.6	അപര്യാപ്തം		DFC		230/093

Soil Analysis Done at : Krishi Vignan Kendra, Kottayam -2014-10-09

കൂടുതൽ വിവരങ്ങൾക്ക് www.keralasoilfertility.net എന്ന വെബ്സൈറ്റ് സന്ദർശിക്കുക.
താങ്കളുടെ കൃഷിഭൂമിയുടെ ആരോഗ്യ സൂചികയും പരിപോഷണ നിർദേശങ്ങളും ലഭിക്കുന്നതിന് സാമ്പിൾകോഡ് ഉപയോഗിക്കുക

Preparation of Nutrient Management Plan

Worked out the frequency distribution of pH classes, major, secondary and micro nutrient content of soil samples collected from each panchayat, as per the critical levels suggested by KAU

Soil reaction (pH) classes and Lime recommendation

	Classes	pH range	Lime (kg/ha)
1.	Ultra acid	<3.5	1000
2.	Extremely acid	3.5 -4.4	850
3.	Very strongly acid	4.5- 5.0	600
4.	Strongly acid	5.1-5.5	350
5.	Moderately acid	5.6-6.0	250
6.	Slightly acid	6.1-6.5	100
7.	Neutral	6.6-7.3	-
8.	Slightly alkaline	7.4-7.8	-
9.	Moderately alkaline	7.9-8.4	-
10.	Strongly alkaline	8.5 -9.0	-
11.	Very strongly alkaline	>9.0	-

Soil analysis data (organic carbon, available P and K) were grouped as low, medium or high as per the soil fertility ratings followed in the S T L under the DOA.

Computed nutrient Index as suggested by Parker et al. (1951)

Soil parameters	Low	Medium	High
Organic carbon (%)	≤ 0.7	> 0.7 - ≤1.5	> 1.5
Available P (kg ha^{-1})	< 11	≥ 11 - ≤24	> 24
Available K (kg ha^{-1})	< 116	≥ 116 - ≤ 275	> 275

Secondary nutrients (Ca, Mg & S)

Soil analysis data of secondary nutrients were grouped as adequate / deficient based on the critical levels (KAU, 2012)

Nutrients	Deficiency	Adequate
Calcium	≤ 300 mg kg^{-1}	> 300 mg kg^{-1}
Magnesium	≤ 120 mg kg^{-1}	> 120 mg kg^{-1}
Sulphur	< 5 mg kg^{-1}	≥ 5 mg kg^{-1}

Micro nutrients (Cu, Zn & B)

Soil analysis data of micro nutrients were grouped as adequate / deficient based on the critical levels (KAU, 2012)

Nutrients	Deficiency	Adequate
Copper	< 1.0 mg kg^{-1}	≥ 1.0 mg kg^{-1}
Zinc	< 1.0 mg kg^{-1}	≥ 1.0 mg kg^{-1}
Boron	< 0.5 mg kg^{-1}	≥ 0.5 mg kg^{-1}

Panchayat level nutrient management plan (NMP)

- Provides information on soil reaction (pH), status and rating of major, secondary and micronutrients of the panchayat.
- Recommendations on lime, organic manuure and fertilizers needed to provide balanced nutrient supply
- Guidelines for maximizing the use efficiency of manures, fertilizers, time and method of application

ADVANTAGES OF NMP

- Helps farmers to apply need based fertilizers and lime thereby minimizing pollution of water bodies/ground water

- There is potential cost savings in inputs, balanced supply of nutrients, improved crop performance and sustaining soil health

- NMP provides guidelines for planning fertilizer needs of the panchayat, Block, District and the State as a whole
- Panchayat wise computation of NMP indicates only the general soil fertility status of the panchayat. However, site-specific fertilizer recommendation based on analysis of soil samples from individual farmer's field is more precise, beneficial and economical

State level soil fertility constraints
(identified from the project)

Soil acidification

- Eighty eight per cent of the soils are in general acidic

- Out of this, 69 % are very strongly to moderately acid- (pH 4.5 to 6) warranting regular application of liming materials to combat acidity

State level soil fertility constraints
(identified from the project)

Soil acidification

- Eighty eight per cent of the soils are in general acidic

- Out of this, 69 % are very strongly to moderately acid- (pH 4.5 to 6) warranting regular application of liming materials to combat acidity

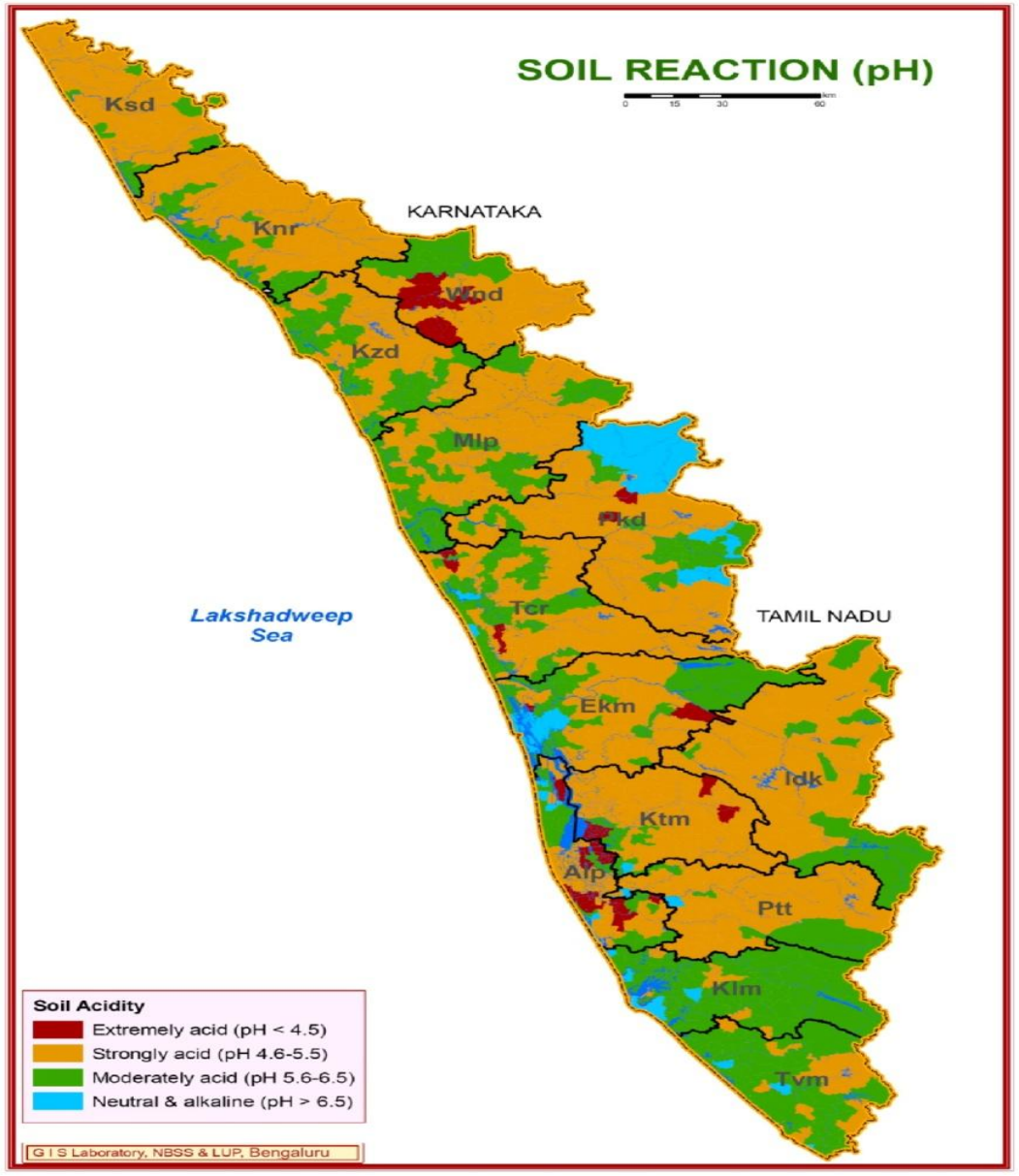
❖Organic carbon is low to medium in 71 % soils

❖ Available P is high in 68 % soil samples

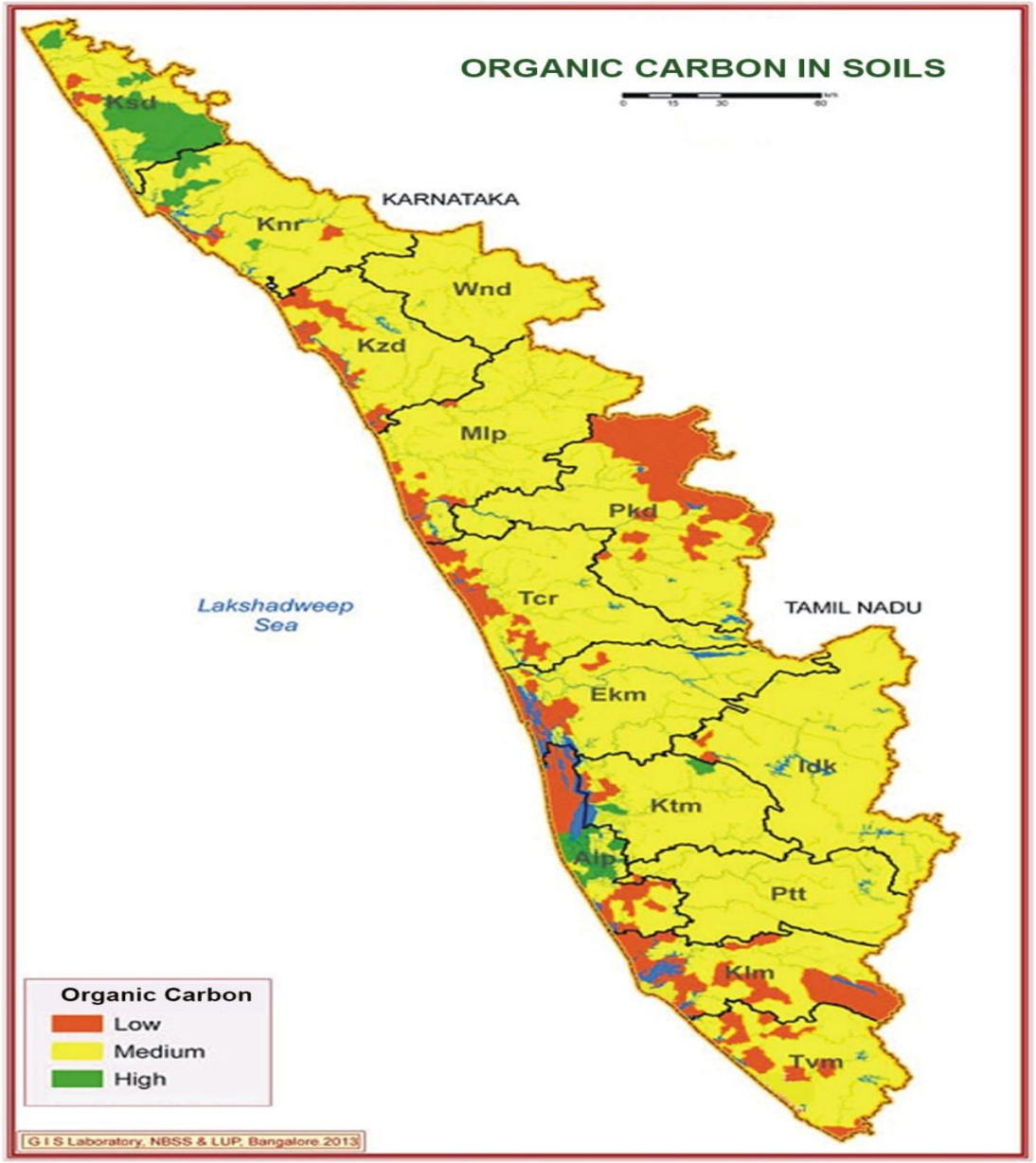
❖ Available K is low to medium in 69 % soils

SALIENT FINDINGS (contd...)

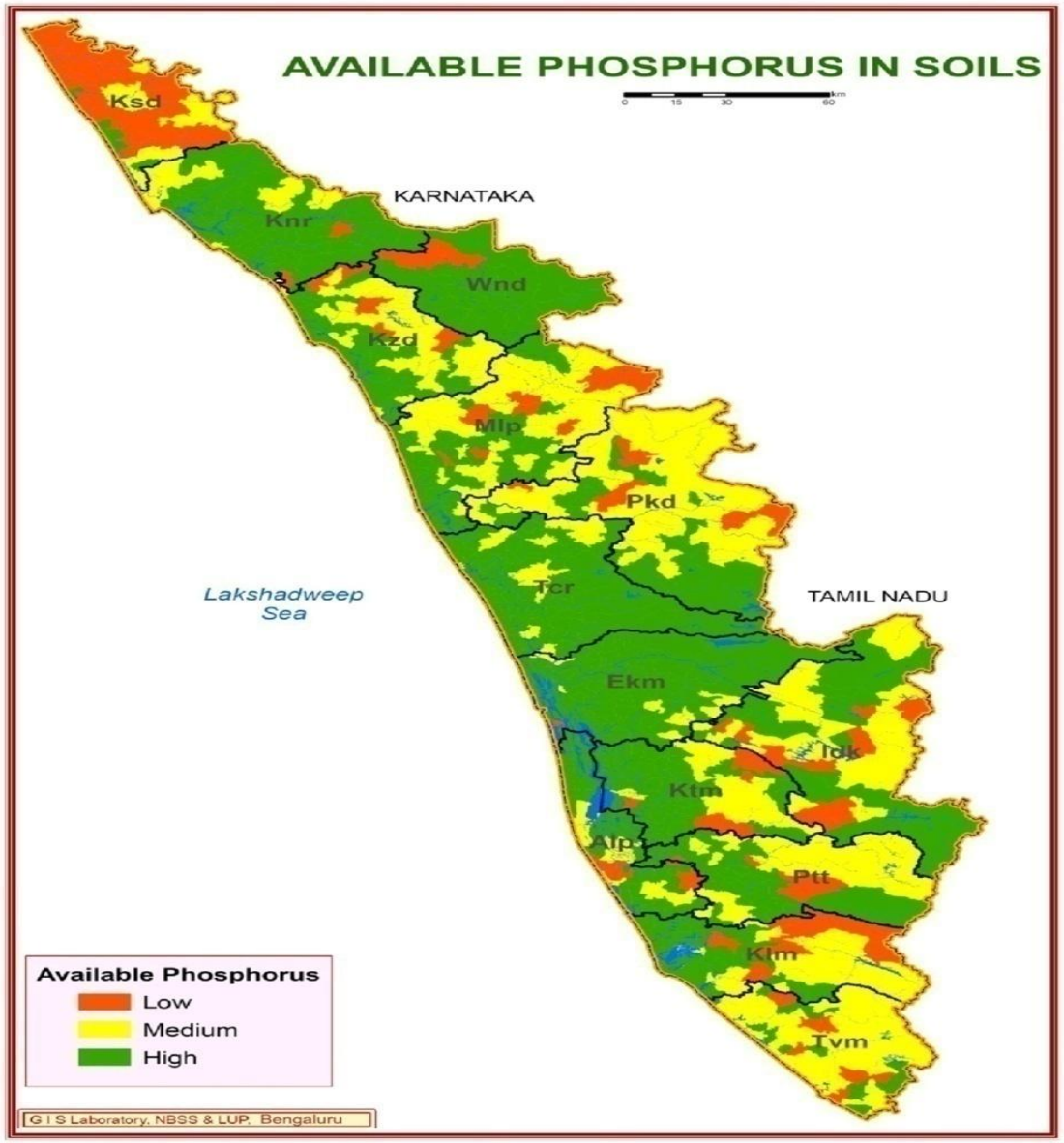
- Deficiency of calcium in 36 % samples
- Magnesium deficiency in 71 % soils
- Sulphur is deficient in 30 % samples
- Copper is deficient in 17 % soils
- Zinc deficiency in 14 % samples
- Boron is deficient in 60 % soils



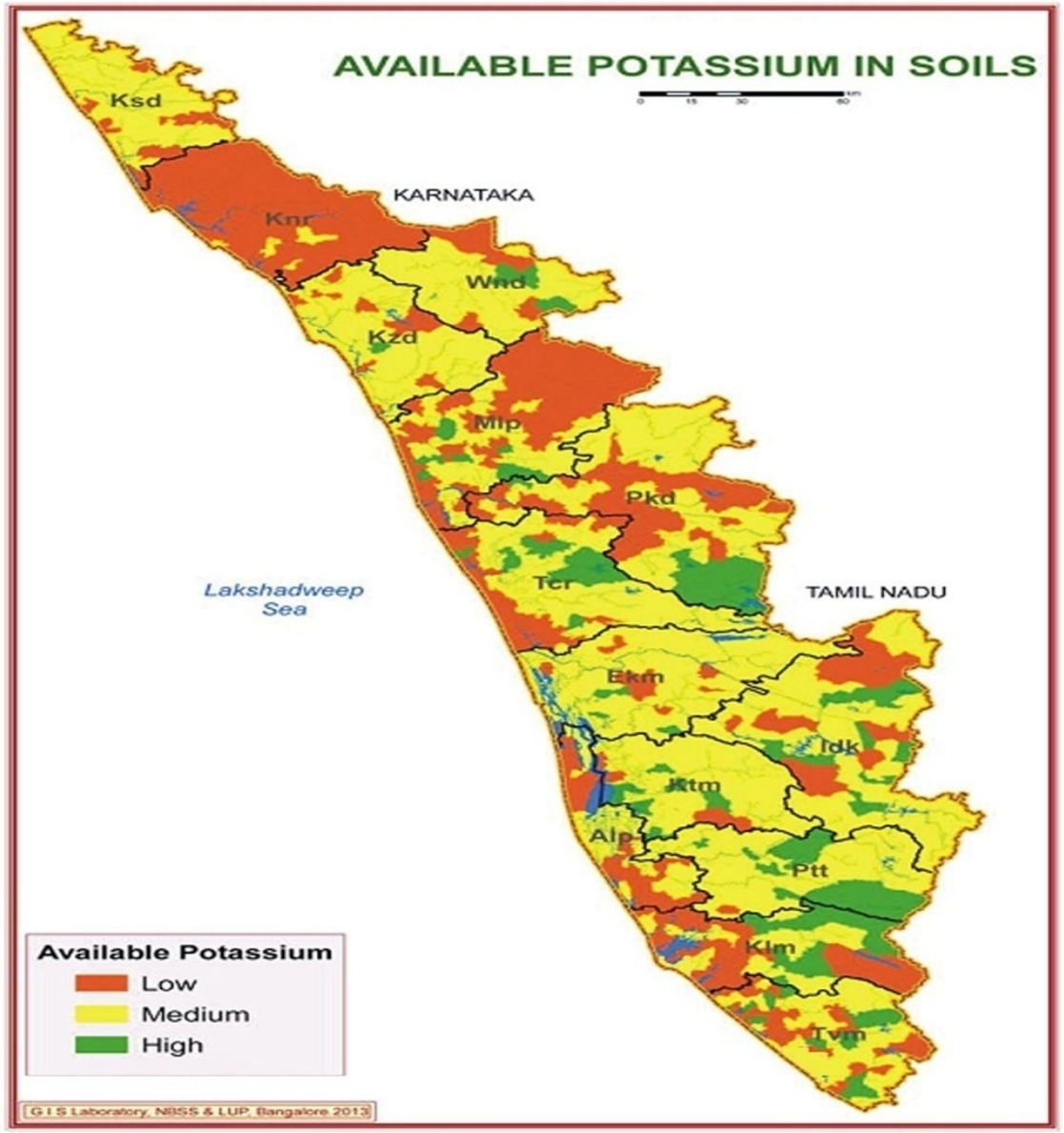
Spatial distribution of soil pH



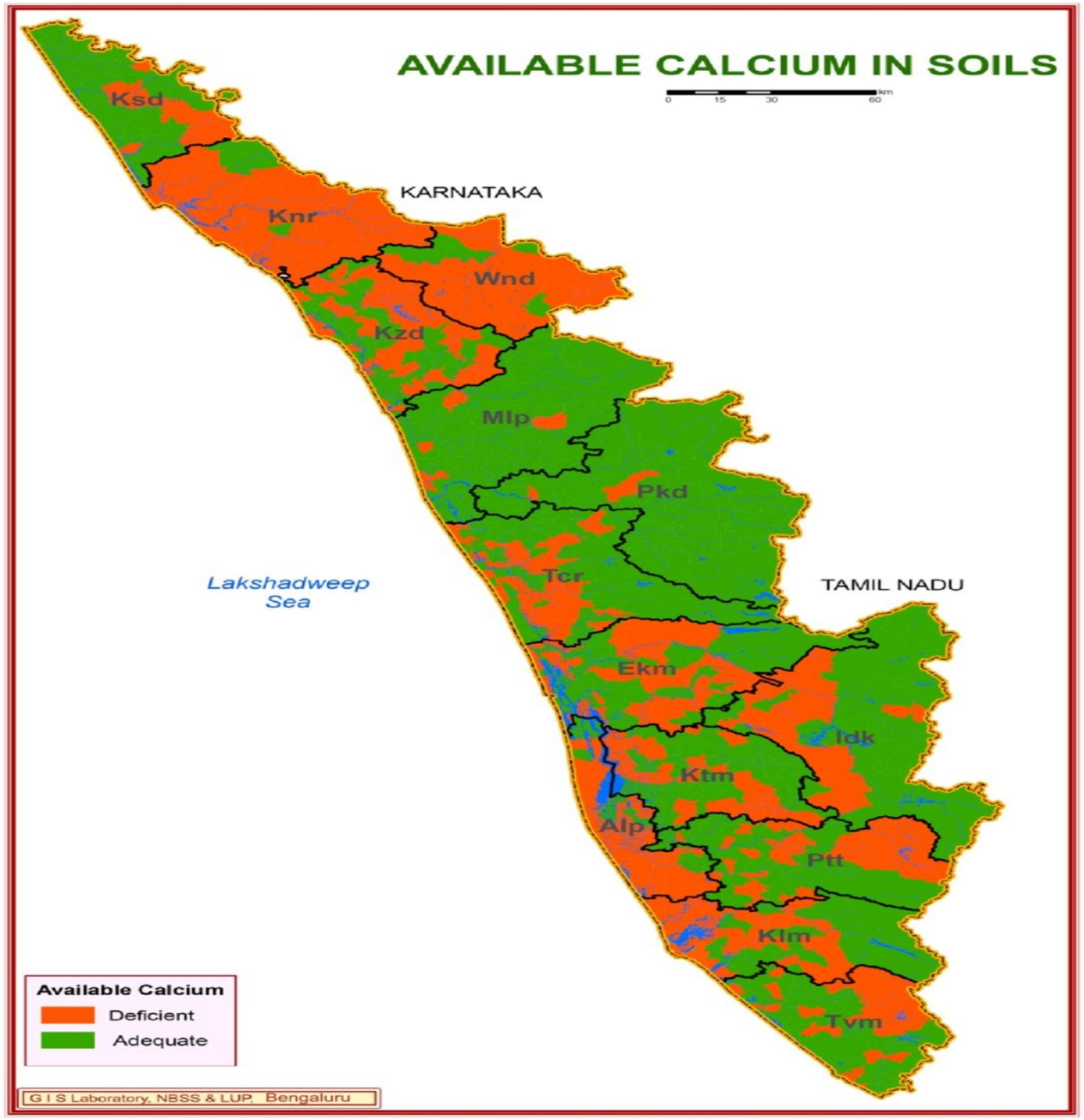
Spatial distribution of soil organic carbon



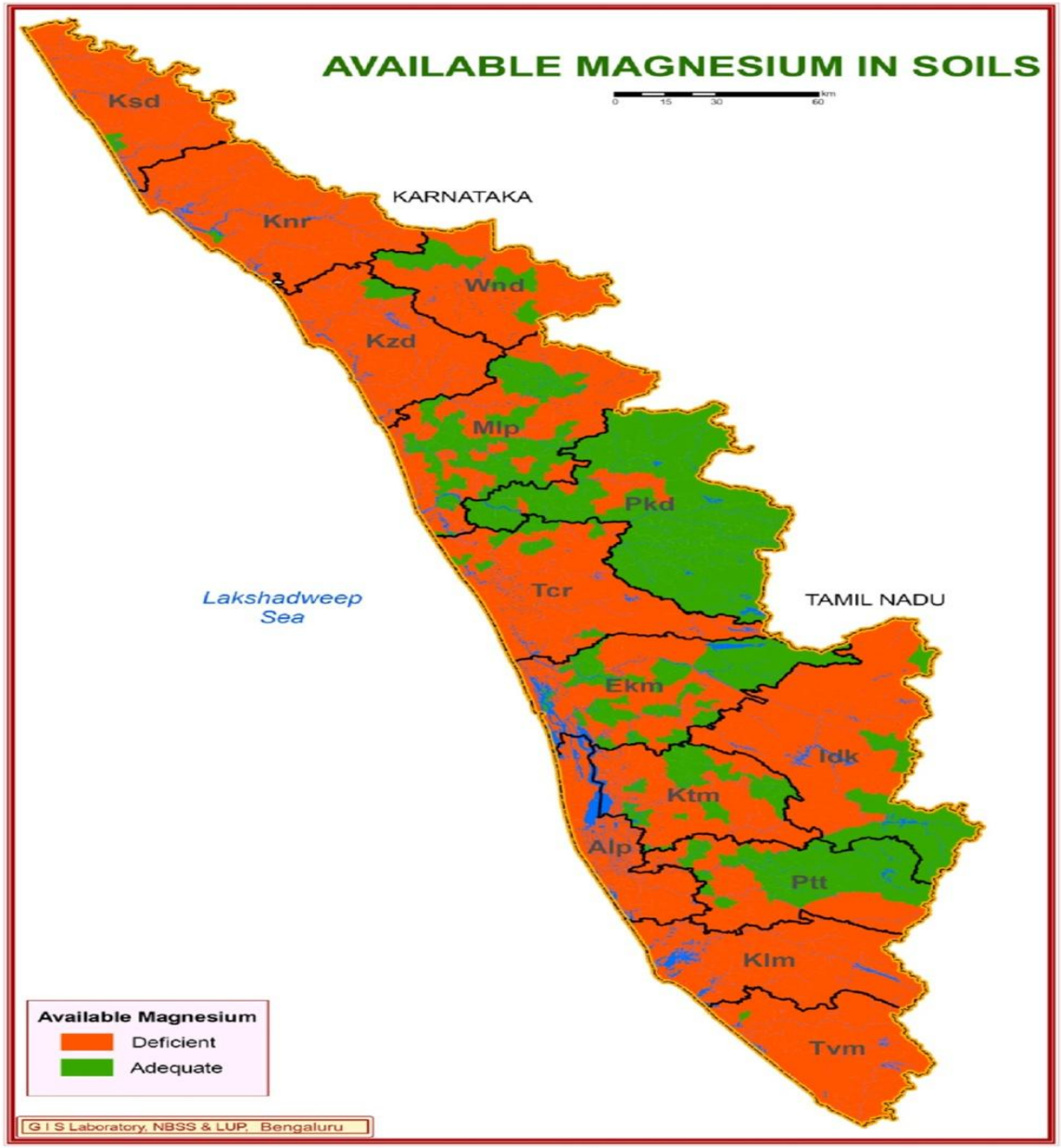
Spatial distribution of available phosphorus



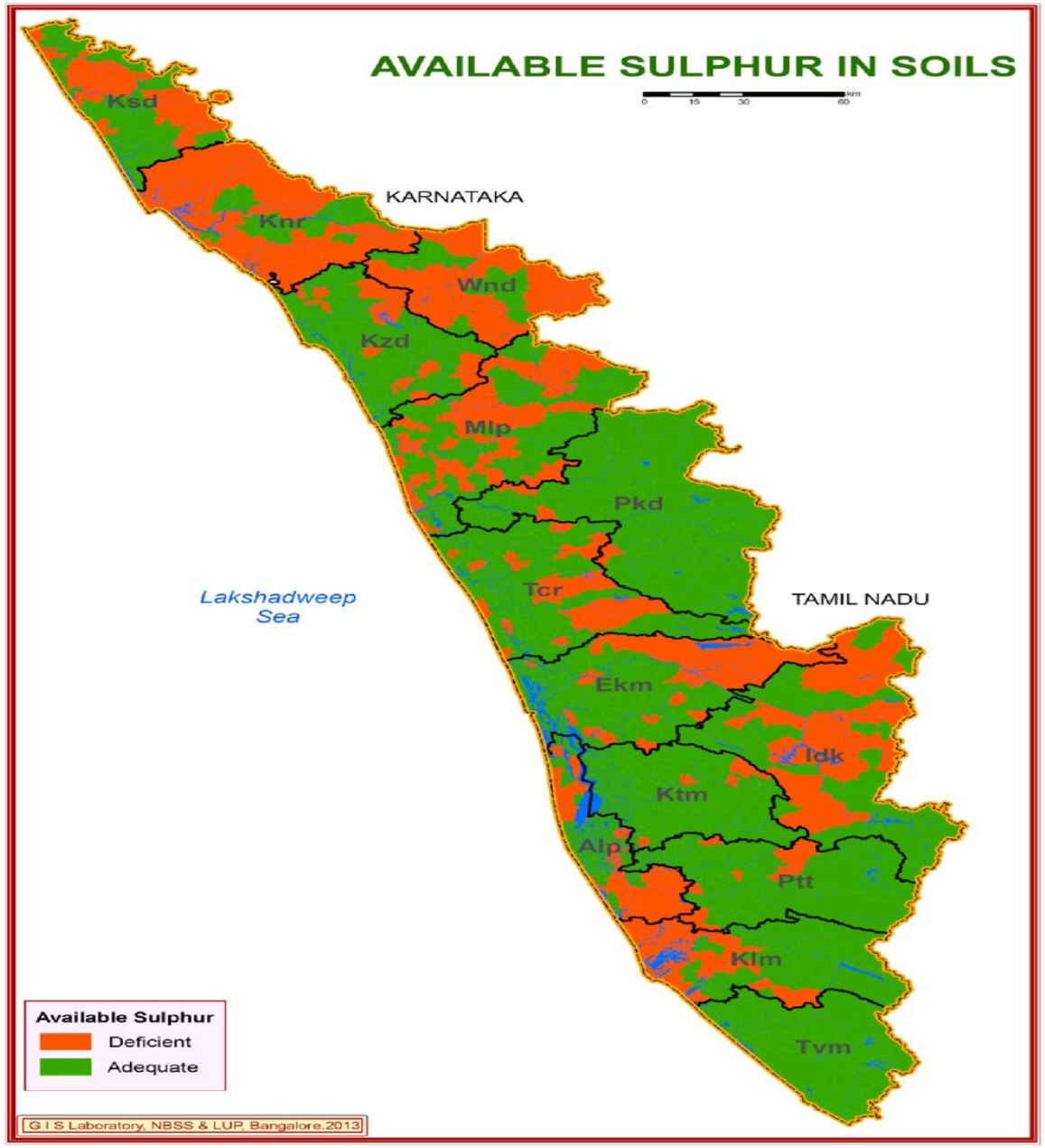
Spatial distribution of available potassium



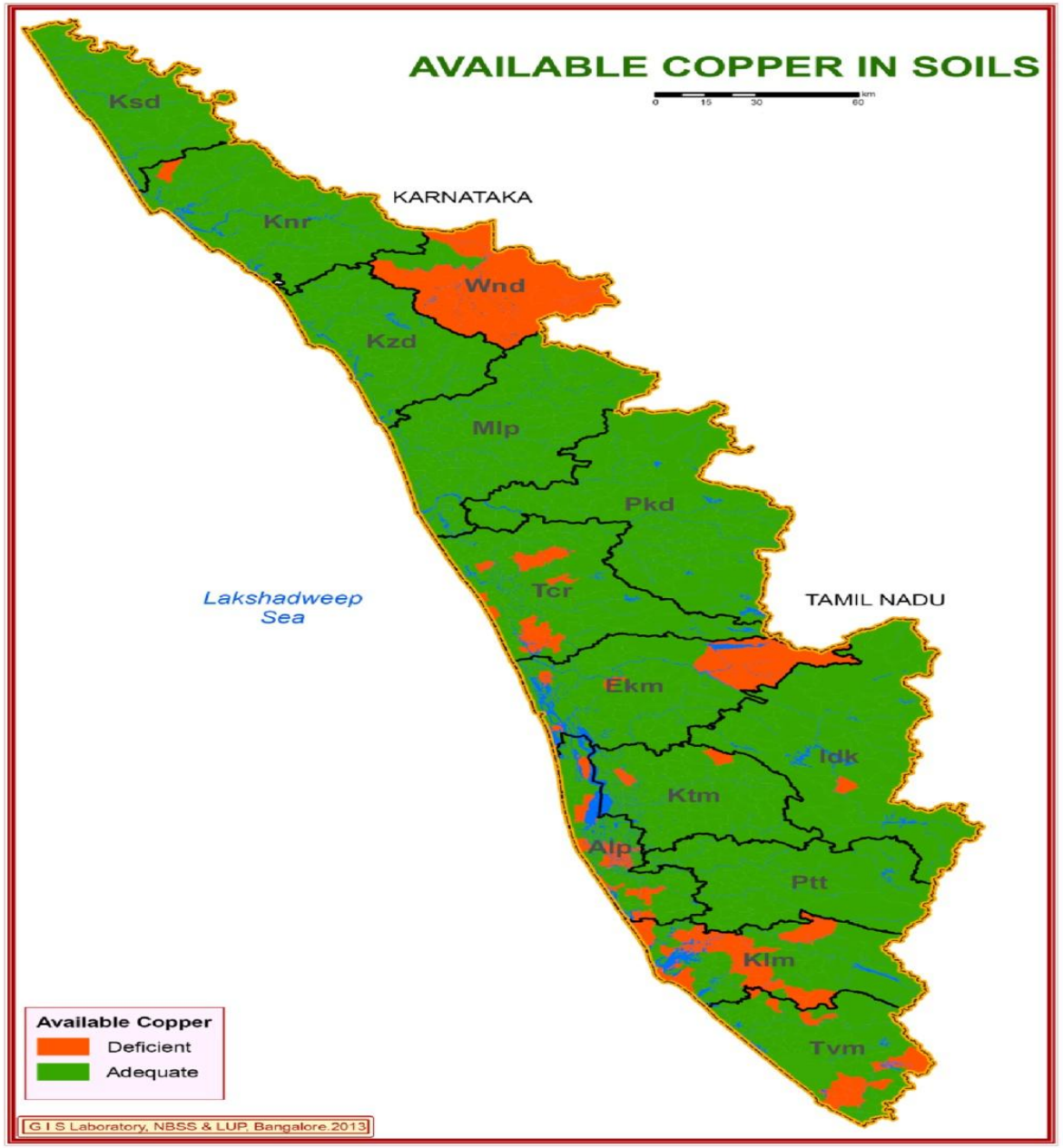
Spatial distribution of available calcium



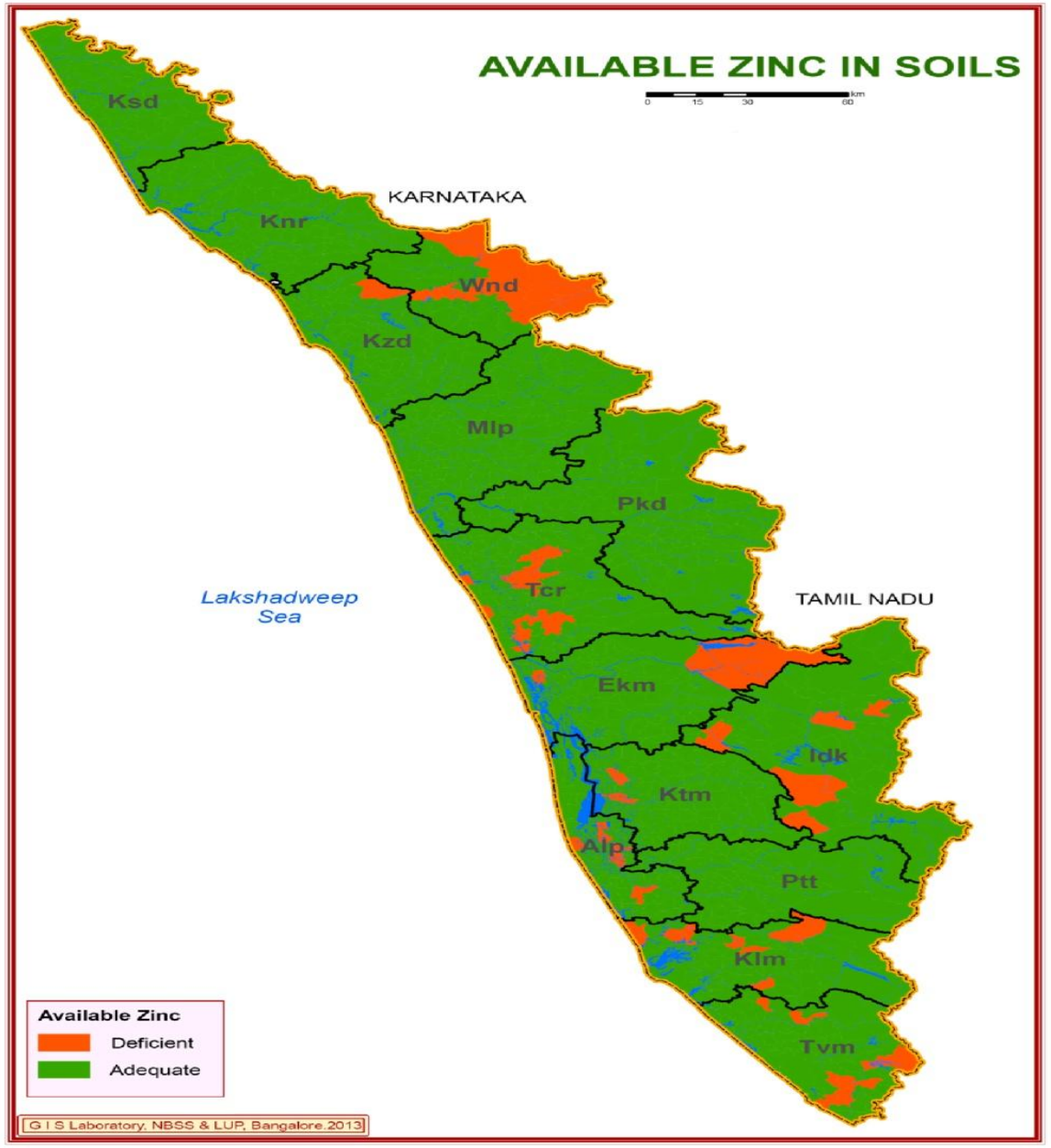
Spatial distribution of available magnesium



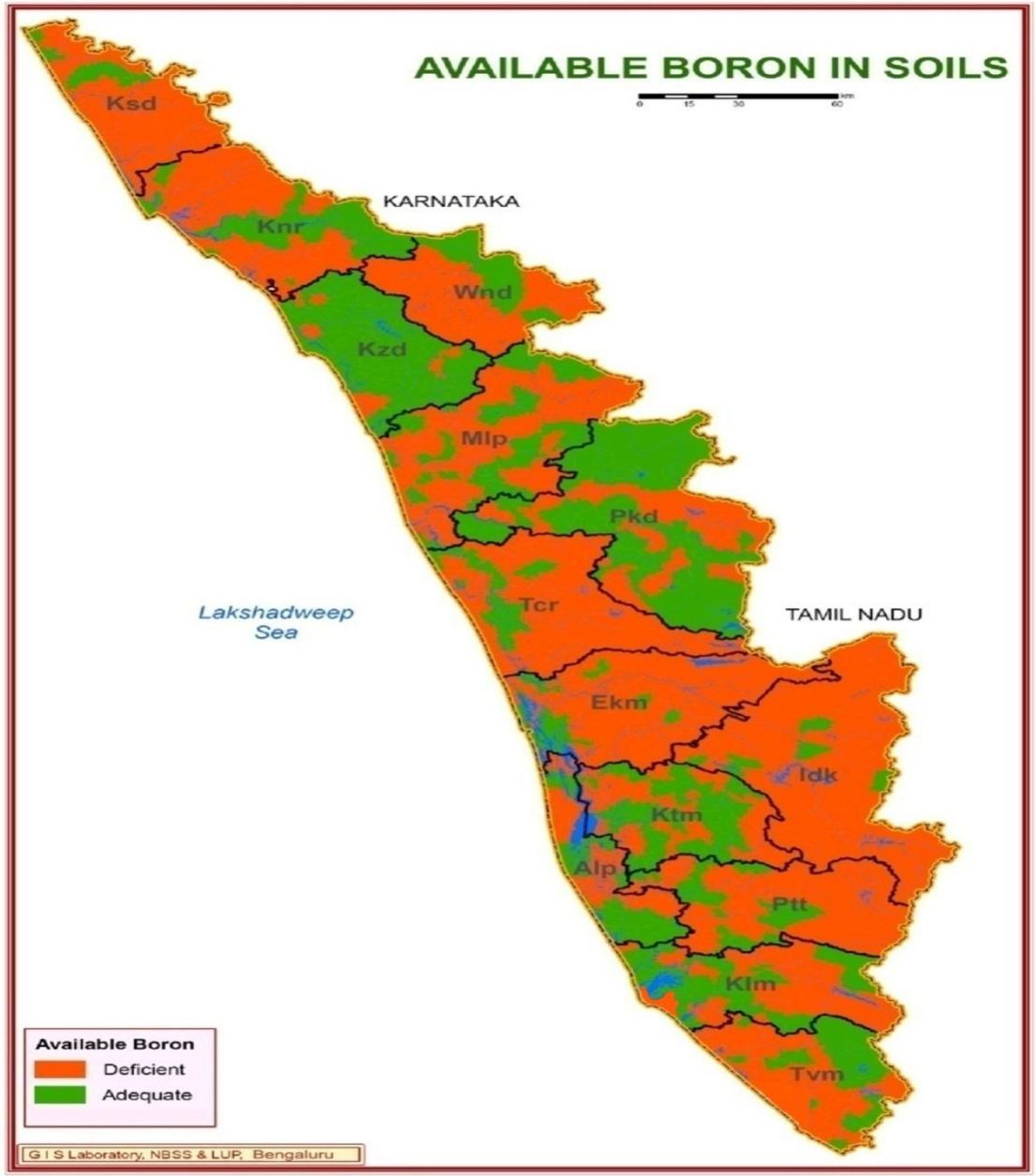
Spatial distribution of available sulphur



Spatial distribution of available copper



Spatial distribution of available zinc



Spatial distribution of available boron

State level Interventions for soil fertility management
Acidity Management through liming

Benefits derived

- Reduces toxicity of Fe, Al & Mn
- Increases the availability of P & other nutrients
- Alleviates deficiency of Ca and Mg (through dolomite)
- Improves microbial activities , N-fixation etc.
- Improves soil structure, thereby increased air and water movement
- Studies on alleviation of sub soil acidity using gypsum ($CaSO_4$) in coconut growing laterite areas are giving encouraging results

Soil reaction (pH) & Lime recommendation

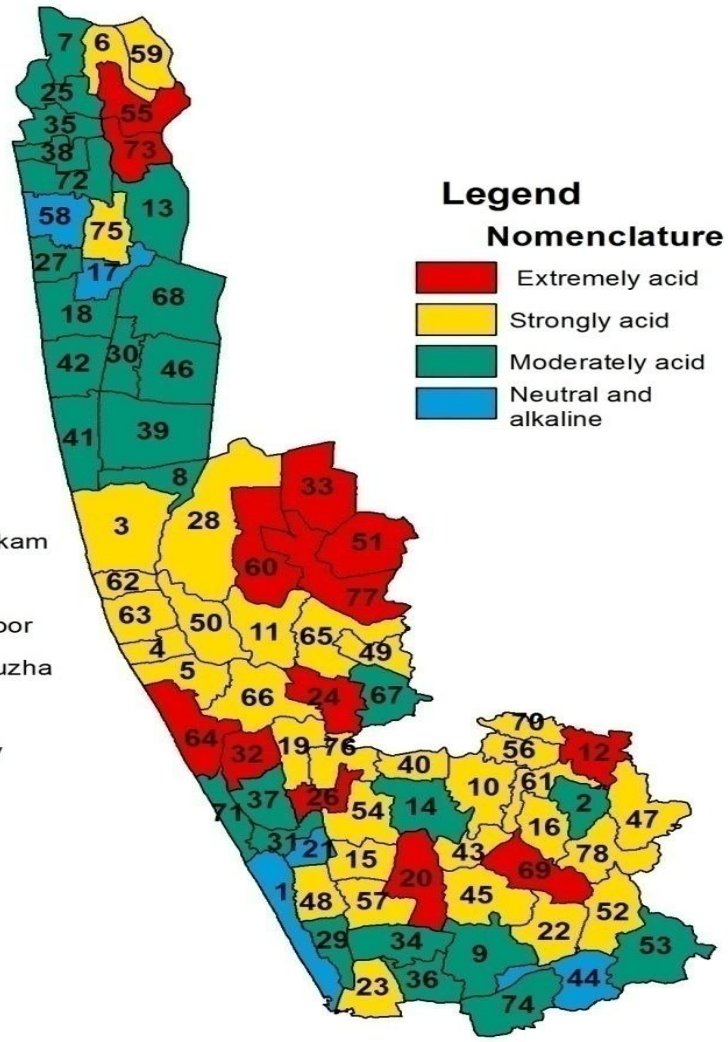
Classes	pH range	Lime (kg/ha)
1. Ultra acid	<3.5	1000
2. Extremely acid	3.5 -4.4	850
3. Very strongly acid	4.5- 5.0	600
4. Strongly acid	5.1-5.5	350
5. Moderately acid	5.6-6.0	250
6. Slightly acid	6.1-6.5	100

Fertilizer recommendation based on soil test

Parameter	Status	Recommendation (KAU)
Organic carbon	Low/Medium/high	125/100/75 % POP
Available P	Low/Medium/high	125/100/75 % POP
Available K	Low/Medium/high	125/100/75 % POP
Calcium	Deficient	Lime application
Magnesium	Deficient	$MgSO_4$ @ 80 kg ha^{-1}
Sulphur	Deficient	Supply through $MgSO_4$
Copper	Deficient	$CuSO_4$ @ 2 kg ha^{-1} or foliar spray (0.5 %)
Zinc	Deficient	$ZnSO_4$ @ 20 kg ha^{-1} or foliar spray (0.5 %)
Boron	Deficient	Borax @ 10 kg ha^{-1} or foliar spray (0.5 %)

NB: Organic manure as per Package of Practices (POP), KAU

ALAPUZHA DISTRICT
SOIL FERTILITY STATUS - pH



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Project: "Soil Based Plant Nutrient Management Plan for Agro-ecosystems of Kerala (2017)"
Prepared By: "GIS Division, IIITM-K"

ALAPUZHA DISTRICT
SOIL FERTILITY STATUS - AVAILABLE PHOSPHORUS (P)

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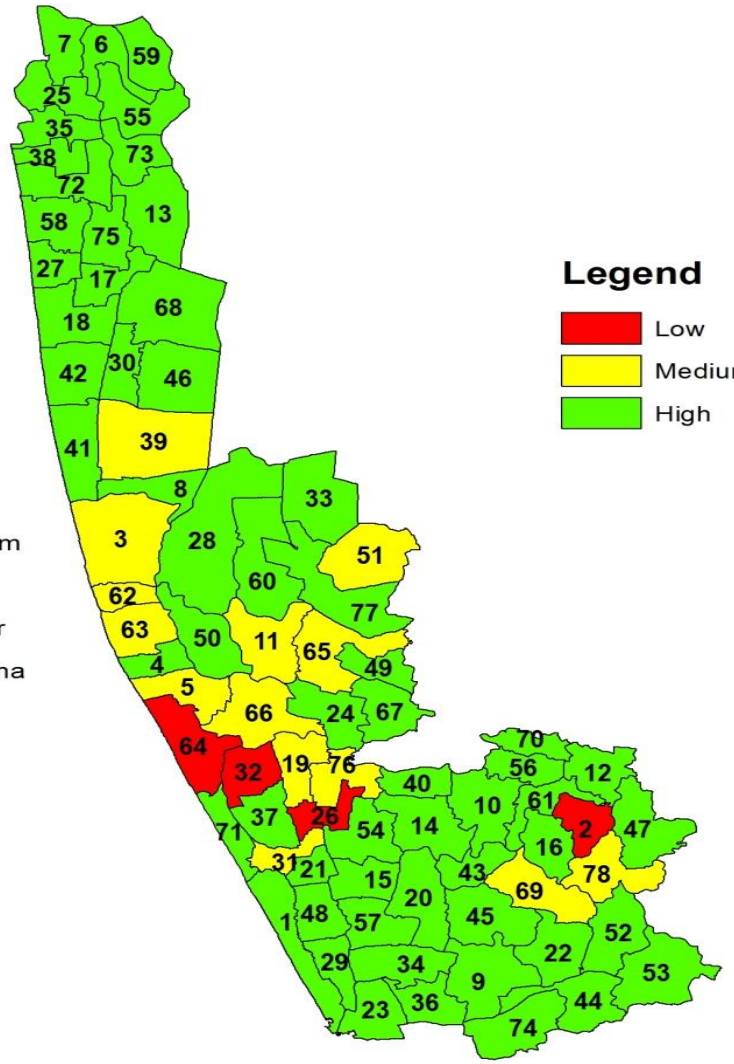

Project : "Soil Based Plant Nutrient Management Plan for Agro-ecosystems of Kerala (2017)"
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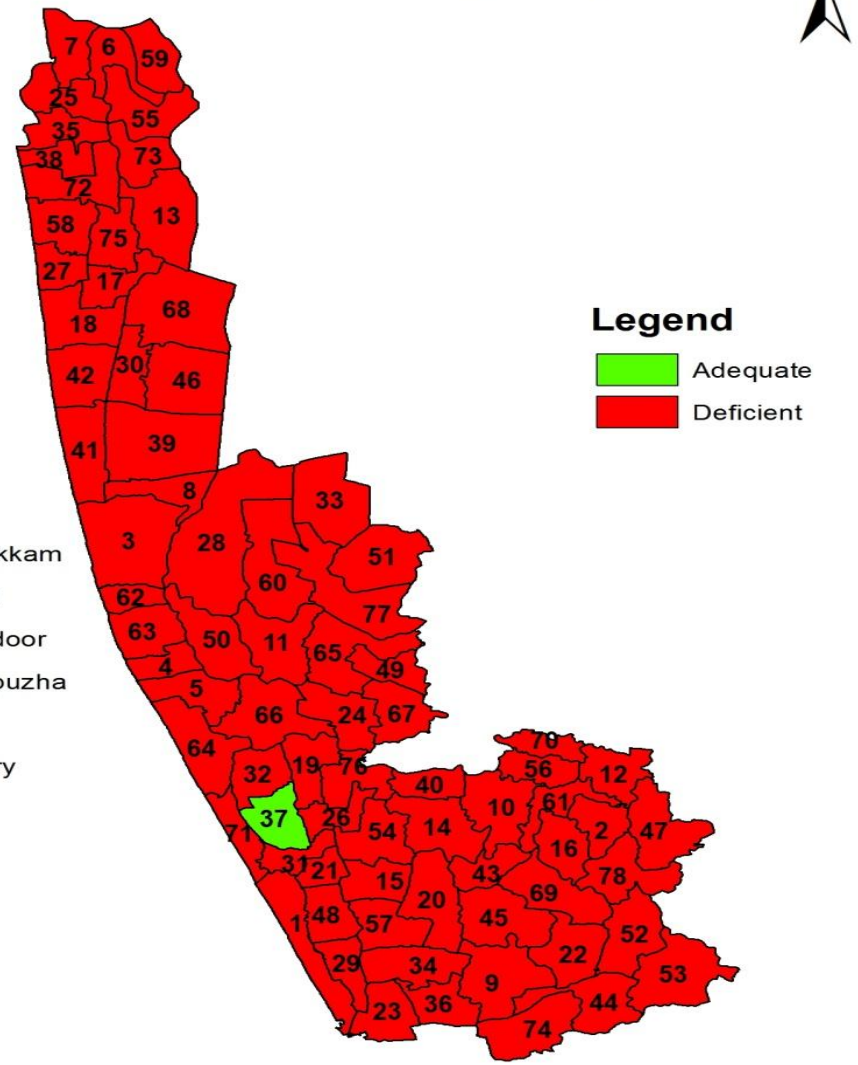
ALAPUZHA DISTRICT
SOIL FERTILITY STATUS - AVAILABLE MAGNESIUM (Mg)



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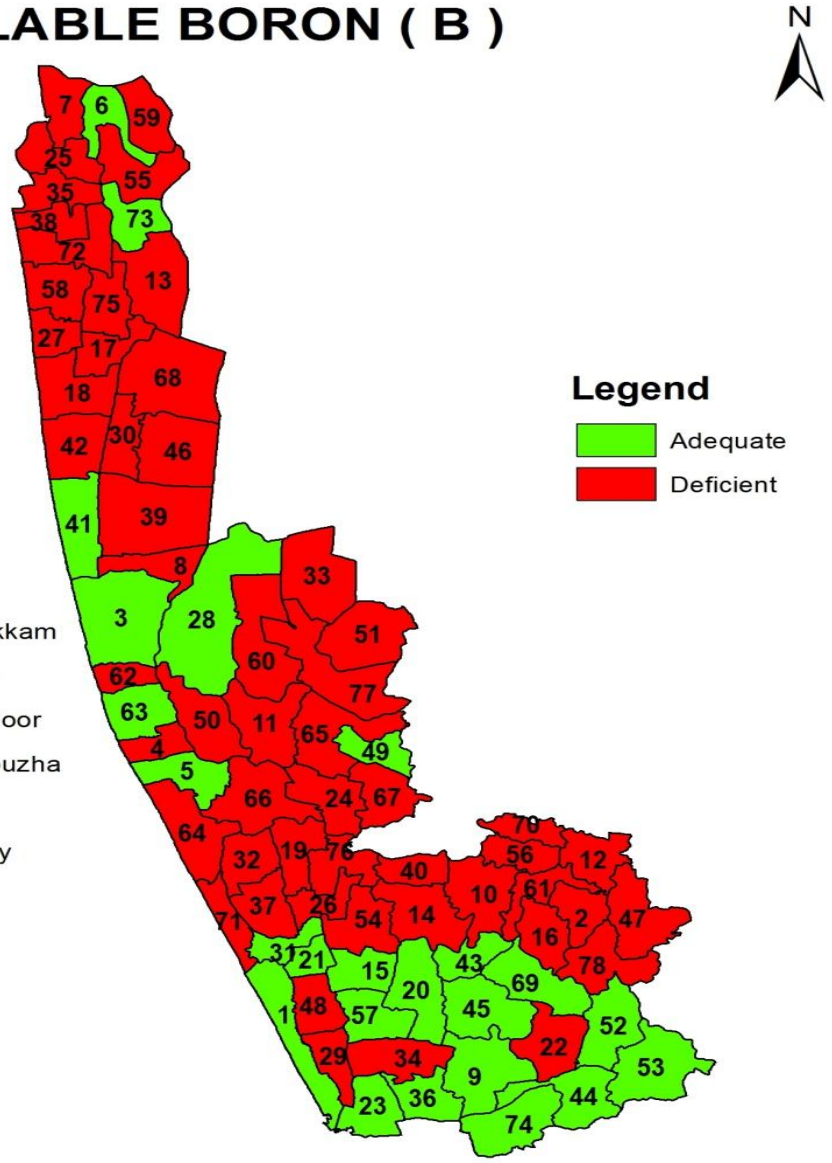
Project : "Soil Based Plant Nutrient Management Plan for Agro-ecosystems of Kerala (2017)"

Prepared By : "GIS Division , IIITM-K "

ALAPUZHA DISTRICT
SOIL FERTILITY STATUS - AVAILABLE BORON (B)



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Soil test based integrated nutrient management –Success stories

Ernakulam District, Vazhakkulam Block, Choornikkara Grama panchayat

Location: Fallow land at Choornikkara panchayat - (15 acres during first year and 30 acres during second year)

Crop: Paddy -First year : Var. Jyothy and Kanchana
& Second year: Var. Uma

Group Initiate of 'Adayalam'- A group of young farmers

Soil test results:
Acidic, high in organic carbon and phosphorus, and deficient in calcium, magnesium and boron

Contd...

Cultivation practices:

- Two week old seedlings were planted using transplanters
- Plant protection measures through green chemicals
- VAM and Pseudomonas were the bio agents
- Agro Ecological System Analysis -Ecological engineering
- Lime (dolomite) and fertilizer application based on soil test

Productivity of rice

1St year : 9.8 tons/ha

2nd year : 10.1 tons/ha

(State average Productivity of rice: 2.5 tons/ha)

Marketing Strategy: Branded rice "Choornikkara kuthari"

Source: Shri John Sherry, Agricultural Officer, Krishibhavan, Choornikkara, Ernakulam

Soil test based integrated nutrient management –Success stories

Malappuram District, Perinthalmanna Block, Angadipuram panchayat

Fallow land (8 acres) at Angadipuram (Kayilipadam)

Crop: Paddy - Var. Ponmani

Padasekharam Convener:
Shri. Yousaf, Pothukkattil (H),
Pariyapuram

Soil test results:
Strongly acidic, medium in organic carbon and potassium, high in phosphorus, and deficient in magnesium and boron

Contd...

Cultivation practices:

- Bio Priming of Paddy seeds with Pseudomonas
- Root dipping of seed mat in trichoderma slurry
- Agro Ecological System Analysis -Ecological engineering
- Fertilizer application based Soil test

Total yield from 3.2 ha: 30 tons

Productivity: 9.2 tons/ha

Marketing strategy

Through Social Media- Door Delivery

(Source: Shri. K.P. Suresh , A.O., Krishi Bhavan – Angadippuram)

Soil test based integrated nutrient management –Success stories

Kollam District, Kottarakkara Block, Ezhukone Grama panchayat

Location: Kakkakottoor (Ezhukone)

Crop: Snake gourd

Name of the farmer:
Sri. Narayana Pillai
Bindu Bhavanam, Kakkakottoor, Ezhukone

Soil test results:
Very strongly acidic, deficient in magnesium, sulphur and boron

Contd...

Results

- Positive influence of soil test based nutrient application over farmers' practices

- Increase in profit over farmers' practices : 15 %

(Source: Ms. Maya S Nair
Agricultural Officer
Krishi Bhavan- Ezhukone)

Way forward

- In the coming years the food production systems will experience pressures from the growing population for high quality food, competition for land, water, energy and the effects of climate change
- The present agriculture scenario of Kerala warrants urgent measures to address the above challenges through implementation of existing technology, traditional knowledge and location specific best management practices to ensure higher productivity of crops, healthy soils and clean environment

Reference

KeralaState Planning Board ,2017, Soil Fertility Assessment and Information Management for Enhancing Crop Productivity in Kerala, State Planning Board, Thiruvananthapuram, pp 514

Department of Agriculture &Farmer's Welfare,2019, Soil Health Management for Sustainable Crop Production in Kerala. (eds.) V.K.Venugopal, K.M.Nair, P.Rajasekharan, A.N.Sasidharan Nair, Kerala State Planning Board, Thiruvananthapuram, P 1-426


Thank You