CHAPTER-I
APPRAISAL OF THE PROBLEM

1.1 Introduction
1.2 Choice of the Area
1.3 Study Area
1.4 Objective
1.5 Selection of the Problems
1.6 Methodology
1.7 Source of Data
1.8 Review of Literature
1.9 Design of the Work
1.10 References
CHAPTER-I
APPRAISAL OF THE PROBLEM

1.1 Introduction:

India is the agrarian country. Agriculture is the main occupation of Indians. In ancient time when the study of Geography started, man was totally unknown about his surroundings. The study of Geography is connected with the arrangement of all things on surface of the earth. The Geographer finds many things and geographical phenomenon and their characteristics of different places on the earth. The Geographer makes analysis of thought and observation of the geographical elements. Geography is considered as a description of the earth surface and exploration of it, gradually emerged with non-active relationship. Land is resource capital of the country. Agriculture is the main occupation of the rural area. The economic and industrial development depends on agriculture and its development.

Agriculture is one of the oldest and prime activities of the human being. It has remained an important source of food from ancient times. In spite of growing industrialization and urbanization in the world, nearly fifty per cent working population is still engaged in agriculture. In developing countries agriculture sector has been a major source of employment and contributed to the national economy. The word agriculture is derived from the Latin word ‘ager’. It means the land or field and ‘cultra’ means cultivation; it means the science and art of producing crop and livestock for economic purpose. Agriculture is an art of raising plant life from the soil for the use of mankind. The basic aim of agriculture is to raise stronger and more fruitful crops and plants and to help them for their growth by improving the soil and supplying the water. Agriculture is the mile stone in the history of human civilization, due to agriculture man settled at a particular place. That’s why agriculture is a part and parcel of human life.

The term agricultural “productivity” is defined, as a ratio of the output to input in relation to land, labour, capital and overall resources employed in agriculture. Singh Jasbir (1984) considered agricultural productivity as the degree of which the economic, cultural, technical and organizational variables (i.e. the man made frame) are able to exploit the abiotic resources of the area for agricultural production. Bhatia (1965) defined agricultural efficiency as the
aggregate performance of various crops in regard to their output per acre but
the contribution of each crop to the agricultural efficiency would be related to
its share of the crop land. Singh (1976) defined agricultural productivity as the
quantity of return from arable land. He argued that quantity of production
denotes its intensity and the spatial expansion. The crop productivity is
manifestation of the influence of various factors including the physical factors
like relief, climate and soil. Socio-economic factors like size of the operational
holding, occupational structure of population, the type of farming and
tendency of farmers and technical and organization factors like crop rotation,
irrigation and mechanization) also influence crop productivity (Bhatia, 1968).

Despite of technological advancement and conquest over nature, the
agricultural activities in the world are closely controlled by physical factors.
Indian agriculture is not an exception for this; today India is facing two main
problems concerned with agriculture. The first is meeting the increasing
demand of food and other is supplying agro products for ever increasing
population and the second is uneven development of agriculture and changing
pattern of agricultural land use. India tried to be self-sufficient in agriculture
through five year plans after Independence by taking systematic efforts. Due to
the unique importance, agriculture gets more and more attention in every five
year plans and top priority is given for the development of agriculture. In our
country agriculture mainly dependant on the land. As land is one of the
important constituents of agriculture, the study of land and agriculture from
the geographical point of view gained more importance after 1950.

At the beginning of 1970 and later on the Green Revolution brought a
remarkable change in the field of agriculture. Due to this, India became not
only self-sufficient in food grains but it could also export a small quantity of it.
The green revolution also known as the HYV revolution, strengthen the Indian
agriculture. Even then, the process of agricultural development is not properly
channelized because of uneven rainfall, unavailability of basic infrastructure
facilities and unbalance allocation of resources. The green revolution is
succeeded only in the areas of irrigation. In spite of lot of efforts made by
government, the small farmers could not get the benefit of it. This creates a
large gap between small and big farmers and imbalance is created. To reduce
this gap, systematic planning is required. For this purpose, it is necessary to
have the detailed information of the region which agricultural geography can
give detailed information of a particulate area. The research in agricultural
geography in the region can be useful to solve the problems of the area and
helpful in planning for agricultural development. The present exposition has an
attempt to study the Phaltan Tahsil for the better planning and development of
agriculture.

The present study is the modest attempt to study the land use and levels
of agricultural development in Phaltan Tahsil of Satara District for its better
agricultural development.

1.2 Choice of the Area:

Phaltan Tahsil is selected for the study. It has many reasons. The choice
of topic under investigation is influenced by many considerations. Firstly,
researcher belongs to Phaltan Tahsil and he is familiar with study area.
Secondly study area falls in drought prone region of Deccan trap of
Maharashtra State, receiving annual average rainfall between 450-500 mm. It
is distributed unevenly in the study area. The study can be useful to solve the
problems of drought prone area and helping in planning for agriculture
development of this area. Thirdly irrigation is a dominant factor in study area
having considerable impact on land use of Phaltan Tahsil. The Banganga
River, the Nira River, wells and tube wells are the source of irrigation in the
study area. Fourthly, unfortunately this area has not been so far studied in
depth from land use point of view.

1.3 Study Area:

Phaltan Tahsil covering the part of the Nira river basin is one of the
economically prosperous tahsils of Satara district in the southern Maharashtra.
It lies between 17º58' North to 18º09' North latitude and 74º10' East to 74º45'
East longitude. It has total geographical area of 1190 sq.km. with 128 villages
and one urban settlement (2011 census). This area is bounded by the Nira river
in the northern side. The area attains 576 metres height (M.S.L.) with
southward land drained mainly by the Banganga, a right tributary of the Nira
River. Phaltan Tahsil lies in the east of Satara district. It is surrounded by
Baramati tahsil in the northern side, in the southeast side lie Man tahsils, in the
southern side lies Khatav tahsil, the south-western sides lies Koregaon tahsil
and in the western side lies Khandala tahsil and Solapur district belongs to the east.

1.4 Objectives:
1. To study the geographical setting of the study area.
2. To study the general and agricultural land use pattern.
3. To analyse the changes in cropping pattern between the period 1991 to 2011.
4. To analyse the crop ranking, crop combination and crop diversification of the study area.
5. To measure the productivity and agricultural development of the study area.

1.5 Selection of the Problems:

The selection of the problems under investigation has been influenced by many considerations. The following are a few of them.

1. Area selected for present research is more dominant in agriculture, mostly in the Banganga River and the Nira river basin.
2. The northern part of the tahsil has significant area under cash crops like sugarcane, wheat. This is influenced by adoption of modern technology in the study area.
3. Farmers are diverted from their traditional methods of agriculture to modern advanced techniques for increasing agricultural production in it.
4. Development of agro based industries specially sugar factories grow and provide financial assistance and source of employment to the farmers of the study area.
5. The significant increase in cash crops in the study area has been due to facilities of irrigation and modern implements.
6. In the last three decades agricultural development and major changes have been placed in the land use and cropping pattern.

1.6 Methodology:

The period for the present investigation is considered from 1991 to 2011. Statistical methods, cartographic techniques are used as per availability of data and requirement. Collected information is tabulated, analysed and conclusions have been drawn. Research methodology is a way to systematically solve the research problems.
The following methods are used for the study.

**Crop combination:**

Rafiullah's (1965) Crop Combination technique has been introduced for 128 villages in Phaltan Tahsil.

Formula -

\[
d = \sqrt{\frac{\sum D_p^2 - \sum D_n^2}{n}}
\]

Where- 
- \( d \) = deviation
- \( n \) = number of crops
- \( D_p \) = Positive difference
- \( D_n \) = Negative difference

**Crop diversification:**

Gibb's Martin Index has been applied for the Crop Diversification and computed for 128 villages in Phaltan Tahsil.

Formula -

\[
Index of Diversification = 1 - \frac{\sum x^2}{(\sum x)^2}
\]

**Crop Productivity:**

Enyedi's Method is chosen to computed Crop Productivity of Phaltan Tahsil as-

\[
Productivity Index = \frac{Y}{Y_n} \div \frac{T}{T_n} \times 100
\]

Where -
- \( Y \) = Production of selected crop in a unit area.
- \( Y_n \) = Total production of selected crop in entire region.
- \( T \) = Area under selected crop in a unit area
- \( T_n \) = Area under selected crop in entire region.

**Agricultural Development:**

For determining the levels of agricultural development various, variables will be used and the data of the all variables have been transformed into indices using 'Z' score technique. The formula is:

\[
Z_i = \frac{X_i - \bar{X}}{SD}
\]
Where-

\[ Zi = \text{standard score for the } i^{th} \text{ observation}, \]
\[ Xi = \text{original value of the } i^{th} \text{ observation}, \]
\[ X = \text{mean of the value of } X \text{ variable}, \]
\[ SD = \text{standard deviation of } X \text{ variable}, \]

The spatial distribution of crop productivity and agricultural development for selected villages are computed, mapped and interpreted. Apart from these percentage methods used at various places this research focuses on study of the geographical setting, socio-economic setup, and changing cropping pattern and the agricultural development of the study area. It focuses on the study of environmental problems which shows are the outcomes in agricultural development in the study area.

1.7 Source of Data:
The present study is based on primary and secondary sources of data.

**Primary Sources:**

Primary data is based on the information obtained from 128 villages through questionnaires. The questionnaires cover aspects like Crop, land use, farmer's education, income from various and problems regarding agriculture and allied sectors. Besides this information, concerned Talathi, Gramsevak and Sarpanch are contacted to get more information of sample villages. The spatial and temporal aspects of general and agricultural land use are studied in depth.

**Secondary sources:**

The secondary published sources are namely, Talula Revenue Record, Socio-economic Abstract of Satara District 1991, 2001 and 2011, District Hand book Census, Department of Irrigation, Department of Forest, Agriculture Trust of Phaltan, Taluka Land Record office and Survey of India (SOI) Topographical sheet No. 47K/1, 47K/5, 47K/9 and 47J/8 on 1:50000 scale. The general land use data on net sown area, forest, fallow land, land not available for cultivation and waste land have been obtained for 1991 to 2011 from Taluka revenue record of Phaltan. The data regarding major ten crops has been obtained for year 1991 to 2011 at village level from secondary sources.
1.8 Review of Literature:

Agricultural land use and productivity in Phaltan Tahsil of Satara District is the topic of the present research work. Most of the researchers have studied Agricultural land use and productivity at village level. But agricultural productivity is in practice an elusive term and its measurement is a very difficult job. Many experts in the field of agricultural geography and agricultural economics have long been engaged in determining and measuring agricultural productivity in different parts of the world. They also worked on delimiting the weaker areas for understanding problems and formulating development programs for same. They used different variables to compute the productivity and evolved some methods.

**Majid Husain (1979):**

Majid Husain is one of the experts in the field of agricultural Geography. He is the eminent expert; he has made important contribution in his book entitled “Agricultural Geography”. According to him fruit farms are small and are located where communication links with the consumption centres. He has also pointed out that soil fertility is maintained by the heavy application of manures and fertilizers. His contribution to the field of agriculture Geography is appreciably good.

**Singh J. (1972 and 1984):**

He has devised a new technique for measurements of agricultural efficiency in Harayana. Further Singh (1990) has calculated the agricultural performance of India. Dutt and Sen Gupta’s contribution is noteworthy in West Bengal. The selected indicators approach has been used by Dutt and Sen Gupata (1969) for assessing the agricultural development of west Bengal.

**Shafi (1972):**

In 1972, Shafi has also shown greater interest in agricultural productivity. He critically examined various measures applied for deriving the efficiency of agricultural productivity and determining the productivity index of the Great Plains of India. Shafis another useful contribution on the measurement of agricultural productivity in 1947. After assessing the pros and cons of various formulas, he has applied a modified formula for determining the productivity index of the whole of India. Based on the productivity index, the author has demarcated regions of high, medium, low and very low productivity in the Great Plains of India.
productivity and the regions which are marginally productive and where the productivity is below the national level.

**Mc Clelland (1974):**

Mc Clelland’s contribution to measure agricultural productivity is noteworthy. In 1974, he has measured agricultural productivity in India by the output per unit area of leading individual crops in the districts. Similarly Sharma and Countinho’s investigation of the dynamism in area is remarkable. In 1974, they have investigated the dynamism in area and productivity per unit area in jowar in Karnataka. They have correlated the changes with the changing socio-economic variants and have highlighted the regional imbalances in the level of jowar productivity. This research is very useful.

**Ali, Mohammad (1975):**

In 1975, another researcher Ali Mohammad from Uttar Pradesh has studied agricultural land use and nutrition in Kher Sitapur and Barabanki District (UP). His entire study is divided into four sections consisting of fourteen chapters. In the forest post researcher has endeavoured to make a comprehensive study of the natural environment physiography, climate and soil of the region with a view bringing out the element of influences of these factors on the existing crop land use. A study has also been made on spatial patterns of general land use, agricultural land use and crop combination regions. The principles of the selection of villages for intensive study of land use and pressure of population have been logically discussed in one chapter.

**Hussain Majid (1976):**

The remarkable work in the agriculture productivity is of Hussain Majid. Who converted the agricultural production into the whole region? Thus the higher the money return per unit of area higher is the agricultural productivity. Money returns are calculated per unit or even per head of agricultural worker (including the cultivator and agricultural labourer) it should be mentioned here that the money value coefficient does not take into consideration the value of the by-products of the crops.

**V. R. Singh (1979):**

In 1979, it is V.R. Singh who has studied a new method of analysis of agricultural productivity for Andhra Pradesh. In his research he takes into account not only the yield of crops but also their areal spread. Based on
intensity of use, reflected in yield and areal spread of the crops, he has devised nine categories by a combination of high, medium, and low yield intensity with high, medium and low spread of crops in the study area.

Varsha Vaidya and V. S. Date (1987):

Two scholars from Maharashtra Varsha Vaidya and V. S. Date have studied influence of variables on productivity in 1987; they have examined influence of some selected variables on agricultural productivity of Maharashtra. Their hypothesis was the productivity which is related to some socio-economic variables, applying correlation and multiple regression techniques. This hypothesis is tested by applying for the years taken into consideration (1961, 1966, 1972 and 1978). They have selected six variables i.e. productivity index (Bhatia 1967), Shafis modified productivity index, standard nutrition unit per hectare, calories per head of total population, money returns per hectare of crop land and money return agricultural worker. The authors used data for the period of 1960-61 and 1979-80.

V. S. Date and N.S. Pawar (1988):

V. S. Date and N.S. Pawar who has worked on agricultural productivity: A micro level study of two villages (Maharashtra). They studied the association between productivity of four selected crops and soil characteristics and economic factors at micro level. Soil samples and related data were collected from Bhadalwadi and Kuravli villages differing in physical and economic aspects. They used 16 variables and finally correlation and multiple regression techniques were used in order to measure significance of the variables and their associations with productivity of four important crops grown in both the villages viz. jowar, bajara, wheat and sugarcane.

Rameshwar Thakur (1989):

Rameshwar Thakurs study of agriculture productivity also remarkable. He examined agricultural productivity in south Bihar plain. He has discussed in his research paper the agricultural productivity in south Bihar, as demonstrated by the coefficient of agricultural productivity. The spatial variation in productivity worked out on the basis of Anchal as an area unit is explained in terms of physical as well as human parameters that govern crop yield.
Singh J (1994):
Singh J. has made very remarkable research on mechanization of agriculture and its effect on agricultural productivity. Singh J has used the approach to determine the level of mechanization of India. The impact of irrigation may be visualized from the angle of transformation in agriculture. The productivity of land is induced in modern subsector and cropping intensity also rises whereas productivity remains low in the traditional subsector and cropping intensity remain quite low in the traditional subsector and cropping intensity remains quite low. Increase in land productivity depends on the intensity of mechanization. The intensity of mechanization can be defined as quantum of application of modern inputs such as seeds (HYV), chemical fertilizers, pesticides, pumps and tractors per unit area.

In 2000, Patil Arun A. has studied changes in Agricultural productivity in Upper Bhima and Upper Krishna Basins in Maharashtra; A Geographical analysis. they selected six variables i.e. Kendall's Ranking Co-efficient, Bhatia’s productivity Index, Agricultural productivity based on standard nutrition Units, based n the total number of calories available per person, money value method and Enyedi’s (1964) method. Aggregate productivity was calculated for the study area and productivity regions were demarked by using six variables. This is done for each of the three years of 1985-86, 1990-91, and 1996-97.

Majid Husain (2002):
In 2002, Majid Husain stated that “Green Revolution” is a term coined to describe the emergence and diffusion of new seed of cereals. The new cereals were the product of research work and concentrated plant breeding with the objective of creating high yielding varieties of rice, lick -8 (miracle rice), at the International rice research Institute, Philippines in the 1960s. The increase in yield from the new seed has been spectacular. In some cases the yield of HYV is more than double the yield of traditional varieties.

In 2004, N.G. Mali worked on A critical study of Agricultural productivity in Parbhani district (M.S.): A geographical and analysis. He has used Weavers and Doi's methods are used for the calculation of crop
combination of every tahsils. In order to determine the tahsil wise concentration of crops Bhatia's (1965) formula is used. Jasbir Singh's (1976) formula is used to calculate index of crop diversification.

N. S. Adnaik (2005):

N.S. Adnaik research of agricultural productivity in the drought prone area is remarkable. He selected eight variables i.e. Kendall's Ranking coefficient, Bhatia’s productivity index, Agricultural productivity based on standard Nutrition units, Enyedi’s productivity index, Shafis modified index, based on calories per capita, Sapre and Deshpande's index and based on Aggregate productivity index was calculated for the study region and productivity regions were demarked by using eight variables. This is done for each of the two years of 1985-86 and 1998-99.

Ogale S. (2013):

Recently Ogale S. has studied agricultural land use and productivity of Baramati Tahsil. He selected eight variables i.e. Kendall's Ranking coefficient, Enyedi’s Productivity Index, Agricultural productivity based on standard Nutrition units, Enyedi’s productivity index based on calories per capita, and productivity regions were demarked by using eight variables.

1.9 Design of the Work:

The present investigation consists of eight chapters.

Chapter first deals with the study covering its objectives, source of the data methodology used in processing data, analysis and interpretation of problems encountered, limitations restricting the scope of study.

Chapter second attempts to present the Physical, Socio-economic profile of the study area. This chapter includes location, physiography, drainage, climate, soil, vegetation, transportation, irrigation and population etc.

Chapter third unfolds The Spatial and Temporal Analysis of General Land Use, study volume of change for net sown area, land not available for cultivation, cultivable waste fallow land and forest land in Phaltan Tahsil.

Chapter fourth assesses The Agricultural Land Use Pattern of ten selected crops both spatial and temporal variations in the study area.

Chapter fifth studies Crop region by applying Crop Ranking, Crop Combination, Crop Diversification and factor analysis techniques.
Chapter sixth deals with Agricultural Productivity and Levels of Agricultural Development of the study area.

Chapter seventh studies the Case Studies of Selected Sample Villages.

Chapter eight throws light on Conclusion, Agricultural Problems of the study area and specific suggestions to solve them.

Bibliography, Questionnaire, and Abbreviations with full forms and Appendix is eventually be enclosed.

1.10 References:


18. Topographical sheet No. 47K/1, 47K/5, 47K/9, 47J/8 and 47J/12.