RISK MANAGEMENT AND AGRICULTURAL INSURANCE

(A STUDY ON ANDHRA PRADESH)

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Abstract-Indian Agriculture has always been a risky business subject to the vagaries of the weather. It is true but since time, farmers have devised measures to limit these risks. Now- a - days, though the problem of risk may be minimized some types of risks remains. Modern insurance sector can play a major role to reduce the risk considerably and safe guard the farmers. The present study aims model, Linear Growth rate, Coefficient of Variation and t-test statistics for fruitful analyses of agricultural insurance. to analyse the growth and fluctuations in agricultural insurance in Andhra Pradesh. The study focused on seven aspects of insurance scheme. Here the study adopted simple regression

Key words- Agriculture, insurance, premium, claims, loss ratio, claim ratio

I. INTRODUCTION

The improvement of farming in early occasions was mostly a reaction to the peril of depending on chasing and assembling for food. Ranchers and others have attempted to discover approaches to make cultivating itself less unsafe by accomplishing better command over the creation forms. However, in farming, as in different regions of human concern, chance stays an apparently unavoidable component of life, as close to home reflection uncovers.

Hazard and vulnerability are inevitable in varying backgrounds, in light of the fact that each choice has its outcomes later on. We would seldom be able to be certain beyond a shadow of a doubt that those outcomes will be. However, chance isn't something to be excessively terrified of. It is regularly said that, in business, benefit is the compensation for bearing the hazard: No hazard implies no increase the undertaking rather is to oversee chance productively, inside the limit of the individual, business or gathering of withstand unfavourable results.

Truth be told, Farmers have consistently comprehended the presence of hazard and have changed in accordance with it in their own specific manners in cultivating. However, a couple of outstanding special cases rather minimal down to earth use has been made of formal techniques for hazard examining in agribusiness. An explanation may have been a viable end of certain wellsprings of hazard gave by different Government plans to help the costs of homestead items, for example, normal horticultural strategy, ranch bolster programs, the costs of farming items have been sensibly very much guaranteed in nations where such proportion of insurance have been in activity, presumably diminished the need to concentrate on chance administration. The exchange dealings at world exchange associations have prompted changes in farming approaches with the commitments of number of part nations to lessen the degrees of security particularly by means of value support. The initial step prompting these measures towards the advancement of universal exchange ranch items. In this way, numerous ranchers will confront more noteworthy introduction to serious market powers thus will appreciate less unsurprising outcomes. The various strategies have been created for breaking down options including hazard are all in all called choice investigation. Progression

of innovation have settled on utilizations of the techniques for choice examination more straightforward and snappier.

The terms 'Uncertainty' and 'Risk' can be characterized in different ways. One regular differentiation is to recommend that risk is flawed information where the probabilities of the potential results are known, and vulnerability exists when these probabilities are not known. Farming is done in the outdoors, and it is particularly presented to chance. Creation hazard originates from the unusual idea of the climate and vulnerability about the presentation of harvests or animals. Value hazard incorporates chance coming from erratic money trade rates. The rules and regulations of the existing governments are caused the risk in farming and affect the production.

Challenges in agriculture may be broadly classified as property risk and personal risk. The personal risk may be sub divided into natural, social and economic. Natural risks mean natural hazards affecting farm property, natural elements, plant and animal diseases, insects and other pests are the three categories.

The components of production risk are weather, rain fall, droughts, climatic changes. Pests, diseases, etc falls under input risks. Price risks are known as market risks. Price risk includes endogenous and exogenous risks. The risk in agriculture particularly concerned to cultivators, agriculture scientists, Argo based companies selling or buying from farmers, Agriculture researchers, etc.

II. AGRICULTURE INSURANCE IN INDIA

India is a place where there is numerous atmospheres and assortment of soil's managing degree for decent variety of agribusiness. Atmosphere is the most significant factor in crop production and decides the proper planning for significant field operations. That is the reason agribusiness in India is frequently called bet with rainstorm. The major risks are exposed during the growth are adverse climate, pests, plant diseases and weeds and wild animals. On an average 11.6 Million hectares are damaged every year by natural calamities and adverse seasonal conditions. In the gross cultivated area, 40% area has perennial irrigation facilities and rest of 60% area depends on rain fall. In monsoon seasons, 20% of rainfall is diverted to agriculture and other activities, rest of rainfall run away to seas.

In India, many discussions on crop insurance has been made to show its importance in handling risk in agriculture. By and large all attempts in this remained mostly on paper. But risks could not be secured. The sequences are:

1. A scheme for grain insurance prepared in 1939 at Mysore state but never implemented. Later a similar endeavour was placed in Baroda state but not materialised.
2. Madhya Pradesh state launched compulsory crop insurance in 1943 but it was discontinued.

3. Punjab state established 100 relief societies in favour of farmers in case of crop failure.
4. Dr .B. V. Narayanaswamy Naidu recommended to Madras Government on a scheme of crop insurance under the Government initiation but it is not taken up.
5. Dr . B. Natarajan, economic advisor to Madras state suggested a scheme of crop insurance at village level. But it never took off.
6. The ICAR (Indian Council of Agriculture Research) suggested another scheme for agriculture insurance but not implemented.

These schemes are not materialised because of very large machinery for implementation for which the insurance company could not offer with the premium charge. Cultivation conditions were not suitable for large scale implementation. Optimum spread of risks between agroclimatic regions is not possible. Proper care was not taken to avoid high risk areas. Nearly 12 agriculture insurance schemes available in India. Traditionally 7 organisations are transacting agricultural insurance in India.

Andhra Pradesh state is no exemption from agricultural risk. It has more drought prone areas in the country. Anantapur district of Andhra Pradesh is one among the six drought districts in India identified by the world bank and many national and international agencies to mitigate the adverse effects of recurring droughts. Several developmental agencies have been extending financial support to these districts with the objective of sustaining growth that has been achieved. The sustainable development called for the identification of the agricultural insurance priorities that are to be emphasised for the sustainable growth of these districts.

In Andhra Pradesh, very high uncertainty in agriculture and in its allied activities is observed. To overcome these kinds of uncertainties and to stabilize the economic life of farmers, agricultural insurance programmes are helpful to crop growers. Government has initiated insurance coverage to stabilize allied activities and agriculture equipment were covered to make the life of the farmer more stable.

In a subsistence agriculture risk and uncertainty is a major hurdle to the growth of agriculture sector as well as the economy of the nation. It is inevitable to reduce the risk and uncertainty in agriculture. In reducing the hazards, agriculture insurance schemes play a vital role. The present study is focused on growth and instability of seven important factors related to agriculture insurance in Andhra Pradesh as a whole with the objective.

III. LITERATURE REVIEW

Reshmy Nair study "Crop insurance in India: Changes and Challenges" (2010) did an evaluation of the agrarian protection program in India. NAIS reveals that while it has exceeded expectations on esteem grounds, the consideration and repayment portions are uneven towards a few districts and yields, and there are delays in settlement of cases and keeping in mind that the development of climate-based protection as an option has tended to a few constraints of customary protection, it is looked by difficulties of an alternate kind. Both these types of protection should therefore be viewed as integral to one another so as to develop a proficient component for managing cataclysmic event chances in agriculture.

V. S. Vyas and Surjit Singh study "Crop insurance in India: Scope for Improvement" (2006) said that The National Agricultural Insurance Scheme is essential for giving protection spread to ranchers, across areas, across seasons and across crops. This paper exhaustively surveys the NAIS proposes changes to make it progressively powerful. The study depends on a detailed investigation of comprehensive information for 11 rabi crop seasons, covering the rabi period of 1999-2000 onwards up to the equivalent in 2004-05. Field examinations were additionally directed in Andhra Pradesh, Rajasthan, Haryana, Madhya Pradesh and Gujarat to survey the reaction of ranchers, investors and different partners. The creators likewise depend on conversations with proficient people like government functionaries from the division of agriculture, academicians, etc in Hyderabad, Jaipur and Nagpur.

Fisher, Susannah and Surminski, Swenja (2012) *study* utilized proof from the field of risk governance and protection and works from the more extensive administration writing to draw significant discoveries for the administration of adoption. With regards to environmental change, how the open private connections are built is vital to how adjustment can be utilized from such a course of action. The proof in this paper recommended that because of business viability and various concerns there will keep on being a job for the public sector alongside by the private segment to guarantee adjustment estimates address helplessness.

Malini. R did a study "Attitude of Farmers Towards Agriculture Insurance: A Study With Special Reference to Ambasamudram area of Tamil Nadu" (2011) this study analysed the attitude of farmers toward crop insurance, and favourable aspects and hurdles prevailing in the implementation of crop insurance. The study showed that the farmers are showing good attitude toward crop insurance. the study also suggested a mechanism to rise up the share of agricultural income.

Arun Kumar Deshmukh and Deepak Khatri study "Agricultural Insurance in India : A Paradigm Shift in Indian Agriculture" (2012) talked about the advancement of insurance of crops in the country and its basic evaluation. The over reliance of Indian horticulture on questionable downpours during storm, makes weakness to hazard and vulnerability. It portrays different sorts of dangers included and farming protection as one of the hazard alleviations instruments in horticulture to keep it from common risks. A relative report is introduced in this paper displaying the exhibition of rural protection plans run by GOI until now. This examination winds up with exact conversation and basic evaluation of hardly any fruitful plans here, for example, NAIS, WBCIS and scarcely any others.

IV. OBJECTIVE

To analyse growth and instability in agricultural insurance in Andhra Pradesh.

V. LIMITATION

The study is confined to Andhra Pradesh state only. The results obtained through analytical process of the data may or may not be reflection of inferences at macro level. However, a comprehensive study is required in view of

complexity existing in diversified geographical divisions at regional and national level.

VI. METHODOLOGY

To satisfy our objective, i.e., the growth of various selected aspects of crop insurance scheme, it is proposed to estimate the linear regression model for the period of 2006-07 to 2016-17. Here, we consider that time(years) as the independent variable (X) and each of the seven factors as dependent variable(Y). To make the study simple, scientific and precise, simple statistical tools like standard deviation, coefficient of variation, linear growth rate and t– test statistic were adopted for the calculations.

The study is basically depending on secondary data to satisfy the objective of the study. The required information may be gathered through different published and unpublished sources. The data is gathered from The Director, Bureau of economics and statistics of Andhra Pradesh.

To determine the growth rate in selected 7 aspects of crop insurance, it is proposed to estimate the linear regression model of the form

$$Y = a + bt$$

Where

Y = Number of farmers covered / Area / Sum insured / Premium / Claims / Loss ratio / Claim ratio

t = Time in years

a, b are the constants to be determined
L. G. R = Linear Growth Rate

$$\text{The Linear growth rate} = \frac{\hat{b}}{\bar{y}} X100$$

$$t = \frac{\hat{b}}{SE\ \hat{b}}$$

The more value of coefficient of variation is the more instability. The simple linear regression equation was estimated by adopting the ordinary least squares method (OLS method).

ANALYSIS:

The crop insurance in agriculture is studied in seven different parameters. For each of these parameters, each equation was estimated and rate of change was tested by t – test and calculated the LGR. The study was carried out to Andhra Pradesh state as a whole.

1. NUMBER OF FARMERS COVERED:

The estimated linear regression equation is

$$Y = 5156.6 + 4605.2* t$$

CV = 41.75%   LGR = 22.83   t = 6.5

The coefficient of time (t) is positive and significant. It is noticed that a significant rise in number of farmers covered under crop insurance. On average, 4605 cultivators are adding under the agricultural insurance schemes. This increase in number of farmers is significant in Andhra Pradesh state. The value of LGR is 22.83. It shows that 22.83% of growth in farmers covered under insurance in AP. This is also known as the average annual growth in farmers under crop insurance scheme. It is inferred that the working of crop insurance scheme is appreciable with respect to number of farmers in the state. The recorded instability in number of farmers insured is 41.75%.

2. AREA:

The estimated equation for area in AP is

$$Y = 9826.9 + 7244.6* t$$

CV = 38.02%   LGR = 24.13   t = 6.7

The coefficient of time (t) is positive and significant. The average annual increase in cropped area under insurance scheme is 7245 hectares every year. This increase is a significant increase. The estimated LGR is 24.13% (i.e. the average annual growth in area during the study period is 24.13%. It is concluded that the area under crop insurance is a significant increase. Therefore, the performance of crop insurance scheme is well and good under area coverage. The instability in cropped area is 38.02.

3. SUM INSURED (Rs.):

The fitted equation for insured amount in AP is

$$Y = 161804867 + 73274412* t$$

CV = 41.25%   LGR = 30.38   t = 7.6

From the above equation, it is noticed a significant increasing trend in sum insured under crop insurance scheme. A significant positive relation was recorded by time variable on sum insured variable. On an average every year Rs.73274412 sum insurance is increasing. This increase is a significant increase. The average annual growth of sum insured amount under crop insurance is 30.38%. It is inferred that the increasing performance of sum assured amounts in crop insurance in the state is appreciable. Almost 41.25% of instability in sum insured was noticed.

4. PREMIUM (Rs.):

The calculated linear equation for premium amounts is

$$Y = 4252551 + 1919904.2* t$$

CV = 38.6%   LGR = 30.44   t = 7.4

The value of b is positive and significant. A positive and significant relationship was recorded between time and premium amounts. A significant increasing trend in premium amounts was noticed in the state. On average Rs.191990.2 premium is increasing every year. By the estimated LGR, the average annual growth in premium amount is 30.44%. It is a good increase in premium amounts under crop insurance. Here 38.6% of instability is observed in premium amount.

5. CLAIMS(Rs.):

The calculated regression equation for insurance claims is

$$Y = 15570122 + 5825506.2* t$$

CV = 37.39%   LGR = 35.37   t = 6.66

The regression coefficient of time is positive and significant. A significant increasing trend in claims by farmers was recorded by the farmers during the time. Every year, on average Rs.5825506.2 claims are increasing. The estimated growth rate is 35.37% (i.e. the average annual growth in claims under crop insurance is 35.37%). It may be concluded that the performance of claims in AP is excellent. Therefore, the performance of agriculture insurance scheme in the state is good. 37.39% of instability is noticed in claims.

6. LOSS RATIO:

The estimated linear regression equation for loss ratio is

$$Y = 0.03178 + 0.0048\ t$$

$$LGR = 1.27 \qquad t = 0.02$$

The coefficient of loss ratio is positive but not significant. Every year 0.005 units of loss ratio is increasing during the study period. The percentage of loss ratio is half percent but it is not significant. It is proved by t – test. The average annual growth in loss ratio under crop insurance is 1.27%. It is noticed that growth in loss ratio is negligible and the performance of crop insurance is good.

7. CLAIM RATIO:

The computed regression equation for claim ratio is given by

$$Y = 0.55887 + 0.2657^*\ t$$
$$LGR = 13.15 \qquad t = 2.38$$

The estimated linear growth rate is 13.15%. The average annual growth in claim ratio under crop insurance scheme in the state is 13.15%. The regression coefficient of time 0.2657. It is positive and significant. A significant increasing trend was noticed by the variable time on claim ratio. Every year nearly 0.27 units of claim ratio may be increasing. This increase is a significant increase. The performance of claim ratio is acceptable. It is inferred, from the above analysis, the functioning of insurance scheme is significant.

Table1 Comparison of LGR and C.V of Crop Insurance Scheme (2006-07 to 2016-17)

	LGR	C.V
No. of farmers	22.83*	41.75
Area (Hectors)	24.13*	38.02
Sum Insured (Rs.)	30.38*	41.25
Premium (Rs.)	30.44*	38.6
Claims (Rs.)	35.37*	37.39
Loss Ratio (%)	1.27	--
Claims Ratio (%)	13.15*	--

In the above table the growth rate of number of farmers, area covered under insurance, sum insured, premium amounts, claims and claim ratio is significant but the growth in loss ratio found to be insignificant in Andhra Pradesh state. The instability was recorded 41.75%, 38.02%, 41.25%, 38.6%, 37.39%. The coefficient of variation reveals the instability in above parameters, number of farmers, area, sum insured, premium, claims respectively.

VII. CONCLUSION

The agriculture insurance schemes in Andhra Pradesh have a high claim to premium ratio. Insurance schemes plays a vital role in agriculture. Based on this study, a few suggestions are offered to improve the efficiency of insurance schemes. They are: Improve market penetration, Rationalisation of premium payments, improve indemnity assessment and payment, Revisit financial arrangements, enable agricultural insurance company to perform its tasks more efficiently. Finally, it is concluded that agriculture insurance schemes play a vital role in reducing the risk in farming in Andhra Pradesh.

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