Raising of crops with irrigation is known as irrigated agriculture. When irrigation is not designed and rain water is the only source of water for the survival and growth of crops, it is termed as rainfed agriculture or dryland agriculture (Barani). Although the terms rainfed and dryland agriculture are dubbed together, they are not synonymous.

A distinction between the dryland and rainfed agriculture is possible depending upon the annual precipitation. Farming within the confines of regions with less than 750 mm. annual rainfall is called dryland agriculture, whereas the one located in zones with more than 750 mm. annual rainfall is designated rainfed agriculture. In dryland regions, inter and intra-season oscillations in rainfall are unusually high. The rainwater conservation in soil where it falls is necessary to moderate the effect of drought-like conditions that often develop between two rain events. In continuation it is important to note that the term 'dry lands' or 'arid lands' is used to distinguish all those areas which experience regular water shortage on a seasonal or longer term basis. Thus it includes not only the arid lands of the world, defined by their extremely low precipitation totals, but also encompasses those regions which may record significant rainfall for at least part of the year.

In the arid zone, rainfall is the major control of land use as many activities are carried out close to their minimal water requirements. Hence, even small rainfall fluctuations can produce major effects on the crop growth and the animal survival. As rainfall decreases from the humid tropics towards the semi-arid zone, the chances of crop failure increases, until below about 250 mm per annum, successful cultivation is not really possible on a long-term basis. Along this same gradient the importance of irrigation increases. Thus there may be two implications of dryland agriculture:

1. The term dryland agriculture may simply mean rainfed agriculture. In that case even those areas which are located in most of the areas where agriculture is largely rainfed may be regarded as regions of dryland agriculture.

2. Another implication of dryland agriculture is that, it may apply only to such regions where the environment is really dry with a limited amount of rainfall,
an absence of irrigation, and where only such crops are grown which are adapted to dry conditions. In this kind of implication, it is imperative to set a climatic limit to such regions in terms of particular isohyet or a certain figure of water balance. Thus dryland agriculture is that of not only rainfed agriculture but also of an arid and semi-arid environment.

According to the Indian Agricultural Atlas (1971) the dryland areas include the zones having an annual rainfall up to 750 mm. According to this definition, Indian arid zone occupies nearly 12 percent of the total geographical area covers parts of the states of Punjab, Maharashtra, Karnataka and Andhra Pradesh.

About 51 Mha land area of India falls under this category and produces most of the coarse grains, pulses, oilseeds, cotton and dry fodder. However, in Punjab and Haryana and other irrigated parts of the above noted zones, the dryland agriculture has been overrun and invaded by irrigated agriculture leading to a contraction of the dryland environment and dryland cultivation. However, three-fourth of India's agriculture is still rainfed agriculture. Even after the maximum utilization of the water resources about half of the arable land will still remain under 'dryland' farming which includes sizable portion of the cultivated land in the arid regions of Rajasthan, Gujarat, Andhra Pradesh, Karnataka, Punjab and Haryana. For instance, in the arid zone of Rajasthan, comprising about 60 per cent of the Indian arid zone, the total area to be irrigated by the Rajasthan Canal and other ground-water resource is about 11 per cent. Thus the remaining 89 per cent of the region will ultimately remain such that farmers will have to learn to live better with natural rainfall as the major source of water.

The significant accomplishments have been made in the technology of arid lands agriculture, with Israel and the south-western US as the prime examples. In Israel, for instance, agricultural output has multiplied eight-fold in the last 25 years, largely through highly efficient and sophisticated irrigation systems. Similarly in the south-western US intensive agricultural systems have evolved where the water is sufficient, the multiple cropping is wide-spread, and average yields are of high records. The
large scale intensive systems for dairy, poultry and beef production have been developed. Large quantities of low cost energy have been an essential input. Israel's agriculture is the outcome of a long struggle against harsh, adverse conditions and of making maximum use of the scarce water and arable land. Its success lies in the determination and ingenuity of farmers and scientists who have dedicated themselves to developing a flourishing agriculture in a region which is more than half desert, thus demonstrating that the real value of land is a function of how it is utilized.

The problems of dryland farming are particularly related to the yield, out turn, agronomical characteristics, soil and moisture needs, and environmental changes, such as water logging and the increase in salinity, the relation between the dietary habits and the nutritional characteristics of these crops, marketing problems, labour input, the fodder value of these crops, the competitive position of these crops in comparison with other crops growing in the region and numerous other infrastructural and technological aspects.

An improved technology removes production constraints, and makes it possible for the producers to accomplish more with available resources or inputs or to manage or operate a larger production unit or larger land area. Thus technological change plays a critical role in agricultural development. The urgent needs of the developing arid lands for sustained agricultural development and improved quality of life of their inhabitants, and the rapidly changing picture of resource availability in the arid lands are by themselves reasons enough to seek new ways to implement technological change.

Appropriate Technology can be applied to increase the carrying capacity of the arid lands. Already there is too much evidence of failure of ill-conceived development activities, some measure caused by attempt to transplant a highly sophisticated or unsuitable technology to arid lands. A key constraint is the financial resources available for development, since countries most seriously in need are those least capable of capital investment. World financial resources would be severely strained to provide enough to implement sophisticated technologies in the arid lands.
A systematic approach to understanding arid lands agriculture and natural resources development technology by which planners can be guided to make selection of improved technologies which are truly implementable can avoid some of this conflict.

**Objectives and Hypothesis of the Study**

1. Arid land distribution, extent, structure, ecological framework, function, status, and management needs proper study and development.

2. To study the use of appropriate technology involving the specific problems of arid lands agriculture in the developing region.

3. To understand the growing importance of dryland farming in agricultural production.

4. To study the management of arid and semi-arid lands to curb desertification.

5. To study the ways and means for the transfer and application of appropriate technology for agricultural development in arid lands from the successful cases like Israel to the problem areas.

The basic hypothesis in the case of the present study is the technological appropriate inputs lead to a successful and sustainable agriculture specially in the case of the dry lands. Further the possible collaboration and transfer of scientific and technological effort are necessary to tackle problem of arid lands at the global level.

**Source of Information and Methodology**

The sources of information include both primary and secondary sources. Primary sources include Government documents, UNESCO reports, FAO reports, documents of Non-Governmental organizations working in this area of study, the Environmental Impact - Assessment manuals etc. The secondary sources includes innumerable books and Journals, Statistical and cartographic techniques used in assessing the spatial and temporal impact of technology transfer. The official, Government web sites have also been explored for the relevent data and literature. The official, Government web sites have also been explored for the relevent data and literature. Basically, the methodology used is primary descriptive and critically analytical as well as
comparative in nature. It is systematic to prescribed areas of understanding and collaboration.

**Scheme of Chapterisation**

**Chapter - 1**

**Introduction**

This chapter deals with basics about dry land farming including definitions, general introduction about the topic and its various dimensions. It deals with various geographical factors which affect the environment and soil characteristics of the study area. The geographical factors include temperature, precipitation, relative humidity, wind, water balance, river water, ground water, flora, fauna etc. These climatic factors are very essential component of Dryland ecosystem.

**Chapter - 2**

**Israel: Modern agriculture under arid condition**

This chapter will emphasize on the level of technology available and its economic viability. Because in present time Israel is the only pioneering country in the field of the development of drylands through proper and effective agricultural technology. So, the aim of this chapter is to know the present level of technology available in Israel. And also to understand the use and effectiveness of the technology which is feasible in Indian conditions.

**Chapter - 3**

**India: Subsistence agriculture under arid condition**

The aim of this chapter is to list down the various levels of agricultural technology available till date, and their function and effectiveness in the modern times. After full investigation and research we can come to know where are we lacking behind Israel as far as technology is concerned. The major part of this study area would be Rajasthan's Thar Desert. But different parts of India would also be taken into the
study i.e. states like Punjab, Haryana, Uttar Pradesh, Madhya Pradesh, Maharashtra, Karnataka, Andhra Pradesh etc.

Chapter - 4

Israeli Technology for Dryland farming and its relevance to India

After studying chapter 3 and 4 the viability of this chapter No. 5 is very important. In chapter 3 and 4 we have come to know the level of technology available in both India and Israel. So, on that basis some recommendation for technology import from Israel to India, can be made.

Chapter - 5

Conclusion : Future prospects of Drylands

In this chapter the summery of the whole work would be given and the future of drylands will be accessed and suggestion would be given.