

Transforming Agriculture Credit through AI

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ABSTRACT

The Artificial Intelligence is transforming the way agricultural financial system through providing data driven insight for taking important financial decision by the service providers. These data along with the traditional physical records are then used by the lenders for examine and assessing the creditworthiness, repayment ability, claim settlement process of the farmers. AI can shift agricultural financial risk management from a reactive approach, to a proactive approach based on early detection, prediction and timely intervention. The current article examines how AI is utilising by the companies in order to improve access to finance.

INTRODUCTION:

Access to finance is crucial for the transformation of the Agricultural landscape in India. This could enhance farmers income, increase the yield and production. Farmers in India often lacks important financial services that could make them less vulnerable to shocks and could help them in increasing productivity through utilisation of technologies and other improved quality of inputs etc.

One of the major reasons why farmers are not having proper access to credit is the repayment risks that often makes lenders (banks and other financial intermediaries) reluctant to provides loans. The repayment risk arises because financial institutions have limited access to their creditworthiness, cash flows, credit history and financial records along with the weather-related shocks such as flood and draught, crop failure because of pest attacks and disease, price risks. These factors often result into delay in the processing of the loan

or claim settlement process in case of an insurance policy.

The major reason why these issues exist is information asymmetry and uncertainty with the farmers income as cash flows are highly vulnerable to production, price, weather and climate-related shocks. Artificial Intelligence (AI) could be used as an effective tool for solving these underlying problems thereby enabling the access of the formal credit to the SMF. AI could reduce this problem by providing data driven insight.

AI based Agriculture Financing

AI is today transforming agricultural financial services through innovation in taking the financial decisions made by the lenders. Traditionally financial institutions relies heavily on physical records for credit and risk assessment of farmers with respect to identifying their eligibility for loans and claim settlement amount. They look for Land records and ownership documents, previous borrowing, repayment history, crop and acreage information, field inspections, Farmer's income and collateral, Credit history for determining their eligibility. The process itself is complex and lengthy one and requires several field visits, and it took several days to finally arriving to a decision. However, with the introduction of AI the data driven insight could be utilised to make more realistic decisions. These data could be obtained through sources such as satellite imagery, weather and climate data, crop health and crop type, historical yield, irrigation and soil-moisture information previous repayment/financial records, land location and acreage, digital transaction data, land records and other government database. Using these data AI models could estimate farm productivity, expected income, probability of default and repayment capacity. These data along with the traditional available physical

data could be then utilised for credit and risk assessment purpose by the lending agencies.

A recent case published on the NITI Aayog's Frontier Tech platform highlights that how an Indian based deep-tech company generate farm level risk score for the financial institutions (FIs) which further help these FIs to take lending decisions. The company generates this score by analysing high-resolution satellite imagery along with AI models to assess key agricultural indicators which includes crop type, acreage, sowing and harvesting cycles, crop health, vegetation growth and historical yield trends. The reports also include environmental factors such as rainfall, temperature, evapotranspiration, groundwater availability and air quality in order to identify the impact of these factors on farm level productivity. As per the case more 2.1 million farm land has been analysed and it took less than an hour and many a case within 30 minutes to complete the assessment process by the FIs. Similarly, a number of Indian Commercial banks are using digital platforms to examine farmers' creditworthiness through past transaction data, land records, and crop patterns using AI and machine learning algorithms (Singh and Mritunjay 2024).

AI and Risk Management

AI could be an excellent source of managing the risk once the credit or insurance have been provided to the client. It can support continuous risk monitoring by analysing satellite imagery, weather conditions, crop health, expected yields and market information. Hence the early signs with respect to the crop stress, adverse weather or declining farm income can be generated and the warnings regarding potential repayment difficulties may be identified. In case of agricultural insurance, AI-enabled remote sensing can help in identifying the areas which may be affected because of climate related issues or pest and crop disease, hence could

estimate the crop damage and facilitates faster and more objective claims assessment. Thus, AI can shift agricultural financial risk management from a reactive approach, to a proactive approach based on early detection, prediction and timely intervention.

Way Forward: -

The inclusion of AI in agriculture credit can improve the efficiency and accuracy of the lending process. The data driven approach could facilitate faster assessment of creditworthiness and repayment capacity, reduce the cost associated with the physical verification. It also results in improving the identification and management credit risk associated with the agriculture.

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