FACTORS AFFECTING INCOME AND SAVING OF SMALL FARMING HOUSEHOLDS IN SARGODHA DISTRICT OF THE PUNJAB, PAKISTAN

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ABSTRACT

Small farmers dominate agriculture sector in Pakistan because 93% of the total farmers belong to the category of small and marginal farmers. These farmers face many problems, which include shortage of inputs, price volatility, low bargaining power and changing government policies in the favor of large farmers. As such, small farmers are trapped in vicious cycle of poverty because they have low income and savings leaving them in a weak position to invest in their farming activities. The study was designed to explore the impact of those variables, which directly or indirectly affect income, and savings of these small farmers in the province of Punjab. In this context, stratified random sampling technique was used to select district Sargodha from Punjab province. Sahiwal tehsil from district Sargodha was selected randomly and then three villages were selected randomly from this tehsil. A sample of ninty small farmers was selected randomly from these villages. Data were collected from these farmers to estimate income and saving models. Log-log form of regression was used to estimate income model and multiple linear regression was used to estimate saving model. In the income model, academic qualification, land holding, agricultural expenditures and number of family members involved in agricultural activities affected income of these small farmers significantly whereas in saving model, age, academic qualification, health expenditures, income of farmer (both from farm and off-farm sources), number of dependent members and credit installments affected savings of these farmers significantly. It was suggested that new technology should be provided to small farmers on easy conditions so they can adopt new agricultural production practices to enhance productivity hence their income and savings.

Keywords: Small farmers, income, saving, log-log regression model

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INTRODUCTION

Agriculture is the base of economic activity in Pakistan. Almost 65.9 percent of country's population living in rural areas depends wholly or partially, on the earnings from agriculture sector. In the export earnings, direct as well as indirect share of agriculture is very high. Agriculture also contributes to growth as a supplier of raw materials to industry as well as market for industrial products. Nearly 20 percent of total output (GDP) and 44 percent of total employment is generated by agriculture sector. Therefore, the development of this sector is imperative for economic development of Pakistan (GoP, 2010).

In Pakistan, majority of the cultivators belong to the category of small or marginal farmers having land less than 12 acres. Importance of these small farmers can be noted by the fact that out of total cultivated area of 40.76m acres, 19.79m (48.56 %) is cultivated by these small landholders. There are 6.62m farms in Pakistan, out of which 85.69 percent (5.6 m) is cultivated by small farmers. In Punjab 85.39 percent of the total farms (3.29m) belong to category of small farms (GoP, 2000).

Agricultural productivity in developing countries is low not only because of the large number of people in relation to available land but also because agriculture sector in these countries is often characterized by primitive technologies, poor organization, and limited physical and human capital inputs and Pakistan is no exception to these conditions. These small farmers who constitute more than three fourth of farming community in Pakistan generally depend upon small scale, non- commercial, traditional agricultural practices. All these factors lead to low productivity, affecting levels of income and saving of farmers especially smaller ones and pushing them in vicious circle of poverty (Todaro, 1997). These small farmers also lack access to financial sources making them dependent on traders, processors and input suppliers. These traders provide credit to farmers on the condition that at the time of harvest, they will sell their produce to those traders only (Pearce, 2003).

All these factors lead to low production putting small farmers at stake of market players, who already face a financial crisis. These meager financial sources coupled with volatile factor and product markets make small farmers vulnerable and unable to adopt new techniques of production. As a result, these small farmers experience low production, which leads to low income and savings. This further leads to low investment per hectare again causing low production, income and savings, this circle continues and these farmers remained under the unbearable burden of poverty. In order to provide these small farmers a viable future, there needs integrated effort by governments, NGOs and the private sector to create a more enabling economic environment for their development (Hazell, 2005). In this background, study in hand was conducted to investigate the impact of major factors which affect income and savings of small farmers in the Punjab province of Pakistan.

MATERIALS AND METHODS

Classification of the population is the first step in sampling procedure, (Kinnear and Taylor, 1987). Population for the study in hand was the small farmers in the Punjab province of Pakistan. Sargodha district was selected from the Punjab province as representative of agricultural practices in the province and then Sahiwal tehsil from the district was selected randomly. Further three villages were selected randomly to collect data from ninety small farmers who were selected using random sampling technique.

Personal interviews method was applied to collect information from the farmers. Ordinary least-square regression procedure was used for data analysis. In this study, two models were estimated, one to estimate the factors affecting income of these small farmers and second to evaluate the impact of major variables on savings of the respondents. Scatter plot between independent variable and its dependent variables for income model suggested a log-log form of regression model whereas a multiple linear regression form was found suitable for saving model. The specific form of the income model is given as under:

$$\text{Ln INC} = \beta_0 + \beta_1 \text{Ln AGE} + \beta_2 \text{Ln AQ} + \beta_3 \text{Ln LH} - B_4 \text{Ln FME} - B_5 \text{Ln AE} + \beta_6 \text{Ln FMIA} + \varepsilon$$

Where;

INC   = Income of farmer (both from farm and off-farm sources in Rs/Year)
AGE   = Age of respondent (Years)
AQ   = Academic qualification (No. of schooling years)
LH   = Land holding (Acres)
FME   = Family expenditures (Rs/Year)
AE   = Agricultural expenditures (Rs/Year)
FMIA   = Family members (number) involved in agricultural activities

The specific form of the savings model is given as under.

$$S = \Upsilon_0 + \Upsilon_1 \text{AGE} + \Upsilon_2 \text{AQ} - \Upsilon_3 \text{FCE} - \Upsilon_4 \text{HE} - \Upsilon_5 \text{NFE} + \Upsilon_6 \text{INC} - \Upsilon_7 \text{NDM} - \Upsilon_8 \text{CI} + \mu$$

Where;

S   = Saving of farmers both from farm and off-farm resources (Rs / year).
AGE   = Age (Years)
AQ   = Academic qualification (No. of schooling years)
FCE   = Food consumption expenditures (Rs/Year)
HE   = Health expenditures (Rs/Year)
NFE   = Non-Food expenditures (Rs/Year)
INC   = Income of farmer (both from farm and off-farm sources in Rs/Year)
NDM = Number of dependent members
CI   = Credit installments (Rs/Year)

RESULTS AND DISCUSSION

The study in hand was conducted to quantify the impact of various factors affecting income and saving of small farmers in the Punjab province of Pakistan.

Income Model

In the estimated income model for small farmers, R2 was 0.57 and adjusted R2 as 0.53. The coefficient of determination (R2) may be interpreted as the proportion of total variability in the dependent variable that can be accounted for by the set of independent variables (Chattarjee and Price, 2000). It is good practice to use adjusted R2 rather than R2 because R2 tends to give an overly optimistic picture of the fit of regression, particularly when the number of independent variables is not very small compared with number of observations (Theil, 1978). Durbin Watson statistics was used to show autocorrelation in the data series. In the estimated model, DW statistics was 2.07, which showed that there was no problem of autocorrelation in the given data set.

The results of the income model reveal that the age of farmers has a positive impact on the total income of farmers, although the elasticity coefficient is non significant. Age is considered to be an important factor in displaying the features of one's personality. Farming is practiced on traditional lines in Pakistan, and most of the work is of physical nature, from cultivation to handling of crops; so young age group is more zealous and earnest in their work and can handle farming activities more efficiently. The coefficient for age explains that for every one percent increase in age, income increases by 15 percent. The elasticity coefficient for academic qualification is positive and significant at five percent level. This reveals that increase in academic qualification has positively contributed in enhancing income of farmers. A more qualified farmer is capable to use specific agricultural practices like usage of appropriate pesticides and good quality seeds and also has technical know how about the latest agricultural implements and practices. The model explains that one percent increase in academic qualification causes 0.40 percent increase in the income, keeping all other factors constant. Land holding is an important factor, more the land holding more will be the chances for a farmer to cultivate not only a variety of different crops but in large quantity also. More output as a result of more land under cultivation means more marketable surplus leading to more income of farmer. The value of elasticity coefficient for land holding was 0.312. The coefficient was significant at five percent level. The elasticity coefficient implies that one percent increase in land for cultivation results into an increase of 31.2 percent in income, keeping all other factors constant.

Family expenditures influence the income, including living style and consumption pattern of respondents. The value of this coefficient is 0.116 and has a negative sign which shows that more the family expenditures less will be the income. This coefficient explains that for every one percent increase in family expenditures,

there may be 11.6 percent decrease in income of small farmers. Agricultural expenditure is the most important factor, which influences the income of the farmers. It is the basic element and the major determinant of the income in the agriculture sector. Agricultural expenditures include cost of production and more cost means more financial requirements for different agricultural inputs and less profit. Good quality seeds, pesticides, preparation of land, fertilizers, water and healthy livestock are no doubt necessary for land cultivation but these expenditures remain economical to a specific point and beyond this it will be just like increasing sunk costs. The value of coefficient for agricultural expenditures is 0.294 with a negative sign. This coefficient explains that for every one percent increase in agricultural expenditures, income of the small farmers reduces by 29 percent, keeping all other factors constant. The value of coefficient of family members involved in agricultural activities is 0.267 and has a positive sign, which shows that more the family members more will be the income. Model shows that one percent increase in members causes 26.7 percent increase in the income, keeping all other factors constant. This factor directly affects the income of farmers.

Table 1. The estimated coefficients of income model.

Variables	Coefficients	Std. Error	T-Statistics	P-Value
Constant	5.740	1.2963	4.440	0.00
Ln (AGE)	0.156	0.166	0.941	0.351NS
Ln (AQ)	0.403	0.173	2.338	0.023*
Ln (LH)	0.312	0.138	2.261	0.028*
Ln (FmE)	-0.116	0.101	- 1.149	0.255NS
Ln (AE)	- 0.294	0 .070	- 4.199	0.000*
Ln (FmA)	0.267	0.128	2.097	0.040**

* highly significant, ** significant at 5% level of confidence, NS non-significant

Saving Model

The coefficient of determination (R^2) is 0.79 which states that given independent variables; explain 79 percent variation in the saving of small farmers. The Durbin Watson statistics (2.02) was also normal showing absence of autocorrelation in the data series. The empirical results indicate that the age of farmers has a positive impact on the saving of farmers. The coefficient is significant at five percent level with a positive sign. The model explains that one year increase in age, increases 711 rupees in the saving, keeping all other factor constant. Age is considered to be an important factor in displaying the features of the personality. As a person becomes mature, he gains wisdom in planning about life which increases their intention to save more and at the same time young age group incurs more expenditures than that of aged. The major reason of reduction in farming families' savings is because of reduced need for precautionary saving (Sand, 2002). The coefficient for academic qualification is positive and is non significant at five percent level. This reveals that increase in academic qualification has positively contributed in enhancing saving of farmers. Every one-unit increase in academic qualification i.e. one schooling year increases the

saving by 745 rupees, keeping all other factor constant. A qualified farmer is more able to use different budgeting techniques thus save more. Furthermore, consumption pattern of a qualified person is far better than that of an unqualified person. Qualification of the respondents directly improves their efficiency that causes increase in income hence saving also improves. Most people save to cover the future expectation e.g., education and marriage (Siddiqui and Siddiqui, 1993). Domestic saving is a major source of investment in Pakistan (Nasir and Khalid, 2004). However, due to low levels of income in Pakistan, people are unable to pay attention to save money (Shahid, 2010).

The value of coefficient for food consumption expenditures is 0.569 with negative sign. The coefficient is highly significant. The coefficient implies that increase in food consumption results into decrease in saving. One unit increase in food consumption i.e. one-rupee causes 0.569 rupees decrease in the saving, keeping all other factors constant. Food consumption expenditure which varies from family to family directly affects the saving of a respondent, more the consumption expenditures less will be the saving.

Table 2. The estimated coefficients of the saving model.

Parameter	Coefficients	Std. Error	T-Statistics	P-Value
Constant	46170.19	16174.45	-2.855	0.005
AGE	711.394	272.238	2.61	0.011**
AQ	745.570	885.596	0.842	0.402NS
FCE	-0.569	0.135	-4.225	0.000*
HE	-1.585	0.813	-1.949	0.055**
NFE	-1.344	0.715	-1.880	0.064***
INC	0.286	0.018	15.867	0.000*
NDM	-266.692	157.110	-1.690	0.095***
CI	-0.817	0.109	-7.464	0.000*

* highly significant, ** significant at 5% level of confidence,
*** significant at 10% level of confidence, NS non-significant

Health expenditures in a poor society are main obstacle in saving, especially in the rural areas where sanitation and availability of pure drinking water is scarce. In absence of proper health facilities, people move to private hospitals, which increase their expenditure on health activities. The value of coefficient for health expenditures is 1.585 and had negative sign. The coefficient is significant at ten percent level. This coefficient implies that one unit increase in health expenditures i.e. one rupee causes 1.585 rupee decrease in the saving, keeping all other factors constant.

Another important factor is different types of non-food expenditures like family functions, maintenance of different farm tools and for the medical treatment of animals. These expenditures are also considered having a negative relationship with the saving of farmers. The value of this coefficient is 1.344 and has negative sign. The coefficient is significant at ten percent level. The coefficient implies that

one unit increase in these expenditures i.e. one rupee results 1.344 rupee decrease in the saving, keeping all other factors constant. The value of coefficient for income is 0.268 and has positive sign. The coefficient is highly significant. This coefficient implies that one unit increase in income i.e. one rupee causes 0.268 rupee increase in the saving, keeping all other factors constant. Income is major determinant of saving; more the income more will be the saving of respondent. Private saving can be likely to grow up regularly as a result of rising per capita income, falling dependency burden and macro stability (Sarfraz *et al.*, 1997).

umber of dependent members is another important factor in determining the level of savings. Due to high birth rate in villages and unemployment, dependency rate is also high. In a family when there are more dependent members, there will be more expenditure, which result into low savings. The value of this coefficient is 266 and has negative sign. The coefficient is significant at ten percent levels. This coefficient implies that one unit increase in dependent members i.e. one member causes 266 rupees decrease in the saving, keeping all other factors constant. The rate of private saving is still very low in Pakistan (Hussain, 1996).

Credit installment is another important variable. Farmers due to lack of finance take credit from different institutes to purchase the agricultural crop inputs. This is due to many reasons, first in the absence of subsidy they need credit, secondly some cash crops like sugarcane when sold to different sugar mills they do not make payments in time and a payment gap is of six month and even one year is common but farmers need cash for further crop cultivation and thirdly some time at the time of sale prices of the produce go down and they have to face losses which increases their requirement for credit. Coefficient for monthly installments for credit is 0.817 with a negative sign. The coefficient is highly significant. The coefficient implies that one unit increase in credit installments i.e. one rupee causes 0.817 rupees decrease in the saving, keeping all other factors constant.

CONCLUSION

Agricultural expenditures showed negative sign with income of the small farming households. The reason for this is high prices and low quality farming inputs like fertilizers, seed and pesticides. As a result these inputs do not cure diseases, which result into low productivity, leading to extra financial burden on farmers by increasing cost, which reduces income and saving of farmers. So provision of quality inputs at fair prices should be the focus of agricultural policies.

Results of the study showed that monthly credit installments had negative impact on income. So farming households should be provided credit at minimum interest rate so that investment per acre can be increased which is necessary to boost productivity. In addition to this, it is also necessary to simplify the existing cumbersome process of loan acquisition. Banks advancing agricultural loans, should provide sufficient amount of finance to farmers hording less than 12 acres land.

Agricultural machinery like laser levelers, tractors, thresher, etc. which are important tools for cultivation are unaffordable for poor small farmers due to which production remains low, so government should give either subsidy or provide these instruments at easy installments. Policy initiatives should be taken to provide technical education i.e. the use of different types of agricultural machinery at gross root level, which will enhance capability, and capacity of small farmers.

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