CHAPTER- I

INTRODUCTION

1.1 The Context: Production Risks in Indian Agriculture

Although agriculture now accounts for only 14 per cent of Gross Domestic Product (GDP), it is still the main source of livelihood for the majority of the rural population as agriculture in India accounts for 50% of employment and sustains 70% of population. It also provides inputs to Industries and forms a significant proportion of the Export market. There are two main cropping seasons-Kharif monsoon crop and Rabi winter crop. Of the 120 million farm holdings 63% are less than one hectare in size with average holding of 0.4 hectares.[1] Any adversity faced by this sector therefore has a multiplier effect on the economy as a whole. The target of 9.0% - 9.5% economic growth envisaged in the current Twelfth Five Year Plan will depend significantly on Agriculture. With such high risk it is imperative to have a risk management tool in place.

Although Indian agriculture faces many risks like price risks, financial & institutional risks, personal risks but the prominent risks that affect the income of those involved in agricultural production and business can be categorized as price risk caused by variation in market prices and production risks caused by variations in volume or quality. Weather indexed risk management **insurance** scheme represents a newly developed alternative to the traditional crop insurance programme for farmers in the emerging markets to cover production

[1] Directorate of Economics and Statistics, Department of Agriculture and Cooperation. and Working Group report of Planning Commission for the 12th five year plan(2012-2017),Ch. IV .

risks. Not only it enhances the risk taking capacity of farmers but also of banks, micro finance lenders and agro based industries.

Further as the insurance products are evolving on universally accepted parameters global pooling of risk through transfer of risk to international markets is easier through re-insurance and makes the model more competitive.

1.2 Statement of the Problem

Indian Agriculture is highly dependent on the vagaries of the weather. Almost two-third of the land is rain fed and affected by the twin problems of drought and flooding. Approximately 20% of the land is perennially drought prone and simultaneously 12% of other areas are flood prone as Ganges, Brahmaputra and Indus are highly prone to flooding. "The gamble of the monsoon" an oft quoted phrase is very apt to describe Indian agriculture. With Ground water resources dwindling and most of the irrigation being highly dependent on non-perennial sources farmers are at the mercy of weather. Strong correlation is observed between fall in crop production and low rainfall.

A study of monsoon rainfall and effect on Kharif crop production over a period of 30 years as brought out by Ulrich Hess is tabulated below (Table 1.1). In the year 2002-2003 a 49% dip in July rainfall led to a fall in Kharif crop production by 19%. Contribution of Agriculture to GDP had dipped by 3.1% leading to a drop in overall GDP growth.

Table 1.1 A study of monsoon rainfall and effect on Kharif crop production

Deficient Rainfall Years	Monsoon rainfall % departure from normal	Rainfall in July	Kharif Food Grain Production (% fall)
1972-73	- 24%	-31%	-7%
1974-75	-12%	-4%	-13%
1979-80	-19%	-16%	-19%
1982-83	-14%	-23%	-12%
1986-87	-13%	-14%	-6%
1987-88	-19%	-29%	-7%
2002-03	-19%	-49%	-19%

*Source: Hess (2003) [2]

Further, current data from 2002-03 to 2010-2011 reveal the same pattern. Departure from normal distribution has led to a fall in Kharif crop production hence impacting the overall production.

Table 1.2: All India Rainfall Distribution from 2001-2002 to 2010-11 and effect on Kharif production

Year	Monsoon Season (June-September)		%Departure	Kharif Production(MT)
	Actual	Normal		
2001-02	826.0	901.1	-8.3	112.07
2002-03	737.1	911.7	-19.2	87.22
2003-04	947.3	902.7	4.9	117.00
2004-05	779.6	893.3	-12.7	103.31
2005-06	879.3	892.5	-1.0	109.87
2006-07	886.6	892.2	-0.6	110.58
2007-08	936.9	892.2	5.0	120.96
2008-09	873.2	892.2	-2.1	118.14
2009-10	689.8	892.2	-22.7	103.95
2010-11	912.8	893.2	2.2	120.20

Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation.

Hence the effect of seasonality in agriculture and weather risk can be broadly observed as follows - during Winter (Rabi) crop production is based on primarily residual soil moisture and low temperature is the major risk and during monsoon

[2] Hess, Ulrich. July, 2003."Innovative Financial Services for Rural India, Monsoon- indexed lending and Insurance for small Holders" Agriculture and Rural Development Working Paper 9, The World Bank, Agriculture and Rural Development.

season as majority of rain is during this period extreme deficit or excess rain is the major risk.

Causal analysis of agricultural losses as compiled by GIC's crop insurance cell show that 90% of losses in crop insurance are due to vagaries of weather. The same is brought out in Table 1.3 below:

Table 1.3 Causal analyses of agricultural losses as compiled by GIC's crop insurance cell

Cause	Proportion of Loss
Low Rainfall/Drought	30%
Excess Rainfall/Floods	35%
Low & High Temperature	25%
Storm, Pest & Earthquake	10%

Source: Varsha Bonds and Options – ICICI Lombard /Rajas Parchure in Agriculture Index Insurance Conference, Aug. 2012 Organised by: Centre for Insurance and Risk management (www.cirm.in)

1.3 Justification- Crop Insurance

Crop insurance is a means of protecting the agriculturist against financial losses due to uncertainties that may arise from crop failures/losses arising out of practically all natural factors beyond their control. It is a financial mechanism in which the uncertainty of loss in crop yields is minimized by pooling large number of uncertainties that impact on crop yields so that the burden of loss can be distributed.

The major risks to which crops are exposed during growth are:

i. Adverse climatic occurrences like drought, dry-spell, flood, untimely/inadequate/excessive rainfall, thunderstorm, hailstorm, cyclone, cold wave, frost etc.

ii. Pests.

iii. Plant diseases and weeds.

iv. Wild animals.

Uncertainty of crop yield is thus one of the basic risks, which every farmer has to face, more or less, in all countries whether developed or developing. But these risks are particularly high in developing countries. Again, in most of these countries an overwhelming majority of farmers is poor with extremely limited means and resources and are, therefore, unable to bear the risks of crop failure particularly a disastrous one. Some of these uncertainties can be addressed by technical measures and by improvements in social and institutional set-up but by no stretch of imagination can they be made completely independent of natural hazards. Also cost benefit impact to society will need to be seen.

The primary issue in designing any crop insurance scheme is whether it should cover all risks (yield based) or certain specified risks only. Recently more emphasis is being placed on specific perils. Mauritius covered only windstorm for the first 27 years while in Cyprus it was hail, rust and drought. The type of schemes operating in USA, Canada, Brazil, Japan, Philippines, Sri Lanka and also India cover all risks.

Weather Based Crop Insurance especially aims to protect the farmers against the incidence of adverse weather conditions like rainfall, temperature, frost, humidity etc. It aims to mitigate the hardship of the insured farmers against the likelihood of financial loss on account of anticipated crop loss resulting from it.

Initially the response from the farmers was not very encouraging as premium rates seemed to be unaffordable in the absence of subsidies from the government. Also inadequate number of weather stations, unrealistic

expectations, poor communication, lack of clarity, technical challenges in designing the insurance product & the consequent basis risk (just limited to parametric weather indices) restricted the scope of insurance. The competition with subsidized area yield insurance in the form of National Agricultural Insurance Scheme (NAIS) was also a significant factor responsible for it.

However, the year, 2007-08 was special from weather insurance point of view as the Hon'ble Finance Minister, while presenting the Union Budget on 28th February 2007, offered for the first time the financial support of the government to weather insurance. This changed the future map of the scheme implementation in the times to come.

His announcement is reproduced below:

"Agriculture Insurance Corporation (AIC) has been running a pilot weather insurance scheme since Kharif 2004 and it appears to be a more promising risk mitigation scheme. Hence, Government will ask AIC to start a weather based crop insurance scheme ***on a pilot basis*** *in two or three States, in consultation with the State Governments concerned, as an alternative to the NAIS. The Scheme will be operated on an actuarial basis with an* ***element of subsidy****. I intend to allocate Rs. 100 crore for this purpose in 2007-08"* [3]

1.4 Purpose and Objectives of the present study

The purpose of this study is

1. To provide an overview of Weather based Insurance Scheme in India.

[3] Working Group report of Planning Commission for the 12th five year plan (2012-2017), Ch. IV.

2. To analyse whether the stated benefits claimed in production risk management are being met or not.
3. To examine what changes in the programme are required and provide a possible roadmap for future.

1.5 Research Questions

(i) How does the performance of WBCIS compare across states and crops over a period of five years?

(ii) Does WBCIS improve the viability and fiscal sustainability of the programme in comparison with NAIS?

(iii) Does WBCIS lead to a more equitable distribution of benefits as compared to NAIS in terms of per farmer claim ratio and proportion of farmers benefitted?

(iv) How does it address the high basis risk?

1.6 Scope and methodology

The focus of this dissertation is primarily on the Government sponsored scheme of Ministry of Agriculture, WBCIS, implemented through Agricultural Insurance Corporation of India for both AIC and the private players. Among the private players ICICI Lombard company is the major player. Hence the journey and growth of ICICI Lombard is traced. Since Rajasthan is the largest state implementing the scheme operationalisation of it in this state is explored through a case study. Time frame for detailed analysis is taken from 2007 with the launch of the scheme with the Government support subsidy on premium. The study is based on existing literature and Secondary data collected from published

materials in the form of Government reports, official websites, journals and publications/Articles.

The choice of methodology for Research question (i) is based on review and analysis of published works and data available from Ministry of Agriculture, Agriculture Insurance Corporation of India and their field offices in Rajasthan. Research question nos. (ii) and (iii) are analytical in nature and is based on the same data and published works. Further, Hazell's (1992) definition has been used for research question (ii) regarding viability and sustainability as follows:

$$(A+I)/P<1$$

Where, A = average administrative costs; I = average indemnities paid; and P = average premiums paid. For fiscal contribution Government of India's budget/subsidy provision over 5 year period has been taken.

For research question (iii), loss cost (claims to sum insured) and claims to premium ratio for farmers have been calculated from available data. For research question (iv), definition of basis risk as used in insurance sector has been used and analysis is based on existing data and published works.

1.7 Chapterisation

The report is organized as follows. Review of literature and evolution of crop insurance in India and abroad is discussed in Chapter 2. WBCIS scheme and concept used in the study and scope and coverage of the scheme are described in Chapter 3. Comparison of WBCIS with NAIS & MNAIS is discussed in Chapter 4. Chapter 5 discusses private sector participation in agriculture insurance with details of scheme in operation by ICICI Lombard. Sixth Chapter discusses various issues related to ground level experience of agriculture insurance based

on micro level investigations in Rajasthan. Conclusions and policy suggestions are presented in the last Chapter 7. References/ Bibliography are given in the end.

1.8 Limitations

In view of the limitations of time and resources it was not possible to carry out field surveys. Hence detailed surveys conducted by AIC have been used for the analysis.

The study is based on the data available in the public domain.

The dissertation aims to analyze the alternate solutions feasible and there is no claim to evolve any model due to the above limitations.