

Problems and Challenges Faced by Indian Agriculture in Current Scenario

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Abstract: *Agriculture is providing the best support to Indian Economy. More than 70% of the total population depending on it. This working paper discusses the dependence of Indian agriculture on uncertain rains, drought, cyclone, pest, hail, disease. Etc.. In addition the farmers experience in different kinds of risks from sowing to harvesting related to different crop enterprises and for different agro-climatic regions and areas. It then indicates for the demand for crop insurance as an alternative to manage production risk. It then brings up the historical overview of crop insurance products and their operation. It is followed by the discussion on the current available crop insurance products for specific crops and regions and also it discusses the recent products with its special features and its defects in those products.*

Key Words: *Crop Insurance, Agro climatic, risk, Farmers expectations.*

1. INTRODUCTION:

The farmers in India continually face risks in crop production due to natural disasters, water scarcity and unexpected weather condition. The risk factors may create the maximum losses to the farmers at the time of production. Due to the above mentioned risk factors the yield level goes down. It creates the worst economic level to the farmers. The majority of our farmers' capacity is limited due to scarce resources and small holdings. They cannot bear the risks which are created by the nature. That failure is not only for income but also it will affect the next investment. This situation leads the farmers to indebtedness. This risk burden can be reduced through the crop insurance. On an average 12 million hectares of crop area is affected annually by these calamities severely impacting the yields and total agricultural production. Crop insurance is the one tool to protect the farmers against the risks. It helps to overcome the risk, to improve their crop yield and also encouraging them for large investments. Here the risk was transferred from the farmers to the Government. So the Government is responsible for providing the better relief to their farmers. It will reduce the crop failure and increase the crop yield.

1.1 CROP INSURANCE

Crop insurance is purchased by agricultural producers, including farmers, ranchers, and others to protect themselves against either the loss of their crops due to natural disasters, such as hail, drought, and floods, or the loss of revenue due to declines in the prices of agricultural commodities. An Indian farmer, Agriculture in India is highly susceptible to risks like droughts and floods. It is necessary to protect the farmers from natural calamities and ensure their credit eligibility for the next season. For this purpose, the Government of India introduced many agricultural schemes throughout the country. The Government of India experimented with a comprehensive crop insurance scheme which failed. The Government then introduced in 1999-2000, a new scheme titled “National Agricultural Insurance Scheme” (NAIS) or “Rashtriya Krishi Bima Yojana” (RKBY)

1.2 Advantages of Crop Insurance:

- It provides protection to farmers against losses caused by crop failure and thereby ensures stability in farm income.
- It also strengthens the position of co-operatives and other institutions that finance, agriculture to the extent it enables the farmer members to repay their loans in years of crop failure,
- By protecting the economic interest of the farmers against possible risk or loss, it accelerates the adoption of new agricultural practices,
- It minimizes the problem of rural indebtedness, which is traceable to the frequent failure of crops,
- It also reduces, to some extent, government expenditure incurred on relief measures extended to meet the havoc caused by natural calamities,
- It may act as anti-inflationary measure, by locking up part of the resources in rural areas.

1.3 Need for Crop insurance:

- Besides droughts and floods, locusts, plant diseases have always been a serious enemy to our agriculture by destroying standing crops and thereby reducing farmers’ income.
- The majority of the holdings are tiny, from which the farmers get marginal surplus in good years and incur heavy deficits in the bad ones.
- Farming is more hazardous than any other enterprise. The weather can make all the difference between success and failure. Consequently, many farmers, particularly the small ones, feel shy of adopting new techniques.

1.4 The need for protecting the farmer from natural hazards arises for the following reasons:

- Besides droughts and floods, locusts, plant diseases have always been a serious enemy to our agriculture by destroying standing crops and thereby reducing farmers’ income.
- The majority of the holdings are tiny, from which the farmers get marginal surplus in good years and incur heavy deficits in the bad ones.
- Farming is more hazardous than any other enterprise. The weather can make all the difference between success and failure. Consequently, many farmers, particularly the small ones, feel shy of adopting new techniques.

1.5 Risk factors in Agriculture:

Risk is an integral part of Agriculture. Each day farmer confronts with different types of risks. In India Agriculture risks are exacerbated by a variety of factors, ranging from climate variability and change, frequent natural disasters, uncertainties in yields and prices, weak rural infrastructure, imperfect markets and lack of financial services etc. The five primary sources of risk in agriculture are as follows,

Production Risks:

Includes weather, insects, disease, technology and other event that are directly affected production quality and quantity.

Price Risk:

Uncertainty in the Market for commodities such as changes in the prices of inputs or outputs.

Financial Risk:

The method in which capital is required and financed and the firm's ability to pay financial obligation.

Institutional Risk:

Changes in Governmental or legal policies which affects the agriculture. Personal Risk: Risk common for all Businesses, such as death, injury/ disease to the farmer / proprietor.

Risk Management Strategies:

In order to reduce production risks, some of the risk management strategies recommended are as follows.

Enterprise diversification:

One effective way to reduce income variability on the farm is diversify the enterprise by combining different production processes. Diversification can be included the different crops, combination of crops and livestock, different end points in the same production processes or different variations in the same crops.

Agriculture Insurance:

The present credit linked Insurance Scheme (NAIS) has proven its worth as a crucial risk intervention mechanism but it suffers from several limitations such as, low indemnity levels, high prices, no coverage for all horticultural crops, poor servicing and awareness level, inadequate loss coverage.

Price support Measures:

Is a vital tool in helping farmers and consumers in achieving food security, while extending remunerating prices to the farmer for their product.

Emerging Commodity Markets:

Recently introduced in India to benefit the farmers for price discovery and protect them from adverse price fluctuations. But due to predominance of small and marginal farmers, lack of awareness, farmer's participation is very negligible.

Contract farming:-

Its aim is to bring the management of agriculture with the best practices of agricultural productions. Setting up a Centre for Risk management in agriculture in the public private partnership model for research, capacity building and popularizing risk management solutions in agriculture. The Government of India and State Governments can't bear all losses arising out of risks in agriculture. The governments should strengthen the institutions, systems and mechanism involved in the mitigation and transfer of agriculture risks. Technological advance in climate science, remote sensing and ICT in developing early warning systems, increasing the effectiveness of instruments for pooling, sharing and transfer of risks enhancing the coping capabilities of farmers.

Aim:

This present study looks at the genesis of agricultural insurance in India, examines various agricultural insurance schemes launched at the India from time to time and the coverage provided by them. Major issues and problems faced in implementing agricultural insurance in the country are discussed in detail.

Objectives:

- To look into the role of government in implementing various agricultural insurance schemes
- To analyze the performance of different schemes on the basis of its features.

2. LITERATURE REVIEW

2.1 Literature review (National Status)

D. Suresh Kumar, B.C. Barah, C.R. Ranganathan, R. Venkatram, S. Gurunathan and S. Thirumoorthy (2011) in their research work, “An Analysis of Farmers’ Perception and Awareness towards Crop Insurance as a Tool for Risk Management in Tamil Nadu”, they have reported the results of a survey of 600 farmers conducted to assess their perception about the various faces of crop insurance schemes. The survey has revealed that most farmers (65%) are aware of risk mitigation measures of the government. But, only half of the farmers have been found aware about the crop insurance schemes/products. This implies that there is a need to disseminate information about the insurance schemes across the target groups. Further, it has been shown that factors such as gross cropped area, income from other than agricultural sources, presence of risk in farming, the number of workers in the farm family, satisfaction with the premium rate and affordability of the insurance premium amount significantly and positively influence the adoption of insurance and premium paid by the farmers. The study has clearly brought out the urgency of developing more innovative products, having minimum human interventions.

S.B. Goudappa, B. S. Reddy and S.M. Chandrashekhara (2012) in their research work, “Farmers Perception and Awareness about Crop Insurance in Karnataka”, they have made a study on the farmers perception and awareness of crop insurance was conducted in North Eastern parts of Karnataka because region receives very less rainfall compared to other part of Karnataka and people of this region always suffering from drought, they continue to suffer. The study revealed that the average size of family among borrowers and non-borrowers was seven. Most of them (44%) are illiterate and 25% were education up to the primary level of education, family size and experience in farming did not show any significant difference between the districts selected for study. Respondent farmers were suggested for improving the existing scheme and they want a quick settlement of claims which is usually taking more than one year. Around three fourth of the beneficiaries suggested to consider the adverse weather condition prevailed during flowering and pod formation stage.

(D. Suresh Kumar, B.C. Barah, C.R. Ranganathan , R. Venkatram,S. Gurunathan and S. Thirumoorthy, 2011)

To insulate farmers against risks in agriculture, government has launched several schemes such as National Agricultural Insurance Scheme and weather index based crop insurance schemes. But their coverage seems to be limited among the farmers primarily due to lack of full information. This paper has reported the results of a survey of 600 farmers conducted to assess

their perception about various facets of crop insurance schemes. The Probit and Tobit models have been employed to analyse the factors affecting awareness among the farmers. Crop diversification index has also been used to examine the farmers' adjustment mechanism against risks. The survey has revealed that most farmers (65%) are aware of risk mitigation measures of the government. But, only half of the farmers have been found aware about the crop insurance schemes/products. This implies that there is need to disseminate information about insurance schemes across the target groups. Further, it has been shown that factors such as gross cropped area, income from other than agricultural sources, presence of risk in farming, number of workers in the farm family, satisfaction with the premium rate and affordability of the insurance premium amount significantly and positively influence the adoption of insurance and premium paid by the farmers. The study has clearly brought out the urgency of developing more innovative products, having minimum human interventions

Dr. MD. Mushfiqur Rahman, Bikash Chandra Ghosh and Dr. Emir Khaled Iqbal Chowdhury (2014) in their research work, "Problems and Prospects of Weather Index Based Crop Insurance in Developing Countries: The main objective of this paper is to theoretically assess weather-index based crop insurance as an instrument to graduate poor farmers out of poverty trap. Data have been collected from literatures of different sources such as journals, working papers, World Bank and other development organizations" websites and research publications are those relevant to the study. Proper preparation for index measurement, premium determination, flexible product design, wider stakeholder involvement, public private partnership, and a „big push“ from government and donors through seed financing can promote weather index based crop insurance in Bangladesh.

2.2 Literature review (International Status)

(Salvatore DI Falco, Felice Adinolfi, Martina Bozzola and Fabian Capitanio, 2014) In this paper discussed Financial insurance for extreme events can play an important role in hedging against the implications of climate change. This paper combines a comprehensive estimation strategy and a unique panel dataset to study the role of financial insurance in farmers' welfare under uncertainty. Data are drawn from a large Italian farm panel dataset. We find that (i) demand for insurance products is likely to increase in response to climatic conditions, and (ii) that the use of insurance reduces the extent of risk exposure. We also find that farm growing more crops are less likely to adopt the insurance scheme. This confirms what is found in the theoretical literature. Crop diversification can be a substitute for, financial insurance in hedging against the impact of risk exposure on welfare.

(Raffia Afroz *, Rulia Akhtar, Puteri Farhana, 2017) This study examines the factors that may affect the willingness to pay (WTP) crop insurance by Malaysian rice farmers in Kedah, Malaysia, for the adaptation of flood risk. 350 farm households are selected and a structured questionnaire is used to elicit data from the respondents. The data are analyzed with descriptive statistics and logic regression model. The average WTP for monthly crop insurance premium by the respondents is MYR 48.15 for every RM 1000 coverage/ha/season. The significant variables influencing WTP crop insurance by the farmers are the age of household head, attending the training course, farm income, and experience and farm size. From the findings of this work, it is urged that to promote crop insurance in Malaysia, the government may require a strategic policy to convince the farmers of the credibility and reliability of insurance scheme

by improving farmers' awareness and understanding of crop insurance through advertisement and training.

(Dr. S.C. Pandey, 2015) This working paper discusses the dependence of Indian agriculture on uncertain rains. In addition the farmers experience other production risks as well as marketing risks related to different crop enterprises and for different agro-climatic regions and areas. It then argues for the need for crop insurance as an alternative to manage production risk. It then takes up the historical overview of crop insurance products and their performance. It is followed by the discussion on the current available crop insurance products for specific crops and regions. It discusses at length the two important products, namely, National Agricultural Insurance Scheme and Weather Based Insurance Scheme. It also reflects on some deficiencies in these products.

(J. Sundar, Dr. Lalitha Ramakrishnan, 2013) this paper discusses the findings of the study in the area of crop insurance. Firstly, it measures the awareness level and source of awareness, secondly examines the farmers' perception, finally, identify the farmers' willingness in paying for crop insurance. The study was conducted in Kunichampet village, Puducherry District, India and 140 convenient respondents were chosen and been carried out in June and July, 2012. From the analysis farmers awareness level about crop insurance was low. Most of the farmers were not willing to pay for crop insurance because of instable income, premium rate, no or low compensation, problems with distribution channels and lack of financial knowledge.

3. HISTORY OF CROP INSURANCE

India is an agrarian country, where the larger part of the people depend on agriculture for their sources of income. The crop production in India is dependent largely on the weather and is harshly impacted by its vagaries as also by an attack of pests and diseases. These unpredictable and uncontrollable extraneous perils render Indian agricultural and tremendously risky enterprise. It is here that crop insurance plays a crucial role in anchoring a constant development of the sector.

3.1. PRE-INDEPENDENCE

As far back as 1915 in the pre-independence era, Shri J.S. Chakravarthi of Mysore State had proposed a rain insurance scheme for the farmers with a view to insuring them against drought. His scheme was based on, what is referred to today as the area approach. He published a number of papers in the Mysore Economic Journal enunciating the concept of Rainfall Insurance. In 1920 Shri Chakravarthi published a book titled "Agricultural Insurance: Practical Scheme suited to Indian Conditions". Apart from this, certain substantial states like Madras, Dewas, and Baroda, also made attempts to introduce crop insurance relief in various forms, but with little success.

3.2 POST-INDEPENDENCE

After the Independence in 1947, crop insurance gradually started to find mention more often. The Central Legislature discussed the subject in 1947 and the then Minister of Food and Agriculture, Dr. Rajendra Prasad gave an assurance that the government would examine the prospect of crops and cattle insurance, and a special study was commissioned for this purpose in 1947- 48. The aspect of crop insurance considered was whether the same should be on an Individual approach or on Homogenous area approach. The former seeks to indemnify the

farmer to the full extent of the losses and the premium to be paid by him is determined with reference to his own past yield and loss experience. The 'individual approach' basis necessitates trustworthy and perfect data of crop yields of individual farmers for a sufficiently long period, for fixation of premium on an actuarially sound basis. The 'homogenous area' approach envisages that in the absence of reliable data of individual farmers and in view of the moral hazards involved in the 'individual approach', a homogenous area comprising villages that are homogenous from the point of view of crop production and whose annual variability of crop production would be similar, would form the basic unit, instead of an individual farmer.

Government of India decided to introduce a Crop Insurance Bill in October 1965 and a Model Scheme of Crop Insurance in order to enable the States to introduce crop insurance if they so desired. In 1970, the draft Bill and the Model Scheme were referred to an Expert Committee headed by Dr. Dharm Narain. Thus, for over two decades the issue of crop insurance continued to be debated and discussed.

3.3. The time line of different avatars of crop insurance in the country is provided in the following table:

Time Period	Crop Insurance Program/Scheme	Salient Features
1971-1978	First individual Approach Scheme	<ul style="list-style-type: none"> • Was introduced on a limited, ad-hoc and scattered scale • General Insurance Corporation (GIC) of India introduced the scheme • H-4 cotton and later included groundnut, wheat and potato • The scheme was implemented in Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Tamil Nadu and West Bengal • 3,110 farmers were covered in a premium of Rs.4.54 lakh against claims of a massive Rs.37.88 lakh
1979-1984	Pilot Crop Insurance Scheme (PCIS)	<ul style="list-style-type: none"> • Was based on based on the 'Area Approach' for providing • Insurance covers against a deficit in crop yield below the threshold level • Rolled out by GIC and the scheme covered cereals, millets, oilseeds, cotton, potato and chickpea • Was restricted only to the loaned farmers of institutional sources on a voluntary basis • Implemented in 12 states till 1984-85 and covered 6.23 lakh farmers

		<ul style="list-style-type: none"> Total premium collected was Rs.195.01 lakh against claims of Rs.155.68 lakh during the entire period
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Following were some of the shortcomings that create a negative effect upon the coverage of the crop insurance scheme.

- Since crop insurance was linked to crop loans, many small and marginal farmers could not participate in the crop insurance scheme because a majority of these farms have poor access to institutional credit.
- The unit of insurance was very large.
- Lack of awareness among the farmers about the crop insurance scheme.
- Major commercial crops like cotton and sugar cane were excluded from the crop insurance scheme

To overcome from those lacking and based on the experience of the pilot crop insurance scheme, a Comprehensive Crop Insurance Scheme (CCIS) was evolved and implemented in 1985. Under the CCIS which was in implementation till Kharif 1999, the total number of farmers covered were 7.63 crores with total sum insured Rs. 25,000 crores and the claim being paid Rs. 2303 crores. In order to enlarge its coverage in terms of farmers, crops and forms of risks, the Government launched the National Agricultural Insurance Scheme (NAIS) on June 22, 1999 expanding the scope and content of the CCIS.

Time Period	Crop Insurance Program/Scheme	Salient Features
1985-99	Comprehensive Crop Insurance Scheme (CCIS)	<ul style="list-style-type: none"> • Was the first nationwide Crop Insurance Scheme • Was linked to short-term credit and was based on the 'homogenous area approach' • The scheme was adopted by 15 States and 2 Union Territories (UTs) • It had covered 763 lakh farmers for a premium of Rs 4 04 crore against claims of Rs 2303 crore
Rabi 1999-2000 to Rabi 2013-14	National Agricultural Insurance Scheme (NAIS)	<ul style="list-style-type: none"> • Were aimed to protect the farmers against the crop losses suffered on account of natural calamities, such as drought, flood, hailstorm, cyclone, pests and diseases • Was implemented by the Agriculture Insurance Company of India Ltd. (AIC)

		<ul style="list-style-type: none"> • Available to all the farmers, both loaned and non-loaned irrespective of their size of holding and covered all crops • Implemented by 25 States and 2 Union Territories and covered 2084.78 lakh farmers • The premium collected was Rs.8, 67,121 lakh against the claim of Rs.25, 37,558 lakh till 2012-13 • The total area insured was Rs.3137.70 lakh hectares during the same till 2012-13
Rabi 2010-11 season	Modified National Agricultural Insurance Scheme (MNAIS)	<ul style="list-style-type: none"> • Was implemented on a pilot basis in 50 districts from Rabi 2010-11 season • The scheme was thought to be easier and more farmer friendly • It was implemented in 17 States and covered 45.80 lakh farmers • Total premium collected was Rs 1,08,800 lakh against the claim of Rs 86,400 lakh until Rabi 2012-13
2007-08	Weather Based Crop Insurance Scheme (WBCIS)	<ul style="list-style-type: none"> • Was launched in 20 States and was implemented by Agriculture Insurance Company of India along with some private companies • The aim of the scheme was to settle the claims within shortest possible time • WBCIS is based on actuarial rates of premium and premium actually charged from farmers has been restricted at par with NAIS • Was implemented in 18 States and 469.38 lakh farmers were covered • Premium of Rs.7, 51,920 lakh was collected against the claims of Rs. 52,860 lakh under the Scheme from 2007-08 to 2012-13

2009-10	Coconut Palm Insurance Scheme (CPIS)	<ul style="list-style-type: none"> • Was introduced on a pilot basis in the selected areas of Andhra Pradesh, Goa, Karnataka, Kerala, Maharashtra, Odisha and Tamil Nadu. Later on, it was extended to West Bengal • The pilot was implemented during the years 2011-12 and 2012-13 and continues to be under implementation • It has been administered by the Coconut Development Board (CDB) • Fifty percent of the premium is contributed by the Government of India, 25 percent by the concerned State Government and the remaining 25 percent by the farmer • 51,108 farmers were covered in a premium of Rs.167.69 lakh against the claims paid off Rs.214.05 lakh till December 2013
2016	Pradhan Mantri Fasal Bima Yojana	<ul style="list-style-type: none"> • Launched in 2016 • The Scheme covers all Food & Oilseed crops and Annual Commercial/Horticultural Crops. • Maximum Premium payable by the farmers will be 2% for all Kharif Food & Oilseeds crops, 1.5% for Rabi Food & Oilseed crops and 5% of Annual Commercial/Horticultural Crops.

4. Performance of crop insurance in India from 1971 to 2018:

Insurance Scheme	Period	Approach	Crops covered	Farmers Covered (Lakes)	Amount (RS. Crores) Premium Collection, (Rabi, Khari f)	Salient Features
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Crop Insurance Scheme	1972-78	Individual	H-4 Cotton, groundnut, wheat, potato	0.03	0.05, 0.38	Voluntary Implemented in 6 states
Pilot crop Insurance Scheme	1979-85	Area	Cereals, millets, oilseeds, cotton, potato and chick pea	6.23	1.95,1.56	Confined to loanee farmers, voluntary, 50% subsidy on premium for small and marginal farmers
Comprehensive Crop Insurance Scheme	1985-99	Area	Food grains and oilseeds	763	404,2303	Compulsory for lone farmers
Experimental Crop Insurance Scheme	1997-98	Area	Cereals, pulses and oil seeds	4.78	2.86,39.78	For covering non-loanee small and marginal farmers also in addition to loanee farmers.
National Agricultural Insurance Scheme	Rabi 1999-2000 to Rabi 2013-14	Area and individual	Food grains, oilseeds, annual commercial and horticultural crops	16.79 million	2944,9857	Available to all farmers. 10 per cent Premium subsidy for small and marginal farmers.
MNAIS	Rabi 2010-11 season	Area and individual	Food crops (Cereals, Millets & Pulses) II. Oilseeds III. Annual	3million		All farmers availing Seasonal Agricultural Operations (SAO)

			Commercial / Horticultural crops			loans from Financial Institutions (i.e. loanee farmers) would be covered compulsorily
Farm Income Insurance Scheme	2003-04	Area	Wheat and rice	2.22	15.68,1.5	Insurance against production and market risks. Compulsory for loanee farmers.
PMFBY	2016	Area	Major Crops	5.52	20513.67	Large scale, crop subsidy insurance scheme in India. The sum insured is calculated over the scale of finance.

5. INFERENCE:

- From 1972 to 2016, Our Indian Government is created, several numbers of crop insurance schemes and many five year plans and also implemented with different level of approaches. But till now our farmer society face lot of flaws from their showing to harvesting.
- After making lot of modification the PMFBY was implemented. But it also having lot of issues from the farmer's side as well as Insurance Companies Side.

6. SUGGESTIONS:

The farmers should be made aware of the various insurance schemes for which adequate publicity / extension support should be provided by the state governments.

- To introduce a comprehensive scheme and coverage so that farmers will be given the insurance cover in respect of the crops of their choice, be they cotton, sugarcane, cashew nut or chilly.

- An awareness campaign to induce non- borrowers to buy insurance covers for major / noticed crops.
- In the present study, it is found that 85% of the sample respondents are dissatisfied about the existing crop insurance schemes. Hence, it is suggested that the Insurance companies and Government should take necessary steps to improve the satisfaction level of farmers by using the following steps.
- Proper steps to be taken by the insurance companies to increase the crop coverage, area Approach, Reduce the premium rate and reduce the formalities in claim etc.

7. CONCLUSION:

To conclude, it may be said that one of the basic objectives of our economic planning is to step up farm production. This can be achieved by adopting crop insurance schemes. Crop insurance schemes will assure the farmers that they will be compensated for losses against natural calamities. These schemes will not only spread the losses geographically, but also spread them over the time. The raison d'être of crop insurance is the stability it imparts to the agricultural produce. Therefore the earlier the scheme is put into operation, the better it will be for the farmers and for the nation.

8. REFERENCE:

- [1] D. Suresh Kumar, B.C. Barah, C.R. Ranganathan, R. Venkatram, S. Gurunathan and S. Thirumoorthy (2011). An Analysis of Farmers' Perception and Awareness towards Crop Insurance as a Tool for Risk Management in Tamil Nadu",
- [2] Goudappa, S. B., Reddy, B. S., & Chandrashekhar, S. M. (2012). Farmers perception and awareness about crop insurance in Karnataka. *Indian Research Journal of Extension Education*, 2, 218-222.
- [3] D. Suresh Kumar^{*a}, B.C. Barah^b, C.R. Ranganathan^a, R. Venkatram^a, S. Gurunathan^a and S. Thirumoorthy(2011), *Agricultural Economics Research Review* Vol. 24 January-June 2011.
- [4] Dr. MD. Mushfiqur Rahman, Bikash Chandra Ghosh and Dr. Emir Khaled Iqbal Chowdhury (2014) , "Problems and Prospects of Weather Index Based Crop Insurance in Developing Countries:
- [5] (Salvatore DI Falco, Felice Adinolfi, Martina Bozzola and Fabian Capitanio, 2014) *Journal of Agricultural Economics*, Vol. 65, No. 2, 2014, 485–504
- [6] (Raffia Afroz *, Rulia Akhtar, Puteri Farhana, 2017) *International Journal of Economics and Financial Issues*, 2017, 7(4), 1-9.
- [7] (Dr. S.C. Pandey, 2015), " Importance of crop insurance in meeting out the problems and challenges faced by Indian Agriculture in current scenario". *International Journal of Scientific and Innovative Research* 2015; 3(2): 105-115,
- [8] [(J.Sundar,Dr.LalithaRamakrishnan, 2013), *International Journal of Business and Management Invention* ISSN (Online): 2319 – 8028, ISSN (Print): 2319 – 801 www.ijbmi.org Volume 2 Issue 1 || January. 2013|| PP.48-54