

Goinformation Based Soil Fertility Maps of Macronutrient Status, Panhala Tehsil of Kolhapur District, (MH)

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Abstract: The present study entitled “Goinformation based soil fertility map of macronutrient status of Panhala tehsil of Kolhapur district (M.S.)” was conducted during the year 2013-2014 at Department of Soil Science and Agricultural Chemistry, College of Agriculture, Kolhapur with an objectives to identify and delineate the deficiency areas of macronutrients and preparation of GPS-GIS based maps of macronutrients status.

The available nitrogen, phosphorus and potassium ranged from 131.3 to 426.4, 9.8 to 41.8 and 217.2 to 782.2 kg ha⁻¹, respectively. Panhala tehsil soils have very low to moderately high available nitrogen, low to very high available phosphorus and moderately high to very high available potassium.

Keyword: Goinformation, Macronutrient, Fertility map, GPS-GIS

INTRODUCTION

Goinformation system can be efficiently use for monitoring soil fertility status, for ensuring balanced fertilization to crop plants. Attempts have been made during present investigation to assess and delineate macronutrient status of the soils at Phanala Tehsil of Kolhapur District (M.S.)

MATERIALS AND METHODS

Total 198 soil samples were collected from 33 villages of Panhala tehsil of Kolhapur district. The soils were rated as Very low, Low, Moderate, Moderately high, High and Very high for the three nutrients (N, P, K) on the basis of their availability as described by Bangar and Zende (1987) and given in Table 2. Soil fertility maps based on GPS-GIS and fertility status were prepared by employing Arc GIS 9.3 software and Idw (3d) method.

Table 1
Standard analytical methods used for Chemical analysis of soil

Sr. No.	Parameters	Methods	References
1.	Available Nitrogen	Alkaline permanganate	Subbiah and Asija (1956)
2.	Available Phosphorus	0.5M NaHCO ₃ pH 8.5	Watanabe and Olsen (1965)
3.	Available Potassium	Flame photometry, 1N Ammonium acetate (pH - 7)	Knudsen and Peterson (1982)

RESULTS AND DISCUSSION

The available nitrogen content in the soils ranged from 131.3 to 426.4 kg ha⁻¹ with an average value of 266.84 kg ha⁻¹ (Table 3, Plates 1-4) . Almost all soil samples were categorized as very low (1.5 %), low

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Table 2
Six tier ratings of available macronutrients

Sr. no.	Ratings	Available nutrients (Kg ha ⁻¹)		
		N	P	K
1.	Very low	<140	<7	<100
2.	Low	141-280	7.1-14	101-150
3.	Moderate	281-420	14.1-21	151-200
4.	Moderately high	421-560	21.1-28	201-250
5.	High	561-700	28.1-35	251-300
6.	Very high	>700	>35	>300

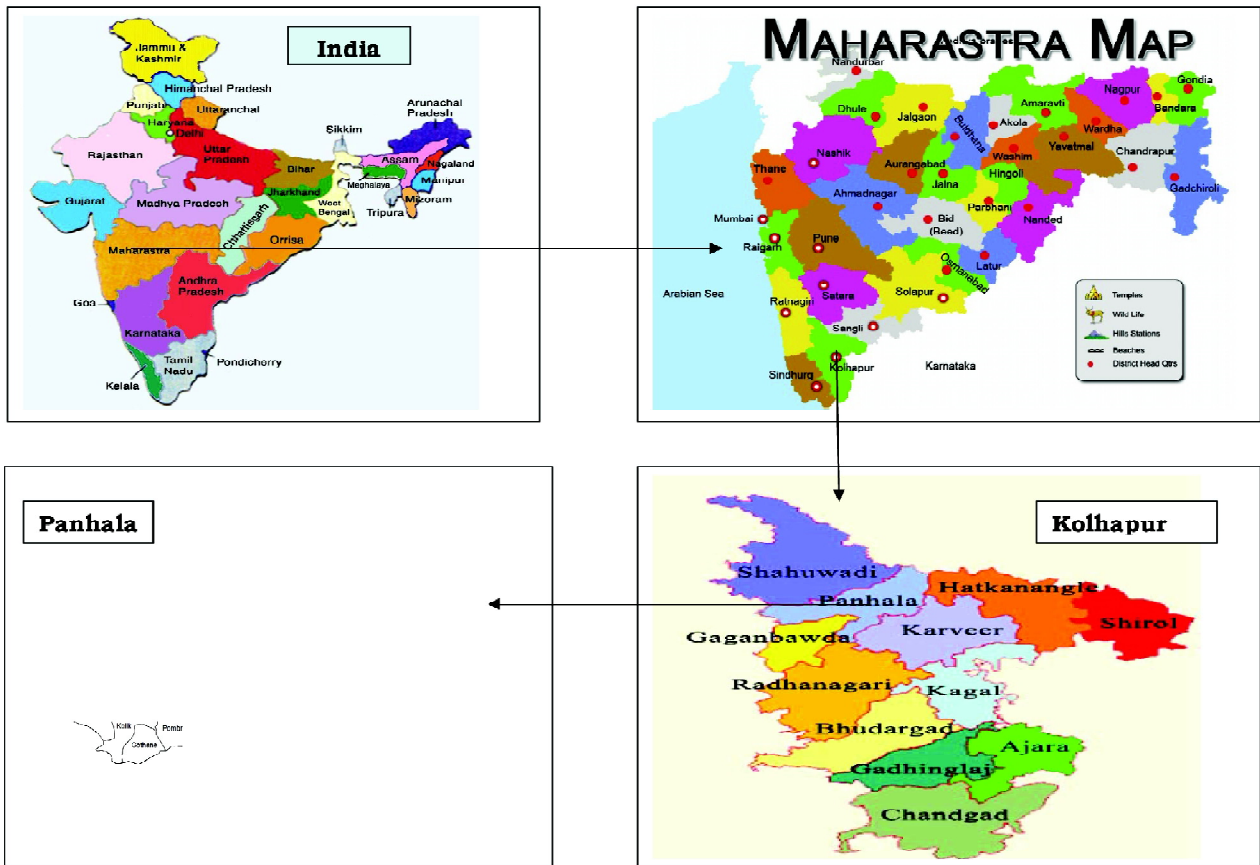
Bangar and Zende (1987)

Table 3

Status of available macronutrient in soils of Panhala tehsil.

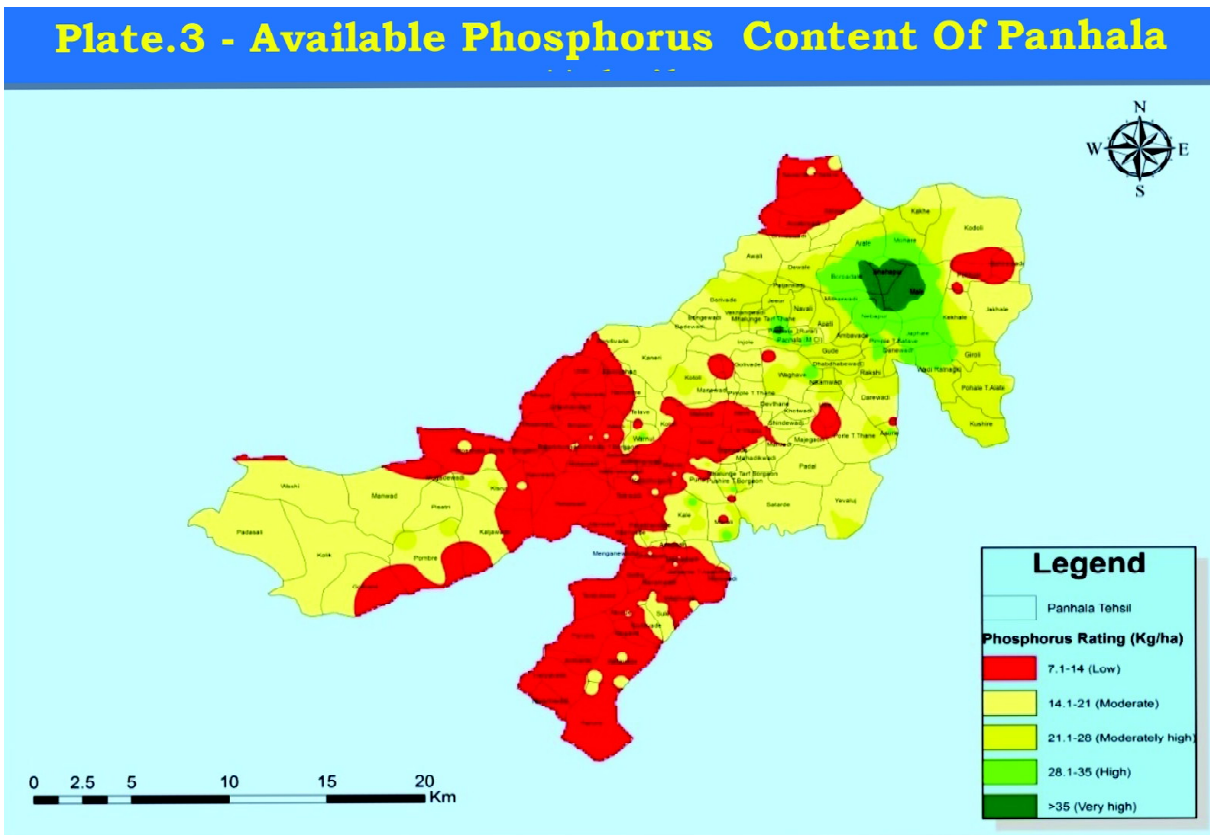
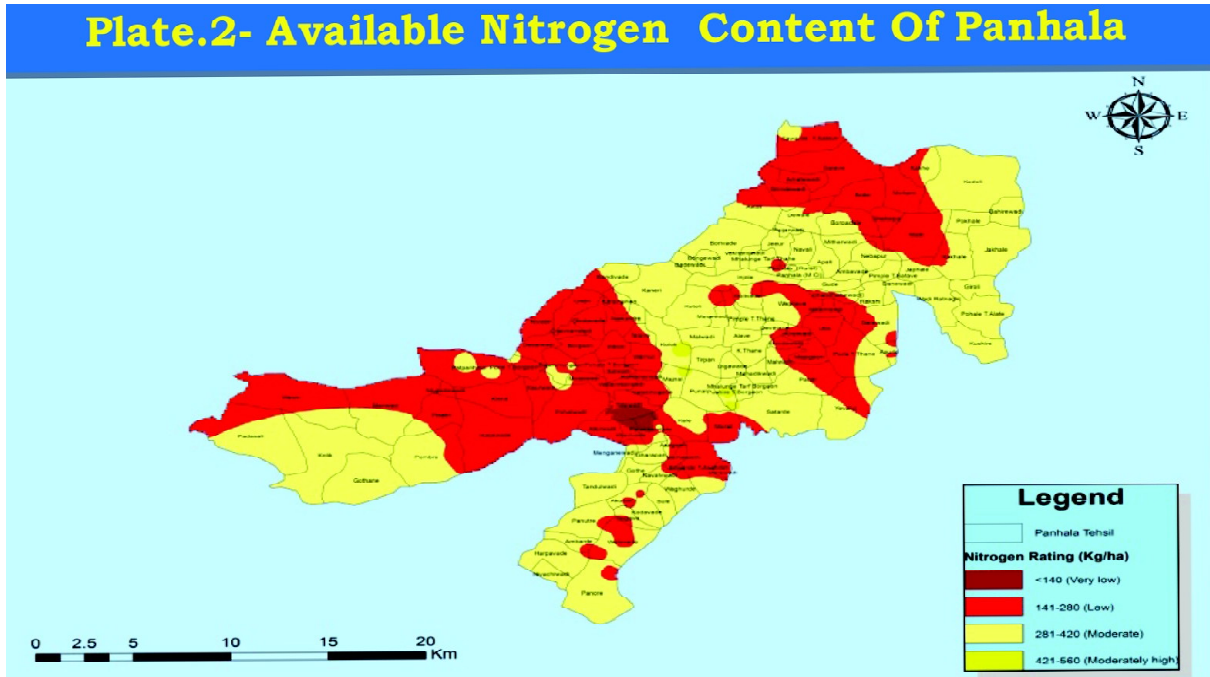
Particulars	Available nutrients (Kg ha ⁻¹)		
	N	P	K
Mean	266.84	17.92	398.08
Range	131.30-426.40	9.8-41.8	217.20-782.20
S.E. ±	3.50	0.46	9.83
Very low	3 (1.5%)	-	-
Low	86 (43.4%)	92 (46.5%)	-
Moderate	105 (53.1%)	59 (29.8%)	-
Moderately High	4 (2%)	29 (14.7%)	22 (11.1%)
High	-	14 (7%)	35 (17.7%)
Very high	-	4 (2%)	141 (71.2%)

Plate.1- Location map of the study area



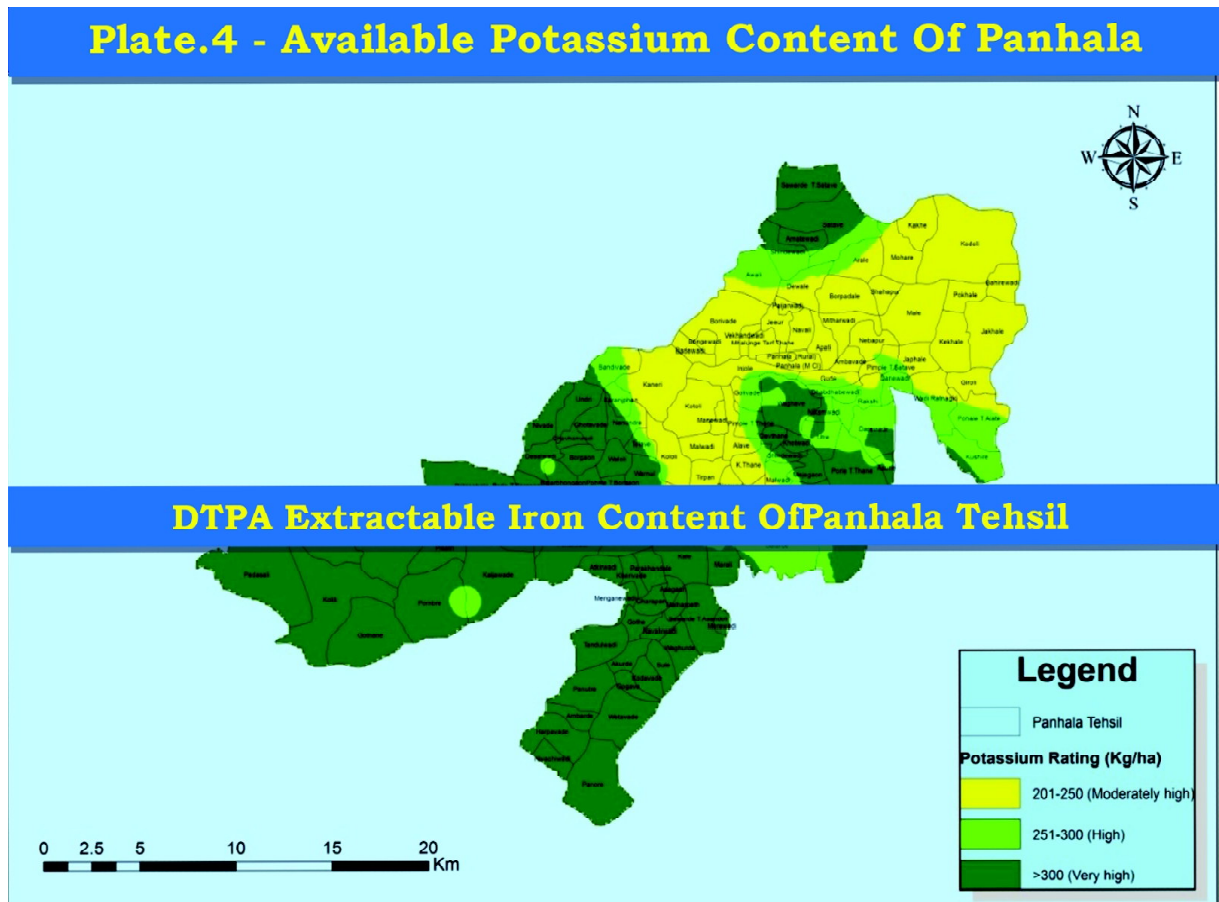
(43.4 %), moderate (53.1 %) and moderately high (2%) Similar results were earlier recorded by Pawar (2011) at the same location. The available phosphorus ranged from 9.80 to 41.80 kg ha⁻¹ with an average value of 17.92 kg ha⁻¹. Among the soil samples collected 46.5 per cent samples were under

low category, 29.8 per cent under moderate, 14.7 per cent under moderately high, 7 per cent under high while 2 per cent samples were under very high category. Similar results were recorded by Patil et al., (1987) in the soils of Konkan region. Low status of available P was reported by Yadav and Pathak,



(1963) in Indian forest soils. The available potassium ranged from 217.2 to 782.2 kg ha⁻¹ with an average value of 398.0 kg ha⁻¹. All the soil samples were in moderately high to very high category of available

potassium (Moderately high 11.1, high 17.7 and very high 71.2 per cent). Similar results were reported by Patil et al., (1987) in Konkan and Pawar, (2011) at the present site.



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