

## IMPLICATIONS OF CLIMATE RISK ON AGRI LOANS AND CREDIT RISK BANKS

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### **Abstract**

*The study basically based on the impact of climate change on agriculture can have significant implications for Agri loans and credit risk for banks. As weather patterns become more extreme and unpredictable, crop yields can be impacted, leading to financial losses for farmers and a corresponding increase in loan defaults. This can pose significant risks to banks that have extended loans to these farmers. Additionally, the transition to more sustainable and climate-resilient farming practices can also have financial implications for farmers and their ability to repay loans. To mitigate these risks, banks typically use a variety of lending and recovering strategies, such as using a combination of loan products, requiring collateral, and partnering with other financial institutions. In this, authors analysed 38 nationalised banks to know about the financial risk due to climatic risk to the bank. The issue of climate risk and its impact on Agri loans and credit risk highlights the need for the financial sector to take a proactive approach to addressing the challenges posed by a changing climate. Increased frequency of extreme weather events droughts, floods, and heatwaves are becoming more frequent and intense, affecting crops and livestock, and leading to soil erosion and degradation.*

**KEYWORDS:** credit risk, climate change, Agri loans of banks.

### **I. INTRODUCTION**

Agriculture is regarded as the nation's backbone. More than 55% of the people depend on agriculture in India. The capital for these agricultural activities is from various sources and one among them is a loan from the bank with an interest rate for the repayment of loans. They must be depended on the yields for the revenue. We cannot predict the environmental conditions as we exactly do not know when the weather may change. Other than these there are other types of risk involved in agriculture. A farmer may obtain agricultural loans to cover the costs of seasonal agriculture activities or operations related to agriculture activities. This kind of loan is also available to assist in purchasing agricultural attributes such as seeds and insecticides and hiring labor for crop cultivation and harvesting. The farmers can avail of loans for various activities of agriculture like carrying out regular activities, purchasing farm equipment including tractors and harvesters, acquiring land, obtaining loans for product marketing & expansion etc.

### **II. REVIEW LITERATURE**

**1. Harjeet Singh & Dr. Himanshu Gupta (2020)** They determined study on institutional agricultural credit and repayment behaviour in India. This factors that influence farmers' borrowing and repayment behaviour in India. It highlights the need for policies that improve farmers' access to credit and provide better support for loan repayment, especially for small and marginal farmers. The study has important implications for policymakers and financial institutions involved in agricultural lending in India, and provides useful insights into how to improve the effectiveness and sustainability of agricultural credit programs.

**2. Dr. V. Suresh Babu, Dr. R. Arputharaj., & Mr. G. Rajesh (2020)** In the preceding study, they examine the repayment of an agricultural loan in Theni district with special reference to the bank of India. The Bank of India is an Indian public-sector bank. It began with the laudable goal of improving rural economies through loans. More than 3400 banks in India have attained 100 percent networking status. The agricultural industry plays a role in the rural economy. Agricultural term loans are available for land development, minor irrigation, farm automation, crop planting, and linking purposes. the recovery performance of agricultural loans and the repayment problems encountered by respondents.

- 3. Iqbal Thonse Hawaladar, Cristi Spulbar, Lokesh, Ramona Birau, & Cristian Rebegea (2020)** In the article, the primary goal of this study is to Analyzing non- performing assets in agricultural loans in India. The study found that the level of NPAs in agricultural loans was higher than the overall level of NPAs in the banking sector in India. The main factors contributing to the high level of NPAs in agricultural loans were identified as climate-related factors, such as droughts, floods, and other natural disasters, as well as other factors, such as inadequate credit appraisal, inadequate loan monitoring, and diversion of funds.
- 4. Jagdeep Kaur Brar, Antoine Kornprobst, Willard John Braun, Matthew Davison, and Warren Hare (2021)** In the article, they analyse a case study of the impact of climate change on agricultural loan credit risk. The study found that climate change had a significant impact on agricultural loan credit risk in the region. The main factors contributing to the increased credit risk were identified as weather-related events such as droughts, floods, and other natural disasters, as well as changes in temperature and precipitation patterns. These factors resulted in lower agricultural productivity, decreased income for farmers, and an increased likelihood of loan defaults.
- 5. Shivali Amit Wagle, & Harikrishnan R, (2021)** In this study, they analyse the effect of planting season in crop production in India state, the effect of planting season on crop production in Indian states is an important topic of research and analysis. Studies have shown that optimal planting windows are crucial for maximizing crop yields, and that climate change is expected to have significant impacts on planting seasons and crop yields. Therefore, it is important to implement adaptation measures to help farmers adjust to changing conditions and ensure food security in the face of a changing climate.
- 6. Rahul Singh Gautami, & Jagjeewan Kanoujiya (2022)** In the article, they analyse role of regional rural banks in rural development and its influences on digital literacy in India. This research investigated the impact of regional rural banks in India on digital literacy and rural development. Regional rural banks and the government, according to the study's findings, should prioritize infrastructure development and digital literacy. It is an important component of regional rural banks and financial inclusion efforts.
- 7. Bhumit Shah, & Rajkumari Soni (2022)** In the article, they analyse a study on role of NABARD and financial initiatives taken in promoting rural finance in India. The Indian economy is based on agriculture, and the real India can be found in the villages. The objectives of economic planning cannot be met without rural economic development. The NABARD is critical to the economic growth of rural India. Microfinance programmers aim to reach the poor and achieve financial sustainability. Microfinance is regarded as a key strategy for poverty alleviation as well as a means of generating economic growth and employment for small, micro, and medium-sized businesses.
- 8. Pritha Dattaa, Bhagirath Behera, & Dil Bahadur Rahut (2022)** In the article, they analyse the Climate change and Indian agriculture: A systematic review of farmers' perception, adaptation, and transformation in Indian agriculture. Climate change is having a negative impact on the Indian agricultural sector. Farmers' perceptions of, and adaptation to, rapidly changing climatic conditions are regarded as critical policy measures in combating these difficulties in life.
- 9. Na Zhao, & Fengge Yao (2022)** In the article, the author examined the Innovative mechanism of rural finance: risk assessment methods and impact factors of agricultural loans based on personal emotion and artificial intelligence. the authors described the impact of agricultural loans and risk assessment methods on personnel and AI. Agricultural finance is currently in a disappointing situation in the current financial climate, particularly during the COVID19 process. Its small peasant financial system could no longer serve farm owners' rapidly increasing demands for agricultural finance.
- 10. Ravi Dupdal, B L Patil, B L Manjunatha, & S L Patil (2022)** In the article, the authors analyse the Climate change mitigation and adaptation strategies in Northern Karnataka's drylands. climate change mitigation and adaptation strategies in drylands of Northern Karnataka are crucial to ensure food security and livelihoods in the region. Mitigation and adaptation strategies need to be context-specific and tailored to the needs and priorities of local communities, and the involvement of institutions is critical to promote their adoption and uptake.

### III. DATA AND METHODOLOGY

Autors have used empirical research with serving the strucutred questionnaires to bankers (Nationalized Banks, cooperative Banks, and Regional Rural Banks) primarily into agri loans. Both primary and secondary data is used. Data is collected from 38 banks as respondents.

#### OBJECTIVES:

- To explore the various climate change risk in agricultural produce.
- To understand the procedures followed by banks for processing Agri loans. To analyses the implications of climate risk on Agri loans.

#### 3.1 Hypothesis Testing Hypothesis 1:

$H_0$  : There is no significant difference in opinion of banks on climate change as a threat to sustainable development of agriculture and to bank.

$H_1$  : There is a significant difference in opinion of banks on climate change as a threat to sustainable development of agriculture and to bank.

#### Hypothesis 2:

$H_0$  : There is no difference in opinion of banks on loss due to estimating future and past climate change is a threat.

$H_1$  : There is a difference in opinion of banks on loss due to estimating future and past climate change is a threat.

#### 3.2 Limitation

- Data is confined to the opinion of the bankers in and around Bangalore.
- The outcome is purely based on the respondent’s opinion, which may not have correct relevance.
- The opinion is confined to times of data collection only.

### IV. DATA ANALYSIS AND FINDINGS

#### 4.1 ANOVA Analysis

**Table 4.1.1 Anova analysis on Hypothesis (H1) Testing.**

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
climate change is a threat	Between Groups	0.843	1.0	0.843	1.212	0.278
	Within Groups	25.051	36.0	0.696		
	Total	25.895	37			
past&future estimating is a challenge	Between Groups	1.297	1.0	1.297	2.867	0.099
	Within Groups	16.282	36.0	0.452		
	Total	17.579	37			

#### Interpretation:

The significance p value of climate change is 0.278 and estimating is a challenge value is 0.099 which is  $>0.05$  So we accept null hypothesis at 5% level of significance. And we concluded that all the banks have same opinion on climate

**Table 4.1.2 Anova analysis on Hypothesis (H2) Testing.**

ANOVA						
		Sumof Squares	df	Mean Square	F	Sig.
climate scenario analysis in infancy	BetweenGroups	2.106	1	2.106	2.181	0.148
	WithinGroups	34.763	36	0.966		
	Total	36.868	37			
Estimating climate Is a challenge	BetweenGroups	1.021	1	1.021	2.618	0.114
	WithinGroups	14.032	36	0.39		
	Total	15.053	37			

**Interpretation:**

The significance p value of climate scenario is 0.148 and estimating climate value is 0.114 which is >0.05, so we accept null hypothesis at 5% level of significance. And we concluded that all the banks have same opinion on climate.

**Findings**

- From the executed survey for various banking institution understood that the bank follows various policies, rules and regulations under different circumstances.
- The operation of the regional rural banks for majority of extent is same and they all follow the similar pattern except some marginal changes in their internal operating system.
- Due the uncertain climate change in many states in India the banks will record the more NPA under their book of accounts in the financial annual report this is a loss for the banks.
- If the government provides any scheme for the farmers to wave off the farmers loan only on the periodic and selected zone farmers loan will be waved off not every farmer's loan.
- Banks will offer the farmers with very minimal interest amount of loan with specific benefits like Pradhan Mantri Krishi Sinchaye Yojna, Paramparagat Krishi Vikas Yojana etc.,
- The banks as categorized the risk parameters according to the droughts, heats, rainfall, floods etc.,
- Banks have separate risk management framework for agricultural credit and they consider climate related factors while processing agricultural loans.
- The banks majorly follow the lead bank guidelines (rebased from time to time), controlling office guidelines from regional office.
- Banks have a strong belief that climate change is a threat to a sustainable environment. Banks have a strong attitude about losses caused by projecting the future, and climate change is a concern.
- The bank also provides crop insurance plans like the Pradhan Mantri Fasal Bima Yojana to reduce agricultural losses caused by climate change.
- Banks that use NABARD's Automatic Refinance Facility (ARF) will be able to offset credit losses caused by weather circumstances.

**V. CONCLUSION**

This study helped to determine how the climatic risk on agricultural loans and the bank's credit risk has been mitigated, making it evident that there is a risk for both banks and their clients (farmers) when there is a shift in the climatic circumstances. The bank follows various schemes stated under the regulatory bodies to operate and mitigate the risk they follow various schemes and their procedures; banks should seek more guidance from the main regulatory body i.e., RBI to reduce their overall risk from the climatic change. Climate change risk is defined as an unpredictability brought on by extreme weather conditions like floods, droughts, and typhoons that generate disasters that pose a physical danger and have a detrimental effect on commerce and the economy as a whole.

Extreme weather-related circumstances are increasing in terms of loss of life, means of livelihood, savings, properties, opportunities for labour, and incomes. This might lead to transition problems. (Such as changing the way things are done, systems and procedures, moving, etc.), which could push up operational expenses. As the climatic condition is uncertain the bank should try to forecast the loss occur in the future and maintain particular reserves of these kinds of risk. The banks should try to mitigate the NPA (Non-Performing Assets) from their clients (farmers).

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