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IMPACT OF AGRICULTURAL CREDIT SCHEMES ON IRRIGATED AREA IN INDIA

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ABSTRACT

Agricultural credit schemes have become necessity for most of the farmers. Government has introduced various credit schemes for them. Proper benefit of these schemes can only be given to the farmers by proper and efficient process. In this research we study the impact of agricultural credit schemes on irrigated area. Data collected during this study reveals that there is positive impact of agricultural credit schemes on irrigated area. Suggestions for better implementation of various agricultural credit schemes and removal of bottlenecks for improving the impact on irrigated area are also given in research paper.

KEYWORDS: *Agriculture Credit Schemes, Net Cropped Area, Net Irrigated Area.*

Introduction

Agricultural credit is considered as one of the basic input for conducting all agricultural development programs. In India, there is immense need of agricultural credit schemes for development and growth of agriculture. Many agencies like co-operative banks, commercial banks, rural banks, etc provide adequate credit to farmers, at a cheaper rate of interest. Moreover, with growing modernization of agriculture the requirement of agricultural credit has increased further in the recent years. Water is an inseparable component for enhancing agricultural productivity, and therefore development of irrigation system has been a key strategy in the growth of agriculture in the country. The net irrigated area in India is 69.09 mha (million hectares) out of 139.97 mha net cropped area. This shows a huge gap between net cropped and net irrigated area. So there is a lot of work has to be done in this field so that maximum output can be taken.

Review of Literature

Agricultural credit has been a significant area of research for decades. Various measures have been taken to improve the availability of credit sources to farmers. Studies have been conducted to evaluate the scope and execution of credit schemes for farmers and their relationship with country's total irrigated area.

Sourovi De in an essay **Agricultural Credit in India: An Overview** attempted to ask apt questions about the situation of land and water resources, input management, terms of trade, agricultural marketing, credit facilities etc. Conditions with limitations on expanding crop area, increase in productivity; totally depend on sustained infusion of credit. Availability of credit at reasonable rates, therefore, becomes a pre-requisite for agricultural growth. The essay established the conclusion that India's rural sectors need credit policies that could support surplus production.

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Kumar Gaurav in "Water irrigation by using wireless sensor network" Emphasizes on the need of conservation of available water resources, develop and use modern techniques of irrigation i.e. drip irrigation, net house or poly house can be of vital importance for this purpose.

Daniel W. Bromley in "Improving irrigated agriculture: institutional reform and the small farmer" is of the view that in modern situations we have used various techniques to irrigate the ill-suited lands for cultivation but we have focused much lesser on the environment in which the modern techniques are applied. So there is a lot of work is supposed to done in the field of institutional environment so that we can get maximum output with the modern irrigating techniques.

Objectives of Study

- To analyze the impact of agricultural credit schemes on irrigated area.
- To give suggestions for improvement in impact of agricultural credit schemes on irrigated area.

Hypothesis

A hypothesis is an idea or explanation that can be tested through study and experimentation. It is a proposal intended to describe certain facts and observations.

H_0: Agriculture Credit Schemes doesn't have any positive impact on irrigated area.

H_1: Agriculture Credit Schemes have positive impact on irrigated area.

Data Collection

The proposed study is based on secondary data related to irrigated area and agriculture credit schemes. Secondary data are collected from Annual Reports of Directorate of Economics & Statistics, Department of Agriculture, Cooperation & Farmers Welfare, NABARD, Agriculture at a Glance and some web sites of various organizations related to agriculture.

Tools and Techniques

For the analysis of the data I took help of various tools like Arithmetic Mean, Standard Deviation, Co-efficient of Standard Deviation, Correlation, T Test (SE of Two Sample Mean), T Test (Observed Correlation Co-efficient) and F Test (Ratio of Variation).

Data Analysis

The study is based on gross/net cropped area and gross/net irrigated area and the impact of agricultural credit schemes on irrigated area in India for the years of 2012-13 to 2016-17.

First of all I am analyzing gross/net cropped area and gross/net irrigated area and then analysis of agricultural credit scheme with its impact on irrigated area in India is given:

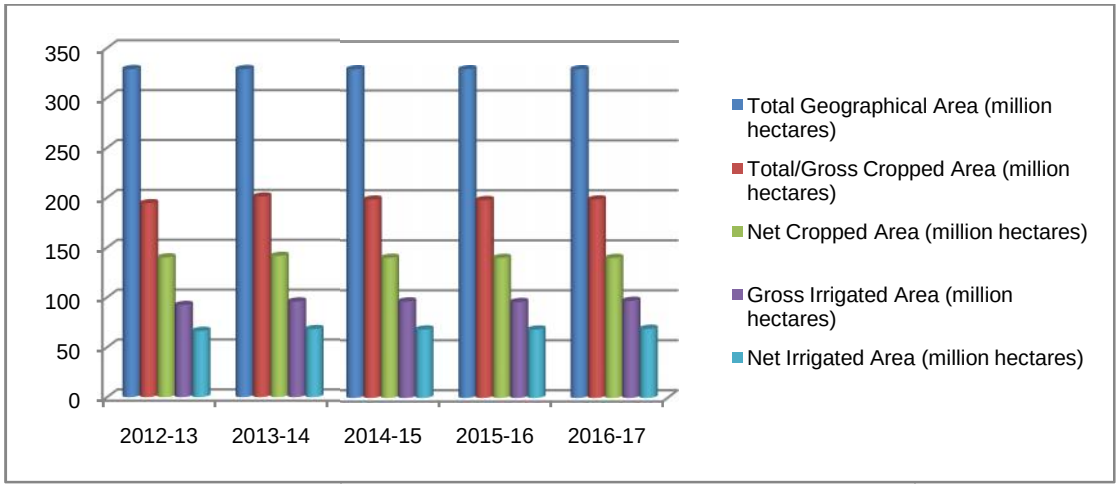
Gross/Net Cropped Area and Gross/Net Irrigated Area (Million Hectares)

S. No.	Classification	2012-13	2013-14	2014-15	2015-16	2016-17
1	Total Geographical Area	328.73	328.73	328.73	328.73	328.73
2	Total/Gross Cropped Area	194.25	200.95	198.36	197.85*	198.47*
3	Net Cropped Area	139.94	141.43	140.13	140.03*	139.97*
4	Gross Irrigated Area	92.25	95.77	96.46	95.91*	97.11*
5	Net Irrigated Area	66.29	68.12	68.38	68.33*	69.09*

Source: 1. Directorate of Economics & Statistics
2. Department of Agriculture, Cooperation & Farmers Welfare
3. Agriculture at a Glance 2017

* Provisional

[Gross Cropped Area (Yc = 191.3455 + 0.3097105x)
Net Cropped Area (Yc = 140.668 - 0.0302932x)
Gross Irrigated Area (Yc = 83.2985 + 0.6003721x)
Net Irrigated Area (Yc = 60.277 + 0.3833458x)]



Interpretation

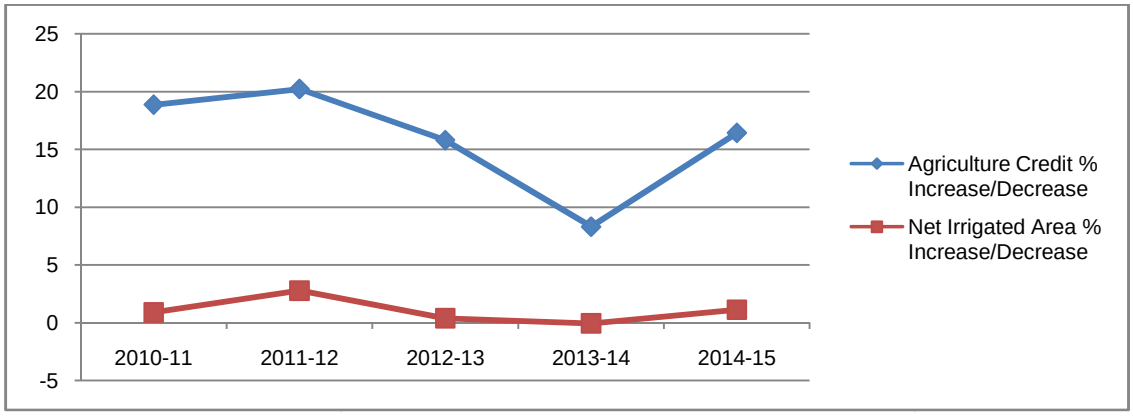
Data in above table show that total cropped area and net cropped area in India have little change through years (2012-13 to 2016-17) but gross irrigated area and net irrigated area are increasing through these years except slight decrease in the year 2015-16. Average gross cropped area in these five years is around 198 million hectares while average net cropped area is around 140 million hectares. Gross irrigated area in these five years increased continuous from 92.25 million hectares in year 2012-13 to 97.11 million hectares in year 2016-17 except slight decrease in the year 2015-16 and net irrigated area increased 66.29 million hectares in year 2012-13 to 69.09 million hectares in year 2016-17 except slight decrease in the year 2015-16.

Impact of Agricultural Credit Schemes on Irrigated Area
(Amount in Crore)
(Area Million Hectares)

Years	Agriculture Credit	% Increase (Decrease)	Net Irrigated Area	% Increase (Decrease)
2012-13	6,07,375	18.85	66.29	0.88
2013-14	7,30,123	20.21	68.12	2.76
2014-15	8,45,328	15.78	68.38	0.38
2015-16	9,15,510	08.30	68.33	(0.07)
2016-17	10,65,756	16.41	69.09	1.11

(Agriculture Credit & Net Irrigated Area in the year 2011-12 are 5,11,029 & 65.71 respectively)

Source: 1. Directorate of Economics & Statistics
2. NABARD, based on data reported by banks and IBA
3. Department of Agriculture, Cooperation & Farmers Welfare
4. India in Figures



Interpretation

In year 2012-13 agriculture credit increased about 19% and net irrigated area increased by 0.88% while in year 2013-14 agriculture credit increased about 20% and net irrigated area increased by 2.76%. In year 2014-15 agriculture credit increased about 16% while net irrigated area increased by 0.38%. In year 2015-16 agriculture credit increased only 8.30% and net irrigated area decreased by 0.07% while in year 2016-17 agriculture credit increased about 16% and net irrigated area increased by 1.11%.

Above analysis shows that net irrigated area increased continuously with increase in agriculture credit from year 2012-13 to 2016-17. When agriculture credit has comparatively lesser increment of 8.3% in the year 2015-16 then the net irrigated area shows negative impact and decreases by 0.07%. This shows that increase in agriculture credit has a positive impact on net irrigated area.

Testing of Hypothesis

Values	Agriculture Credit (X) (amount in thousands crore)	Net Irrigated Area (Y) (area million hectares)
Arithmetic Mean	832.8184	68.042
Standard Deviation	156.60484	0.93
Co-efficient of Standard Deviation	0.188042	0.0137414
Correlation (r)	0.90	
PE under Correlation	0.0573126 (r is significant)	
T Test (SE of Two Sample Mean)		
H_o	No significant difference between two sample mean.	
H_1	Significant difference between two sample mean.	
Significance Level	.05	
SE	9.77	
Table Value	2.306	
Compare	SE > Table Value, H_o Rejected, H_1 Accepted.	
Conclusion	It is proved that there is a significant difference between two sample mean.	
T Test (Observed Correlation Co-efficient)		
H_o	No significant difference in the co-efficient correlation between two samples.	
H_1	Significant difference in the co-efficient correlation between two samples.	
Significance Level	.05	
SE	3.58	
Table Value	3.18	
Compare	SE > Table Value, H_o Rejected, H_1 Accepted.	
Conclusion	It is proved that there is a significant difference in the co-efficient correlation between two samples.	
F Test (Ratio of Variation)		
H_0	Both the samples have been taken for normal population having the same variance.	
H_1	Both the samples have been taken for normal population not having the same variance.	
Significance Level	.05	
SE	28054	
Table Value	6.39	
Compare	SE > Table Value, H_0 Rejected, H_1 Accepted.	
Conclusion	It is proved that both the samples have been taken from normal population not having the same variance.	

Interpretation

Above statistical analysis shows that arithmetic mean of agriculture credit is 832.8184 thousand crore while net irrigated area is 68.042 million hectares. Standard deviation of agriculture credit is 156.60484 and standard deviation of net irrigated area is 0.93. This shows that there is lesser variation in net irrigated area in comparison to variation in agriculture credit. Coefficient of standard deviation shows that there is 18.80% variation in agriculture credit while it is 1.37% for net irrigated area.

Correlation between agriculture credit and net irrigated area is 0.90 which is high degree positive correlation. Probable error under correlation is 0.0573126. Since value of correlation is greater than 6 times of probable error hence '**r**' is significant.

It is proved from T test (SE of two samples mean) that there is a significant difference between two sample mean. It is also proved by T test (Observed Correlation Co-efficient**)** that there is a significant difference in the co-efficient correlation between two samples. F test (ratio of variation) proves that both the samples have taken from normal population not having the same variance.

"As per the above analysis correlation between agriculture credit and net irrigated area is 0.90. Being greater than 6 times of probable error hence 'r' is significant. Hence the hypothesis i.e. Agriculture Credit Schemes have positive impact on irrigated area, is proved".

Suggestions & Recommendations

There are following suggestions & recommendations for improvement in irrigated area:

- Farmers should be well informed about the available agriculture credit schemes related to irrigation.
- Training programmes for farmers should be organized for drip irrigation system and other water efficient systems.
- More budget should be infused for agriculture research, seed development and other water conservation techniques.
- Government should take care of execution for small irrigation project as well as large irrigation projects because there are lots of farmers with small land holding.
- Inspiring and imparting knowledge and information to the farmers about Rain Water Storage so that the rain water can be utilized even after the draught or famine.

Conclusion

This study establishes that the impact of agricultural credit schemes on irrigated area is apparent. Present scenario of irrigated area is somewhat satisfactory but there is massive opportunity to disseminate it beyond our thought. There are maximum farmers with small land holdings while maximum government projects are for large land holding farmers so it is advisable to pay more attention on small land holding farmers so that irrigated area can be increased to a large extent. Application of various suggestions given in this research paper can help in improving the impact of agricultural credit on irrigated area.

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