

Tomato suitability Map – diagnostic kit for farm sustainability

R. Srinivasan, N. Maddileti and V. Kasthuri Thilagam

¹ICAR-National Bureau of Soil Survey and Land Use Planning, Regional Centre, Bangalore-560024, Karnataka, India

*Email of the Corresponding author: srinivasan.surya@gmail.com
doi.org/10.5281/TrendsInAgriculture.20697732

Introduction

Tomato (*Solanum lycopersicum. L*) is an essential commercial vegetable globally. It is categorized as a vegetable for cooking purposes and as a cash/horticultural crop in farming. The tomato is a plant whose fruit is a consumable berry, utilized in culinary applications as a vegetable. Belonging to the nightshade family, the tomato is related to tobacco, potatoes, and chili peppers. Highly adaptable, tomato plants are mainly grown for their delicious, nutrient-rich fruits. In addition to cooking, various parts of the plant provide benefits in culinary, medicinal, and gardening contexts.

Tomatoes rank as India's third most significant horticultural crop, following onions and potatoes, and play an essential role as a cash crop that sustains the income of smallholder farmers. As the world's second-largest tomato producer, India regards this crop as a fundamental element of its agricultural economy, dietary health, and export sector. Major cultivation areas are found throughout Southern, Central, and Western India, with prominent commercial centers recognized for their year-round farming. Tamil Nadu ranks among the top five states in tomato production within India. The majority of the tomato farming in the state is concentrated in several key districts in the northwestern and central regions, with Krishnagiri and Dharmapuri together contributing



over 60% of the overall production. The state typically produces between 20 to 40 tonnes per hectare, with peak harvesting generally occurring after the monsoon season.

Tomatoes are a crop that grows best in warm conditions and need to be planted in a frost-free area. They flourish in temperatures ranging from 18°C to 27°C and ideally receive 6 to 8 hours of direct sunlight each day. These plants do well in well-aerated, sandy loam soils that are rich in organic material. The optimal soil pH level lies between 5.5 and 6.5, with a desired depth of 15 to 30 cm. Ensuring proper drainage and maintaining temperature is essential, as tomatoes are very sensitive to excessive moisture and drastic changes in temperature.

Crop suitability evaluation

Land evaluation is focused with the assessment of land performance when utilised for specified purposes (FAO, 1976) and can be characterised as "all methods to explain or predict the potential use of land". Land assessment analysis serves as a link between land resource surveys and land use planning and management. Land suitability evaluation for crop planning and management requires detailed field data such as slope, soil depth, soil texture, and percentage surface stoniness (Srinivasan *et al.*, 2021).

Soil surveys provide valuable data for improving physical land suitability classifications, planning, and environmental protection-based soil quality and crop adoptability. Farm-scale soil surveys are extremely beneficial for gathering quantitative data on the spatial distribution of soil qualities and their potential. Detailed soil maps with additional information about soil qualities and spatial distribution are required for current land appraisal, suitability analysis, land resource management, land use planning, and other environmental modelling. Detailed farm soil data and other climatic conditions were examined in a portion of Kaveripattinam Block in Krishnagiri district of Tamil Nadu and a suitability map was developed (S1-Highly, S2-Moderately, S3-Marginally, and N-Not Suitable) (Fig. 2).

An area of about 4007 ha (13.10%) is highly suitable (S1) lands for tomato, whereas, moderately suitable (Class S2) land is 8855 ha (29%) with minor limitations of gravelliness, drainage, slope and rooting depth. An area of about 9801 ha (32%) is marginally suitable (Class S3) for growing tomato with moderate limitations of texture, rooting depth, slope and gravelliness. An area of about 2757 ha (9%) is not suitable (Class N) in the study area. The tomato crop suitability on each parcel of land with specific limitations will aid in the selection of site-specific crops, soil and water conservation, and nutrient management in the Kaveripattinam block of Tamil Nadu.

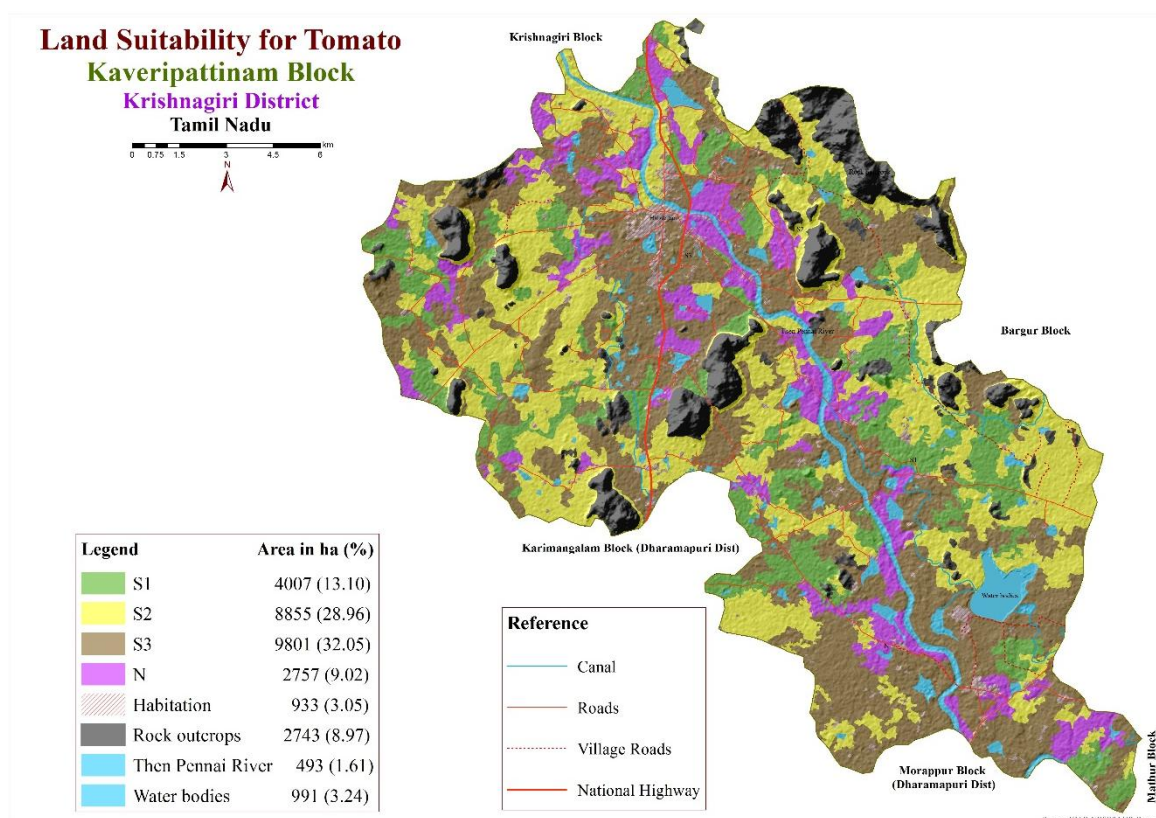


Fig. 2 Tomato crop suitability evaluation in Kaveripattinam block, Tamil Nadu

Conclusions

The appropriateness of any crop is determined by soil quality and current climatic conditions, which influence crop quality and yield. Crops that are unique to a region have distinct characteristics and flavours. Krishnagiri district is well-known for high-quality tomato production, despite volatile market pricing. As a result, assessing the farm adaptability of tomatoes is a preferable option for crop selection and preventing crop loss. Creating soil-based crop suitability maps with good spatial distribution and assisting in the adoption of site-specific crop usage and nutrient management practices.

Reference

- Food and Agriculture Organization of the United Nations (FAO). (1976). A Framework for Land Evaluation. Soils Bulletin, No. 32. FAO, Rome.
- Srinivasan, R., Rajendra Hegde, Kasthuri Thilagam, V. and Naveen Kumar, S. (2021). Soil-site characterization on crop productivity in Alfisols of Eastern Ghats of Tamil Nadu, India. *Journal of Soil and Water Conservation* 20(4): 355-364, DOI: 10.5958/2455-7145.2021.00045.X.