

## **Influence of Weather Index based Insurance (WIBI) on Financial Stability of Cotton Farmers in Chitradurga, Karnataka-A case study**

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### **ABSTRACT**

*India is the second largest cotton producer and consumer in world. Though India ranks first in area its production is very low when compared to other major cotton producing countries. This is due to uncertainty in weather condition which is due to Natural calamities like rising temperatures, erratic rainfall pattern, increase in the severity of droughts, floods and cyclones cause huge losses in the production of cotton. To overcome this farmers have to opt for insurance like WIBI.*

*In the present article authors report the Influence of Weather Index based Insurance (WIBI) on Financial Stability of Cotton Farmers through random sampling and questionnaire with respect to gender, age, education, land owned and experience. The results obtained are highly encouraging and further work is been carried to know the influence of WIBI on farmers livelihood, to estimate whether WIBI is suitable for cotton crops, to analyze the impact of WIBI scheme on cotton crops etc.*

**Keywords:** Weather Index based Insurance, risk, Crop insurance, financial stability.

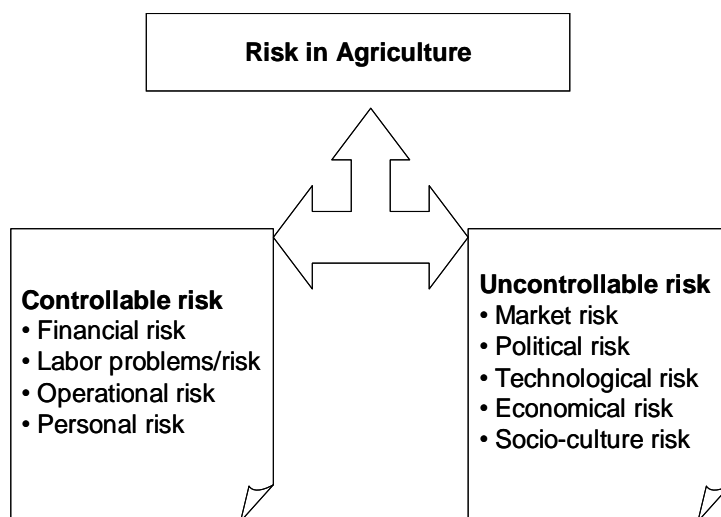
### **INTRODUCTION:**

Agriculture is considered as the backbone of Indian economy. In India agriculture has occupied almost 43 percent of India's geographical area. Majority of Indian population depend on agriculture sector. It provides livelihood to a vast majority of rural mass consisting about three fifth of its population spreading through length and breadth of the country. The agriculture sector is one of the largest contributors to India's GDP even after there is decline in agriculture share of India. The agriculture sector in India continues to be the most vulnerable sector despite the improvement in scientific and technological innovations. In India, agricultural risks are becoming worst 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. It is estimated that 53% of the damage caused in agriculture production in India is due to uncertainty in climatic condition. In such a case the farmers of our nation need to depend upon crop insurance to mitigate the risk associated with agriculture sector. However, the poor development of risk management tool like crop insurance in the country gives huge opportunities for the emerging agricultural insurance like weather index based insurance to pull the producer from out of the poverty trap by securing him from income shocks and by ensuring that a fair share of the price goes to the producer. A large number of private insurance companies have been operating in the Indian Insurance Market since October, 2000. The private companies have done pioneering work in agricultural insurance chiefly by way of introduction of weather insurance products.

### **Risk in Agriculture:**

The agricultural sector is exposed to a variety of risks which occur with high frequency. The risk includes high variability of production outcomes, production risk, Input and output price volatility is important source of market risk, Many agricultural production cycles stretch over long periods of time, and farmers must anticipate expenses that they will only be able to recover once the product is marketed leading to financial risk, adoption of new technologies in modernizing agriculture such as in introduction of genetically modified crops causes an

increase in producer liability risk. These risks can be manageable to some extent however the risk caused by the change in climatic condition or Natural calamities like rising temperatures, erratic rainfall pattern, increase in the severity of droughts, floods and cyclones have caused huge losses in agricultural production and the livestock population.



#### **Indian cotton Scenario:**

The crops in India is divided into three types namely food, commercial and Beverage crops. Among commercial crops, cotton plays a vital role in economical growth of country by providing substantial employment and making significant contributions to export earnings. India is the second largest cotton producer and consumer in world. India has the largest area under cotton in the world. This is almost one fourth of the world cotton area. Though India ranks first in area its production is very low when compared to other major cotton producing countries. The production share of India in the world is much lower for the vast area the crop occupies. The main reason is uncertainty in climatic condition.

In India Karnataka state occupies sixth place in production of cotton accounting 143100 Bales/Year. Cotton is one of the important commercial crop in the State. Cotton is grown mainly in Dharwad, Gadag, Haveri, Belgum, Bellary, Bijapur, Shimog, Mysore, Davengere and Chitradurga Districts. Though Karnataka occupies sixth place in the production of cotton, there is decline in the production year by year. This is due to the risk associated with the crop grown. To mitigate the risk associated with the crop grown farmers need to depend upon Insurance like Weather index based insurance.

#### **Weather Index Based Insurance (WBI):**

Weather index based insurance is an alternative to traditional Crop insurance for agriculture products. Weather index based insurance provides the compensation on the basis of rain fall data. The main aim of weather index based insurance is to protect the farmers against weather related shocks such as shortage or heavy rain fall, Natural calamities like rising temperatures, erratic rainfall pattern, increase in the severity of droughts, floods and cyclones.

#### **Importance of WIBI:**

Importances of WIBI are as follows;

- It is transparent and does leads to high level of client comfort.
- It is easy to administer and does leads to low management expense.
- It is multiplier effects on the economy as it enable access to factors of production
- It enhances the risk taking capacity of farmers, banks. Micro finance lender and agro based industries
- It is easy to transfer the risk to international market finance through re insurance

#### **How Weather Index Based Insurance works:**

The impact of weather risk to a particular crop in a specific area is based on threshold values at which production loses are expected to arise. WIBI provides compensation against adverse climatic condition rather than field verification and the damages caused in the production place due to which there is reduction in

administration cost which makes them cost effective.

The claim settlement to policy holders are determined based on weather index parameter, which is mentioned in the insurance contract. Insurance companies collected data from meteorological department /local weather monitoring station and based on this information compensation settlement will be done to the farmers.

## REVIEW OF LITERATURE:

Barnett and Mahul, (2008) have suggested the ways and means of effective mechanisms for transferring risk through investment and economic growth, thus contributing to poverty reduction in rural areas of lower income countries. Weather index insurance is a rather simple concept that, under certain circumstances can effectively transfer covariate weather risks spatially. Since the policyholder has no better information than the insurer about the primary index, weather index insurance is not highly susceptible to the asymmetric information problems of adverse selection and moral hazard. Further, operating costs are generally lower for weather index insurance than for traditional insurance products.

Carriquiry and Osgood, (2008) suggested that the contract design and the selection of appropriate weather-based index, in particular, is crucially vital in minimizing basis risk. The other factors that have implications for basis risk are the proximity of the insured crop to a weather station, and the availability of climate data.

Clarke (2011) worked on a Theory of Rational Demand for Index Insurance which showed that a farmer might be worse off with the insurance than without it. The existence of basis risk means it is possible that a farmer pays the premiums, experiences a loss, but then, does not receive an insurance payout. By a theoretical model, Clarke (2011) showed that the demand for index insurance of risk-averse agents would be low when the basis risk is high. Existing empirical studies have also addressed the significance of basis risk, in order to measure the basis risks.

Kotreshwar and Kanakasabai (2006) have suggested on the precipitation derivatives; they opined that it appropriately suits for the Indian economy. Monsoon derivatives could serve as particular purpose mode of facilitating the shift of entire monsoon risk to capital markets. A well-developed monsoon derivative market is critical for the development of insurance markets as it provides an opportunity for insurers to hedge their monsoon exposure.

Gine (2007) argues that index insurance is transparent, inexpensive to administer, enables quick payouts, and minimizes moral hazard and adverse selection problems associated with other risk coping mechanisms and insurance programs.

## OBJECTIVE OF THE STUDY:

- To know the changes in Financial Stability of Cotton Farmers through WIBI in Chitradurga district, Karnataka, since weather index based insurance is modern technique for avoiding existing agriculture risk and financial strengthening to the farmers in Karnataka.

## DATA COLLECTION AND ANALYSIS:

The primary data was collected from the respondent through simple random sampling and questionnaire in selected villages like Bharmasagara, chitradurga, hireguntanura, thuruvanuru, hiriyuru, dharmapura. The sample size is 81. The respondent involved during the collection of data were uneducated farmers, educated farmers, younger farmers, aged farmers etc. the information differs from farmer to farmer based on their gender, age, education, level of knowledge, land holding and experience.

### Data analysis and interpretation:

The Primary data collected from the respondent were analyzed with the help of statistical tool (i.e. average), and the result are tabulated which is given in Table 1.

**Table 1: Cotton Farmers response on WIBI with respect to Financial Stability**

Particulars	Categories	Frequency	Percentage	Positive response	Negative response
District	Chitradurga	81	81	58	23
	<b>Sub-Total</b>	<b>81</b>	<b>81</b>	<b>58</b>	<b>23</b>
Gender	Male	63	77.77	45	18
	Female	18	22.23	13	5
	<b>Sub-Total</b>	<b>81</b>	<b>100.00</b>	<b>58</b>	<b>25</b>

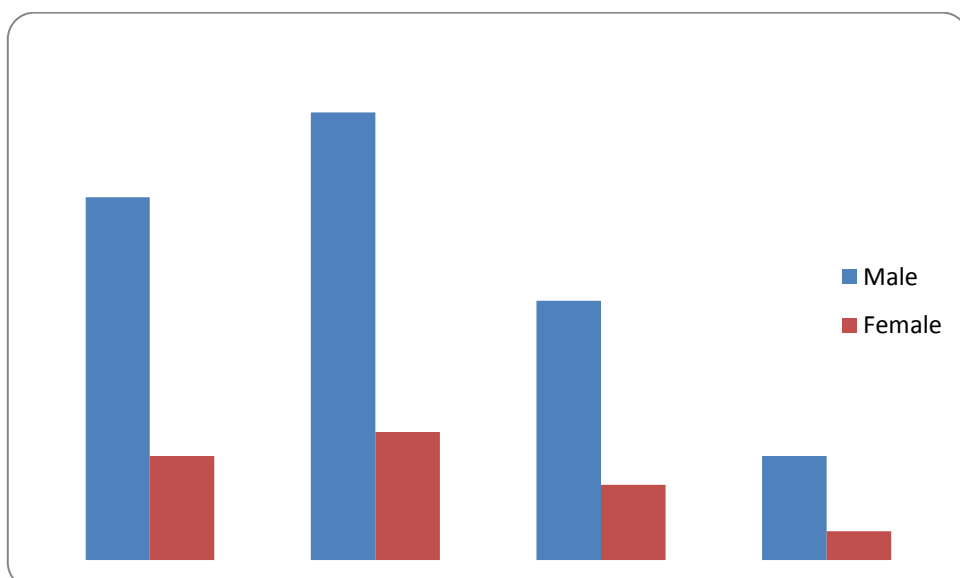
Particulars	Categories	Frequency	Percentage	Positive response	Negative response
Age	18-30	11	13.58	7	4
	31-45	36	44.45	29	7
	46-60	27	33.33	20	7
	Above 60	07	8.64	02	5
	<b>Sub-Total</b>	<b>81</b>	<b>100.00</b>	<b>58</b>	<b>23</b>
Education	Matriculation	14	17.28	9	5
	PUC	24	29.63	21	3
	Degree	08	09.87	5	3
	Post Graduate	05	06.18	3	2
	Uneducated	30	37.04	20	10
	<b>Sub-Total</b>	<b>81</b>	<b>100.00</b>	<b>58</b>	<b>23</b>
Land Holding	Small Growers	32	39.50	19	13
	Large Growers	49	60.50	39	10
	<b>Sub-Total</b>	<b>81</b>	<b>100.00</b>	<b>58</b>	<b>23</b>
Experience	Below 10 years	17	20.99	13	4
	11-20	23	28.39	18	5
	21-30	14	17.28	09	5
	31-40	18	22.22	13	5
	Above 40	9	11.12	05	4
	<b>Sub-Total</b>	<b>81</b>	<b>100.00</b>	<b>58</b>	<b>23</b>

**Cotton Farmers response on WIBI with respect to gender on Financial Stability:**

The total sample size is 81, in which 63 are male and 18 are female farmers. Among male farmers 45 of them have positive response towards WIBI saying that WIBI will bring financial stability in case if there is any natural vagaries, similarly among female farmers 13 expressed the same opinion. The positive and negative response of the farmer's w.r.t WIBI is given in table 2 and the graphical representation of the response of the farmer's w.r.t WIBI is given in fig 2.

**Table 2: Cotton Farmers response on WIBI with respect to gender on Financial Stability**

Categories	Frequency	Percentage	Positive response	Negative response
Male	63	77.77	45	18
Female	18	22.23	13	5



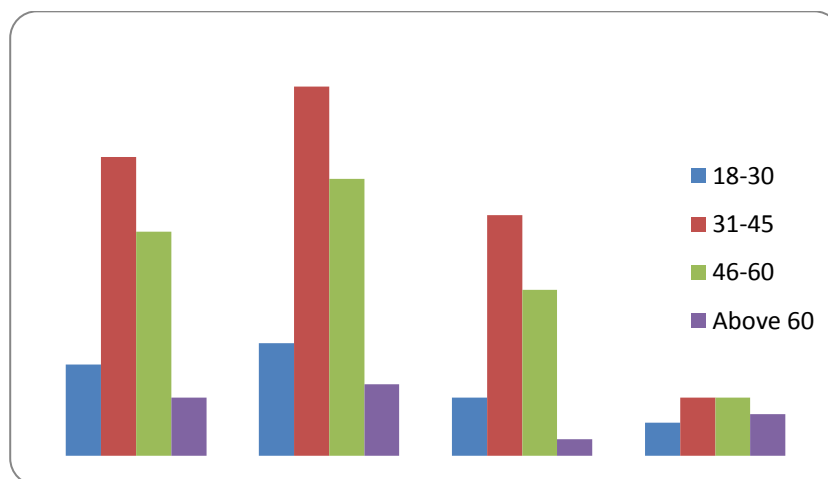
**Graphical representation of Cotton Farmers response on WIBI with respect to gender on Financial Stability**

### Cotton Farmers response on WIBI with respect to Age on Financial Stability:

The positive and negative response of the influence of WIBI on financial stability w.r.t age is given in table 3 and the graphical representation of the response of the influence of WIBI on financial stability w.r.t age is given in fig 2. It is evident from the table that among the overall sample size the farmers whose age lies in between 31 to 45 have more positive response to wards WIBI when compared to others.

**Table 3: Cotton Farmers response on WIBI with respect to Age on Financial Stability**

Categories	Frequency	Percentage	Positive response	Negative response
18-30	11	13.58	7	4
31-45	36	44.45	29	7
46-60	27	33.33	20	7
Above 60	07	8.64	02	5



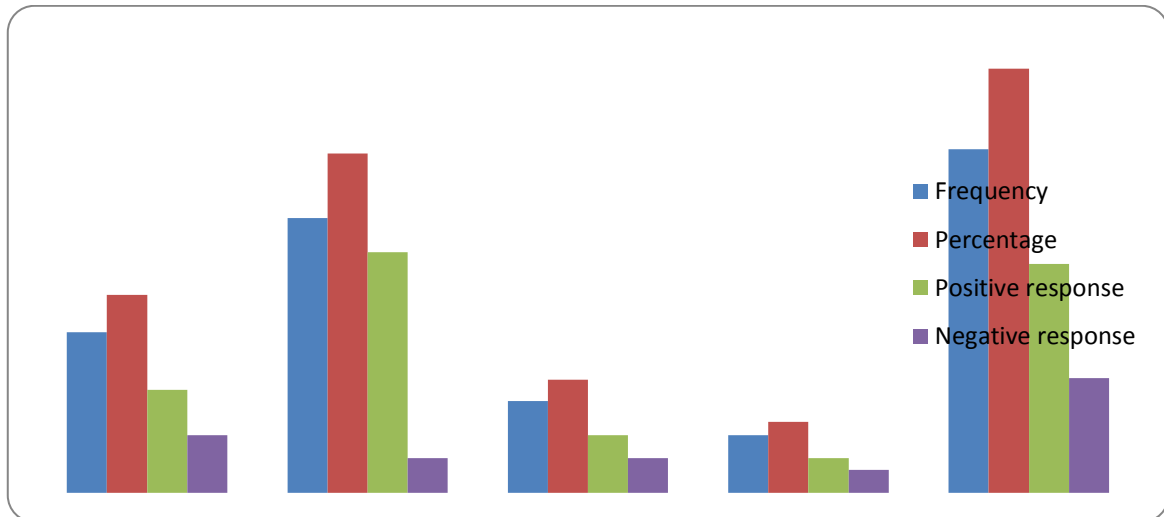
**Graphical representation of Cotton Farmers response on WIBI with respect to Age on Financial Stability**

### Cotton Farmers response on WIBI with respect to Education on Financial Stability:

As per the survey conducted it is clear that among the overall farmers 51 farmers are educated and 30 are uneducated. Among the farmers who are educated, the farmers who have completed Pre University education showed more positive response of about 21 farmers which is quite more when compared to other educated farmers. The results obtained is given in Table 4 and the Graphical representation of Cotton Farmers response on WIBI with respect to Education on Financial Stability is given in Fig 4.

**Table 4: Cotton Farmers response on WIBI with respect to Education on Financial Stability**

Categories	Frequency	Percentage	Positive response	Negative response
Matriculation	14	17.28	9	5
PUC	24	29.63	21	3
Degree	08	09.87	5	3
Post Graduate	05	06.18	3	2
Uneducated	30	37.04	20	10



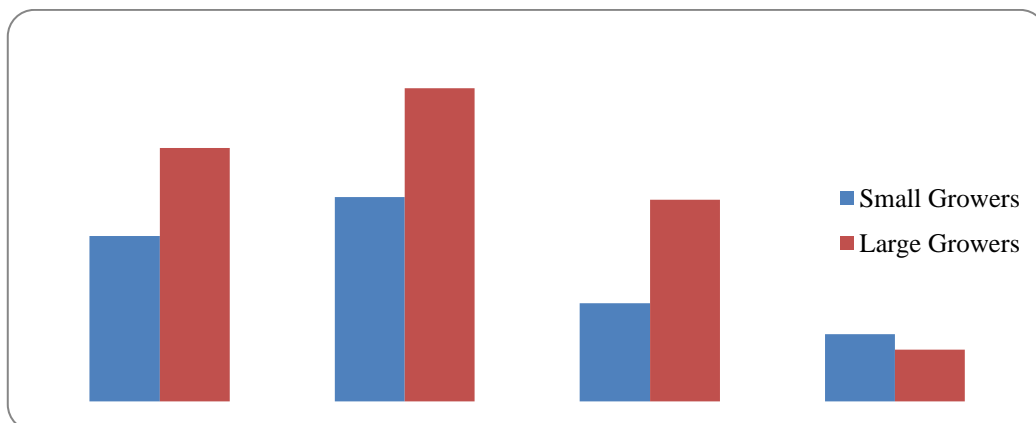
**Graphical representation of Cotton Farmers response on WIBI with respect to Education on Financial Stability**

**Cotton Farmers response on WIBI with respect to Land Holding on Financial Stability:**

Among the sampling size of the farmers in Chitradurga District, 49 of the farmers grows cotton in large quantity and 32 of them in small quantity. Out of these farmers 39 of the large growers have positive response towards WIBI and among small growers 19 have the positive response. The results obtained are tabulated which is given in table 5 and the Graphical representation of Cotton Farmers response on WIBI with respect to Land holding on Financial Stability is given in Fig 5.

**Table 5: Cotton Farmers response on WIBI with respect to Land Holding on Financial Stability**

Categories	Frequency	Percentage	Positive response	Negative response
Small Growers	32	39.50	19	13
Large Growers	49	60.50	39	10



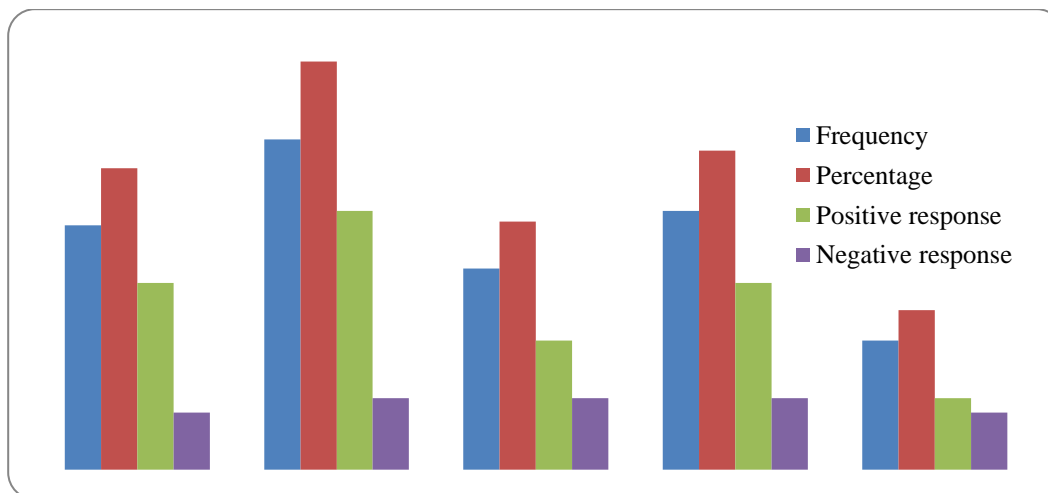
**Graphical representation of Cotton Farmers response on WIBI with respect to Land holding on Financial Stability**

**Table 6, Cotton Farmers response on WIBI with respect to Experience on Financial Stability**

Inorder to know the Farmers response on WIBI with respect to experience of the farmers in cultivation of cotton questionnaire was carried out in Chitradurga among 81 farmers. It was observed that the farmers who have less experience/ young farmers showed positive response towards WIBI when compared to farmers above middleage. The results obtained are given in Table 6 and the graphical representation of Farmers Farmers response on WIBI with respect to Experience on Financial Stability is given in Fig 6.

Categories	Frequency	Percentage	Positive response	Negative response
Below 10 years	17	20.99	13	4
11-20	23	28.39	18	5

Categories	Frequency	Percentage	Positive response	Negative response
21-30	14	17.28	09	5
31-40	18	22.22	13	5
Above 40	9	11.12	05	4



**Graphical representation of Cotton Farmers response on WIBI with respect to Experience on Financial Stability**

## CONCLUSION:

It is well known that there is a lot of risk in Agriculture sector due to change in weather condition and also the risk associated due to natural calamities. These factors have affected the production of cotton every year. The decrease in production of cotton in Karnataka has considerable economical growth. In order to know the Influence of Weather Index based Insurance (WIBI) on Financial Stability of Cotton Farmers in Chitradurga, Karnataka a series of questionnaire was carried out among 81 farmers in Chitradurga district with respect to gender, age, education, land owned and experience. Based on the above factors, observation and farmers statement it is clear that the introduction of WIBI in Karnataka has significant impact on development of financial stability of farmers which in turn will improve the financial status of farmers as well as production of cotton in Karnataka.

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