

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
DEPARTMENT OF AGRICULTURE AND FARMERS WELFARE

RAJYA SABHA
UNSTARRED QUESTION NO. 2256
TO BE ANSWERED ON THE 05/08/2022

DEPLETION IN FERTILITY OF SOIL

2256. SHRI BRIJLAL:
SHRI HARNATH SINGH YADAV:

Will the Minister of AGRICULTURE & FARMERS WELFARE be pleased to state:

- (a) whether fertility of soil is depleting rapidly and soil in many State including Bihar and Uttar Pradesh has been found to be deficient in Nitrogen and Phosphorous, if so, details thereof;
- (b) efforts made to find reasons for depleting fertility of soil and remedial steps taken in this regard;
- (c) total number of farmers who have been provided Soil Health Cards and number of Soil Health Laboratories in country and number of farmers getting soil test during last three years, State –wise; and
- (d) whether Centre for Science and Advancement has analyzed soil test report of Ministry, if so, conclusions drawn therefrom?

ANSWER

MINISTER OF AGRICULTURE AND FARMERS WELFARE

(SHRI NARENDRA SINGH TOMAR)

(a): The state-wise (including Uttar Pradesh and Bihar) nutrient status including Nitrogen and Phosphorous status of soil testing in Cycle – II (2017-18 to 2018-19) is at **Annexure- I**.

(b): Soil fertility depletion occurs when the quantities of nutrients removed from the soil in harvested products exceed the quantities of nutrients being applied. Off-site losses of nutrients can also occur through soil erosion, run off, leaching and burning of crops residues. Government is implementing Soil Health Card (SHC) scheme since 2015 to soil sample collection, analysis and Soil Health Cards distribution to all the farmers in the country. Soil health card provides nutrient status of the soil along with prescription about balanced and integrated use of inorganic and organic fertilizers to maintain good soil health. Soil health card based fertilizer use advisories are issued to farmers through State Government from time to time. Demonstrations about balanced use of fertilizers based on soil health card recommendations and training to the farmers on proper and integrated use of fertilizers are integral part of the scheme. Financial assistance is provided to State Governments for training of farmers, demonstrations on farmer fields and organizing farmer melas. Since 2015, around 6.45 lakh demonstrations, 93781 farmer's trainings and 7425 farmers melas and 79 workshops have been organized/conducted through the State Governments under the Scheme at Panchayat and village level.

Indian Council of Agricultural Research (ICAR) also imparts training, organizes front line demonstrations to educate farmers on these aspects.

(c): 10.74 crore Soil Health Cards in Cycle-I (2015 to 2017 and 11.97 crore Soil Health Cards in Cycle-II (2017 to 2019) have been distributed to farmers. In Model Village Programme (2019-20), 19.64 lakh land holding based soil health cards have been distributed to farmers across the country. During the year 2020-21, 27014 land holdings based Soil Health Cards have also been distributed in district Varanasi, Uttar Pradesh. There are 11818 soil testing labs (499 static, 113 mobile, 8811 minilabs and 2395 village level labs) sanctioned to the states so far. State/ UT-wise total number of farmers provided with soil health cards during last three years is given at **Annexure-II**

(d): National Productivity Council (NPC), New Delhi and National Institute of Agricultural Extension Management (MANAGE), Hyderabad have conducted study about the Soil Health Card Scheme and gist of conclusion drawn by them are at **Annexure III**.

Annexure – I

State wise Macro Nutrients& Organic Carbon Status based on Soil Health Card distributed during Cycle –II (2017-19)

Sl. No.	State	Nitrogen (N)					Phosphorous (P)				
		VL	L	M	H	VH	VL	L	M	H	VH
1	A&N Islands	620	2,180	18	2	3	2,420	353	44	1	5
2	Andhra Pradesh	354,615	771,494	314,541	18,580	6,045	0	163,367	427,045	875,013	0
3	Arunachal Pradesh	16	4	202	12,651	97	5,478	6,168	1,244	62	20
4	Assam	6,037	106,032	61,716	86,436	333	136,087	93,560	28,985	4,226	2442
5	Bihar	2,699	131,996	93,019	179	193	9,904	23,885	169,718	18,642	6051
6	Chhattisgarh	82,453	641,734	219,849	9,998	3,243	75,385	249,406	483,417	90,442	58140
7	Delhi	24	278	786	2	0	582	387	110	5	5
8	Goa	1,099	4,241	7,848	1,463	1,440	8,487	2,074	3,354	1,162	1012
9	Gujarat	147,810	1,004,221	506,177	22,896	7,932	37,104	208,492	1,022,385	345,687	76549
10	Haryana	274,559	16,017	452	7	326	745,058	293,406	176,530	41,455	31039
11	Himachal Pradesh	1,933	37,898	44,255	6,492	213	2,410	10,293	65,754	16,768	8453
12	Jammu And Kashmir	2,770	17,758	64,034	8,896	9,889	28,796	49,730	58,688	8,116	2908
13	Jharkhand	3,861	27,426	25,337	760	252	12,698	24,972	13,642	1,938	4265
14	Karnataka	201,266	245,426	226,283	44,705	66,058	236,685	359,034	626,356	231,086	188949
15	Kerala	735	31	11	0	1	28,502	20,895	57,916	10,641	14103
16	Ladakh	7	14	178	16	0	157	1,611	2,740	192	114
17	Madhya Pradesh	110,116	1,312,667	419,260	10,445	2,328	293,147	867,457	624,973	46,524	34196
18	Maharashtra	468,113	1,318,683	824,774	79,414	41,851	174,424	534,288	1,277,334	358,578	438128
19	Manipur	221	624	872	1	1	286	864	741	158	251
20	Meghalaya	39	18	50	14	0	19,221	13,027	7,375	606	379
21	Mizoram	60	1,437	10,732	9	1	4,350	7,573	242	36	35
22	Nagaland	11	81	3,257	8,604	55	8,312	2,100	1,348	161	86
23	Odisha	2,382	1,721	1,046	6	4	220,028	182,559	131,873	18,528	15270
24	Puducherry	4,768	1,136	26	0	3	4,252	535	933	172	41
25	Punjab	25,485	1,036	1,613	499	549	152,116	266,470	286,560	46,295	18712
26	Rajasthan	6	2	0	0	0	41,776	351,817	1,016,098	83,283	10119
27	Sikkim	330	6,919	2,980	4	5	208	1,606	4,486	3,102	831
28	Tamil Nadu	396,110	902,140	34,256	218	777	169,831	343,577	442,286	174,910	202740
29	Telangana	245,278	608,733	161,603	13,146	3,600	59,183	161,769	429,785	182,866	187908
30	DD & DN Haveli	196	1,431	587	0	1	219	1,472	469	110	161
31	Tripura	1,608	15,884	11,671	1,267	26	1,907	10,983	14,122	3,281	598
32	Uttar Pradesh	4,484,086	423,505	78,771	2,489	5,963	1,431,542	2,957,863	498,718	78,896	117295
33	Uttarakhand	2,924	62	372	38	9	19,596	21,506	55,016	30,159	14102
34	West Bengal	30	377	727	18	0	64	79	245	159	605
	Total	6,822,267	7,603,206	3,117,303	329,255	151,198	3,930,215	7,233,178	7,930,532	2,673,260	1,435,512

State wise Macro Nutrients& Organic Carbon Status based on Soil Health Card distributed during Cycle –II (2017-19)

S. No.	State	Potassium (K)					Organic Carbon (OC)					Total No. of Samples
		VL	L	M	H	VH	VL	L	M	H	VH	
1	A&N Islands	2,113	616	90	3	1	1,126	1,405	164	3	130	4,093
2	Andhra Pradesh	0	200,125	484,447	780,669	0	222,906	570,933	324,526	181,851	165,119	1,465,146
3	Arunachal Pradesh	4,933	3,806	3,744	440	49	15	11	126	115	12,705	21,883
4	Assam	115,309	89,028	51,424	9,206	313	12,497	92,016	56,575	26,594	77,655	278,719
5	Bihar	9,420	25,198	178,251	12,127	3,205	4,477	55,696	136,298	28,423	3,302	474,486
6	Chhattisgarh	26,069	93,322	517,965	296,929	22,581	104,427	377,043	284,758	105,714	84,901	949,751
7	Delhi	17	153	393	442	84	24	165	597	278	26	1,090
8	Goa	1,328	3,618	6,360	3,343	1,411	713	1,920	1,485	2,298	9,674	19,307
9	Gujarat	27,233	75,921	866,980	690,366	29,943	55,260	572,011	591,691	259,677	211,546	1,688,836
10	Haryana	128,786	263,673	485,113	293,215	120,280	156,875	1,005,829	103,416	1,733	22,604	1,356,297
11	Himachal Pradesh	2,601	7,357	60,888	28,095	4,673	983	10,494	21,753	20,981	49,452	107,856
12	Jammu And Kashmir	11,843	33,474	91,207	10,718	891	4,193	21,471	39,511	30,219	52,824	148,552
13	Jharkhand	6,643	13,722	30,963	5,298	932	5,375	14,602	15,807	13,191	8,666	71,883
14	Karnataka	138,239	240,247	627,259	575,724	60,819	211,669	585,018	420,540	208,345	213,119	1,610,837
15	Kerala	13,594	29,685	56,025	28,903	3,853	6,202	19,441	23,292	19,980	62,648	133,506
16	Ladakh	36	176	2,583	1,748	258	23	108	230	729	3,728	4,805
17	Madhya Pradesh	50,158	139,996	1,118,385	522,155	34,962	95,674	575,098	674,963	317,704	201,981	1,781,446
18	Maharashtra	63,039	116,037	837,099	1,308,886	457,280	306,101	1,134,050	794,508	315,858	231,078	2,785,533
19	Manipur	233	545	1,265	220	29	4	67	162	357	1,711	2,362
20	Meghalaya	8,936	16,989	10,706	3,771	170	396	1,386	6,694	5,573	26,556	41,110
21	Mizoram	31	1,070	10,831	294	3	150	5,629	5,656	515	287	10,229
22	Nagaland	1,107	2,795	6,242	1,852	10	80	568	1,481	2,225	7,654	12,023
23	Odisha	46,706	151,395	270,800	78,251	20,729	108,134	229,189	153,151	51,221	26,682	584,754
24	Puducherry	175	759	2,592	1,864	543	0	0	1	0	1	7,168
25	Punjab	42,402	164,830	346,804	165,857	50,034	5,960	562,631	190,805	3,560	7,095	779,271
26	Rajasthan	12,909	151,569	1,031,156	291,900	15,525	358,670	903,675	199,817	27,250	13,533	1,499,354
27	Sikkim	181	984	6,160	2,664	241	4	232	288	419	9,293	10,319
28	Tamil Nadu	33,777	138,361	679,446	342,188	139,480	317,657	767,944	204,186	30,715	12,615	1,354,984
29	Telangana	115,492	141,934	376,168	336,066	59,483	145,061	468,869	199,913	145,549	66,012	1,068,820
30	DD & DN Haveli	34	68	559	997	773	39	701	1,215	413	63	2,429
31	Tripura	3,976	16,507	9,180	1,206	13	4,047	8,126	14,567	3,061	1,102	30,967
32	Uttar Pradesh	302,024	923,591	3,695,609	150,605	10,498	890,734	3,615,792	478,096	55,035	44,054	4,864,005
33	Uttarakhand	5,244	27,785	82,596	20,767	4,072	8,721	44,770	47,981	18,227	19,495	140,058
34	West Bengal	329	252	447	118	6	54	194	279	312	313	1,150
	Total	1,174,917	3,075,588	11,949,737	5,966,887	1,043,144	3,028,251	11,647,084	4,994,532	1,878,125	1,647,624	23,313,029

State wise Micro Nutrients Status based on Soil Health Card distributed during Cycle –II (2017-19)

Sl.No.	State	Boron(B)		Copper(Cu)		Iron(fe)		Manganese(Mn)		Sulphur(S)		Zinc(Zn)		Total No. of Samples
		Sufficient	Deficient	Sufficient	Deficient	Sufficient	Deficient	Sufficient	Deficient	Sufficient	Deficient	Sufficient	Deficient	
1	Andaman And Nicobar Islands	2,693	126	2,352	464	2,809	9	2,800	17	10	2,811	2,400	421	4,093
2	Andhra Pradesh	1,211,017	252,173	1,390,633	69,026	1,047,134	415,461	1,309,394	142,199	1,309,483	155,500	942,483	521,676	1,465,146
3	Arunachal Pradesh	4	18	11,214	1,753	12,837	135	10,115	2,797	8,073	4,899	7,492	5,477	21,883
4	Assam	11,230	250,829	261,780	2,313	262,957	2,123	249,456	13,844	254,672	6,854	243,287	21,759	278,719
5	Bihar	3,183	224,990	125,569	102,634	122,232	105,959	120,793	107,269	18,112	210,063	111,523	116,685	474,486
6	Chhattisgarh	627,926	263,496	904,800	34,468	843,977	98,094	907,308	31,518	617,568	338,961	533,824	408,811	949,751
7	Delhi	931	157	1,079	9	1,016	73	956	132	843	245	1,079	10	1,090
8	Goa	2,742	3,360	5,895	113	5,988	21	5,916	78	617	1,709	5,027	981	19,307
9	Gujarat	845,740	844,101	1,585,484	104,288	1,266,014	424,177	1,604,945	82,024	1,320,193	370,136	1,155,150	535,139	1,688,836
10	Haryana	377,731	252,998	1,029,442	37,705	751,007	540,162	729,473	548,229	1,142,338	97,815	904,522	385,225	1,356,297
11	Himachal Pradesh	36,528	1,880	92,912	2,677	86,069	9,580	76,241	18,859	44,923	7,694	86,386	9,306	107,856
12	Jammu And Kashmir	18,243	6,026	93,887	24,266	78,267	36,344	65,390	51,945	50,285	32,642	77,016	41,121	148,552
13	Jharkhand	37,819	12,329	45,809	3,135	46,184	4,463	42,578	6,376	38,934	15,256	36,460	14,239	71,883
14	Karnataka	721,695	875,177	1,515,779	123,591	756,063	884,745	1,355,484	269,903	1,032,317	609,151	624,101	1,017,286	1,610,837
15	Kerala	55,391	50,166	122,004	4,486	126,034	3,559	122,519	6,942	67,905	36,833	119,785	9,979	133,506
16	Ladakh	281	342	4,019	253	3,623	1,137	2,803	1,360	257	360	3,416	1,399	4,805
17	Madhya Pradesh	1,254,195	484,211	1,725,964	106,377	1,466,198	383,284	1,665,714	167,203	1,379,019	440,742	1,064,639	790,553	1,781,446
18	Maharashtra	1,423,686	1,234,717	2,691,136	77,560	940,664	1,836,776	2,375,375	382,743	1,241,148	1,435,895	1,301,289	1,477,271	2,785,533
19	Manipur	422	381	617	186	776	26	780	23	378	425	511	292	2,362
20	Meghalaya	71	18	18,078	2,660	18,720	2,046	13,116	7,371	44	51	13,302	7,497	41,110
21	Mizoram	16	0	13	0	16	0	13	0	8	10	13	3	10,229
22	Nagaland	262	10	11,217	788	11,980	25	11,100	830	11,738	268	8,053	3,950	12,023
23	Odisha	9,303	20,938	788	1,275	1,000	1,327	516	1,297	17,394	22,756	19,301	18,121	584,754
24	Puducherry	10	2,482	5,883	48	5,304	629	5,812	110	1	0	5,460	470	7,168
25	Punjab	6,918	12,702	764,110	3,892	686,263	83,649	411,436	344,814	649,336	107,413	666,020	103,850	779,271
26	Rajasthan	3	4	1,429,980	73,062	719,714	782,999	1,362,258	125,303	1,261,844	241,247	738,131	764,965	1,499,354
27	Sikkim	5,305	4,919	9,032	1,189	9,402	822	9,475	746	9,340	884	6,924	3,300	10,319
28	Tamil Nadu	606,449	725,343	1,280,437	49,960	883,832	448,374	985,635	319,628	838,295	494,066	930,426	402,441	1,354,984
29	Telangana	744,917	225,895	878,164	91,613	543,916	427,263	749,262	213,345	788,526	185,269	580,238	391,962	1,068,820
30	The Dadra And Nagar Haveli And Daman And Diu	2,164	48	2,402	25	2,332	96	2,392	32	2,414	14	2,241	187	2,429
31	Tripura	24,691	5,516	30,308	448	30,344	437	30,244	573	28,761	1,639	24,608	6,246	30,967
32	Uttar Pradesh	2,711,144	1,453,818	4,842,704	212,049	3,768,639	1,291,422	4,232,132	787,852	3,163,095	1,846,679	3,560,221	1,504,552	4,864,005
33	Uttarakhand	61,244	65,723	125,247	15,042	117,736	22,564	113,398	24,558	105,691	34,711	113,947	26,472	140,058
34	West Bengal	945	206	1,137	12	1,134	16	1,017	128	380	771	1,095	56	1,150
	Total	10,804,899	7,275,099	21,009,875	1,147,367	14,620,181	7,807,797	18,575,846	3,660,048	15,403,942	6,703,769	13,890,370	8,591,702	23,313,029

Annexure II**State-wise number of Soil Health Cards distributed to farmers during last three years**

Sl. No.	States/UTs	Number of Soil Health Cards distributed to farmers during			
		2018-19	2019-20	2020-21	2021-22
1	Andaman & Nicobar	7915	1007	3000	-
2	Andhra Pradesh	5955299	226487	-	-
3	Arunachal Pradesh	22128	225	53	-
4	Assam	1300901	66218	-	-
5	Bihar	5068432	123866	305223	-
6	Chhattisgarh	3105840	59302	387	-
7	Dadra and Nagar Haveli	12994	-	-	-
8	Goa	12520	2938	6556	-
9	Gujarat	8694942	63591	-	-
10	Haryana	4082642	25235	18972	-
11	Himachal Pradesh	627108	19671	5168	-
12	J & K	946770	70246	159890	-
13	Jharkhand	545461	58572	-	-
14	Karnataka	6157661	65034	40104	-
15	Kerala	2209717	80045	118022	-
16	Madhya Pradesh	5992885	127585	133000	-
17	Maharashtra	9545517	201837	-	-
18	Manipur	114522	10010	10010	-
19	Meghalaya	205802	3243	8531	-
20	Mizoram	15901	2119	-	-
21	Nagaland	6000	27304	-	-
22	Odisha	1544049	162405	52056	-
23	Puducherry	12089	2508	64	-
24	Punjab	1160568	17793	19196	-
25	Rajasthan	10457699	86341	33347	-
26	Sikkim	66000	2936	-	-
27	Tamil Nadu	5197325	58317	32750	-
28	Telangana	4226005	110664	165527	-
29	Tripura	96100	15602	6467	-
30	Uttar Pradesh	8348647	255517	20000	-
31	Uttarakhand	524437	13645	6700	-
32	West Bengal	3298000	4520	-	-
Total		89561876	1964783	1145023	-

Annexure III

Gist of conclusions of study drawn by National Productivity Council, New Delhi and National Institute of Agricultural Extension Management (MANAGE), Hyderabad

S. No.	Study drawn by	Conclusions
1	National Productivity Council (NPC), New Delhi	<ul style="list-style-type: none">• As a result of application of fertilizer and micro nutrients as per the recommendations on Soil Health Cards, it was reported that there has been a decrease of use of chemical fertilizer application in the range of 8-10%.• Overall increase in yield of crops to the tune of 5-6% was reported due to application of fertilizer and micro nutrients as per recommendations available in the Soil Health Cards.• The use of Neem Coated Urea has resulted in lower consumption of fertilizer by about 4-5% with lower incidence of pests and diseases with higher yields to the tune of 5-6%.
2	National Institute of Agricultural Extension Management (MANAGE), Hyderabad	<ul style="list-style-type: none">• There is some reduction in fertilizer use, especially nitrogen and increase in bio-fertilizers and other micro-nutrients use. This is a good sign as N: P: K ratio was highly skewed towards nitrogen.• Costs were reduced due to low fertilizer use. Crop yields have also increased for majority of the crops, although only moderately.• Two-thirds of the sample farmers indicated that SHC is beneficial which is encouraging.• Overall, paddy farmers reduced use of urea by 9%, DAP/SSP by 7%, but increased use of Potassium by 20%. This is a healthy sign of moving towards balanced use of fertilizers. All the three crops showed a decline in costs per acre by about 4 to 10 percent.• There was substantial decline in fertilizer use especially urea and DAP in paddy and cotton resulted in decreased cost of cultivation per unit area.
