



Food and Agriculture  
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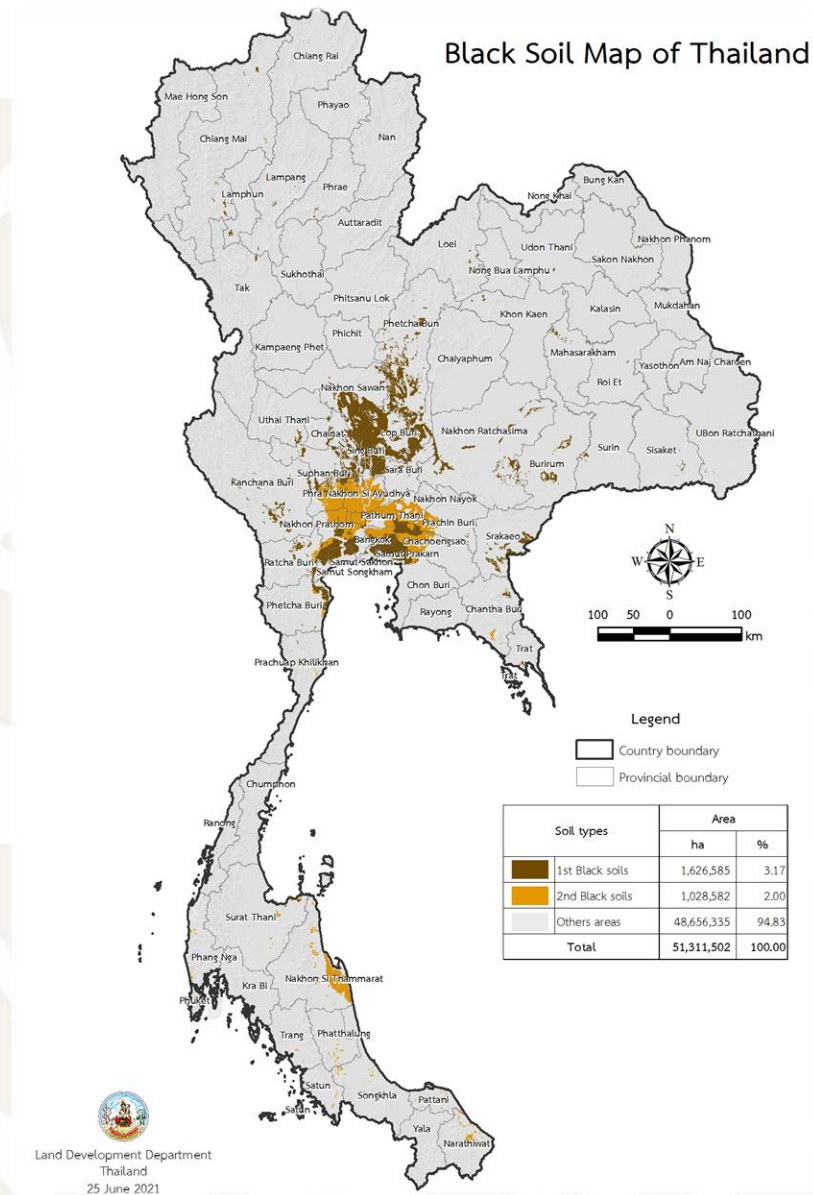
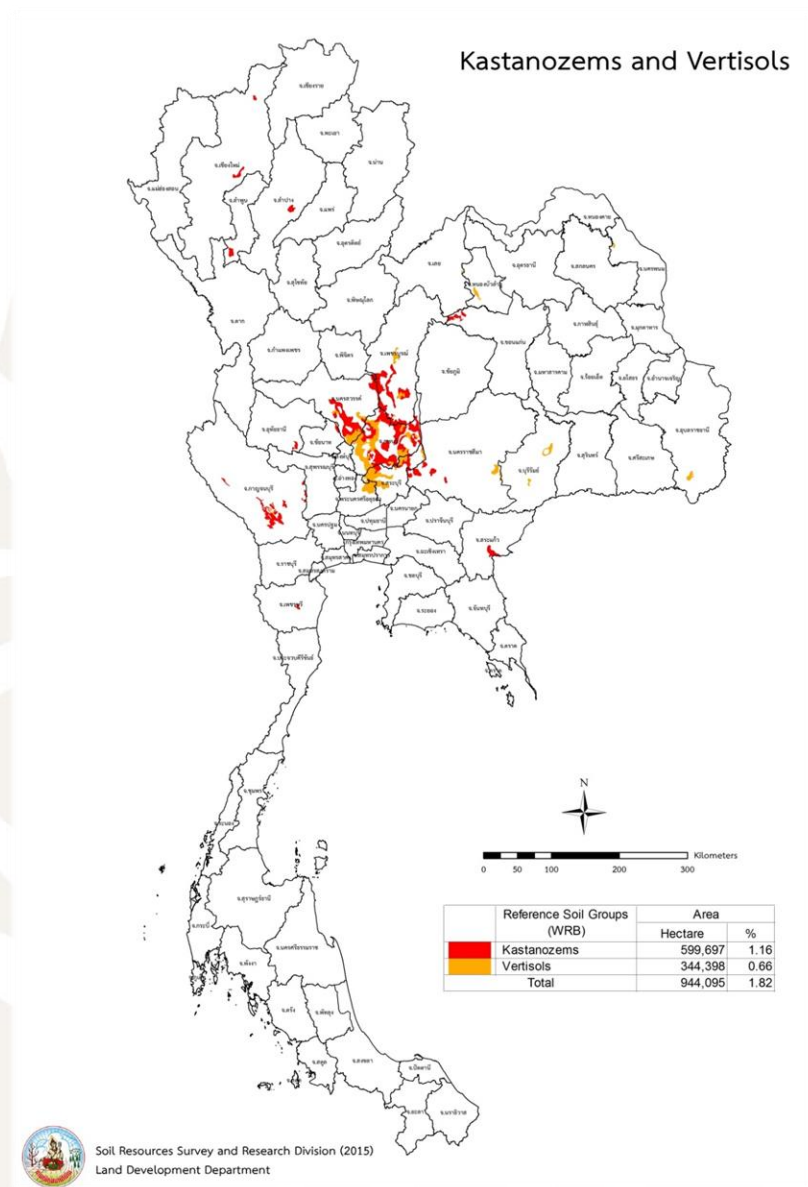
# Black soils of Thailand, Country Report

Launch of the  
International Research  
Institution of Black Soils

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# Black soil: follow the FAO definition

Black soils (FAO, 2021) are mineral soils which have a black surface horizon, enriched with organic carbon that is at least 25 cm deep. Two categories of black soils are recognized.

1

## 1st category Black Soils

- The presence of black or very dark surface horizons typically with a chroma of  $\leq 3$  moist, a value of  $\leq 3$  moist and  $\leq 5$  dry (by Munsell colours);
- The total thickness of black surface horizons of  $\geq 25$  cm;
- Organic carbon content in the upper 25 cm of the black horizons  $\geq 0.6\%$  and  $\leq 20\%$ ;
- CEC in the black surface horizons  $\geq 25$  cmol/kg; and
- A base saturation in the black surface horizons  $\geq 50\%$

2

## 2nd category Black Soils

- The presence of black or very dark surface horizons typically with a chroma of  $\leq 3$  moist, a value of  $\leq 3$  moist and  $\leq 5$  dry (by Munsell colours);
- The total thickness of the black surface horizons of  $\geq 25$  cm; and
- Organic carbon content in the upper 25 cm of the black horizons  $\geq 0.6\%$  and  $\leq 20\%$

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# Black soil in Thailand

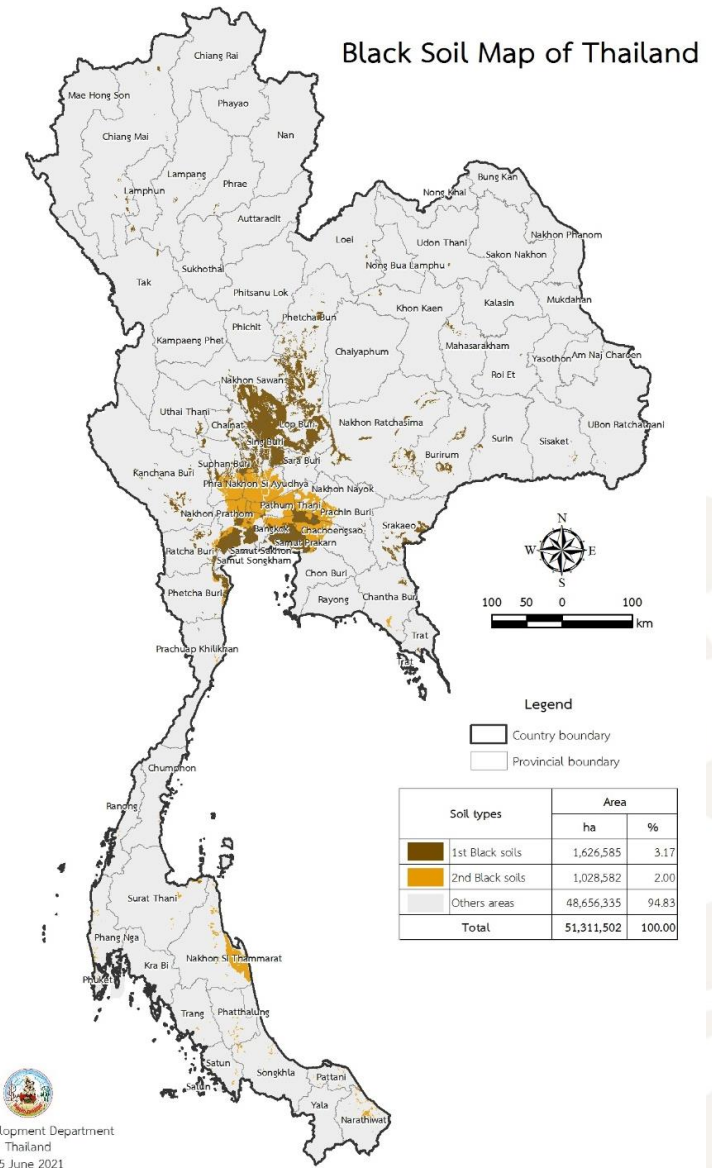
The total areas of black soil are 2,655,167 hectares.

1st category black soils 1,626,585 hectares.

RSG	Order	Great group	Epipedon
Kastanozems	Mollisols	Haplustolls, Hapludolls	Mollic
Vertisols	Vertisols	Haplusterts	Mollic
Gleysols	Inceptisols Mollisols Vertisols	Endoaquepts Endoaquolls Endoaquerts, Epiaquerts	Mollic Mollic Mollic
Luvisols	Alfisoils	Haplustalfs, Paleustalfs	Mollic

2nd category black soils 1,028,582 hectares.

RSG	Order	Great group
Gleysols	Inceptisols Ultisols	Endoaquepts Plinthaquults
Luvisols	Alfisoils	Haplustalfs



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# Sample of 1<sup>st</sup> Black soil



Bangkok  
soil series

Eutric Gleysols

Very-fine, smectitic, nonacid, isohyperthermic Vertic Endoaquepts



Paddy field



Lopburi  
soil series

Pellic Vertisoils

Very-fine, smectitic,  
isohyperthermic Typic  
Haplusterts



Field crop

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Source: <http://iddindee.idd.go.th/SoilSeries>





# Sample of 2<sup>nd</sup> Black soil



Ayutthaya soil series

Eutric Gleysols

Very-fine, mixed, active, acid, isohyperthermic Vertic Endoaquepts



Paddy field

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**Source:** <http://iddindee.idd.go.th/SoilSeries>





# The situation of Black soil in Thailand

- Land utilization from the Black Soils is suited for intensive cropping with high yield and high economic return.



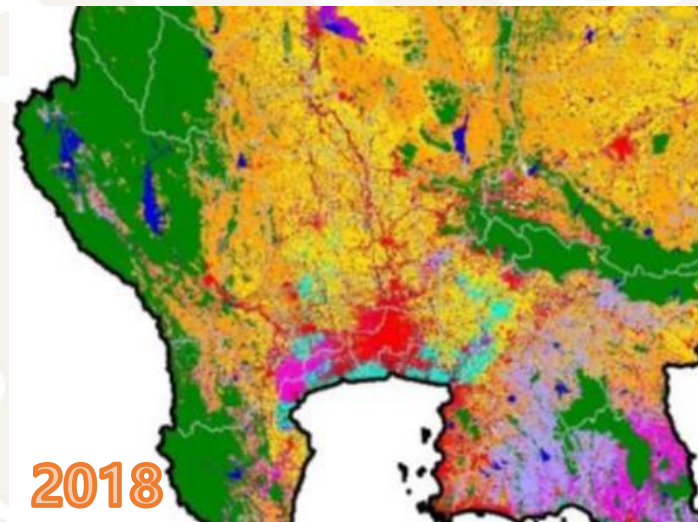
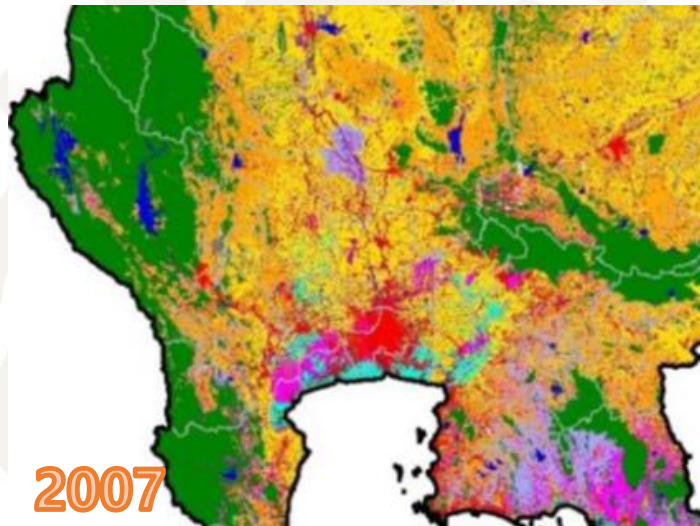
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# The situation of Black soil in Thailand

- Thailand faced a crisis of land resources during the past decades. The problem that emerged from soils were likely more on soil degradation, declining soil fertility, and soil pollution.
- The fertile lands suitable for agriculture like black soils have been used for non-agricultural activities.
- Farmlands are exposed to natural disasters such as droughts and floods that tend to be more severe due to global climate change.

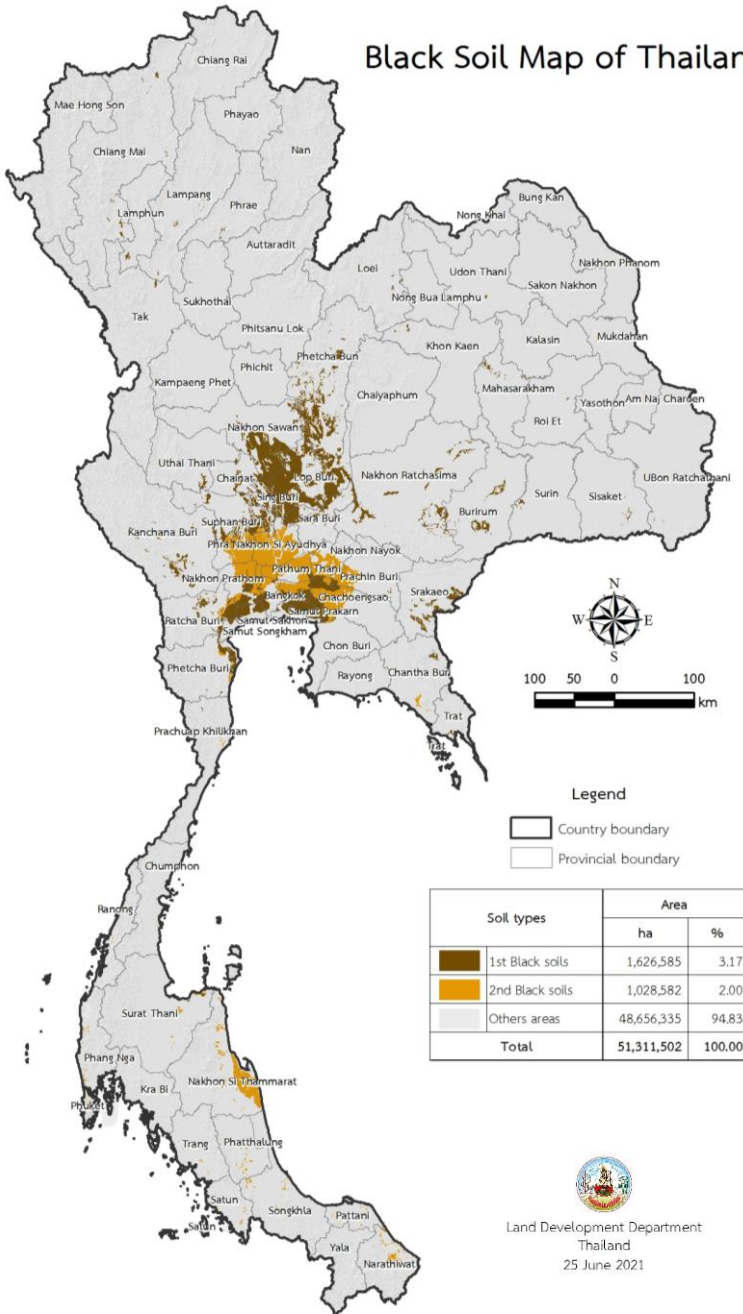


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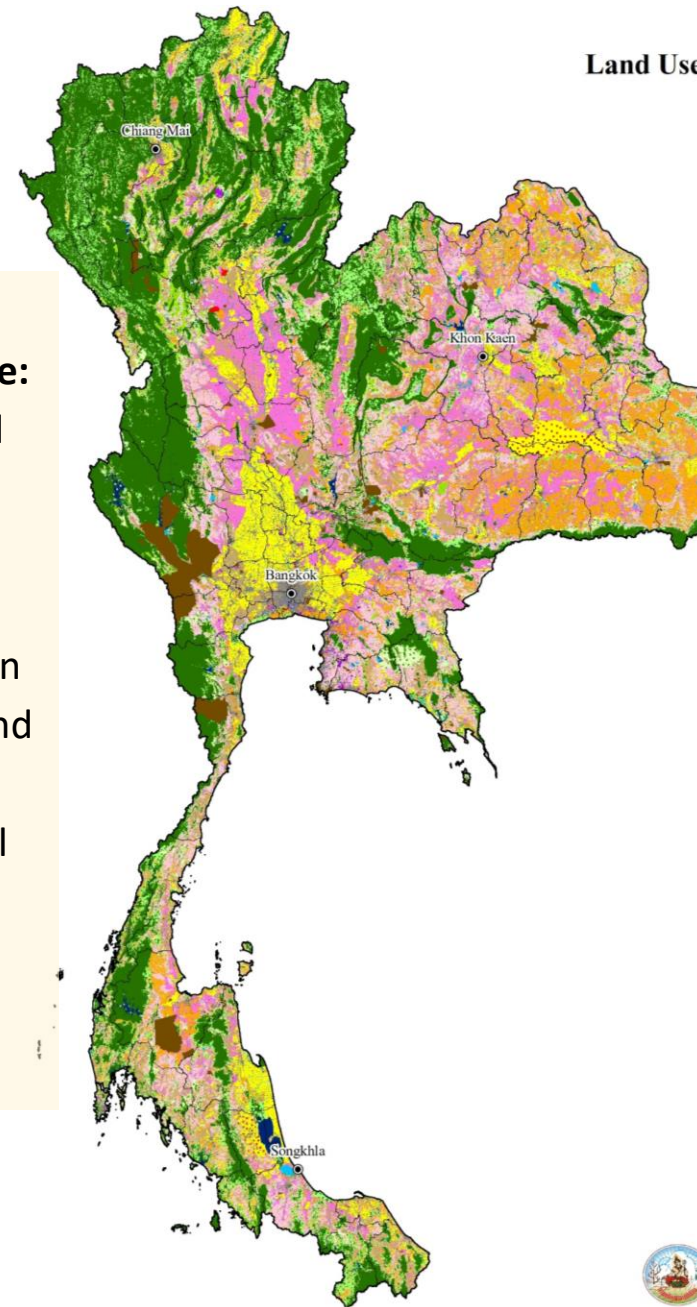
Black Soil Map of Thailand



### The policy recommendations for the Black Soils plantation zone are:

- Preserve prime agricultural land for sustainable use to ensure an adequate land base for ag-production.
- Promote intensive ag-production in small farmland to maximize land utilization.
- Designate the prime agricultural land at the local level using the principle of sustainable land-use planning.

Land Use Plan of Thailand



Land Use Plan of Thailand		Total (Rai)	%
1. Forest zone		135,085,480	42.12
1.1 Conservation forest zone		110,573,858	34.47
1.1.1 Protected forest zone		86,215,739	26.88
1.1.2 Forest rehabilitation zone		2,894,140	0.90
1.1.3 Conditional forest rehabilitation zone		21,463,979	6.69
1.2 Economic forest zone		15,887,088	4.96
1.2.1 Preservation forest zone		5,713,406	1.78
1.2.2 Forest rehabilitation zone		788,906	0.25
1.2.3 Conditional forest rehabilitation zone		9,384,776	2.93
1.3 Preservation forest zone by cabinet resolution		8,624,534	2.69
2. Agricultural zone		153,184,527	47.77
2.1 Prime agricultural zone		42,933,316	13.39
2.1.1 Paddy zone		22,612,888	7.05
2.1.2 Field crop, orchard, perennial plants		17,690,527	5.52
2.1.3 GI plants zone (approved by EU)		2,629,901	0.82
2.2 High potential agricultural land		73,193,948	22.83
2.2.1 Paddy zone		33,726,836	10.52
2.2.2 Field crop, orchard, perennial plants		39,467,112	12.31
2.3 Low potential agricultural land		37,057,263	11.56
2.3.1 Paddy zone		21,403,974	6.68
2.3.2 Field crop, orchard, perennial plants		15,653,289	4.88
3. Community zone		14,236,101	4.44
4. Industrial zone		1,958,639	0.61
4.1 Existing industrial zone		1,190,847	0.37
4.2 Mining zone		767,792	0.24
5. Ratchaphatsadu land or Royal property zone		8,239,599	2.57
6. Water resources zone		7,902,556	2.46
6.1 Water resources within forest zone		2,493,472	0.77
6.1.1 Natural water reservoir		1,123,802	0.34
6.1.2 Man-made reservoir		1,369,670	0.43
6.2 Water resources out of forest zone		5,409,084	1.69
6.2.1 Natural water reservoir		3,360,747	1.05
6.2.2 Man-made reservoir		2,048,337	0.64
7. Historical zone		89,991	0.03
8. Recreation and open space zone		-	-
<b>Total</b>		<b>320,696,893</b>	<b>100.00</b>



- Government action plan (Y2023-2027) of the Land Development Department aims to protect and increase the productivity of prime farmland for food security and sustainable use.



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# Public relations & Creating awareness

Participate in the World Soil Day event that will take place on December 5th., to raise awareness and perception of the importance of black soils



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