



RESEARCH ARTICLE

SOIL CLASSIFICATION AND LAND CAPABILITY OF THANJAVUR TALUK, THANJAVUR DISTRICT, TAMILNADU - INDIA

*Mithra, J. and Baskaran, R.

Department of Industries and Earth Sciences, Tamil University, Thanjavur, TN, India

ARTICLE INFO

Article History:

Received 08th July, 2016
Received in revised form
24th August, 2016
Accepted 19th September, 2016
Published online 30th October, 2016

Key words:

Soil Series, Crops grown, Soil Productivity,
Land capability and Thanjavur Taluk.

Copyright © 2016, Mithra and Baskaran. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Mithra, J. and Baskaran, R. 2016. "Soil classification and land capability of Thanjavur Taluk, Thanjavur District, Tamilnadu - India", *International Journal of Current Research*, 8, (10), 40161-40164.

ABSTRACT

Soil is a major part of the natural environment, alongside air and water and it's vital to the existence of life on the planet. Investigation of soil series and its village wise distribution, crops grown and capability in Thanjavur Taluk on the basis of the data derived from the Soil Survey Department.

INTRODUCTION

Soil is one of the most important non-renewable basic natural resources on the earth's surface. Great attention has been paid throughout the World to the study of soils, their geographic distribution and extent, behavior, potentials and problems and suitability for various uses. The importance of soil and its rational use for sustained agriculture was realized long ago in Tamilnadu. The first soil survey conducted in the then existing Madras Presidency was in the Thanjavur delta in 1912 to show the distribution of major nutrients in soils. Later several such surveys were carried out with specific objectives. Standard soil survey work in Tamilnadu was started in 1960 with the major objectives of providing comprehensive information on all aspects of soil.

Aims and Objectives

The aim of present study is to classify the soils as well as land capability of Thanjavur Taluk. In order to achieve the above mentioned aim the following objectives are taken into consideration.

- 1) To analysis the types of soils in Thanjavur Taluk.
- 2) To identify the fertility of soil based on soil characteristics and crops grown in the soils.

- 3) To study the soil distribution of Thanjavur Taluk.
- 4) To evaluate the soil capability of Thanjavur Taluk.

Study Area

Thanjavur Taluk is one of the Eight Taluks in Thanjavur District. It is the important Taluk in Thanjavur District and the area is 6073 (ha). It is situated at 10°37'17" North latitude and 79°08'13" East longitude (Fig. 1). It consisting of 91 Revenue villages with the population of 448301, out of this 222679 is male and 225622 are female. This Taluk is bounded on east by Papanasam and Orthanadu Taluk, Pudukkottai District on the South, on the West by Thiruchirappalli District and Thiruvaiyaru Taluk bounded on the north side. The climate of Taluk is fairly healthy. The maximum temperature recorded is 34.03 C in June and the minimum temperature is 20.74 C in January. There are two rainfall seasons one is South west monsoon climate (from June to September), and another one is North east monsoon climate (from October to January). The Taluk is a deltaic region having a slope from West and towards the East. This region is drained by the important Rivers of Cauvery, Vennar and Grand anaicut Channel and its distributaries. Paddy is the most important crop of the Taluk. There are Thirteen soil series occurs in Thanjavur District, out of which nine soil series such as 1.Kalathur, 2.Vallam, 3.Madukkur, 4.Budalur, 5.Mudukulam, 6.Alanthur, 7.Pudugai, 8.Adhanur and 9.Pattukottai soil series are found in the Thanjavur Taluk (Fig.2, Table 1, Fig. 3).

*Corresponding author: Mithra, J.

Department of Industries and Earth Sciences, Tamil University, Thanjavur, TN, India.

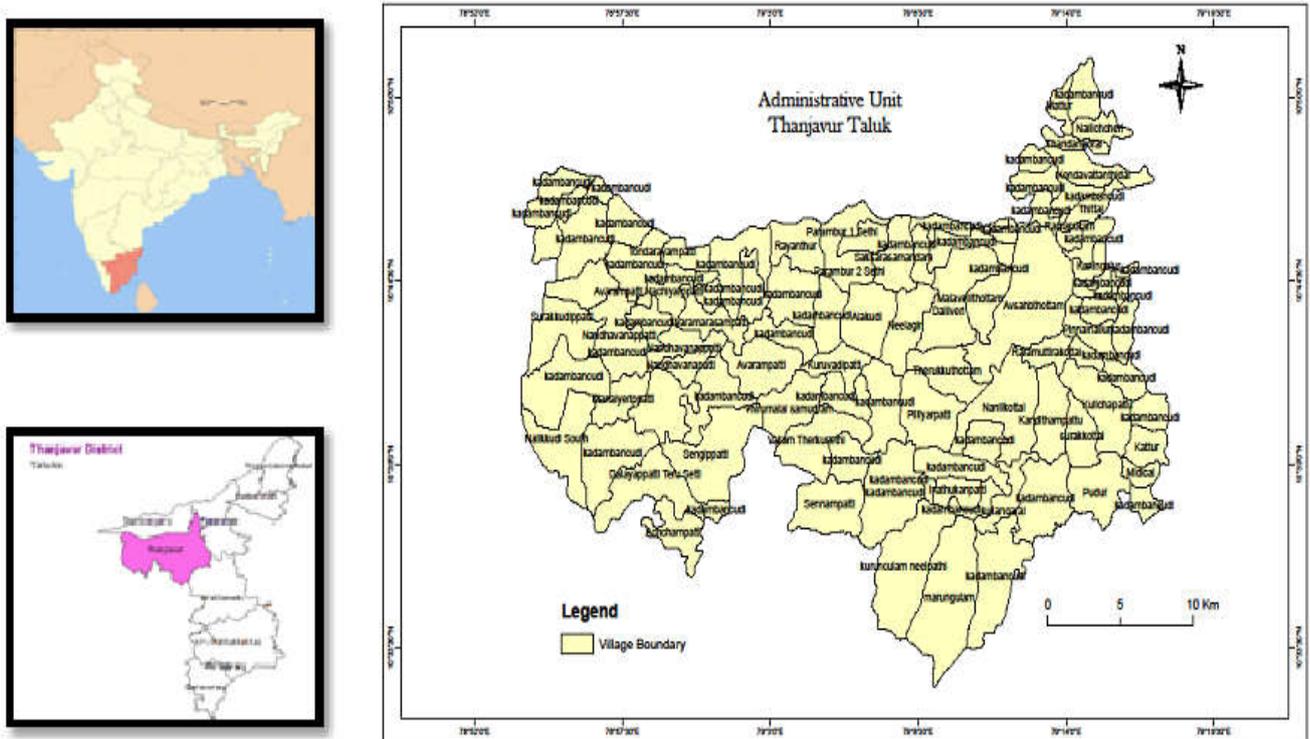


Fig.1. Location Map of the Study Area

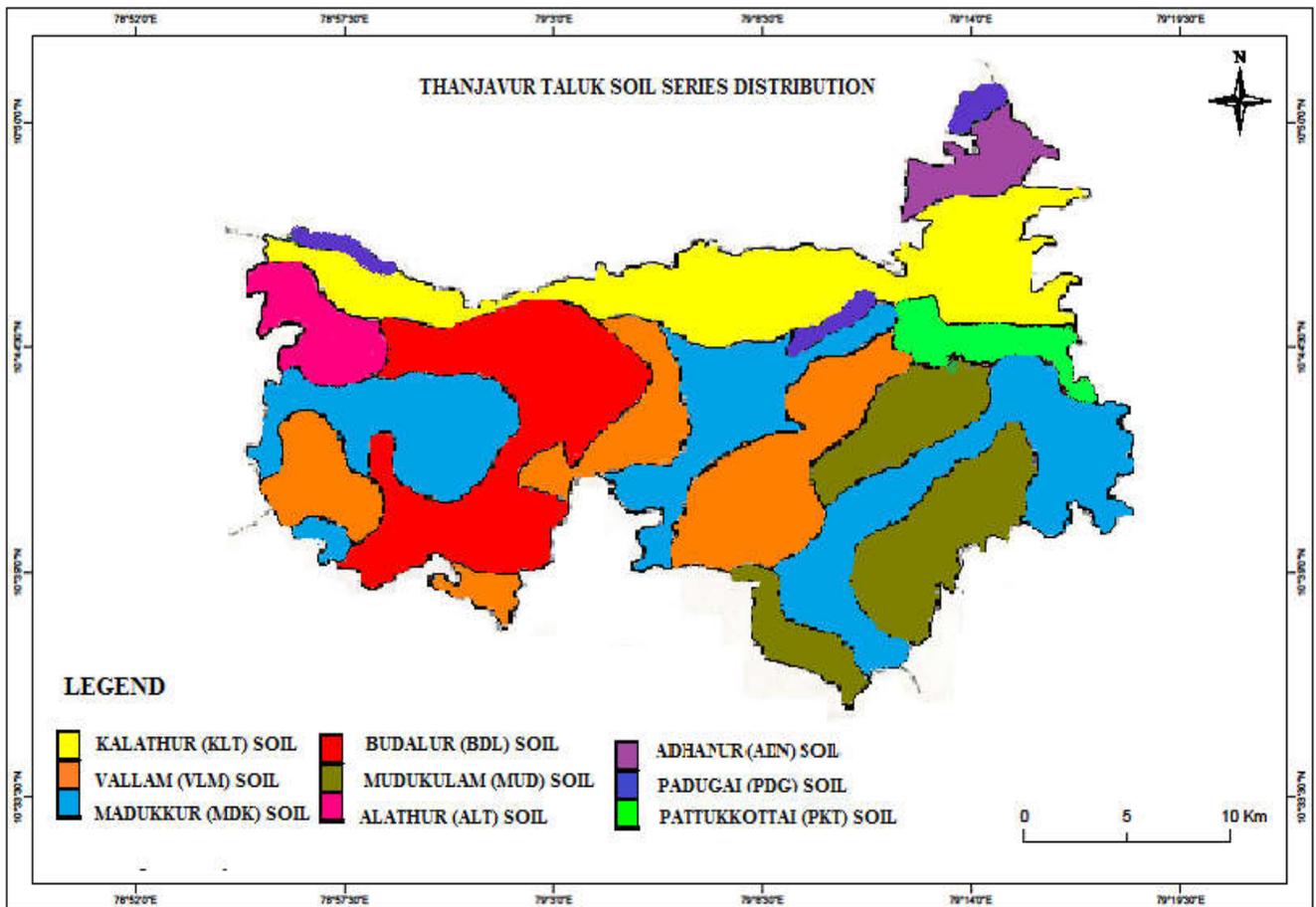


Fig.2. Thanjavur Taluk Soil Series Distribution

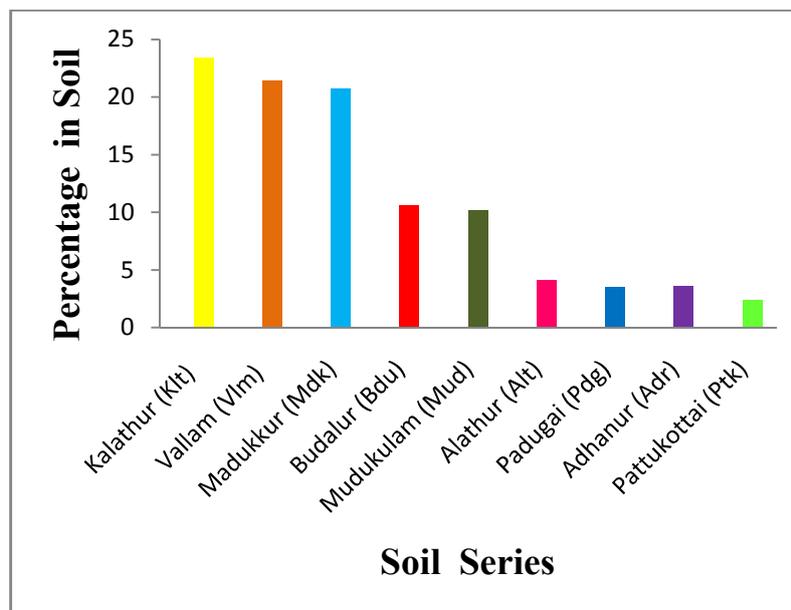


Fig.3. Percentage of Soil series Thanjavur Taluk

Table 1. Soil Distribution in Thanjavur Taluk

S.No.	Soil Series	Extent (ha)	% Total
1	Kalathur (Klt)	14,260	23.42
2	Vallam (Vlm)	13,045	21.43
3	Madukkur (Mdk)	12,641	20.76
4	Budalur (Bdu)	6,449	10.59
5	Mudukulam (Mud)	6,166	10.13
6	Alathur (Alt)	2,523	4.14
7	Padugai (Pdg)	2,119	3.48
8	Adhanur (Adr)	2,213	3.64
9	Pattukottai (Ptk)	1,463	2.41

1) Kalathur (Klt) soil series

Kalathur soil series occurs in Northern part of Thanjavur Taluk. It consists of very dark gray brown, very deep calcareous soils and it is fine textured Cauvery river alluvium clay. Paddy, Sugarcane, and cotton are cultivated in this soil series by irrigation. In the rainfed area pulses are cultivated. It extends up to 14,260 (ha) and percentage of 23.42 in Thanjavur Taluk. This soil needs drainage improvement, soil Breeding and liberal addition of organics. This soil series was classified as average productivity classes.

2) Vallam (Vlm) soil series

It occurs in Eastern part, middle part, Western part, minimum covered in Northern part and also minimum covered in Southern part of Thanjavur Taluk. It comprises of moderately deep sandy loam, yellowish red soils occupying the top most portion of the laterite cap. Since there is no possibility of irrigation, only rainfed crops such as Groundnut, Millets, Cashew nut and Eucalypts are grown in this soil series. It extended to 13045 (ha) with percentage of 21.43 in Thanjavur Taluks. This soil needs special soil conservation measures and liberal addition of organics. This soil series was classified as poor productivity classes.

3) Madukkur soil series (Mdk)

Madukkur soil series occurs in East and Southern part of the Thanjavur Taluk. It is very deep brown soil. Groundnut,

Gingelly, paddy, millets and chillies are cultivated in this soil series by irrigation, Groundnut and millets are cultivated in rainfed area of this soil series. The total area of Mudukkur soil series along with padugai is 14760 (ha) with the percentage of 24.24. Uses of conservation irrigation methods are the special needs of this soil. This soil series was classified as average productivity classes.

4) Budalur (Bdl) soil series

This soil series are identified in west and southern part of Thanjavur Taluk. These are yellowish red to dark red, deep, non-calcareous acidic gravelly in - SITU soils derived from granitic genesis. Groundnut, Gingely, paddy, millets and chillies are cultivated in this soil series by irrigation. In the rainfed area Groundnut and millets are cultivated. It is extended to 14,078 (ha) with percentage of 23.13 of Thanjavur Taluk. The soil needs use of conservation irrigation methods, soil conservation methods and liberal addition of organics. This soil series was classified as average productivity classes.

5) Mudukulam (Mud) soil series

Mudukulam soil series occurs in the east and southern part of Thanjavur Taluk (Fig. 6). It consist of dark red very deep non calcareous, fine loamy textured one occupying in the gently sloping land subjected to severe soil erosion. Groundnut, flowers and vegetables are cultivated in the soil series by irrigation, Groundnut, millets and fruit trees are cultivated in the rainfed areas. It is extended to 141078 (ha) with the

percentage of 23.13 in Thanjavur Taluk along with Budhalur and Pattukkottai soil series. Special needs of this soil series is use of conservation irrigation methods, soil conservation measures and liberal addition of organics. The soil series was classified as average productivity classes.

6) Alathur (Alt) soil series

It occurs in the western part of Thanjavur Taluk. These are grayish brown, fine loamy, very deep strongly calcarious, moderately alkaline soil occurring at the bottom of the Cauvery Mettur project area. In this soil serious paddy, sugarcane and millets are cultivated by irrigation method. It is extended to 2,523 with percentage of 4.14 in Thanjavur Taluk. Drainage improvement and selection of suitable crops are the special needs of this soil. The series was classified as poor productivity classes.

7) Adhanur (Adn) soil series

It occurs in the northern part of Thanjavur Taluk. It comprises of dark gray brown to dark yellowish brown, loamy texture soils derived from Cauvery alluvium. The soils are very deep non – calcarious, having sand layer within hundred cm. Paddy, sugarcane and cotton are cultivated in this soil series by irrigation. In the rainfed area pulses are cultivated. It is extended to 2,213 with percentage of 3.46 in Thanjavur Taluk. In this soil drainage improvement is the special need. This soil series was classified as average productivity classes.

8) Padugai (Pdg) soil series

Padugai soil series minimum occurs in the northern part and north eastern part of Thanjavur Taluk. Brown, very deep, fine loamy, young soils lying near the rivers, sandy clay loam cultivated. Banana, sugarcane, vegetables, flowers and paddy are cultivated in this soil series by adopting irrigation method. In the rainfed area some crops are grown like Groundnut, Gingely and Eucalyptus. Soil limitation – surface run off. It is extended up to 14760 (ha) with percentage of 24.24 in Thanjavur Taluk. Use of conservation irrigation method is the special needs of this soil. This soil series was classified as good productivity classes.

9) Pattukkottai (Pkt) soil series

It occurs in the eastern part of Thanjavur Taluk and it is Pale brown, very deep loamy, non – calcarious occupying the top portion of the gently sloping. Groundnut, Gingelly, Vegetables and chillies are cultivated in the soil series by adopting irrigation method. In the rainfed area a crops like Groundnut, Coconut, fruit trees, Eucalyptus and casuarinas are grown. Soil limitation – surface run off and erosion. It is extended to 14,078 (ha) with percentage of 23.13 in Thanjavur Taluk. This soil needs special use of conservation irrigation methods, soil conservation measures and liberal addition of organics. Pattukkottai soil series was classified as average productivity classes.

Summary and Conclusion

The present work project of “Soil classification and land capability” forms a part of soil distribution and mapping system. There are 13 soil series prevailing in Thanjavur district out of this, 9 soil series are identified in Thanjavur taluk. Mostly they are alluvial, red, sandy clay, laterite, and alkaline soils. In the

project, types of soil, fertility of soil, land capability, crops grown, characteristics of soil have been analyzed. Rainfall, wind, sun and flowing of water are the important factors that influence the types of soils. Soil varies widely from place to place. Kalathur soil series and Adhanur soil series occurs in northern part of Thanjavur taluk. These soil series are made up of sediments deposited by Cauvery river alluvium soil. This soil series are fertile and becomes highly productivity with addition of organic manure and fertilizers. Vallam soil series and Budhalur soil series are identified in western and middle of Thanjavur taluk made up of red soils. Though these soils are not very fertile, crops can be developed with lot of irrigation and manuring. These soil needs use of conservation irrigation method and liberal addition of organics. Madukkur soil series made up of laterite soils. This soil series occurs in the western, eastern and middle of the Thanjavur taluk. This soil series is less fertile and cannot retain moisture and hence it is unsustainable for cultivation. Crops can be grown by application of large quantities of manures, fertilizers and use of conservation irrigation method. Alanthur soil series are alkaline soil occurring in the northwestern part of Thanjavur taluk and it is found in minimum percentage in this taluk. Drainage improvement and selection of suitable crops are the special needs of the soils. Madukkulam, Padugai and Pattukkottai soil series are sandy clay-loam soils occurring in the east part of the Thanjavur taluk. Most of the areas of the Pattukkottai soil series are fallows. Drainage improvement, manuring, soil conservation measures are the requirements of these soil series.

Recommendation

Soil is a non-renewable resource. It is difficult to replace the soils from the area where it has been eroded therefore it is necessary to protect the soil. Planting of trees will help in protecting the soil from erosion.

Acknowledgement

I express my heartfelt thanks to all staff members of Soil and Water Management Research Institute, Land use and Land Survey Department and Statistical Office of Thanjavur for providing the necessary data and help.

REFERENCES

- All India soil and land use survey 1970. Soil survey Manual. Indian Agricultural Research Institute.
- Essays on Environment and Resources Edited by: “PRITIVISH NAG”.
- National Bureau of soil survey and Land – use planning 1983. Soil Map of India, Indian Council for Agricultural Research.
- Rajan, S. V. G. and Rao, H.G.G. 1987. Studies of Soils of India, Vikas publishing House Pvt., Ltd., New Delhi.
- SOIL ATLAS of Soil and Water Management Research Institute Thanjavur.
- U.S. Department of Agriculture 1972. Soil Taxonomy: A system of soil classification for making and Interpreting soil survey, Agriculture Hand book No. 436, Washington D.C.
- Wadia, D.N., M. Skherjeetroducting Note on the Geological Formation of the Soils of India, Records, Geological Survey of India.