In a country like India, agriculture occupies an important place in the national economy both from the point of view of its contribution to National Income and generation of employment opportunities. On one hand agricultural sector in India is more dependent upon Nature and on the other hand, the ability of the Indian farmer to bear risk and uncertainty resulting from the vagaries of nature is very limited because of his poor economic conditions. Therefore, most of the studies relating to agricultural production functions and returns to scale and farm size, which ignore the aspect of uncertainty and risk are incomplete and inadequate. The present study attempts to explore the nature of various uncertainties faced by the farmer and the decision making under the presence of these uncertainties. An attempt is also made to examine various policies to reduce the adverse impact of these uncertainties and related risks.

In agriculture, two types of uncertainties are considered:

1. Environmental uncertainties reflected through nature
2. Behavioural uncertainties dependent upon the psychological make-up of the farmer, his capital position etc.

Environmental uncertainties, in the present study, are analysed for seven major crops of Gujarat State for the period of two decades i.e. 1950-60 and 1960-70. The environmental uncertainties like yield uncertainty, rainfall uncertainty and price uncertainty have been worked out in terms of coefficient of variation. With the help of environmental uncertainties, crop allocation of the Gujarat farmers belonging to the various size groups of holdings is
examined in order to test the various known hypotheses regarding farmer's behaviour. Another type of uncertainty i.e. behavioural uncertainty reflected through the decision making by the farmers, has been analysed with the help of Game Theoretic Models. Taking various seed-varieties of cotton as farmers' strategies against nature's strategies reflected through different natural conditions prevailing in different years, pay-offs of the farmers in terms of revenue (either gross or net) are obtained. Then, optimal strategies and derived in terms of various Decision Rules using this Game Theoretic Approach. Further, to reduce the adverse impact of yield uncertainties on the basis of the uncertainties observed in Gujarat state, a Crop Insurance Scheme is worked out. Policy implications of the scheme are also discussed, if, to begin with, it is restricted to the vulnerable group of small farmers only.

The present study has its own limitations and therefore one has to be cautious while making use of the present study for policy making purposes. The conclusions of the study are of indicative type because of the limitations of the data which constrains the use of more appropriate methods and techniques. Estimation of uncertainties is based on aggregative data for seven major crops. Moreover, it has not been possible to work out the uncertainty in the adoption of new technology or in the adoption of different doses of various types of chemical fertilisers. Farm level data will be more suitable in this type of study since decisions are taken at the farm level. Therefore, the results of the present study should be used with caution for actual policy making since the analysis is applicable to the
average farmers and not to individual farmers of the Gujarat State. The study, therefore, attempts at an understanding the problem and the implications of various policies pursued to tackle it.

The arrangement of the study covering the above aspects is made on the basis of following chapter scheme.

The first chapter surveys the theoretical developments that have taken place in the area viz., Risk and Uncertainty in agriculture.

The second chapter surveys the work done by other researchers on Risk and Uncertainty in Gujarat Agriculture.

The third chapter pertains to environmental uncertainties especially yield uncertainty, price uncertainty and rainfall uncertainty in Gujarat Agriculture.

In the fourth chapter, on the basis of uncertainties measured in third chapter, actual crop allocation made by the farmer over-time and space and across the size-distribution of holdings is studied and some hypotheses are tested.

Fifth chapter is devoted to the obtaining of optimal plans based on the various decision rules used in Game Theoretic Approach. The actual land allocation is then compared with the optimal land allocation.

In the sixth chapter, a crop insurance scheme for Gujarat state, as a measure to reduce uncertainty in agriculture is worked out.

The last chapter pertains to the conclusions and policy implications emerging from the present study.