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IMPACTS OF CREDITS ON AGRICULTURAL MECHANIZATION AND DEVELOPMENT IN URMIA COUNTY

LEILA TALEB MARANDI; LOGHMAN RASHIDPOUR*
Department of Agricultural Management, College of Agriculture, Mahabad Branch, Islamic Azad University, 59135-433 Mahabad, Iran

Abstract

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The purpose of this study is to investigate the impact of Agricultural Bank credit on mechanization promotion in the agricultural sector in Urmia County, West Azerbaijan province of Iran. This is a cross-survey research and it is applicable in purpose. The statistical community of this study includes farmers working on agricultural farms of Urmia County. Agricultural Bank has provided facilities for 416 people for agricultural purposes. The volume of sample, by referring to the Cochran-Formula which is used as criteria, 200 people were chosen. In this study, a random sampling method was used. For assembling data, a 30-item questionnaire was developed by the researcher based on a set of Likert's 5-choice, which at the end Cronbach's alpha coefficient was 0.872. In analyzing the data, descriptive and inferential statistical methods and variable t-test were used to test hypotheses. The results of this study show that the Agricultural Bank's credits have a positive impact on all aspects of agricultural mechanization such as structural modernization of irrigation, decreasing cost, and improving a quality of land, tools and rural economy. Our results are useful for the policy makers and other stakeholders to consider facilities role on agricultural mechanization and development.

Key words: impact; credits; agriculture; mechanization; development; Urmia

Introduction

Agriculture is not only the backbone of our food, livelihood, and ecological security system but is also the very soul of our sovereignty. However, as most researchers acknowledge, moving toward the development and achievement of independence, has a direct relationship with agricultural products (Douglas, 2003). A strong and efficient agricultural sector has the potential to enable a country to feed its growing population, generate employment, earn foreign exchange and provide raw materials for industries.

Generally, the traditional roles of agriculture as captured by the FAO (2011) include the provision of food security, the supply of raw materials for industry, creation of employment and generation of foreign exchange earnings.

The role of financial capital as a factor of production to facilitate economic growth and development, as the need to appropriately channel credit to rural areas for economic development of the poor rural farmers cannot be over emphasized. Financial development is considered one of the most vital sources of economic growth (Beck and Laeven, 2006). Credit is an important instrument that enables farmers to acquire commands over the use of working capital, fixed capital, and consumption goods (Siddiqi et al., 2004).

As noted by Baiyegunhi et al. (2010), household credit constraints have a number of serious consequences for pro-

**Corresponding author*: Rashidpour@iau-mahabad.ac.ir, Rashidpour@gmail.com

duction and consumption in the short run and for asset accumulation, poverty reduction and evolution of well-being in the long run.

Rhaji (2008) identified that farm size of the farmers, previous year's income, enterprises type, household net worth and level of household agricultural commercialization are significant but negative factors influencing the bank's decision to ration credit. Based on the results obtained farmland redistribution, farm income improvement, gender specific and credit allocation policies to the crop sub-sector were recommended. Of course, it should be noted that in most of the researches related to agriculture and funds, researchers agree that lands got smaller and using heavy agricultural tools is not worthy (Baiyegunhi et al., 2010; Rhaji, 2008) Hence the policy making, in this case, is trying to integrate agricultural lands (Eynali, 2013; Carter and Olinto, 2003).

Shahidue and Faruqee (2003) examined the impact of agricultural credit on household welfare in Pakistan. The results of their study showed that agricultural credit not only crops but also on household consumption might have the impact on other indicators of well-being might have the effect. Bashir et al. (2008). It is clear from the above discussion that the credit does have an impact on the productivity of sugarcane crop. All these findings make anyone conclude that commercial banks are effectively serving the agricultural sector of Pakistan through their credit disbursement schemes hence improving the living standard of people living in rural areas, reducing the poverty and ultimately helping the economy of the country.

Saleem and Jan (2011) examined the impact of currency credits on agricultural production in the valley of Ismail Khan. The results showed that there is a significant relationship between the gross domestic product of agriculture with the facilities allocated for fertilizers, pesticides, irrigation, and tractors. Credit plays an important role in increasing agricultural productivity. Timely availability of credit enables farmers to purchase the required inputs and machinery for carrying out farm operations (Saboor et al., 2009).

Research results in India showed that the agricultural facilities have had positive effects on raising the level of technology required by farmers to produce agricultural products and most agricultural facilities are associated with seed, fertilizer, and chemicals (Dantwala, 1989). The coefficient of credit was significant, which indicated that credit has a positive impact on the productivity of rice, providing a clue that credit is an important tool for improving and increasing the agricultural productivity in general and that of rice in particular (Bashir and Mahmood, 2010). Cornejo and McBrid (2002), Anthony (2010), pointed out that the impact of bank facilities and the actual rate of exchange on the export of agricultural products is positive in the long run because the ultimate goal of the package is nothing but export.

Okpukpara (2010) believes that access to credit affects household welfare outcomes through two channels. He said first credit access alleviates the capital constraints on agricultural households. Binam et al. (2004) estimated technical efficiency of various categories of farmers and found that efficiency differences are significantly influenced by the amount of agricultural credit utilized in production.

In the case of investment in the agricultural sector, small but growing empirical literature suggests that in rural areas of developing countries, credit constraints have significant adverse effects on farm output (Petrick, 2004), farm profit (Foltz, 2004) and farm investments (Carter and Olinto, 2003). Increased access to credit has a positive effect on the labor market (Bruhn and Love, 2014). Foltz (2004) also has found that there is a relationship between given facilities and value added to the agriculture sector. Bakwena and Bodman (2010) analyze the role of financial development in oil versus non-oil (mining) economies and find that financial development plays a crucial role in influencing the efficiency of investment, thus economic performance; however, the potency of financial institutions is higher for a non-oil producer.

We examine the impact of Agricultural Bank credits on examined agricultural financing in Urmia County, West Azerbaijan province of Iran. This paper is organized as follows; the introduction reviews the empirical and theoretical literature on agricultural financing; discussion of models and methodology, data and empirical evidence, conclusion and recommendations of the study.

Materials and Methods

The present study sought to examine the impact of Agricultural-Bank's facilities on the development of agricultural mechanization in Urmia. The descriptive research method is used and its purpose is applicable. The target community of this research is farmers of Urmia including 65191 people, that 416 of them were given bank facilities in 1390 from Agricultural-Bank. The volume of statistical sample size, referring to the table of Cochran was 200 people. Sampling method in the research was a random sampling method.

Data gathering tool was the questionnaire which was built up in relation to the effects of the micro and macro facilities of Agricultural Bank on the development of agricultural mechanization in Urmia which is based on Liker's 5-option spectrum. In the last assessment of the questionnaire calculated by Cronbach alpha coefficient, 0.872 is obtained. To examine the narrative content questionnaire, in spite of observing the principles of the questionnaire, after it is set, it is given to several

of the experts and pundits in management course and after the reforms, it is approved by them. For data analysis, SPSS software is used and t-test single variable is used as well.

Result and Discussions

The findings derived from the collected data showed that 87 percent (174 people) of the respondents were male and only 13% (n=26) were female. In terms of work experience in agriculture, 32% of participants (n=64) has a history of agriculture from 1 to 10 (Figure 1) also in terms of a level of education participants, the results are in accordance with Table 2.

The results of the impact of mechanization on the promotion of agriculture showed that among the effects were mentioned for impact on decreasing cost the statements of "have a good shape" and "Net profit increase" was given the importance and more value compared to other items (Table1).

In Table 1 for each of the items: Mean standard deviation and coefficient of variation has been shown, results showed that the participants "net profit increased" by the coefficient of variation of 0.284 is in first priority and "increase the quality of products" by the coefficient of variation of 0.165 changes are the last priority. To test this hypothesis, one sample t-test was used. As one can see in the Table 2, in terms of the farmers participating in this research facilities has a significant and positive impact ($P < 0.05$) on reducing cost and increasing distribution and production. This finding can be understood from the significant difference between the

Table 1
Ranking of facilities impact on reducing cost and increasing productivity

Facilities impact on reducing the cost	M	SD	C.V	R
Facilities increase the quality of products	3.85	0.634	0.165	1
providing production costs	3.77	0.835	0.221	2
Reduction in the ultimate price products	3.65	0.865	0.237	3
impact the direct delivery of goods	3.6	0.861	0.239	4
Acquiring Agricultural Bank's Facilities in influencing the distribution of products easier	3.52	0.907	0.258	5
Using Agricultural Bank's facilities in Competitiveness of products	3.56	0.933	0.262	6
Set the stage for the efficient use of inputs	3.62	0.959	0.265	7
Net profit increase	3.38	0.959	0.284	8

Source: research data – Likert -type scale: very low (1); low (2); moderate (3); high (4); very high (5) M: Mean, SD: Standard deviation, C.V: Coefficient of variation, R: Rank

Table 2
Sample t-test statistical indicators of the ultimate structural cost

Exam	Total Mean	Standard Deviation	T Calculated	Freedom Degree	Significant Level
One-Sample Test	3.676	1.042	10.561	199	0.0001

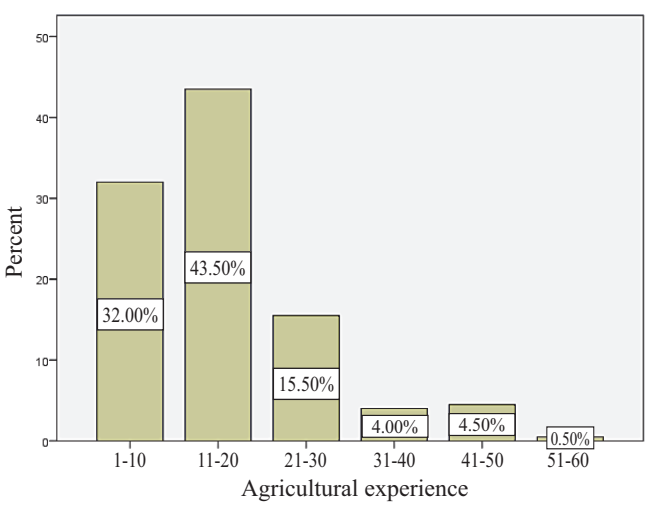

Fig. 1a. Distribution of experience in agriculture

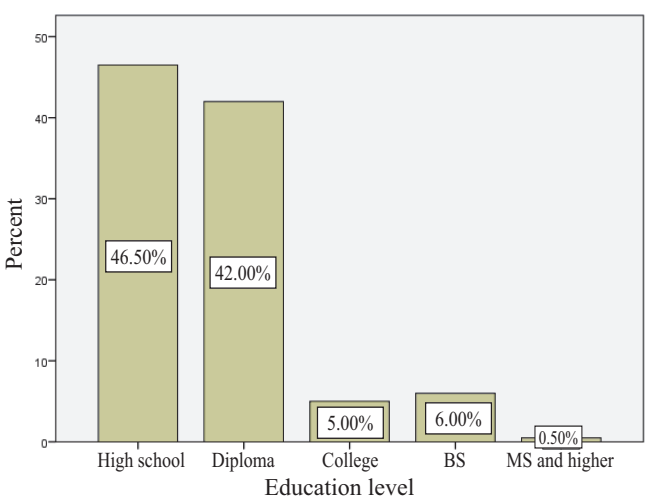

Fig. 1 b. Distribution of education level

average total views of average scale 3 (because it is done according to the 5-rate Likert Spectrum).

Respondents views showed that the most important item of effective effects on refreshing agricultural tools was "Getting agricultural facilities for modernizing and improving packaging" (Table 3). Checking with the findings related to the frequency of comments on each of the items answered by respondents; average, standard deviation and coefficient of changes (Table 3), one could see that gaining agricultural facilities for "modernization and improvement of packaging" with a Coefficient of Variation of 0.372, "help to equip agricultural machinery and tools" with a Coefficient of Variation of 0.357, and "amenities in cultivation" with a Coefficient of Variation of 0.335, are in the priority of the first to the third. To check the impact of banking facilities on the modernization of agricultural tools, a single t-test sampling inference is used that relevant data are brought to the Table 4.

The results of Table 4 suggest that from farmers' view, Agricultural Bank's facilities have had a positive impact on modernization of agricultural tools in Urmia (t=4.240; p=0.05 < 0.001) because as it is seen in the above table, a significant level of the corresponding test P (0.001) is smaller than 0.05. The larger average score (3.23) out of scale (3) is another confirmation for this matter. Therefore, the respondents agree to this entry that Agricultural Bank's facilities have had a positive impact on the modernization of agricultural tools in Urmia and the present hypothesis can be confirmed.

Based on the results showed in Table 5, of the prioritization of facilities impact on the modernization of irrigation structures, among the factors mentioned, "Increase productivity of drainage products" has received the importance and value more than other items on the modernization of irrigation structures. Table 5 findings related to the view of farmers on the impact of bank facilities to use modern irrigation systems are shown and by examining the frequency of their views on each item to determine; mean, standard deviation and coefficient of variation can be found that in farmers' views, using bank facilities in "Increase productivity of drainage products" with the coefficient of variation of (0.245) is the first priority and "using facilities to reduce the

Table 3
Ranking of facilities effects on refreshing tools

Facilities effects on refreshing tools	M	SD	C.V	R
Agricultural Bank's Facilities granted for reducing the use of human resources	3.86	0.825	0.214	1
Land preparation for coping with natural disasters	3.59	0.897	0.250	2
On the modernization of agricultural machinery	3.66	1.098	0.300	3
Furnishing amenities in cultivation	3.39	1.136	0.335	4
Help to equip tools and agricultural machinery	3.31	1.183	0.357	5
Getting agricultural Facilities for modernizing and improving packaging	3.1	1.152	0.372	6

Source: research data – Likert -type scale: very low (1); low (2); moderate (3); high (4); very high (5) M: Mean, SD: Standard deviation, C.V: Coefficient of variation, R: Rank

Table 4
Sample t-test statistical indicators of modernization of machinery

Exam	Total Mean	Standard Deviation	T Calculated	Freedom Degree	Significant Level
One-Sample Test	3.23	0.561	4.240	199	0. 001

Table 5
Ranking of facilities impact on the use of new irrigation systems

Facilities impact on the use of new irrigation systems	M	SD	C.V	R
Increase productivity of drainage products	3.65	0.894	0.245	1
to reduce water loss in the area	3.7	0.925	0.250	2
Reducing prices because of quality improvement in irrigation	3.47	0.923	0.261	3
To the equipment of irrigation system	3.55	0.966	0.272	4
To feel convenient in irrigation	3.48	0.956	0.275	5
To reduce the damage caused by drought	3.44	1.166	0.340	6

Source: research data – Likert -type scale: very low (1); low (2); moderate (3); high (4); very high (5); M: Mean, SD: Standard deviation, C.V: Coefficient of variation, R: Rank

damage caused by the drought" with a coefficient of variation of (0.340) is in the end priority.

To test this hypothesis, the one-sample t-test was used. The results of the test (mean=3.507, N=199) show that the average level of comments of participants in confidence is 0.05 which is significantly different from criteria amount (3) (t=10.284, p=0.01), thus test assumption is rejected the research assumption is confirmed. So, we can say that the participants believe that bank's facilities had a positive impact on the modernization of irrigation structures (Table 6).

Respondent's views showed that the most important item of effective effects on refreshing agricultural tools was "Facilities using in mechanical operations for soil protection" (Table 7). The findings of descriptive statistics and coefficients of variation suggest that priorities are as follows: "improving mechanical operations for soil protection", "saving natural resources" and "reclaiming the wasteland".

The results of the test (mean = 3.558, N = 199) show that the average opinions of at the level of confidence which is 0.05, that is significantly different from criteria amount (3) (t = 13.354, p = 0.01) and thus test assumption is rejected the research assumption is confirmed. Thus we can say that the facilities of the Agricultural Bank had a positive impact on agricultural lands of Urmia county (Table 8).

Based on the results showed in Table 9, Gaining Agricultural Bank's facilities impact for greenhouse construction was the important impact in the rural economy.

Table 6
Single t-test statistical indicators of irrigation structures

Exam	Total Mean	Standard Deviation	T Calculated	Freedom Degree	Significant Level
One-Sample Test	3.507	0.642	10.284	199	0.001

Table 7
Ranking of given facilities impact on the quality of agricultural lands

Facilities impact on the quality of agricultural lands	M	SD	C.V	R
Improving mechanical operations for soil protection	3.3	1.004	0.304	1
Saving natural resources	3.18	1.069	0.336	2
Reclaiming the wasteland	3.02	1.075	0.356	3
Using supportive tillage	2.91	1.09	0.375	4
Using Agricultural Bank's facilities to do Soil testing for fertilizer recommendations	2.8	1.098	0.392	5
Improving the operation of preparing the Ground for planting	2.7	1.08	0.400	6
Improving agricultural infrastructure	2.63	1.126	0.428	7

Source: research data – Likert -type scale: very low (1); low (2); moderate (3); high (4); very high (5); M: Mean, SD: Standard deviation, C.V: Coefficient of variation, R: Rank

Table 8
Single t-test statistical indicators about land quality structure

Exam	Total Mean	Standard Deviation	T Calculated	Freedom Degree	Significant Level
One-Sample Test	3.558	0.389	13.354	199	0.001

Table 9
Ranking the impact of given facilities on the rural economy

Facilities impact on rural economy	M	SD	C.V	R
Gaining Agri-Bank's Facilities impact for greenhouse construction	3.89	0.895	0.230	1
Building places for growing fish	3.89	0.952	0.245	2
Improving rural women's employment	3.81	0.998	0.262	3
Establishment of fruit orchards	3.61	1.031	0.287	4
Building places for housing animals	3.40	1.037	0.305	5
Establishment agricultural processing industry	3.22	0.988	0.307	6
Create savings for rural households	3.15	1.05	0.333	7
Building places for housing bees	3.14	1.134	0.361	8

Source: research data – Likert -type scale: very low (1); low (2); moderate (3); high (4); very high (5)
M: Mean, SD: Standard deviation, C.V: Coefficient of variation, R: Rank

Table 10
Single t-test statistical indicators about rural economy

Exam	Total Mean	Standard Deviation	T Calculated	Freedom Degree	Significant Level
One-Sample Test	3.690	0.332	19.889	199	0.001

The results show that the Agricultural Bank's facilities had a positive impact on the rural economy in Urmia because as we see in the table above, the relevant test P (0.001) is smaller than 0.05. This confirms this entry since the mean scores (3.690) is larger than scale mean (3). Therefore, respondents are in favor of this that facilities of Agricultural Bank have had a positive impact on the rural economy in Urmia and the hypothesis is confirmed (Table 10).

Agriculture has a direct considerable impact on food security improvement in the country, providing the basis for sustainable development, increasing prosperity in rural and urban areas. Considering this fact, the majority of economic analysts agreed that funds and facilities are an integral and essential component of economic development and agricultural areas; and they are considered as a long-term investment.

Hence, this research seeks to examine the influence of Agricultural Bank's facilities on agricultural mechanization in Urmia, to examine all aspects of this study, five hypotheses formulated and analyzed on the basis of data assembled from the sample statistics.

The findings showed that in the case of the impact of facilities on decreasing total cost and increasing production and distribution, it can be said that according to the farmers, in terms of the impact of the facilities, and its use directly for providing of goods and increasing the net profit is the priority; in defining the findings it can be said that the main purpose of the work is to gain profit and in the case of agriculture, farmers, ideally consider it as their main job, therefore, it is natural to expect to earn income according to the size of the capital investment (human resources, financial and time). In confirmation of this claim, one can refer to the findings of Okpukpara (2010) and Bakwena and Bodman (2010). The case of the findings that confirm these findings, one can refer to findings of FAO, 2011; Siddiqi et al., 2004; Saboor et al., 2009; Bashir et al., 2008.

And the findings related also indicated that according to the farmers, facilities in these areas is very fruitful and impressive, and can assist farmers in this matter. To confirm the findings of this research, one can refer to the investigation conducted by Saleem and Jan (2010). The findings of FAO (2011), Douglas (2003), Petrick (2004), also agree with these findings that most of the facilities are given to the agricultural sectors, agricultural services, related industries, and agriculture.

Another result is concentrated on examining the impact of Agricultural Bank's facilities on irrigation structures, modernization of the equipment for spraying and fertilizers and rural economy; findings related to the hypothesis testing at three cases showed loan's positive impact on the modernization of the equipment for spray, irrigation structures, and improving the quality of the field. Most of the relevant research findings also suggest that given facilities and funds in mechanization, in the quality of land, fertilizer, and spraying etc. are in accordance with the findings of this research. The case of the findings that confirm these findings, one can refer to findings of Anthony (2010).

The result that we can get from the findings of this research is that agriculture of a country is the economic infrastructure and it needs a long term and short term investment; And one of the investment approaches in this field is to provide bank facilities that will encourage farmers to do farming in large and small lands, and it will be considered as a support for present and future economy. Of course, the point that needs to be emphasized is that allocation of facilities and funds, all of the aspects of agriculture, before planting, up to withdrawal should be taken into account, and scheduled surveillance in the field of codification and execution should be done as well.

Conclusions and Recommendations

- With regard to the impact of facilities on the agricultural mechanization, free training to justify farmers to take the advantages of provided facilities could be offered.
- Due to the impact of facilities on the facility's modernization and equipping agricultural machinery and tools, reducing the use of human sources, modernization, and improvement of the packing, amenities on land cultivation, preparation for coping with natural disasters, the allocation of facilities the modernization of agricultural machinery should be the top priority.
- Based on results, it is recommended that by considering the impact of bank facilities on the modernization of irrigation systems, necessary actions should be done.
- Increase the relationship between farmers and credit branches of Agricultural Bank to increase the farmers' knowledge is recommended.
- The results showed that the Facilities of Agricultural Bank influenced the rural space and therefore it can cause the

development of less-developed regions. Therefore, it is suggested that, with regard to national measures of this matter, necessary actions should be done by officials.

References

Anthony, E., 2010. Agricultural credit and economic growth in Nigeria: An empirical analysis. *Business and Economics Journal*, **14:** 1-7.

Baiyegunhi, L.J.S., G.C.G. Fraser and and M.A.G. Darroch, 2010. Credit constraints and household welfare in the Eastern Cape province, South Africa. *Journal of Agricultural Research*, **5** (16): 2243-2252.

Bakwena, M. and P. Bodman, 2010. The role of financial development in natural resource abundant economies: Does the nature of the resource matter? *Botswana Journal of Economics* **7:** 16-31.

Bashir, M.K. and Y. Mehmood, 2010. Institutional credit and rice productivity: A case study of district Lahore, Pakistan. *China Agricultural Economic Review,* **2** (4): 412-419. doi: 10.1108/17561371011097722.

Bashir, M.K., Z.A. Gill, S.A. Hassan and A. Sultan, 2008. Impact of credit disbursed by commercial banks of the productivity of sugarcane in Faisalabad district. P*akistan Journal of Agricultural Sciences*, **44**(2): 361-363.

Beck, T. and L. Laeven, 2006. Institution building and growth in transition. *Economies Journal of Economic Growth*, **11:** 157-186.

Binam, J.N., G. Tonye, J. Nyambi and M. Akoa, 2004. Factors affecting the technical efficiency among smallholder farmers in the slash and burn agriculture zone of Cameroon. *Food Policy*, **29**(5): 531-545. http://dx.doi.org/10.1016/j.foodpol.2004.07.013

Bruhn, M. and I. Love, 2014. The real impact of improved access to finance: Evidence from Mexico. *The Journal of Finance,* **69**(3): 1347-1376. http://dx.doi.org/10.1111/jofi.12091

Carter, M. and P. Olinto, 2003. Getting institutions right for whom? Credit constraints and the impact of property rights on the Quantity and composition of investment. *American Journal of Agricultural Economics*, (11): 83-91.

Cornejo, J.F. and W.D. McBrid, 2002. Adoption of Bioengineered Crops, United States Department of Agriculture Economic Research Service Agricultural Economic Report No. (AER-810) 67 pp.

Dantwala, M.L., 1986. Strategy of agricultural development since independence, Indian agricultural development since independence: a collection of essays, New Delhi: *Oxford and IBH Publishing Co. Pvt. Ltd.*

Douglas, P., 2003. Financial services for the rural poor, helping to improve Donor effectiveness in microfinance. *Donor Brief*, No. 15.

Eynali, J., 2013. Evaluation of the role of land integration in improving the efficiency of production factors in aquatic exploitation. *Journal of Space Economics and Rural Development*, **2** (1): 51-69. (Persian).

Foltz, J., 2004. Credit market access and profitability in Tunisian agriculture. *European Review of Agricultural Economics*, (30): 229-240.

Food and Agriculture Organization (FAO), 2011. The State of Food and Agriculture 2010- 2011: Women in Agriculture: Closing the Gender Gap for Development, FAO, Rome.

Okpukpara, B., 2010. Credit constraints and adoption of modern cassava production technologies in rural farming communities of Anambra State, Nigeria. *African Journal of Agricultural Research*, **5** (24): 3379-3386.

Petrick, M., 2004. A Micro econometric analysis of credit rationing in Polish farm sector. *European Review of Agricultural Economics*, (31): 23-47.

Rhaji, M. A., 2008. An analysis of the determinants of agricultural credit approval/loan size by commercial banks in South-Western Nigeria. *Nigeria Agricultural Development Studies*, **1**(1): 17-26.

Saboor, A., M. Hussain and M. Munir, 2009. Impact of micro credit in alleviating poverty: An Insight from rural Rawalpindi Pakistan. *Pakistan Journal of Life and Social Sciences*, **7**(1): 90-97.

Saleem, M. A. and F. A. Jan, 2011. The impact of agricultural credit on agricultural productivity in Dera Ismail Khan (District) Khyber Pakhtonkhawa Pakistan. *European Journal of Business and Management*, **3**(2): 38-44.

Shahidur. R.K. and R.R. Faruqee, 2003. The impact of farm credit in Pakistan. *Agricultural Economics*, **28** (3): 197-213.

Siddiqi, M., W. Mazhar-ul-Haq and K.N. Baluch, 2004. Institutional credit: A policy tool for enhancement of agricultural income of Pakistan. *International Research Journal of Arts & Humanities (IRJAH)*, **37**: 157-174.

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