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Impact assessment of institutional agriculture finance on production, employment and farmers' income: A study of Agra, Uttar Pradesh, India

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Abstract
The present research study has measured the impacts of institutional agriculture finance on production, employment and farmers' income in Agra district of Uttar Pradesh, India. In this regard, a standardized questionnaire or tool; Farmers Perception and Satisfaction Measurement Scale (FPSMS) has been constructed in order to measure themeasure the perception and satisfaction level of the farmers about the institutional framework and schemes for agriculture finance, present position of institutional agriculture finance flow, institutional agriculture finance, performance of institutions towards agriculture finance, and impact of institutional agriculture finance on production, employment and farmers' income in the study area. For that sample 500 farmers, working in different rural and semi-rural area of Agra district was collected. Moreover, we have employed 'Pearson correlation coefficient' and linear regression to examine the impacts of institutional agriculture finance on production, employment and farmers' income in Agra district of Uttar Pradesh, India. Estimations suggested that there are moderate but positiveimpacts of institutional agriculture finance on production, employment and farmers' income in Agra district under different quantiles.On the basis of research findings, recommendations to policy makers, industry professionals, academicians, and stakeholders are being suggested in order to improve the farmers' income and agriculture production.

Keywords: *Employee Income, Agricultural Production, institutional agriculture finance, Pearson correlation coefficient', Regression analysis*

I. Introduction

Uttar Pradesh has 2, 04, 03,000 hectares irrigated land and in India it is 9, 57, 72,000 hectares. The state has the potential to double its agro-growth from the present 2.5% to 5% per annum. Presently, this most populous state of India has 59% of its workforce engaged in Agriculture, as per Census 2011, but with an average holding size of just 0.76 hectares and predominance of small and marginal holdings. 29% of its population was below the poverty line in 2011-12. As per the Situation Assessment Survey of NSS (2012-13), average monthly income of an agro-household in UP was the third lowest in the country. Agra has a rich historical background, famous for Taj Mahal, Red Fort and Petha (A Sweet). It comprises 6 Sub-Districts and 15 Blocks with the total population of 44, 18,797 out of which 2, 48,151 are Cultivators. Net sown area of the District is 2, 87,294 hectares constituting 72% of the net geographical area. The net irrigated area is 2, 36,376 hectares, of which 90% and 8% are irrigated by wells/tube wells and canals respectively. The cropping intensity of the District works out to 145%. State Horticulture mission has included Agra District for promotion of commercial cultivation, rejuvenation, post-harvest management and marketing of Mango, Aonla, Guava and Tuberose.

The role of LBS is useful for the development of the economy especially in the backward area; it acts as to co-ordinate the efforts of all other Commercial Banks, financial Institutions and other development

agencies for bringing about the overall development of the Districts. It revealed that the Institutional credit flow to the Agriculture has been increasing for the past four decades. The structure of the sources of credit has witnessed a clear shift and commercial banks have emerged as the major source of Institutional credit to Agriculture in the recent years imparting training to borrowers regarding procedural formalities of financial Institutions could be helpful in increasing their access to Institutional credit. Smallholder farmers live in most vulnerable conditions. Despite having the knowledge of exploitation of money lenders, prevailing difficult situations of their lives are enforcing them to barrow money for high rate of interests from money lenders Policies have played negligible role towards development of smallholder farmers.

II. Review of Literature

It has been evident from the previous research work institutional agriculture finance has impacted the production, employment and farmers' income, level of impact could be debatable and researchable. In this context, several studies have been conducted. Surendran and Manoharan (2012) studied the "Lead Bank Scheme in Virudhunagar District" and evaluates the sector-wise contribution of commercial banks and Indian Overseas Bank set by the District Credit loans. An integrated approach is required on the part of Lead Bank as a consortium leader with regard to assessing the potentiality of the District and meeting out the credit needs of the target groups. The shortfall noted in the operation and preparation of DCPs should be overcome through useful and realistic approach. Although the performance of Lead Bank in respect of overdue is satisfactory. Perception of farmers and agriculture loan borrowers on accessing the credit extended by the commercial banks in Kerala.

Researcher found that the impact of Agriculture credit which is provided by the Commercial Banks is very suitable, they want to say no to moneylenders and say yes to Commercial banks. But in this process banks faces multitude of problems regarding disbursement of loan and recovery issues (Mathew, 2010,Bauri, 2010; Sarkar et al., 2011; Biggs, 1990; Hall et al., 2002; World Bank, 2012; Boogaard et al., 2013; Davies et al., 2018; ISPC, 2015; Sparrow & Traoré, 2018; Watson et al., 2015). Alagarsamy (2010) discussed about the trend and growth of the loans issued, recoveries of loans, outstanding loans and overdue of commercial banks in the Virudhunagar District. It revealed that the marginal farmers had performed well not only in the prudent investment they had made on the financial and physical assets, but also in the better and more efficient utilization of factors and inputs in the study area. Commercial bank credit, promoted Agriculture inputs to meet their various day-to-day Agriculture expenses and recovery position is good. It revealed that the overdue position is very bad among all the credit Institutions in the formal sector because of poor loan recovery were largely attributed to lack of sufficient field staff to ensure follow-up after the sanction of loan and absence of statutory powers to induce prompt repayment by the borrowers as far as the banks are concerned and Secondly crop failure. If crop give adequate income, farmers prefer to repay of Money lender instead of bank loans. Government waiving policy farmers make lenient to repay (Kalaichel vi, 2009; (Bhatta and Aggarwal, 2016; Kumar and Viswanathan, 2012; Deshingkar and Akter, 2009, Deshingkar and Start, 2003).

The original objective of institutional agriculture finance is bringing about overall improvements in the production, employment and income level of the farmers along with branch expansion, mobilization of deposits and lending to the priority sectors, especially in rural/semi urban areas. The LBS is useful and needs to be continued. The SLBC and various for a under LBS should focus on addressing the „enablers" and „impeders" in achieving greater financial inclusion and flow of credit to priority sectors, while continuing t monitor subsidy linked government sponsored schemes (Thorat, 2009; (Nordas and Gleditsch, 2007; Laczko and Aghazarm, 2009; Tacoli, 2009; Scheffran et al., 2012). Moreover, Rao (2009) examined the agriculture credit system in India and the Institutional and non-Institutional credit system in Krishna District through a sample survey. It is observed that among all the Institutional agencies financing Agriculture Commercial Banks perform major role and primary Agriculture credit societies and that of RRBs are meagre. Farmers prefer to get Institutional Finance. The result indicates that bank plays on a significant role on Agriculture development in Bangladesh. Timely flow of Agriculture credit can meet farmers demand to ensure Agriculture productivity (Sarker, 2016; Patnaik and Narayanan, 2015; Upadhyay et al., 2015; (Warner and Afifi (2014); Adger et al., 2002, 2015; Curtis and Schneider, 2011; Gray and Bilsborrow, 2013; Henry et al., 2004; Hunter et al., 2013; Mueller et al., 2014; Stal, 2011). Furthermore, the study of Agunuwa, Ekokotu Vincent, Inaya, Lucky, Proso, Timothy (2015), Gunakar Bhatta (2014), Abedullah N. ahmood, M. Khalid And S.Kouser (2009), Moh Khalid Bashir, Mod Masood Azeem (2008) and Crientna C. David (1982) reveal that the discovery of crude oil has led to the neglect of the Agriculture sector in Nigeria, which in turn has resulted in acute shortage of supply of food stuffs, industrial raw materials, and has brought about high level of importation of these commodities, thereby increasing cost of living drastically.

III. Estimations And Results

For measuring the impacts ofInstitutional Agriculture Finance on production, employment and farmers income and to achieved proposed objective "To measure the impact of Institutional Agriculture Finance on

production, employment and farmers income" and to test the null **$H_0$1**Institutional Agriculture Finance has negative impacts on production, employment and farmers' income and alternative hypothesis **H1**Institutional Agriculture Finance has positive impacts on production, employment and farmers' income, correlation coefficient and simple linear regression were estimated and results are computed in table 1 and 2. These results are estimated over following test items; Production; Simplifies disbursement procedures (item-1), Removes rigidity regarding cash and kinds (item-2), No need to apply for a loan for every crop (Item-3), Assured availability of credit at any time enablingreduced interest burden for the farmer (item-4), Helps buy seeds, fertilizers at farmers convenienceand choice (item-5), Helps buy on cash-avail discount from dealers (item-6), Credit facility for 3 years - no need for seasonal appraisal (item-7), Maximum credit limit based on agriculture income (item-8), Any number of withdrawals subject to credit limit (item-9), Repayment only after harvest (item-10), Each withdrawal to be paid within 12 months (item-11), Credit limits can be enhanced depending on performance and needs (item-12), Crops failed farmer could get an extension of up tofour years (item-13), Cash withdrawals through slips accompanied by card and passbook (item-14) and All branches engaged in agricultural lending could issue Kisan Credit Cards. Employment; Not aware of crop insurance (item-1), No need of insurance (item-2), Lack of premium paying capacity (item-3), Not satisfied with crops covered (item-4), Not satisfied with area approach (item-5), Inadequate publicity of the scheme (item-6), No faith in scheme / agency (item-7) and Bank help to take insurance policy (item-8) and Income; Lack of agriculture policy (item-1), Lack of credit policy (item-2), Lack of price fixation of product (item-3), Lack of knowledge on free productionimplements (item-5), Lack of information at right time (item-6), Lack of free seeds and fertilizers in subsidies (item-7), Lack of loan waive scheme (item-8), Lack of information transfer through agriculturedepartment (item-9), Government to motivate bank for provide in easyway (item-9), Government has to encourage farmers to formassociation (item-10) and Due of Institutional Agriculture Finance and its associated schemes, your income level has been increased significantly (item-11).

Table 1. Model Summary for Institutional Agriculture Finance (independent variable) and production (Dependent variable) in agriculture sector

Variable	R	R^2	Share of Independent Variable (%)	Dispersion of Regression Line	p-value
Institutional Agriculture Finance	0.380	0.144	14.4%	04.54	0.000**

Table 1 shows the correlation coefficient "R" between the Institutional Agriculture Finance (independent variable) and agricultural production (dependent variable) of the farmers is 0.380. Value of p-ratio (0.000<0.01) depicted that there is significant low level of correlation between Institutional Agriculture Finance and agricultural production of farmers. Further, value of the coefficient of determination R^2 is 0.114 (Square of correlation coefficient R) which shows the amount of variability in the agricultural production of farmers due to the different Institutional Agriculture Finance offers by Uttar Pradesh and Government of India and share of independent variable (Institutional Agriculture Finance) is 14.5% that means Institutional Agriculture Finance shares 74.5% in total agricultural production of farmers and remaining 55.5% share in agricultural production would get correlated with other variables such as availability of land, water, manure, work force, capital amount and other sources of income etc. Moreover, with the help of regression equation it has also estimated, whether this 14.5% share of Institutional Agriculture Finance significantly impact or not the agricultural production of farmers and calculated results are presented in table 2.

Table 2 Results of regression model for Institutional Agriculture Finance and Agricultural production of farmers

Model	standardized Coefficient (Beta)	p-Value
Constant	50.34	0.000**
Institutional Agriculture Finance	05.78	0.000**

With the help of above listed regression table 2, following regression equal has been computed in relation to Institutional Agriculture Finance (independent variable) and agricultural production for farmers in the study area.

$$Y_2 = \alpha_0 + \alpha_1(X_1)$$

$$\text{Agricultural Production} = \alpha_0 + \alpha_1 (\textbf{Institutional Agriculture Finance})$$

$$\text{Agricultural Production} = 99.77 + 0.061 (\textbf{Institutional Agriculture Finance})$$

Table 2 and above estimated equation shows that if independent variable (Institutional Agriculture Finance) being constant with zero value then score of dependent variable (Agricultural production) is 50.34, which has created and comprises with other variables such as availability of land, water, manure, work force,

capital amount and other sources of income etc. whereas if value of independent variable (Institutional Agriculture Finance) would get increase by one then score ofAgricultural production get enhance by 05.78. Moreover, for both the above cases values of p-ratio are 0.000 (0.000<0.01) and 0.000 (0.000<0.01) which are significant at 0.01 and 0.05 levels of significance. Hence, it is concluded that Institutional Agriculture Finance offers by Uttar Pradesh and Government of India has significant and low positive impact onAgricultural production of farmers.

Thus, the proposed objective "To measure the impact of Institutional Agriculture Finance on production, employment and farmers income" has achieved and the null **$H_0$1**Institutional Agriculture Finance has negative impacts on production, employment and farmers' income is rejected and alternative hypothesis **H1**Institutional Agriculture Finance has positive impacts on production, employment and farmers' income is being accepted over following test items; Production; Simplifies disbursement procedures (item-1), Removes rigidity regarding cash and kinds (item-2), No need to apply for a loan for every crop (Item-3), Assured availability of credit at any time enablingreduced interest burden for the farmer (item-4), Helps buy seeds, fertilizers at farmers convenienceand choice (item-5), Helps buy on cash-avail discount from dealers (item-6), Credit facility for 3 years - no need for seasonal appraisal (item-7), Maximum credit limit based on agriculture income (item-8), Any number of withdrawals subject to credit limit (item-9), Repayment only after harvest (item-10), Each withdrawal to be paid within 12 months (item-11), Credit limits can be enhanced depending on performance and needs (item-12), Crops failed farmer could get an extension of up tofour years (item-13), Cash withdrawals through slips accompanied by card and passbook (item-14) and All branches engaged in agricultural lending could issue Kisan Credit Cards. Employment; Not aware of crop insurance (item-1), No need of insurance (item-2), Lack of premium paying capacity (item-3), Not satisfied with crops covered (item-4), Not satisfied with area approach (item-5), Inadequate publicity of the scheme (item-6), No faith in scheme / agency (item-7) and Bank help to take insurance policy (item-8) and Income; Lack of agriculture policy (item-1), Lack of credit policy (item-2), Lack of price fixation of product (item-3), Lack of knowledge on free productionimplements (item-5), Lack of information at right time (item-6), Lack of free seeds and fertilizers in subsidies (item-7), Lack of loan waive scheme (item-8), Lack of information transfer through agriculturedepartment (item-9), Government to motivate bank for provide in easyway (item-9), Government has to encourage farmers to formassociation (item-10) and Due of Institutional Agriculture Finance and its associated schemes, your income level has been increased significantly (item-11).

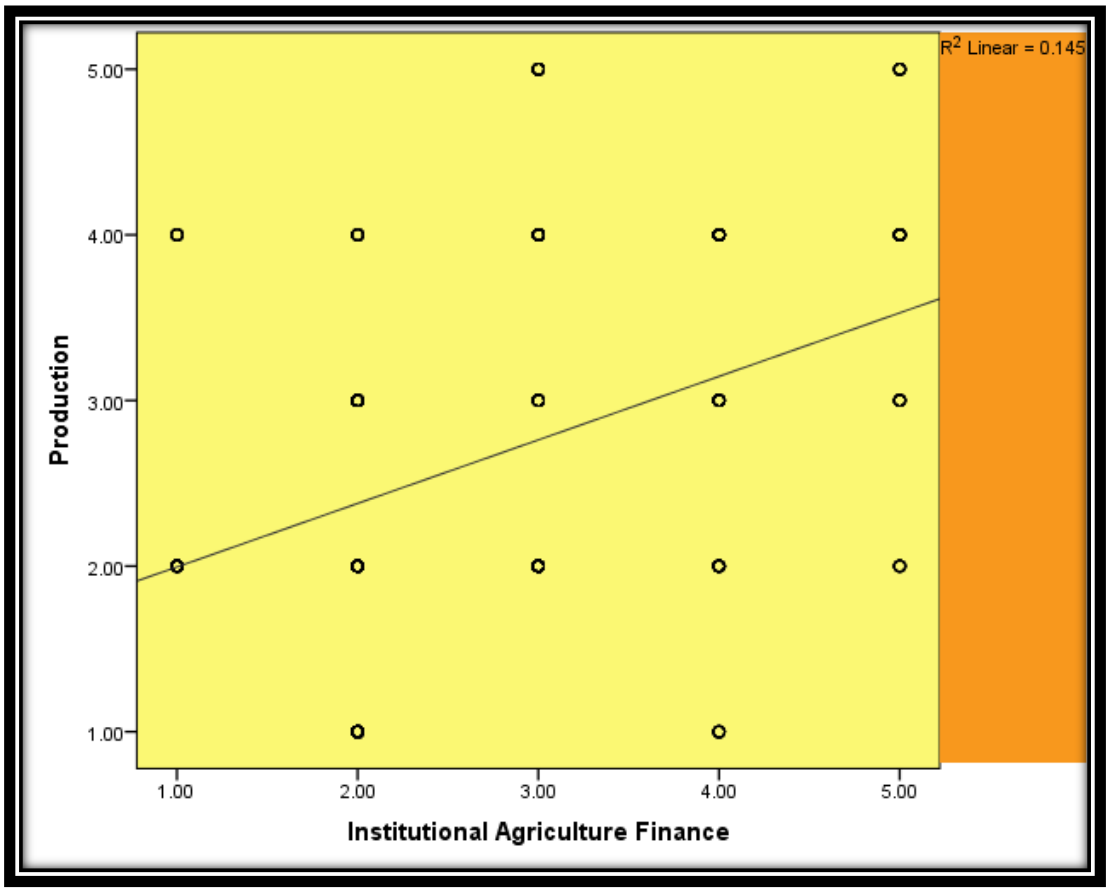

Figure 1 Correlation between Institutional Agriculture Finance and agricultural production of farmers with regression line

Correlation graph 1 shows the collective and comprehensiveInstitutional Agriculture Finance which is combination of following items; Production; Simplifies disbursement procedures (item-1), Removes rigidity regarding cash and kinds (item-2), No need to apply for a loan for every crop (Item-3), Assured availability of credit at any time enablingreduced interest burden for the farmer (item-4), Helps buy seeds, fertilizers at farmers convenienceand choice (item-5), Helps buy on cash-avail discount from dealers (item-6), Credit facility for 3 years - no need for seasonal appraisal (item-7), Maximum credit limit based on agriculture income (item-8), Any number of withdrawals subject to credit limit (item-9), Repayment only after harvest (item-10), Each withdrawal to be paid within 12 months (item-11), Credit limits can be enhanced depending on performance and needs (item-12), Crops failed farmer could get an extension of up tofour years (item-13), Cash withdrawals through slips accompanied by card and passbook (item-14) and All branches engaged in agricultural lending could issue Kisan Credit Cards. Employment; Not aware of crop insurance (item-1), No need of insurance (item-2), Lack of premium paying capacity (item-3), Not satisfied with crops covered (item-4), Not satisfied with area approach (item-5), Inadequate publicity of the scheme (item-6), No faith in scheme / agency (item-7) and Bank help to take insurance policy (item-8) and Income; Lack of agriculture policy (item-1), Lack of credit policy (item-2), Lack of price fixation of product (item-3), Lack of knowledge on free productionimplements (item-5), Lack of information at right time (item-6), Lack of free seeds and fertilizers in subsidies (item-7), Lack of loan waive scheme (item-8), Lack of information transfer through agriculturedepartment (item-9), Government to motivate bank for provide in easyway (item-9), Government has to encourage farmers to formassociation (item-10) and Due of Institutional Agriculture Finance and its associated schemes, your income level has been increased significantly (item-11) have low positive impacts on agricultural production of farmers.

IV. Conclusion and Recommendations

Results concluded that collective and comprehensive Institutional Agriculture Finance which is combination of following items; Production; Simplifies disbursement procedures (item-1), Removes rigidity regarding cash and kinds (item-2), No need to apply for a loan for every crop (Item-3), Assured availability of credit at any time enabling reduced interest burden for the farmer (item-4), Helps buy seeds, fertilizers at farmers convenience and choice (item-5), Helps buy on cash-avail discount from dealers (item-6), Credit facility for 3 years - no need for seasonal appraisal (item-7), Maximum credit limit based on agriculture income (item-8), Any number of withdrawals subject to credit limit (item-9), Repayment only after harvest (item-10), Each withdrawal to be paid within 12 months (item-11), Credit limits can be enhanced depending on performance and needs (item-12), Crops failed farmer could get an extension of up to four years (item-13), Cash withdrawals through slips accompanied by card and passbook (item-14) and All branches engaged in agricultural lending could issue Kisan Credit Cards. Employment; Not aware of crop insurance (item-1), No need of insurance (item-2), Lack of premium paying capacity (item-3), Not satisfied with crops covered (item-4), Not satisfied with area approach (item-5), Inadequate publicity of the scheme (item-6), No faith in scheme / agency (item-7) and Bank help to take insurance policy (item-8) and Income; Lack of agriculture policy (item-1), Lack of credit policy (item-2), Lack of price fixation of product (item-3), Lack of knowledge on free production implements (item-5), Lack of information at right time (item-6), Lack of free seeds and fertilizers in subsidies (item-7), Lack of loan waive scheme (item-8), Lack of information transfer through agriculture department (item-9), Government to motivate bank for provide in easy way (item-9), Government has to encourage farmers to form association (item-10) and Due of Institutional Agriculture Finance and its associated schemes, your income level has been increased significantly (item-11) have low positive impacts on agricultural production of farmers.

It has been noticed from the estimation that Institutional Agriculture Finance which is combination of following items; Production; Simplifies disbursement procedures (item-1), Removes rigidity regarding cash and kinds (item-2), No need to apply for a loan for every crop (Item-3), Assured availability of credit at any time enabling reduced interest burden for the farmer (item-4), Helps buy seeds, fertilizers at farmers convenience and choice (item-5), Helps buy on cash-avail discount from dealers (item-6), Credit facility for 3 years - no need for seasonal appraisal (item-7), Maximum credit limit based on agriculture income (item-8), Any number of withdrawals subject to credit limit (item-9), Repayment only after harvest (item-10), Each withdrawal to be paid within 12 months (item-11), Credit limits can be enhanced depending on performance and needs (item-12), Crops failed farmer could get an extension of up to four years (item-13), Cash withdrawals through slips accompanied by card and passbook (item-14) and All branches engaged in agricultural lending could issue Kisan Credit Cards. Employment; Not aware of crop insurance (item-1), No need of insurance (item-2), Lack of premium paying capacity (item-3), Not satisfied with crops covered (item-4), Not satisfied with area approach (item-5), Inadequate publicity of the scheme (item-6), No faith in scheme / agency (item-7) and Bank help to take insurance policy (item-8) and Income; Lack of agriculture policy (item-1), Lack of credit policy (item-2),

Lack of price fixation of product (item-3), Lack of knowledge on free production implements (item-5), Lack of information at right time (item-6), Lack of free seeds and fertilizers in subsidies (item-7), Lack of loan waive scheme (item-8), Lack of information transfer through agriculture department (item-9), Government to motivate bank for provide in easy way (item-9), Government has to encourage farmers to form association (item-10) and Due of Institutional Agriculture Finance and its associated schemes, your income level has been increased significantly (item-11) have low positive impacts on agricultural production of farmers.

The estimations suggested that Institutional Agriculture Finance which is combination of following items; Production; Simplifies disbursement procedures (item-1), Removes rigidity regarding cash and kinds (item-2), No need to apply for a loan for every crop (Item-3), Assured availability of credit at any time enabling reduced interest burden for the farmer (item-4), Helps buy seeds, fertilizers at farmers convenience and choice (item-5), Helps buy on cash-avail discount from dealers (item-6), Credit facility for 3 years - no need for seasonal appraisal (item-7), Maximum credit limit based on agriculture income (item-8), Any number of withdrawals subject to credit limit (item-9), Repayment only after harvest (item-10), Each withdrawal to be paid within 12 months (item-11), Credit limits can be enhanced depending on performance and needs (item-12), Crops failed farmer could get an extension of up to four years (item-13), Cash withdrawals through slips accompanied by card and passbook (item-14) and All branches engaged in agricultural lending could issue Kisan Credit Cards. Employment; Not aware of crop insurance (item-1), No need of insurance (item-2), Lack of premium paying capacity (item-3), Not satisfied with crops covered (item-4), Not satisfied with area approach (item-5), Inadequate publicity of the scheme (item-6), No faith in scheme / agency (item-7) and Bank help to take insurance policy (item-8) and Income; Lack of agriculture policy (item-1), Lack of credit policy (item-2), Lack of price fixation of product (item-3), Lack of knowledge on free production implements (item-5), Lack of information at right time (item-6), Lack of free seeds and fertilizers in subsidies (item-7), Lack of loan waive scheme (item-8), Lack of information transfer through agriculture department (item-9), Government to motivate bank for provide in easy way (item-9), Government has to encourage farmers to form association (item-10) and Due of Institutional Agriculture Finance and its associated schemes, your income level has been increased significantly (item-11) have low positive impacts on income of farmers.

Collective and comprehensive Institutional Agriculture Finance which is combination of following items; Production; Simplifies disbursement procedures (item-1), Removes rigidity regarding cash and kinds (item-2), No need to apply for a loan for every crop (Item-3), Assured availability of credit at any time enabling reduced interest burden for the farmer (item-4), Helps buy seeds, fertilizers at farmers convenience and choice (item-5), Helps buy on cash-avail discount from dealers (item-6), Credit facility for 3 years - no need for seasonal appraisal (item-7), Maximum credit limit based on agriculture income (item-8), Any number of withdrawals subject to credit limit (item-9), Repayment only after harvest (item-10), Each withdrawal to be paid within 12 months (item-11), Credit limits can be enhanced depending on performance and needs (item-12), Crops failed farmer could get an extension of up to four years (item-13), Cash withdrawals through slips accompanied by card and passbook (item-14) and All branches engaged in agricultural lending could issue Kisan Credit Cards. Employment; Not aware of crop insurance (item-1), No need of insurance (item-2), Lack of premium paying capacity (item-3), Not satisfied with crops covered (item-4), Not satisfied with area approach (item-5), Inadequate publicity of the scheme (item-6), No faith in scheme / agency (item-7) and Bank help to take insurance policy (item-8) and Income; Lack of agriculture policy (item-1), Lack of credit policy (item-2), Lack of price fixation of product (item-3), Lack of knowledge on free production implements (item-5), Lack of information at right time (item-6), Lack of free seeds and fertilizers in subsidies (item-7), Lack of loan waive scheme (item-8), Lack of information transfer through agriculture department (item-9), Government to motivate bank for provide in easy way (item-9), Government has to encourage farmers to form association (item-10) and Due of Institutional Agriculture Finance and its associated schemes, your income level has been increased significantly (item-11) have low positive impacts on agricultural production of farmers. Since, farmers are aware about the different institutional agriculture finance flow schemes and activities taken up by Uttar Pradesh and Central of India. Having different level of perception, satisfaction and benefits is different and debatable issues of the farmers. Sometimes, implementation policies and process is so long and ineffective so farmers are not getting timely assistance and benefits of such schemes. Therefore, it is recommended to policy makers, banking officials and Government organizations that they must focus on farmers' friendly agricultural finances schemes and initiatives having maximum benefits to farmers. It has been noticed that implement process is not so effectively, hence bankers need to ensure fair and timely implementations of proposed schemes and without any problems to the farmers.

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References

[1]. Bai, J. and Perron, P. (2003). Critical values for multiple structural change tests. Econometrics Journal, **6**(1), 72-78.

[2]. Bisaliah, S. and Dev, S.M. (2010). Private capital formation in Indian agriculture: an analysis of farm level data. Consultancy Report, Food and Agriculture Organization, Rome.
[3]. Chand, R. and Kumar, P. (2004). Determinants of capital formation and agriculture growth: some new explorations. Economic and Political Weekly, **39**(52), 5611-5616.
[4]. Das, A., Senapati, M. and John, J. (2009). Impact of agricultural credit on agriculture production: an empirical analysis in India. Reserve Bank of India Occasional Papers, **30**(2), 75-107.
[5]. Garrett, H. E. and Woodworth, R. S. (1969). Statistics in psychology and education. Vakils, Feffer and Simons Pvt. Ltd., Mumbai.
[6]. Gine, X. and Kanz, M. (2018). The economic effects of a borrower bailout: evidence from an emerging market. Review of Financial Studies, **31**(5), 1752–1783.
[7]. Government of India. (2014). Key indicators of debt and investment in India. NSS 70th round, NSSO, MoSPI, New Delhi.
[8]. Gulathi, A. and Bhathla, S. (2002). Institutional credit to Indian agriculture: defaults and policy options. Occasional Paper 23. National Bank for Agriculture and Rural Development, Mumbai.
[9]. Kumar, H.H.V. and Reddy, C.B.V. (2017). Impact of urbanization on land use pattern of rural-urban gradient of Bengaluru North: an economic analysis. Economic Affairs, **62**(2), 1-10.
[10]. Hausman, J. A. (1978). Specification tests in econometrics. Econometrica, **46**(6), 1251-1271. 57
[11]. Hoda, A. and Terway, P. (2015). Credit policy for agriculture in India - an evaluation: supporting Indian farms the smart way: rationalizing subsidies and investments for faster, inclusive and sustainable growth. Working Paper. Indian Council for Research on International Economic Relations, New Delhi, 1-34.
[12]. Kamath, R., Mukherji, A. and Sandstrom, M. (2010). Accessing institutional finance: a demand side story for rural India. Economic and Political Weekly, **45**(37), 56-62.
[13]. Kongcharoen, C. and Kruangpradit, T. (2013). Autoregressive integrated moving average with explanatory variable (ARIMAX) model for Thailand export. Proceedings of 33rd International Symposium on Forecasting, Seoul, South Korea.
[14]. Kumar, A., Singh, R.K.P., Jee, S., Chand, S., Tripathi, G. and Saroj, S. (2015). Dynamics of access to rural credit in India: patterns and determinants. Agricultural Economics Research Review, **28**(Conference Number), 72-78.
[15]. Mehrotra, N. (2011). Agriculture credit: the truth behind the aggregate numbers. Economic and Political Weekly, **46**(42), 22-26.
[16]. Mishra, S. (2008). Risks, farmers" suicides and agrarian crisis in India: is there a way out? Indian Journal of Agricultural Economics, **63**(1), 38-54.
[17]. NABARD. (2018). All India Rural Financial Inclusion Survey (NAFIS) 2016-17. National Bank for Agriculture and Rural Development, Mumbai.
[18]. Patra, B. and Padhi, P. (2016). Determinants of non-performing assets - bank-specific and macroeconomic factors: a panel data analysis of different group of commercial banks operating in India. Theoretical and Applied Economics, **XXIII** (4), 215-236.
[19]. Pradhan, N.C. (2013). Persistence of informal credit in rural India: evidence from „All-India debt and investment survey" and beyond. RBI Working Paper Series, 1-21.
[20]. Ray, M., Ramasubramanian, V., Kumar, A. and Rai, A. (2014). Application of time series intervention modelling for modelling and forecasting cotton yield. Statistics and Applications, **12**(1&2), 61-70.
[21]. RBI. (1954). Report of the All-India Rural Credit Survey. Reserve Bank of India, Mumbai. 58
[22]. Sahay, J. (2006). Elements of agricultural engineering. Standard publishers' distributors, New Delhi.
[23]. Sahu, G.B. (2007). Supply analysis of institutional credit to agriculture for major states in India. Indian Journal of Agricultural Economics, **62**(4), 664-678.
[24]. Shergill, H.S. (1998). Rural credit and indebtedness in Punjab. Monogaph, Institute for Development and Communication, Chandigarh.
[25]. Sidhu, R.S., Vatta, K. and Kaur, A. (2008). Dynamics of institutional agricultural credit and growth in Punjab: contribution and demand-supply gap. Agricultural Economics Research Review, **21**(Conference Number), 407-414.
[26]. Singh, S., Kaur, M. and Kingra, H.S. (2007). Flow of funds to farmers and indebtedness in Punjab. The Punjab State Farmers Commission, Punjab.
[27]. Singh, S., Bhogal, S. and Singh, R. (2014). Magnitude and determinants of indebtedness among farmers in Punjab. Indian Journal of Agricultural Economics, **69**(2), 243-256.
[28]. Singh, G., Kaur, G.A., Kaur, R. and Kaur, S. (2017). Indebtedness among farmers and agricultural labourers in rural Punjab. Economic and Political Weekly, **52**(6), 51-57.
[29]. Vatansever, M. (2013). Forecasting non-performing loan ratio in Turkey using Box-Jenkins approach. Proceedings of Credit Scoring and Credit Control Conference-XIII, Edinburgh, Scotland.