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AN EMPIRICAL RESEARCH STUDY OF GLOBAL CROP INSURANCE - ISSUES AND CHALLENGES

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ABSTRACT
Agriculture is the oldest human activity with which human learn growing food stables and build human civilisation. Worldwide, agriculture is basic and foremost economic activity but it becomes vulnerable due to its association with nature. Deteriorate natural conditions like floods, droughts, storms, climate changes and others have been causing sever crop, revenue and livelihood stock loss in agriculture sector. To protect agriculture and farmers from these natural calamities every country has been adopting safety measures. Crop insurance is the one of the major and common programmes as safety net. In this article, tried to understand evolution of crop insurance in global scenario, factors facilitated growth of crop insurance, analyse the various crop insurance programmes adopted by major countries and also studies common challenges faced by countries in the way of ensuring these programmes. Secondary data is used for this study.

KEY WORDS: *Natural Calamities, Economic Damages, Risk Mitigation, Federal Life Insurance Corporation, Drones. National Guarantee Fund for Farming Calamities (FNGCA).*

Crop insurance is the vital tool in risk management and safety net for agricultural sector worldwide. Countries, across the world have been experiencing sever climate change and natural calamities. Agricultural activities are closely associated with nature and any extremes in natural conditions have great impact on agricultural activities and results in heavy crop and revenue losses. These losses, affects farmers standard of life, their livelihood and rural economy of every country. Agriculture losses also made great concern over food security in the world.As Dr. Joe Outlaw from Texas A&M's Agri cultural and Food Policy Centre (AFPC) rightly opined, that crop insurance remains the corner stone of the farm safety net (American magazine TODAY by National Crop Insurance Services, America www.ag-risk.org).In order to safeguard farm sector's stakeholders and to ensure food security in present-future comprehensive crop insurance system must in place in every country. Major agriculture based Developed and developing countries embarked crop insurance system with their local needs and necessities.

Crop insurance is risk management and safe guard instrument, which give risk coverage and financial flow in case of crop and revenue loss due to natural calamities. Governments, government agencies, private participants, banks and farmers are stakeholders of crop insurance system. Crop insurance market steadily growing worldwide. The global crop insurance market size was worth around USD 39.81 billion in 2022. The global crop insurance market is experiencing significant growth, driven by increasing climate variability and the need for risk mitigation in agriculture. The market is projected to reach USD 61.51 billion by 2030, with a compound annual growth rate (CAGR) of 5.59% from 2025 to 2030.

EVOLUTION OF CROP INSURANCE

Crop insurance, is still evolving concept in the world. Benjamin Franklin was likely first person to have thought about crop insurance,based on a severe storm of 24th October 1788 in French country side which destroyed crops. First crop insurance programme (hail insurance) started in 1820 in France and Germany for Grapes. In 1883, US started its first insurance programme for tobacco. The earliest multi-peril crop Insurance started in US in 1939 with formation of Federal Crop Insurance Corporation (FCIC). The US, China, Philippine and India are major countries that contributing to in evolution of Crop insurance. The following factors have role in growth of crop insurance.

CLIMATE CHANGE AND NATURAL CALAMITIES

With climate change and increased temperature world-wide,all countries experienced sever natural calamities. More frequent and intense extreme weather events like droughts, floods, and hailstorms are impacting crop yields and increasing the risk for farmers.

In Africa, 1098 natural disasters occurred during 1995-2020 with 279 million people affected and damaged of US $ 14.5 billion. The most frequent type of disaster was floods (65%), followed by storms (14%) and droughts(12%).In Asia, there were 2816 natural disasters in this period with floods(42%) and storms(28%) affecting 3.8 billion people and damage cost US$ 1.1 Trillion. In the case of Latin America and the Caribbean 1212 natural disasters occurred and 110 million people were affected damage accounted for US$ 154 billion.India has experienced significant crop losses due to natural disasters, with estimates showing that over 33 million hectares of cropped land were affected by floods and excess rains in a six-year period (2015-2021), Almost two million hectares of cropped land area were affected in financial year 2023, while another 35 million hectares were impacted by drought during the same timeframe, representing a substantial portion of the country's total crop area. Almost all States are frequently hit by flood-related crop losses.Since 2000, there have occurred8942 major

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natural disasters the world over, affecting more than 4.53 billion people and claiming1.42 million lives, with total economic damages of $ 4.13 trillion (6% of the world GDP) (EM-DAT, 2024).

To safe guard agriculture sector and farmers from these natural calamities Crop insurance is effective tool. So, all governments encourage systematic growth of crop insurance.

W.T.O. CONDITION

World trade organisation agreements stipulate countries from direct incentives for farm sector in order to make farm sector more competitive. So, countries adopting and encouraging indirect support systems to support their respective agriculture sector. So, all government have chosen crop insurance as instrument to strength farm sector and protect farmers livelihood.

GOVERNMENT SUPPORT

Subsidies and other forms of government support play a crucial role in evolvingand popularising crop insurance programmes.

TECHNOLOGICAL ADVANCEMENTS

Digital technologies like drones, satellite imagery, and IoT sensors are improving risk assessment and claims processing, making insurance more accessible and efficient.

CROP INSURANCE IN MAJOR COUNTRIES

United States of America

Crop insurance in America can trace it roots all the way back to 1880, when private insurance companies first sold policies to protect farmers against the effects of hailstorms. These Crop-Hail policies are still sold today by crop insurance companies and are regulated by individual state insurance departments. In 2024, farmers spent just almost $1.3 billion on Crop-Hail insurance to protect $46 billion worth of crops.Before the Federal Crop Insurance Program was established, private insurers had difficulty providing affordable insurance products to producers. In 1938, American Congress passed the Federal Crop Insurance Act, which established the first Federal Crop Insurance Program that multi-peril insurance programme and creating Federal Crop Insurance Corporation(FCIC) to deliver coverage. These early efforts were not particularly successful due to high program costs and low participation rates among farmers. The program had difficulty amassing sufficient reserves to pay claims and was not financially viable. In 1980 congress passed the crop insurance act allowing private sector insurance delivery and establishing the public-private partnership that still exist today.

The Federal Crop Insurance Reform Act of 1994 dramatically restructured the program. And in 1996, the Risk Management Agency (RMA) was created in the U.S. Department of Agriculture to administer the Federal Crop Insurance Program. Through subsidies built into the new program guidelines, participation increased dramatically. By 1998, more than 180 million acres of farmland were insured under the program, representing a three-fold increase over 1988.

In May of 2000, Congress approved another important piece of legislation: the Agricultural Risk Protection Act (ARPA). The provisions of ARPA made it easier for farmers to access different types of insurance products including revenue insurance and protection based on historical yields. ARPA also increased premium subsidy levels to farmers to encourage greater participation and included provisions designed to reduce fraud, waste and abuse.

The 2014 Farm Bill accelerated the evolution from traditional farm price and income support to risk management, solidifying crop insurance as the primary tool for farmers in dealing with production and price risk.

The Agricultural Improvement Act of 2018, commonly referred to as the 2018 Farm Bill, strengthened crop insurance by adding new products and directing research to the development of products for additional crops and modifying existing programs to address non-traditional agricultural commodities and/or production and marketing systems and issues related to catastrophic crop losses. These actions will increase crop insurance's role as a key component of the farm safety net. In addition, the bill makes a number of changes to the details of individual parts of the crop insurance system with a view to improving the delivery and management system and working more closely with other allied USDA agencies.Federal crop insurance is sold and serviced by private-sector crop insurance companies and agents, while being regulated by the Federal government. Federal crop insurance programme has grown rapidly since private sector delivery began in 1981 when only 45 million acres and $6 billion worth of crops were insured. In 2024, 2.4 million polices were sold protecting more than 130 different crops covering more than 540 million acres, with an insured value of $200+ billion in crop and livestock protection.

People's Republic of China

The People's Republic of China, with strong government commitment, has developed the world's second largest agricultural insurance market.Stages of Development of the Agricultural Insurance System in the People's Republic of China.

Initial phase government-led mode (1982–1992). The Government of the People's Republic of China (PRC) was the direct operator of agricultural insurance. The state-owned People's Insurance Company of China (PICC) operated all domestic insurance businesses, including agricultural insurance. Because of the high risk and high cost of agricultural insurance, the PICC was facing significant losses. But, with assistance from government subsidies, the company was able to support the development of the agricultural insurance during this period. **Market-led mode (1993–2003).** During this period, the PRC began to accelerate its transformation into a market economy. The PICC gradually transformed into a commercial insurance company, and the pursuit of profit maximization became the main goal of the company. Agricultural insurance, as a branch or department of commercial insurance, was completely market-oriented and no longer received undisclosed subsidies. At this stage, the agricultural insurance business shrank significantly, and operations in many places were in trouble.

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Government–market cooperation mode (2004–present). In 2004, the No. 1 Document of the Central Government proposed for the first time that the PRC should "speed up the establishment of a policy-based agricultural insurance system." Since then, the threshold for institutions to engage in agricultural insurance has been lowered. The central and local governments started to subsidize agricultural insurance premiums and management costs and to shape several aspects of the policy, basically forming the framework for government guidance, market operation, and coordinated promotion. Under this model, insurance companies achieved commercial competition under a high level of regulation, and the agricultural insurance market in the PRC developed rapidly. By 2020, the country's agricultural insurance premium income had reached US$ 81.50 billion, providing risk protection worth US$ 4.13 trillion for 189 million households and paid US$ 61.66 billion in compensation to 51 million affected households, becoming an important source of funds for farmers' post-disaster reconstruction and recovery of production and life.

France

France is major European country, has large and diversified agriculture sector.In 2020, France had the largest utilised agricultural area in the EU, totalling 27.4 million hectares. France is the largest agriculture food producer in Europe and top exporter of cereals, dairy and wine. French agriculture is also severely affected by natural conditions and highly use of pesticides. To safeguard agriculture sector French government with European union association employed comprehensive crop insurance programmes.

France has a government-subsidized crop insurance system to protect against weather-related risks with a significant portion of premiums covered by subsidies and the European Union. The system is a public-private partnership that includes the National Guarantee Fund for Farming Calamities (FNGCA).

Key features of the French crop insurance system

- Public-private partnership: The system combines private insurance for insurable risks with a public guarantee fund for catastrophic events.
- Risk coverage: It primarily covers weather-related risks like drought, hail, and frost.
- Government and EU subsidies: Premiums are heavily subsidized by the French government and the European Union, with the goal of encouraging farmers to purchase insurance.
- Public guarantee fund: The FNGCA was created to provide compensation for exceptional events that are not covered by private insurance policies.
- Recent reforms:
  - 2005 reform: The reforms strengthened the private insurance market and shifted the FNGCA's role to cover only non-insurable hazards.
  - 2023 reform: The government is implementing reforms to reduce the compensation rate for uninsured farmers in an effort to encourage them to purchase insurance.
- Risk management tiers: France uses a multi-tiered approach for crop losses:
  - Tier 1: Farmer bears the risk for low-intensity events.
  - Tier 2: A subsidised, multi-risk crop insurance policy covers medium-intensity risks.
  - Tier 3: National solidarity compensation is provided for exceptional risks.
- Compensation for Tier 3: The level of compensation under Tier 3 differs based on insurance status:
  - Insured farmers: Receive 90% compensation from the state, with the insurer covering the remaining 10%.

  Uninsured farmers: Receive 45% compensation from the state, with the farmer bearing the rest
- Insurance uptake: Despite the reforms and subsidies, insurance adoption remains relatively low, with about 13.3% of farms insured in 2020, though this is an increase from 12% in 2016. though it has been increasing, with field crops, wine-growing, and vegetables being the most insured sectors.

India

Crop insurance as a concept for risk management in agriculture has emerged in India since the turn of the twentieth century. From concept to implementation, it has evolved sporadically but continuously through the century and is still evolving in terms of scope, methodologies and practices.

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 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 princely states like Madras, Dewas, and Baroda, also made attempts to introduce crop insurance relief in various forms, but with little success.

Post-Independence

After the attainment of 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 possibility of crop and cattle insurance, and a special study was commissioned for this purpose in 1947-48.

The first aspect regarding the modalities of crop insurance considered was whether the same should be on an Individual approach or on Homogenous area approach. In October 1965 the Government of India decided to introduce a Crop Insurance Bill 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.DharmNarain.

Thus for over two decades the issue of crop insurance continued to be debated and discussed. Government of India introduced

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legislation regarding crop insurance. India's First ever Crop Insurance scheme implemented in 1972, after following programmes implemented Pilot Crop Insurance Scheme (PCIS) – 1979, Comprehensive Crop Insurance Scheme (CCIS) – 1985, Experimental Crop Insurance Scheme (ECIS) – 1997,Pilot Scheme on Seed Crop Insurance (PSSCI) – 2000,Farm Income Insurance Scheme (FIIS) – 2003, Pradhan Mantri Fasal Bima Yojana(2016)

Pradhan Mantri Fasal Bima Yojana

Under One country one policy Pradhan Mantri Fasal Bima Yojana as single flagship crop insurance programmeacross nation was launched on 18 February 2016. This scheme envisaged to help decreasing the burden of premiums on framers who take loan for cultivation and also will safeguard them against the inclement weather.This scheme has been implemented in every state of India, in association with respective state government. It envisages the uniform premium of only 2 per cent to be paid by the farmers for kharif crops, and 1.5 per cent for the rabi crops. The premium for annual commercial and horticulture crops will be 5 per cent. This scheme replaced the existing two crop insurance schemes1. National Agricultural Insurance Scheme (NAIS) and 2. Modified NAIS. The Scheme is implemented through a multi-agency framework by selected insurance companies under the overall guidance & control of the Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW)Ministry of Agriculture & Farmers Welfare (MoA&FW), Government of India (GOI) and the concerned State in coordination with various other agencies; viz Financial Institutions like Commercial Banks, Cooperative Banks, Regional Rural Banks and their regulatory bodies, Government Departments viz. Agriculture, Co-operation, Horticulture, Statistics, Revenue, Information/Science & Technology, Panchayat Raj etc.

Common characteristic of Crop insurance in world

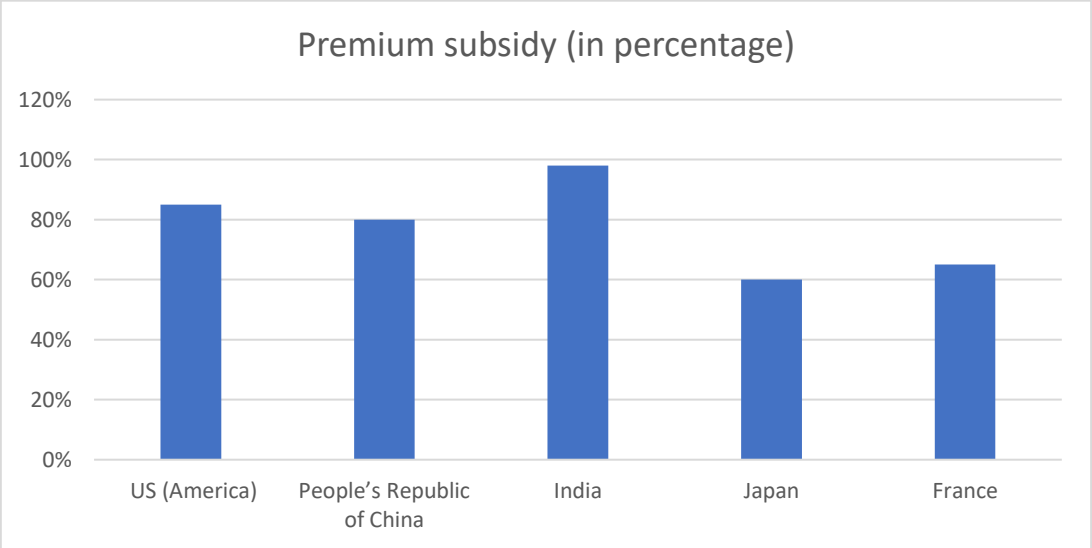
After the study of crop insurance in major countries, we can identify following common characteristics.

- All crop insurance programmes across world are supported by their governments with policy and financial measures. Government agencies are implementing and regulating crop insurance system.
- Premium of crop insurance are highly subsidized by governments. Burden of premium subsidy is shared by central and provisions(states)

Crop Premium subsidy

Country Name	Premium subsidy (in percentage)
US (America)	85%
People's Republic of China	80
India	98%
Japan	60%
France	65%

Source:-Gathered from journals &reference



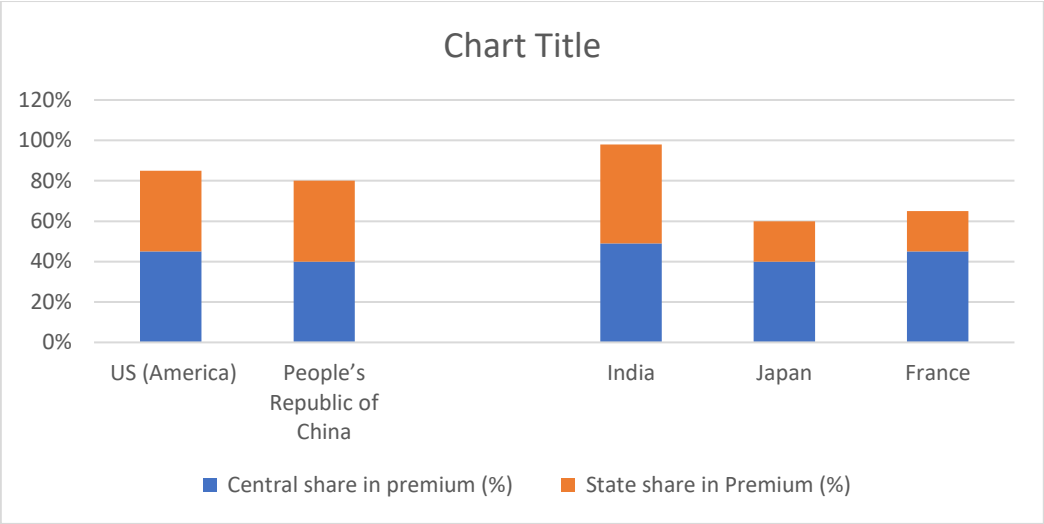
Above bar diagram evident that all countries adopting highly subsidised crop insurance programmes. India paid out high subsidies for crop insurance programmes to low burden on farmers.

Crop Premium Subsidy Share

Country Name	Central share in premium (%)	State share in Premium (%)
US (America)	45%	40%
People's Republic of China	40%	40%
India	49%	49%
Japan	40%	20%
France	45%	20% (European union)

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Source: Gathered from journals &reference



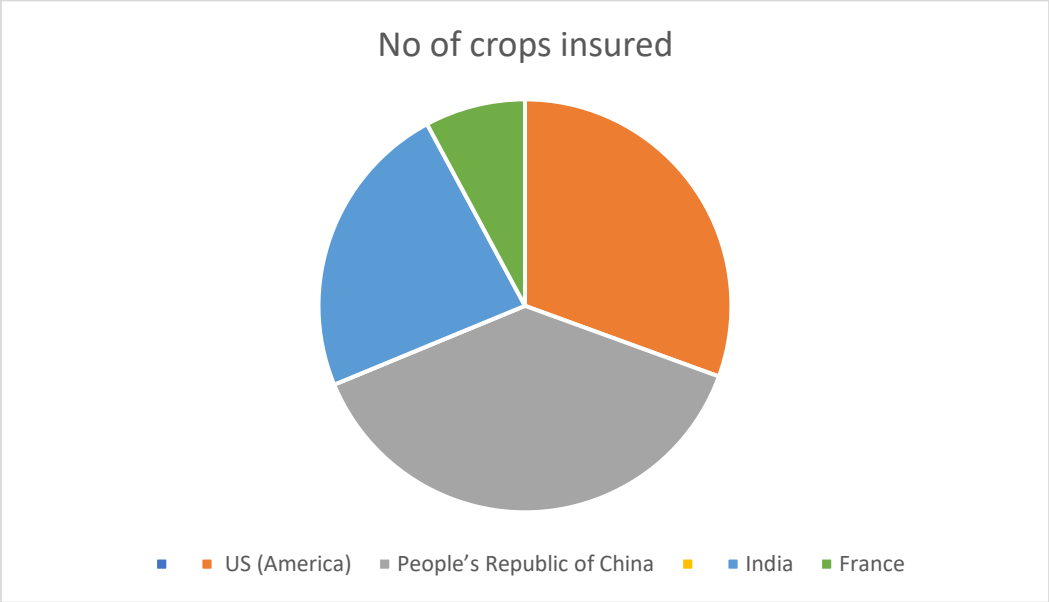
Above data and diagram put light on crop premium subsidy share among central government and state government. It is clear that central governments have major share in crop premium subsidy. In India central and shares equally burden of premium subsidies.

- US and People's Republic of China have well grownup crop insurance system and covers more crops and giving high coverage of agricultural area. In India and France crop insurance system is still evolving and need more awareness and coverage programme. The following table put light on this.

Crop and Area coverage

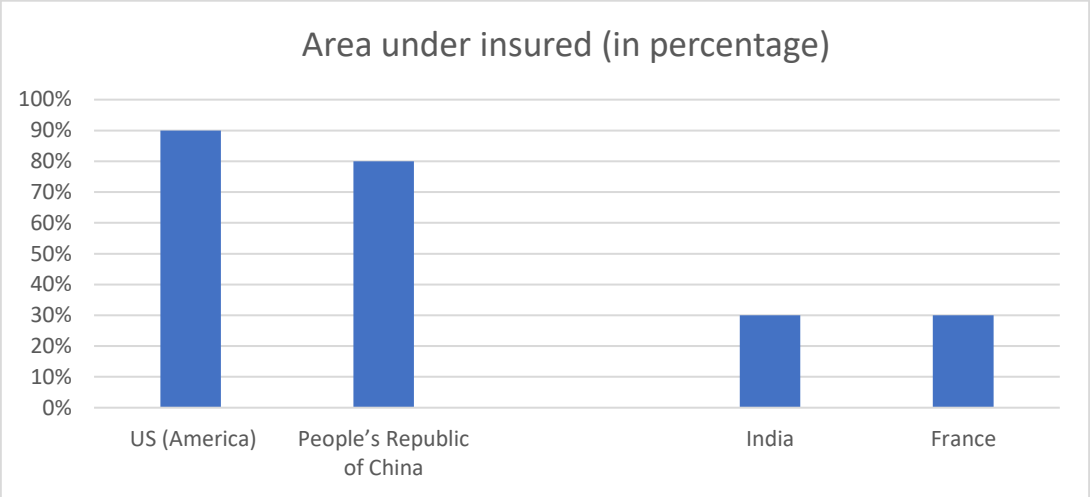
Country Name	No of crops insured	Area under insured (in percentage)
US (America)	136	90%
People's Republic of China	170	80%
India	104	30%
France	35	30%

Source: Gathered from journals &reference



The above pie diagram shows that China and America providing crop insurance products for various crops. India and France should extend insurance coverage.

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The above bar diagram explains the area coverage under crop insurance. China and America have given average area covering 80%. India and France need to extent crop insurance to more area

Challenges

- High administration costs are very concerned aspect for crop insurance system.
- In spite of high subsidies, Uptake is very low in countries. There needs mass publicity for insurance schemes.
- High premium costs can make crop insurance unaffordable for smaller farmers
- Issues relating to loss assessment and claim settlement are very important in every country.

CONCLUSION

Crop insurance is really a essential policy instrument for farm sector to mitigate risks which are unavoidable due to natural conditions. Crop insurance programmes well designed and implemented in developed countries and private sector participation in system make it very successful. But in developing nations like India still crop insurance programmes in experimental stage. Majority of farmers unaware and ignore towards crop insurance. There are a lot of administration issues need to address. Private players must encourage in crop insurance programmes. Still now onus of designing and implementing crop insurance programme on government. Government should give stage to private sector that can help all stakeholders of farm sector**.**

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