

Technology Adoption and Smallholder Productivity: An Empirical Evidence of Smallholders Horticultural Practices in Developing Economyⁱ

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This paper investigates the impact of technology adoption on smallholders' productivity in different production environments in the horticultural sector in Pakistan. The adoption of technologies and innovation is at the core of agricultural development policy, particularly in developing economies. Improvements in smallholders' agricultural productivity is necessary to achieve goals of food security and poverty alleviation. The adoption of innovations and various technology choices can improve the smallholders' productivity. We use farm-level survey data to estimate a meta-frontier in the horticultural sector of Pakistan. The estimation of meta-technology ratios is associated with the choice of technology. These data have been collected from four regions of Pakistan representing different agro-climatic zones and varying crop cultivation (including vegetables, fruits, grains, and other crops). We classify 50 different kinds of crops into four groups, including grains, vegetables, fruits, and other crops. The input variables are categorised as land acre (area of crops), labour, irrigation, fertilizers and pesticides (i.e., weedicides, herbicides, fungicide, and insecticides). We use Lowe aggregators to aggregate these crops output into four output and 6 input variables. We use data envelopment analysis (DEA) to compute technology-gap ratios in the horticultural sector. We note significant differentials in technology gap-ratios among technology adopters and non-adopters in different agro-climatic zones. Farmers in vegetable growing districts were more likely to adopt technologies compared to fruits and other crops, thus achieving higher productivity and profitability. The findings from our current study suggest that policy interventions on credit availability, extension services, marketing, and value addition strategies are important to improve farm level performance.

Key words: Meta-Frontier, Technology Gap, Smallholders, Horticultural sector, DEA

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Loans, Wealth Creation and the Socio-Economic Situation of Agricultural
Women in the Taluka Area of Khairpur District, Sindh, Pakistan: A Study
Based on Interviews with Female Focal Groups

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Abstract

This paper relies on information obtained from focal group discussions with 26 women involved in farming in four villages in the Sindh province of Pakistan. The sample was drawn from poor households possessing little or virtually no land. Focus group data were collected by using a semi-structured questionnaire. The main purpose of this paper is to identify factors that favour or impede these women taking of agricultural loans for development. The findings indicate that only women in one village had taken loans for the purpose of advancing agriculture. Distinct from other villages, the women in this village had developed strong social networks and were politically quite active. In the village Gagri, the presence of social capital played a major role in agricultural development and alleviated the poverty of their households. In the other villages, the poverty of the households of females participating in the focal focus group discussions remained entrenched. These women seemingly followed a pathway to poverty alleviation and agricultural wealth creation that could be followed by women from other villages. However, this would be a hasty conclusion because women from the other three villages face serious impediments to the creation of social capital, which are identified in this paper. An additional contribution of this paper is to identify the nature of agricultural loans and conditions, which restricted the ability and willingness of the women to take loans for agricultural development. This enables us to provide a grassroots assessment of their current situation as far as finance for women in agriculture is concerned. The results also enable us to suggest a new hypothesis (relevant to the Indian subcontinent) about the relationship between the likelihood of women from agricultural households forming social networks to promote agricultural development in order to reduce the poverty-level of their households. Moreover, the literature frequently expresses doubts about the view that male ownership of land is the major impediment to women obtaining loans for agricultural purposes. All land owned by households in this survey is owned by males. Furthermore, attention is brought to some of the difficult problems involved in measuring social capital and its components. These are often overlooked in the literature.

Keywords: Agricultural development, agricultural finance, Pakistan, poverty alleviation, small-scale agriculture, social capital, social networks, women in agriculture.

JEL Classifications: G1, O1, Q1, Z1

Microfinancing in Developing Countries: An Assessment Taking Particular Account of the Views of Becker and Posner

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Abstract

This paper assesses the views expressed by Gary Becker and Richard Posner about the economic value of relying on microfinancing for economic development as well as their opinions about its desirability as a means of alleviating poverty. It also raises some issues overlooked by Becker and Posner. Where relevant, the discussion is related to results obtained from a case study of microfinancing in the Sindh District of Pakistan. Subjects covered include the economic efficiency of the supply of microfinance, the optimality of microfinancing versus philanthropy, whether high interest rates and short-term loans for microfinance are justified, preference for females rather than males in microfinancing, social networking and the efficient provision and allocation of microfinance, and the prospects for escaping from poverty as a result of microfinancing.

Keywords: economic development, institutional financing, microfinance, Pakistan, poverty, social networks

JEL codes: G10, O11, O16

What Drives Smallholders' Productivity in Pakistan's Horticultural Sector?

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Abstract

Smallholders are indispensable to ensuring food security in the developing economies where they farm. Policy interventions often target smallholders to provide for example, input subsidies, extension services and access to credit, because increased total factor productivity (Hsieh & Klenow, 2009) can ensure that they are better placed to support food security. However, the impact of such interventions and the drivers of TFP growth are largely unknown due to lack of comprehensive data and appropriate methodology. To overcome these impediments, we propose an econometric estimation of the components of TFP growth in a Bayesian set-up and apply this to new farm-level survey data of smallholders from Pakistan's horticulture sector. The results indicate large technical and mix efficiency differentials across agro-climatic zones and farm sizes. These disparities in technical and mix efficiency are due to suboptimal farm practices, potentially from limited access to and adoption of technology. Government policy makers, support agencies, farmer groups and other stakeholders have latitude in providing adequate education and training programs aimed at improving input-use efficiency and introducing innovative practices leading to TFP growth.

Key words: Scope economies, developing economy, aggregator function, mix efficiency, TFP

JEL Classification: D31

Farmers access to credit and its impacts on fertilizer demand in Pakistan

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Agriculture is the mainstay of Pakistan's economy as it accounts for 18.9% to GDP and employs 42.3% of the labour force. However, majority of small farmers are facing financial constraint. The provision of agricultural credit can play crucial role in improving crop production through purchase of modern technological inputs like chemical fertilizers. In Pakistan, almost all soils are deficient in nitrogen, 80% to 90% are deficient in phosphorus and 30% in potassium. Balanced fertilization can considerably increase crop production. However, the purchase of fertilizers by smallholders is limited due to low farm income and better access to credit may help them to increase the fertilizer consumption to the desired level. In view of this, the proposed study evaluates the impact of credit access and amount on fertilizer consumption. By employing a multistage sampling procedure, we conducted a farm survey among a random sample of 860 farms in Punjab and Sindh provinces in 2017. About 50% sample farmers are not benefitting from the agricultural credit schemes. Results of instrumental variable regression analysis show that credit access and amount have positive impact on fertilizer demand. However, credit retrieved from institutional sources has substantial impact on fertilizer demand than that of non-institutional sources. Among institutional sources, private loan is more efficient in meeting fertilizer demand than public loan. Based on these findings, we suggest there is considerable scope to increase fertilizer demand through privatizing the agricultural credit market.

Key words: *Agricultural credit; fertilizer; institutional credit; non-institutional credit; Pakistan*

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Credit in Rural Pakistan: Barriers for Smallholder Farmers and Potential Policy Solutions

This policy brief has been prepared *as a part of ACIAR project ADP/2016-028-Creating Wealth in Smallholders Farms through Efficient Credit Systems in Pakistan*¹

Key messages

- Credit services are important for improving productivity and wealth creation for smallholder farmers.
- Microfinance services and specialized banks are main providers of credit for smallholders.
- Availability and convenience of finance plays a larger role in borrower decisions compared to interest and service costs – borrowers are susceptible to poor financial choices.
- Latent demand exists for Islamic financing services.
- Awareness of government assistance schemes is low.

Credit in developing countries enables the expansion of smallholders' opportunities to increase their farm productivity and profitability (Duflo, et al., 2006, Fakudze and Machethe, 2015). Despite the increase in sources of formal and informal agricultural financing in recent years, smallholders still have limited access to credit in Pakistan.

Background

This project aims to investigate two proven levers of smallholders' wealth creation in Pakistan in the form of more efficient credit markets and schemes that promote entrepreneurial opportunities for women. Understanding the success factors and barriers to effectiveness in these two areas will enable the design of more effective schemes and policies.

What did we observe in the 2015 ACIAR study on Pakistan smallholder productivity?

This study follows from ADP 2015/2014 which involved a large survey of smallholder farmers in the Pakistan Punjab (n=800). That study measured many factors that could affect farm productivity, including access to markets, farming practices and innovation. One finding from the results was that access to credit on reasonable terms was linked to farm productivity and profitability but less than 50% of farmers in that sample had applied for credit and most were unsuccessful.

Latent demand exists for Islamic financing services.

In the survey, 75% of farmers who had received a loan stated they would prefer Islamic finance. Only 17% of farmers had received a loan from an Islamic finance provider which means that the demand for Islamic finance is currently not being met and could be discouraging some farmers from seeking finance due to religious reasons. The evidence for this can be seen in responses from non-borrowing farmers. Only 11% of non-borrowers would consider conventional microfinance compared to nearly half (48%) who would accept Islamic microfinance.

Among Islamic finance providers, Qarde Hasan (71%) and Murabha (13%) were the most common forms of credit for smallholders.

How do smallholder farmers access credit and what do they use it for?

In the current study we extensively surveyed nearly 800 Punjab smallholders about credit, financial services and farming practices. These were mixed farms that included horticulture, livestock and grain.

Of those surveyed, 47% had taken some form of loan in the past three years. While there are many formal and informal avenues for credit, microfinance banks (44%), MFI/NGO (23%) and specialised banks (14%) accounted for most of the lending activity to these farmers.

The majority of borrowing farmers used credit for operational purposes to smooth out cash flow through the year. For example, farmers used credit to buy seeds and fertilizer and then repaid this loan at harvest time. A small number of farmers (less than 10%) used loans for capital investments. This is concerning because capital investments such as equipment and land purchases are likely to have greater effect on productivity improvement over time. Increasing credit for productive capital investment represents an opportunity for agricultural development policy.

The survey data showed that most farmers considered availability and convenience as the main reason for their choice in financial services. Fees and lending costs received less attention which means that farmers could be making bad financial choices.

Awareness of government assistance and financial literacy is low.

Farmers with experience of banks and financial services were more likely to be borrowers of money. Without experience and understanding of banks and lending, borrowing is difficult.

The State of Punjab has introduced schemes to assist borrowing but awareness of this among small holders is low. Only 23% of borrowers and 11% of non-borrowers were aware of the Punjab Kissan Package and less than half of these borrowers were registered for the package. This suggests problems with communication and access to these programs.

Akhuwat (60% of registered borrowers) and ZTBL (25%) are actively promoting the schemes and account for most of the farmers taking up the schemes.

Policy makers need to review the communication and access to these schemes if they are to be effective.

Main risks for credit default by farmers

- Climatic events such as drought and flood.
- Rising costs of inputs such as water, energy, fertilizer and pesticides.
- Outbreaks of pests and diseases.
- Financial emergencies such as medical costs and house repairs diverting loans away from farm production.

Policy recommendations

Microfinance is playing a significant role in the development of smallholder farms but farmers need better awareness to make decisions. General improvement in financial literacy will raise borrowing rates. Mobile phones and radio could be used to promote learning.

Islamic finance can play a greater role in the business of farming. There is an unmet demand and policies should be introduced to promote Islamic financial services.

Farmers are not very aware of government schemes and only some lenders appear to be promoting the financial assistance schemes. Promotion to raise awareness and cooperation with lenders is needed.

Further Information

Tisdell, C., Ahmad, S., Nadia, A., Steen, J. and Verreyne, M-L. (2017). Loans, Wealth Creation and the Socioeconomic Situation of Women in the Taluka Area of the Khairpur District, Sindh, Pakistan: A Study Based on Interviews with Female Focal Groups, Working Paper No. 62 Social Economics, Policy and Development, School of Economics, The University of Queensland, Australia.
<https://rsmg.group.uq.edu.au/files/2788/WP62.pdf>

The Access of Women to Agricultural Credit in Rural Pakistan: Challenges and Prospects

This policy brief has been prepared based on the paper, *“Loans, Wealth Creation and the Socio-Economic Situation of Agricultural Women in Pakistan”*, which is written as a part of ACIAR project DP/2016-028-*Creating Wealth in Smallholders Farms through Efficient Credit Systems in Pakistan*¹

Key messages

- Social capital and networking influence the ability of the women to obtain loans and other resources for agricultural development.
- Many women and their families with agricultural activities on smallholdings appear to be trapped into chronic poverty due to financial disadvantages.
- Government or NGOs’ support could provide information related to agricultural techniques that can improve the effectiveness of the loans to improve the livelihood of women and their families.

Credit in developing countries enables the expansion of smallholders’ opportunities to increase their farm productivity and profitability (Duflo, et al., 2006, Fakudze and Machethe, 2015). Despite the increase in sources of formal and informal agricultural financing in recent years, smallholders still have limited access to credit in developing economies. Although the capacity of women to find new business opportunities is well documented (Naudé, 2011), for a variety of reasons it is difficult for women in small-scale

¹We would like to thank Sandra Figueira for her assistance in preparing this policy brief.

agriculture to obtain credit or even to ask for it. It is therefore crucial to identify what are the conditions that enable the provision of loans to women in rural farming communities.



Background

The goal of this study was to obtain insights into demand-side credit issues faced by women involved in small-scale agricultural activities and the implications of credit supply for their ability to engage in entrepreneurial activity and wealth creation. This study was conducted in four villages of the Khairpur District of Sindh Province in Pakistan. District Khairpur is located in upper/northern Sindh on the left bank of the Indus River. The majority of people in the district are directly or indirectly dependent on agriculture for their survival. Focus group interviews with women from four villages Gagri, Faizabad, Abdul Kareen Solangi and Sanwalo Khan Jamali were conducted to investigate barriers to access agricultural credit. To obtain comparative insights, two groups were chosen that had taken loans and two groups that had not. However, only one of the groups, Gagri, had taken a loan for agricultural purposes.

Is ownership important?

This study clarified two important aspects of the dynamics of small-scale credit in developing countries. First, male ownership of the land does not impact negatively upon the accessibility to women of micro loans. Second, it also became clear that the use of land as collateral for the purpose of securing agricultural loans appears to have been over emphasised in the literature. Lenders were

more likely to consider the ability (and the willingness) of a borrower to repay the loan in full and in a timely fashion, regardless of collateral.

Social networks and agricultural loans for women

It was found that social community networks influenced the ability of women to obtain loans and other means for agricultural development. When women formed connections with other women who had successfully obtained credit, they were also more likely to be successful with their application. However, it was also observed that poverty reduced the level of the availability of resources (time and money) to engage in social networks. Conversely, as the degree of poverty of these households decline, the chances of social networks being formed for this purpose, rises.

Women Constraints to Credit Access

- Absence of profitable opportunities for agricultural investment or knowledge concerning these opportunities
- Low level of social capital and networking among the agricultural women
- Existence of high lending risk given their economic restrictions
- Low level of awareness of possible sources of finance
- Difficulties in servicing debt, especially in the early stages
- Difficulties in establishing creditworthiness
- High rates of interest and service charges

Dynamics of social capital and networks

This study also tried to understand the dynamics of the creation and development of localised aspects of social capital between the lenders and borrowers. It was shown that the past credit history of the borrowers and trust in their credit worthiness are fundamental for the establishment of women's social network. All members of a social network are expected to co-operate to provide mutual advantages to each other. Perceptions about how much potential members of a social network can be trusted to co-operate with one another

influences whether or not a social network is likely to be established. Once an effective social network is formed, it can be extended or utilized for a widening range of purposes, as evidenced by the Gagri village case. However, a strong case exists for taking into account 'good' governance, as far as economic growth is concerned. This should include (to the extent possible) an allowance for the codification of the law and its enforcement.



Financial constraints

Cash flow problems - One crucial factor that can influence the decision for a lender to provide credit is cash flow constraints. Repayment of the loans is required over a comparatively short period of time. This can create a cash flow problem (in particular, for innovative projects) because it usually takes a while before many investments in agriculture provide an adequate cash flow to service loans. In general, the poorest agriculturalists have little or no capacity to draw on other sources of income or assets to service as debt if the cash flow from a financial agricultural investment is insufficient to cover the instalments agreed to for debt repayment.

Short-term loans versus long-term loans - Loans made to women in households with little agricultural land are relatively short term, for example, for periods of 1-2 years. Long-term loans, which might increase agricultural wealth, are rare. This is perhaps due to insufficient collateral of borrowers to cover the bigger long-term loans, should they default.

Creditworthiness - The main criterion adopted by lenders for giving loans to the

women who participated in the focus group discussion appears to be their creditworthiness. Timely repayments of previous loans usually establish this. However, it can be difficult for first-time borrowers to obtain a loan. In some cases, this can be overcome by having a surety or sureties. Some group loans contain an element of this type of insurance.

High cost of borrowing - Women's reluctance to take loans is also an indicator that higher loan repayments can be a deterrent for the poor women. Given the poor socio-economic conditions in the two villages, women did not seem interested in loans due to high cost of borrowing and their ability to repay. In a third village, there was interest in taking a loan for agriculture if the women could be advised how to increase their returns from agriculture.

Policy recommendations

Local governments should support and provide information that can help the women smallholders to increase their agricultural returns by:

- Encouraging the formation of social networking among women smallholders to create more opportunities for collective action in obtaining credit
- Raising their awareness of techniques and methods that would increase their agricultural profitability, especially when credit is provided so that improved profitability can service the loan
- Developing partnerships between credit providers and extension services can enable the adoption of better farming techniques as a condition of the loan.

Further Information

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