

Nutrient Mapping for Fertilizer Recommendations under Micro-watershed Level in Northern Transitional Zone of Karnataka, India

Key words : Available Phosphorous, Available Potassium, Micro-watershed, Nutrient mapping

The total area of micro-watershed is 859 ha with varied physiography marked by upland, midland and lowlands. The study area falls under semi-arid zone of Karnataka and receives annual rainfall of 933.4 mm, most of which is concentrated during the months of June to September. The mean average annual air temperature is 24°C. The surface soil samples well distributed in the selected micro-watershed collected for assessment of soil fertility status. The latitude and longitude were recorded at soil sampling site using GPS. The samples processed in laboratory and analysed fertility parameters using standard analytical methods (Jackson 1979)

The soils are moderately acidic to neutral (4.72 to 7.05) in reaction and non saline (0.08 to 0.68 dS/m). The low pH and EC values of the study area might be due to leaching of bases and salts influenced by physiography and high rainfall

(Sivashankaran *et al.*, 1993). The organic carbon content ranges from 3.4 to 6.8 g per kg of soil and the area under low to medium category. The reason for low organic carbon content might be attributed to the prevalence of tropical conditions, where the degradation of organic matter occurs at a faster rate coupled with little or non-addition of organic manures and low vegetative cover on the fields, thereby, leaving less chances of accumulation of organic carbon in these soils. Similar observations were made by Nayak *et al.*, (2002) in soils of Central Research Station OUAT, Bhubaneswar. The soils are low in available nitrogen (63 to 280 kg⁻¹) and apply full recommended dose of nitrogenous fertilizers for respective crops every year. The major portion of nitrogen pool is contributed by organic matter, the low organic matter content due to faster degradation and consequent removal of organic matter coupled with lesser nitrogen fertilization

Fig. 1: Location of the Hanumankoppa micro-watershed (LISS III

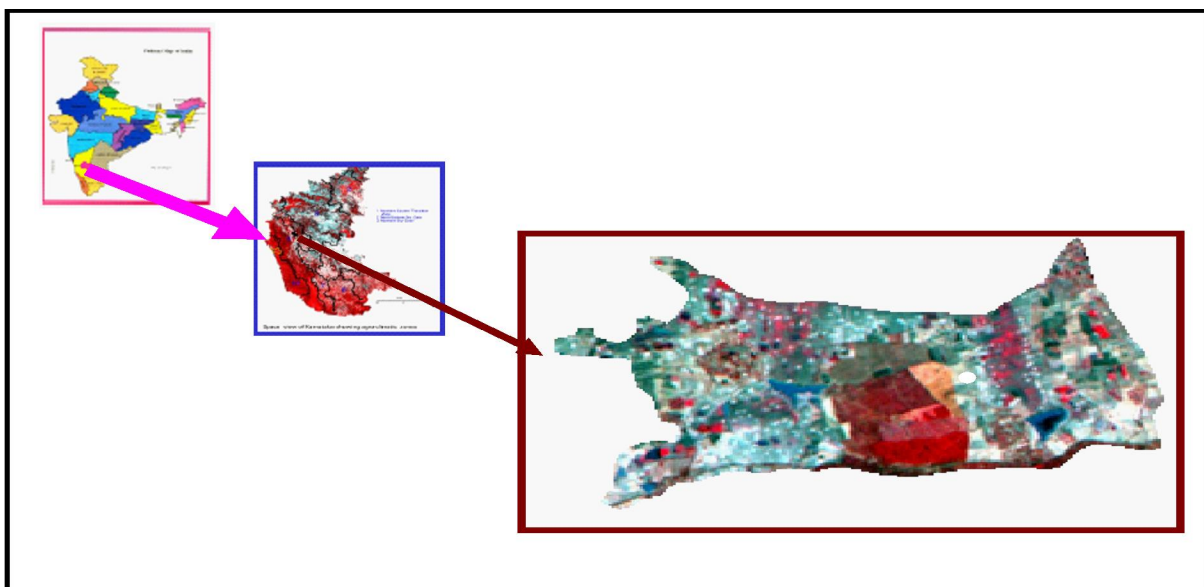


Fig 2. Soil reaction status of micro-watershed

Fig 3. Organic carbon status of micro-watershed

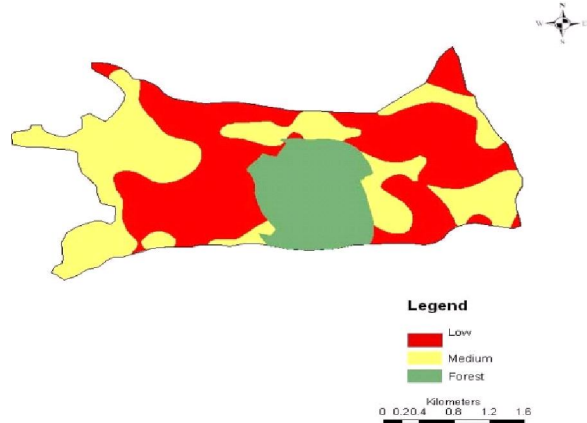
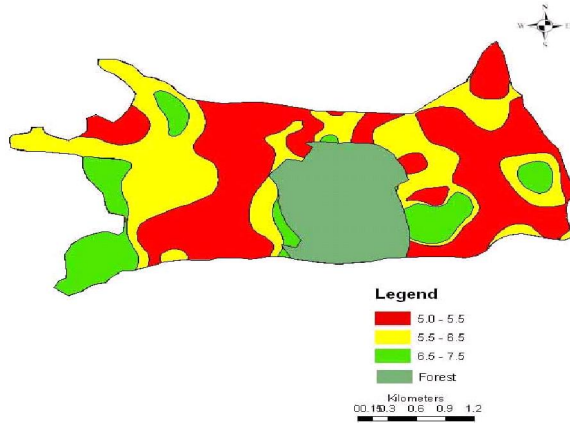


Fig 4. Available Nitrogen status of micro-watershed

Fig 5. Available P₂O₅ status of micro-watershed

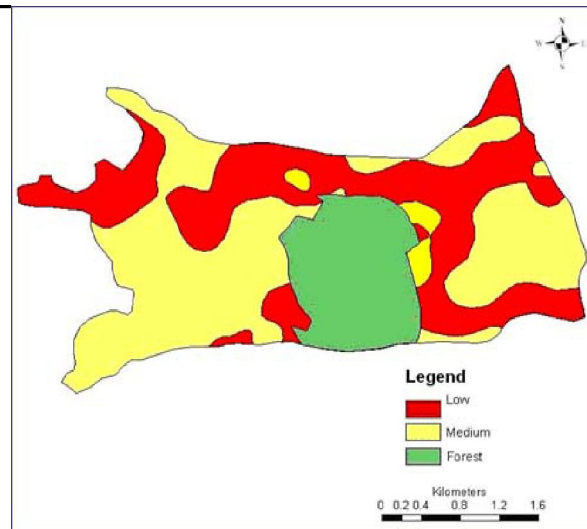
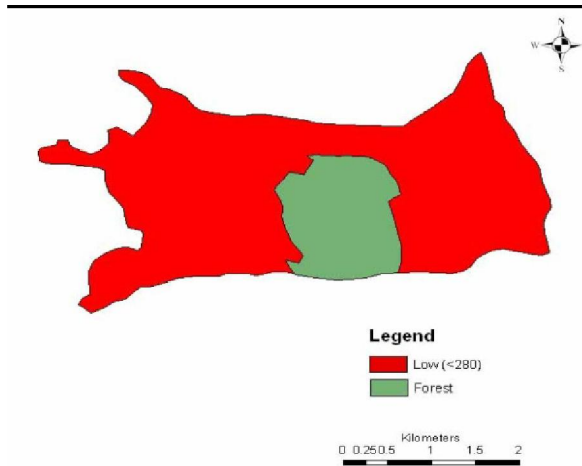
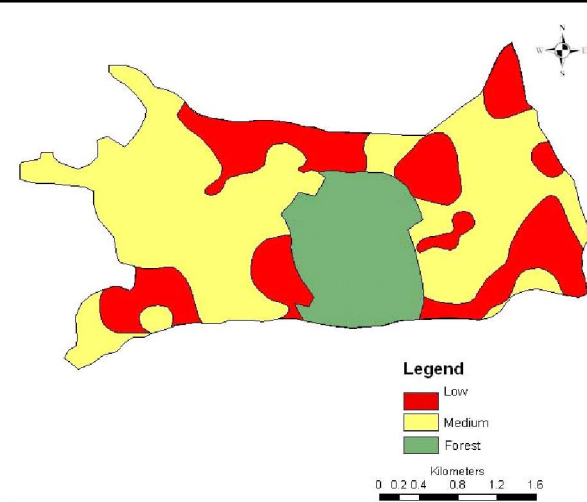
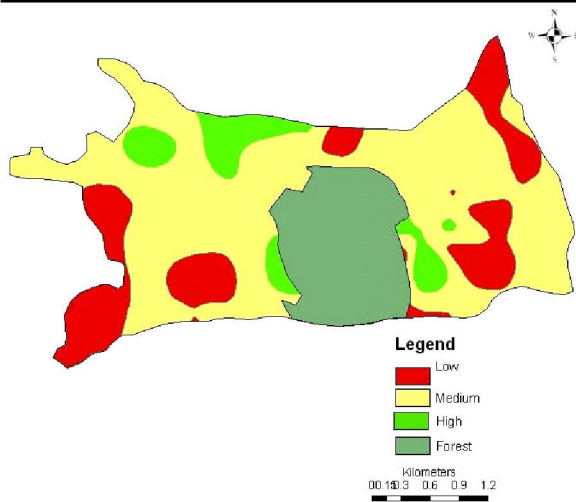


Fig 6. Available Potassium status of micro-watershed

Fig 7: Available Sulphur status of micro-watershed



leading to nitrogen deficiency. The results obtained in the present study are in agreement with the findings of Govindarajan and Datta Biswas (1968). The available phosphorous (P_2O_5) content was low to medium (10.1 to 42.0 kg per ha) due to phosphate fixation by 1:1 type of clay minerals and soil acidity. The results are in conformity with the findings of Bopathi and Sharma (2006). Application of full recommended dose of phosphotic fertilizers for low category soils and half recommended dose for soils under medium category for all crops every year. The available potassium was low to high (97 to 370 kg per ha) and area under low, medium and high category was 198 ha, 616 ha and 45 ha, respectively due to predominance of K rich mica and feldspar minerals in parent material. Similar results observed by Ravi Kumar (2006). Apply full recommended dose of potassic fertilizers for soils low in available K_2O and half the recommended dose for medium category soils and no need of application for high category soils. The available sulphur (SO_4) content ranges from 6.4 to 18.4 mg per kg and area under low and medium category was 559 ha and 301 ha, respectively and needs to be supplement with primary fertilizers every year for sustainable production.

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