Women's Time Allocation in Agricultural Activities in Tehsil Mian Channu, Pakistan: An Economic Analysis

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ARTICLE INFO	ABSTRACT
	Women play a significant role in agriculture as they assume various activities in agriculture such as cleaning of fields, fields preparation, sowing, weeding, harvesting, picking, cleaning of grains, drying of grains etc. but, unfortunately, they remain invisible workers. Their participation as decision-makers concerning these activities is also uncertain. This study is an economic analysis of women's time allocation in agricultural activities in tehsil Mian Channu, Pakistan. A questionnaire is used to collect data from a random sample of 250 female respondents. The study points out the active participation of females in agriculture activities. Age of the woman and education of woman has a negative sign in crop production activities. Age of the woman and education of woman exhibit a positive association with women time allocation in non-crop production activities. Dependency Burdenis positively related to women participation in both crop production activities and non-crop production activities. The results also reveal that the number of adult males in a household is negatively related to woman's time allocation and a tenant woman allocates more time to crop production activities than non-crop production activities.

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1.   Introduction

The role of females in economic development and particularly in agriculture sector development has gained much attention all over the world. They have contributed significantly to most economic activities but their efforts have not been recorded on the overall economic scale. Poverty is a common problem among developing countries but women have taken a leading role in providing income and food for the household. They spend long hours in various activities including selling and marketing goods in urban areas (Blackden, 2003).They participate in the processing and production of food. They have become entrepreneurs and give an ample share to their families.

In agriculture, women are facing many problems e.g., lack of access to land, financial resources, agricultural training, education and many other gender-specific obstacles. In developing countries, 10 percent to 20 percent of the farmers or landholders are women. If the

female farmers are not empowered, they are unable to get a chance of contract farming and consequently, they do not get high wages and income (M. Alston, 1995). Women may earn extra income by selling animals and engaging themselves in poultry farm works, marketing work and household activities (Fresco, 1986).

The major challenge that females face in rural areas is that their work is neglected. Health is another problem that rural women face. They do not take a proper and healthy diet in their life which become the cause of various diseases. In Pakistan, most rural females are illiterate due to a lack of educational facilities. Therefore, they have to rely on their casual learning system (Fresco, 1986). Lack of access to agriculture inputs and finance is another major problem faced by women in agriculture. Women farmers are not able to get credit easily due to many factors like limited education, high transaction, and irregularity of employment and nature of women business. They have less access to different agriculture inputs such as fertilizers, machinery and pesticides. Moreover, they have also less access to agricultural information and agricultural extension services (Ugwu, 2012).

Finance is also a constraint for women as they are unable to use drought-resistant seeds, fertilizers and other modern tools and technology of agricultural farming for efficient crop production. If women have given chance to use the available resources like man, this may enhance food production up to 30% by women. In most countries, different NGOs and organizations are working to provide educational support and agricultural training to the small landholder female workers (Burton & Reitz, 1981).

In the major part of the world, women play an effective role in the agriculture sector including agricultural processing and trading but their efforts in agriculture are neglected by the government due to the male dominating society. In developing countries, the participation of females in the agriculture sector is overwhelmed but in different training programs, they have been excluded from getting access from modern technologies of food production, crop cultivation, marketing work, poultry management (Kumar, 1992).

Farm women have to face many health problems that decrease their productivity. Due to a lot of work on the farm, women face many physical injuries and sickness. They put up with many health issues due to the incidence of work. They endure many diseases like skin allergy, asthma and cough while performing farm activities. They work a full day in the fields which cause many health issues for them. They perform off the farm and home activities without taking care of their health and resultantly their health badly affect. They are confined to local markets where prices are lower than urban markets due to limited access to advanced technology and low market opportunities (Duckett, 2001).

It is admitted that small farmers and particularly farm females are not getting enough support from the agricultural system in developing countries. The discouragement of farm females is due to a lack of financial resources and moral support so they have become a neglected part of the farming community.

This study is about the women contribution to the agricultural sector in Tehsil Mian Channu. According to the best of knowledge, this type of study has not been conducted in Tehsil Mian Channu to analyze women participation in pre-harvest and post-harvest crop activities, household, livestock, and marking activities. The remainder of the study is organized as follows. The study is divided into five sections: Section two contains the reviews of the literature. In section three, data and the methodology has been explained. Section five encompasses the preliminary analysis and econometric analysis of women's contribution to the agriculture sector. Finally, we have a conclusion and the policy implications of the study.

2. Review of Empirical Literature

Table 1 exhibits the review of studies that investigate the impact of women empowerment in the agriculture sector.

Table 1:
Studies on Women Contribution in Agriculture

Reference(s)	Country/ Area	Time Period/Obs.	Methodology	Impact of Women Empowerment and Agriculture
Alston (1890)	Behar (India)	1960 -1970	OLS	(+ive)
Moock (1976)	USA	2014-2017	OLS	(+ive)
Bruton and Reitz (1981)	Singapore	1960-1970	OLS	(+ive)
Ember (1983)	Karnataka	1988-1998	OLS	(+ive)
Fabiyi (1987)	India	1961-2001	OLS	(+ive)
Das (1991)	India	1974-1983	OLS	(+ive)
Liepins (1996)	South Asia	1992-1997	Panel Data Analysis	(+ive)
Singh (1999)	Tanzania	1987-1997	OLS	(+ive)
Enete (2002)	Tanzania	2010-2014	OLS	(+ive)
Saryu and Kalkaji (2003)	Poonch Jammu	100	OLS	(+ive)
Dass (2007)	Lahore Pakistan	1996-2001	OLS	(+ive)
Kishtawaria (2007)	Pakistan	1980-1986	OLS	(+ive)
Fenton et al. (2007)	China	1996-2002	OLS	(+ive)
Fabiyi (2007)	Philippines	1969-1973	OLS	(-ive)
Damisa (2007)	Asia	1999-2002	Panel data Analysis	(+ive)
Parakh (2008)	Danish	150	OLS	(+ive)
Amin et al. (2009)	Bangladesh	1993-1998	OLS	(+ive)
Amin (2009)	Latin America	1999-2007	Panel data Analysis	(+ive)
Alston (2010)	Hyderabad India	2003-2004	OLS	(-ive)
Chayal and Dhakha (2010)	South India	1928-1963	Log linear Method	(-ive)
Satyvathi et al. (2010)	Bangladesh	1975-1965	OLS	(+ive)
Alkire and Peterman (2011)	South Asia	1973-1975	Panel data Analysis	(-ive)
Farnworth et al. (2014)	District Peshawar	1989-1991	OLS	(+ive)
Gosh and Gosh (2014)	China	1920-1960	OLS	(-ive)
Rana and Dilbagh (2017)	Philippines	2001-2010	OLS	(-ive)

The review of the literature shows that women participate in each agricultural activity. Women are in charge of food security at home, produce and prepare food. They are well aware of the economic importance of the agriculture sector.

3. Model Data and Methodology
3.1 Model Specification

In an individual supply of labour analysis, it is an important decision of an individual to decide about her time allocation for working in the labour market at a wage rate or choose her time for leisure. Both the working hours and leisure hours are related to utility function as being

economic goods. In other words, a person works and get money for the consumption of commodities (L) and get utility. If a person does not work but prefer to choose leisure (*l*), this also gives her utility. The person knows that each extra hour of leisure will decrease her income and consumption. So, the hourly wage exhibits the opportunity cost of leisure. Assume that utility is a function of income *x* and leisure *l* while labour hour is denoted by L.

$$U = U(x,l) \tag{1}$$

Income is generated by working $(T-l)$ hours at wage *w* per hour. Non-wage income (*π*) is determined autonomously for individual choice.

The utility maximum problem is:

Maximize $\quad U = U(x,l) \text{ s.t } x = wL + \pi = w(\text{T-l}) + \pi \tag{2}$

Lagrangian function of labour-leisure model is:

$$L = U(x,l) + \lambda \left[\pi - x + w(T-l) \right] \tag{3}$$

The FOCs are:

$$U_x - \lambda = 0 \tag{4}$$

$$U_l - \lambda w = 0 \tag{5}$$

Constraint is given by: $\pi - x + w(T-l) \tag{6}$

Assuming second-order conditions hold, the Marshallian demand function (MDF) for leisure is:

$$M^l = M^l(w,x) \tag{7}$$

$$M^l = M^l(w, wT + \pi) \tag{8}$$

Taking partial derivative of MDF for leisure w.r.t wage (w):

$$\frac{\partial M^l(w,x)}{\partial w} = \frac{\partial M^l}{\partial w} + \frac{\partial M^l}{\partial x} \frac{\partial x}{\partial w} \tag{9}$$

The Hicksian demand functions (HDF) are derived from duality:

$$H^l(w,\bar{u}) = M^l(w,x) = M^l \left[w, e(w,\bar{u}) \right] \tag{10}$$

Taking the partial derivative of HDF for leisure w.r.t wage (w)

$$\frac{\partial H^l(w,\bar{u})}{\partial w} = \frac{\partial M^l \left[w, e(w,\bar{u}) \right]}{\partial w} \tag{11}$$

$$\frac{\partial H^l}{\partial w} = \frac{\partial M^l}{\partial w} + \frac{\partial M^l}{\partial x}\frac{\partial x}{\partial w} \tag{12}$$

$$\frac{\partial H^l}{\partial w} = \frac{\partial M^l}{\partial w} + \frac{\partial M^l}{\partial x}\frac{\partial e(w,\bar{u})}{\partial w} \tag{13}$$

$$\frac{\partial H^l}{\partial w} = \frac{\partial M^l}{\partial w} + \frac{\partial M^l}{\partial x}M^l \tag{14}$$

$$\frac{\partial M^l}{\partial w} = \frac{\partial H^l}{\partial w} - \frac{\partial M^l}{\partial x}M^l \tag{15}$$

By plugging in the value of x in MDF for leisure, we get:

$$\frac{\partial M^l}{\partial w} = \frac{\partial H^l}{\partial w} + \frac{\partial M^l}{\partial x}T \tag{16}$$

From Eq (15) and Eq (16), we find:

$$\frac{\partial M^l}{\partial w} = \frac{\partial H^l}{\partial w} + \frac{\partial M^l}{\partial x}(T - M^l) \tag{17}$$

Since optimal level of leisure l^* is given by MDF for leisure, therefore:

$$\frac{\partial M^l}{\partial w} = \frac{\partial H^l}{\partial w} + \frac{\partial M^l}{\partial x}(T - l^*) \tag{18}$$

$$\frac{\partial M^l}{\partial w} = \frac{\partial H^l}{\partial w} + \frac{\partial M^l}{\partial x}L^* \tag{19}$$

PE = SE + IE in terms of labour $\tag{20}$

To observe the women's time allocation in agricultural activities in tehsil Mian Channu, the following models are proposed. We have divided these models into crop production activities-based models and non-crop production activities-based models. The general form of women's time allocation in agricultural activities can be written as:

$$TimeH = f(EDU, DEPB, AGE, ADLM, TENSTA) \tag{21}$$

In the econometric form, the model can be written as:

$$TimeH = \beta_0 + \beta_1 EDU + \beta_2 DEPB + \beta_3 AGE + \beta_4 ADLM + \beta_5 TENSTA + \varepsilon \tag{22}$$

A)   Crop Production Activities-Based Models

$$CPA = \beta_0 + \beta_1 EDU + \beta_2 DEPB + \beta_3 AGE + \beta_4 ADLM + \beta_5 TENSTA + \varepsilon \tag{23}$$

$$WCPA = \beta_0 + \beta_1 EDU + \beta_2 DEPB + \beta_3 AGE + \beta_4 ADLM + \beta_5 TENSTA + \varepsilon \tag{24}$$

$$CCPA = \beta_0 + \beta_1 EDU + \beta_2 DEPB + \beta_3 AGE + \beta_4 ADLM + \beta_5 TENSTA + \varepsilon \tag{25}$$

B)   Non-Crop Production Activities-Based Models

$$NCPA = \beta_0 + \beta_1 EDU + \beta_2 DEPB + \beta_3 AGE + \beta_4 ADLM + \beta_5 TENSTA + \varepsilon \tag{26}$$

$$HHA = \beta_0 + \beta_1 EDU + \beta_2 DEPB + \beta_3 AGE + \beta_4 ADLM + \beta_5 TENSTA + \varepsilon \tag{27}$$

$$LSA = \beta_0 + \beta_1 EDU + \beta_2 DEPB + \beta_3 AGE + \beta_4 ADLM + \beta_5 TENSTA + \varepsilon \tag{28}$$

$$MKTA = \beta_0 + \beta_1 EDU + \beta_2 DEPB + \beta_3 AGE + \beta_4 ADLM + \beta_5 TENSTA + \varepsilon \tag{29}$$

3.2   Data and Methodology

We have got the data from 250 female respondents to examine their time allocation in agricultural activities in tehsil Mian Channu. The questionnaire is used as a research tool to obtain information. The ordinary least square method is used. Table 2 gives the construction of variables.

Table 2:
Construction of Variables

Variable	Description	Coding	Expected Sign
Dependent Variables			
Crop Production Activities			
TimeH	Time Allocation in Agricultural Activities (in Hours)	As it is	
CPA	Total Hours spent in Crop Production Activities (Average)	As it is	
WCPA	Total Hours spent in Wheat Crop Production Activities (Average)	As it is	
CCPA	Total Hours spent in Cotton Crop Production Activities (Average) by a Woman	As it is	
Non-Crop Production Activities			
NCPA	Total Hours spent in Non-Crop Production Activities by a Woman	As it is	
HHA	Total Hours spent in Household Activities by a Woman	As it is	
LSA	Total Hours spent in Livestock Activities by a Woman	As it is	
MKTA	Total Hours spent in Marketing Activities by a Woman	As it is	
Independent Variables			
AGE	Age of Woman	As it is	+/-

EDU	Education of Woman	1=Literate 0 =Illiterate	+/-
DEPB	Dependency Burden	Non-Earning People/Family Size	+
ADLM	Number of Adult Males in Household	As it is	-
TENSTA	Tenure Status of Woman	0 for owner 1 for tenant	+

3.3   Profile Area of City Mian Channu

This city was named after the Sufi saint Baba Mian Channu who has lived and buried there. It was said that the English rulers tried to alter the name of the city but failed. Since that time, this area is known as Mian Channu. Mian Channu city has different educational institutes, public library, medical units, railway station, fruits market and parks. To perform religious obligations, mosques and Gurdwara are also there. It was declared as a town and subdivided into thirty-six union councils. The population of this city is 99thousandapproximately in 2020. Mian Channu had been part of Multan district from 1 June 1985 but nowadays Khanewal is the district of Mian Cha 3.33 nnu.This city has a major contribution towards the production of cotton, wheat and mangos. The first agriculture-based tool industry of Pakistan was constituted in Mian Channu with the name of Ghazi limited industry, constructed by Ghazi Mustafa Ghazi. He was a very famous industrialist and warrior of the 1947 freedom struggle.

Figure 1: Mian Channu City Map

4.   Results and Discussions
4.1   Women's Contribution in Various Agricultural Activities: A Preliminary Analysis

In this section, we describe the females' participation in agricultural activities in Tehsil Mian Channu.

A)   Time Allocation in Pre-Harvest Crop Production Activities

Women's time allocation in pre-Harvest crop production activities is given in Table 3. The table points out that most women are engaged in the production of wheat crop. A woman spends 11.89 hours in the production of wheat in a season per acre.

Table 3:
Average Time Spent on Per Acre in Pre-harvest Activities (in hours)

Activities	Cotton	Wheat
Land Preparation	3.88	4.95
Sowing	1	2
Weeding	1	2
Manuring	2	1
Ploughing	2	1.94
Total	9.88	11.89

Similarly, a woman dedicates 9.88 hours to cotton production. The table shows that pre-harvest crops activities are land preparation, sowing, weeding, manuring and ploughing. Land preparation requires long hours (4.95 hours in wheat and 3.88 hours in cotton) in the fields and involves difficult posture in handling with traditional implements.

B)   Time Allocation in Post-Harvest Crop Production Activities

Table 4 exhibits the women's time allocation in post-harvest crop production activities. These activities include harvesting, collection of harvested crops, threshing, making bundles, transportation and storage.

Table 4:
Average Time Spent on Per Acre in Post-harvest Activities (in hours)

Activities	Cotton	Wheat
Harvesting	4	3
Collection of Harvested Crop	2	2
Threshing	1	0
Making Bundles	1	0
Transportation	1	1
Storage	1	0
Total	10	6

The table uncovers that a woman elapses 10 hours per acre on average in the cotton crop in post-harvest activities relative to wheat crop where the average per acre time allocation is 6 hours. Moreover, it is evident that among post-harvest activities, most of the time is spent in harvesting (4 hours in cotton crop and 3 hours in wheat crop).

C)   Time Allocation in Various Household Activities

Women's time allocation in various household activities is given in Table 5. These activities encompass cleaning the house, cooking, dishwashing, embroidery, sewing, knitting, childcare and laundry.

Table 5:
Average Time Spent on Various Household Activities

Activities	Daily Time Spent (in Hours)
Cleaning House	1.1
Cooking	2.05
Dish Washing	1
Embroidery, Sewing and Knitting	2.1
Childcare	2.6
Laundry	1
Total	9.85

The females reallocating more time to childcare and cooking activities (2.6 hours in childcare and 2.05 hours in cooking). The average time spent on various household activities is 9.85 hours every day.

D)   Time Allocation in Livestock Activities

Table 6 demonstrates women's time allocation in livestock activities. These activities are animal feeding, collection of eggs, animal watering, preparation of yoghurt, animal milking, chick feeding, watering, draining, yoghurt planning, cleaning shed cleaning milk, chick feeding building sheds, cleaning sheds, dung collection, making dung cakes.

Table 6:
Average Time Spent on Livestock Activities

Activities	Daily Time Spent (in Hourly)
Animal Feeding	1
Collection of Eggs	1
Animal Watering	1.32
Preparation of yoghurt	1.98
Animal Milking	2
Chick Feeding	2
Building Sheds	0
Cleaning Sheds	1
Dung Collection	0
Making Dung Cakes	0
Total	9.85

Table 6 displays that the females are allotting more time to the preparation of yoghurt activities (1.9 hours). The average time spent on various livestock activities is 9.85 hours every day.

E)   Time Allocation in Marketing Activities

Women's time allocation in various marketing activities is given in Table 7.   These activities consist of chick selling, milk selling, ghee selling, cattle selling, cattle purchasing.

Table 7:
Average Time Spent in Marketing Activities

Activities	Daily Time Spent (in Hours)
Chick Selling	0.00
Milk Selling	1.68
Ghee Selling	0.00
Cattle Selling	0.00
Cattle Purchasing	0.00
Total	1.68

The females are allocating more time only to milk selling activities (1.68 hours). Moreover, the table highlights that the women are not doing any other marketing activities. The average time spent on various marketing activities is also 1.68 hours every day.

4.2 Women's Contribution in Various Agricultural Activities: An Econometric Analysis

In this section, we have done an econometric analysis by investigating the women time allocation in crop production activities and non-crop production activities. We have disaggregated the crop production activities into wheat crop production activities and cotton crop production activities. Similarly, non-crop production activities by a woman are also disaggregated into household activities, livestock activities and marketing activities.

Table 8 and Table 9 indicate the OLS estimates of women's contribution in crop production activities and crop production activities respectively. The age of the woman has shown a negative sign in crop production activities in aggregated and disaggregated. As the age of the woman increases, she is unable to work physically in the crop fields due to weakness and physical deterioration in body and therefore, its participation in crop production activities reduces. However, in non-crop production activities, the age of the woman has turned up with positive sign except for household activities. This is because as the age of a woman increases, she tends more towards non-crop production activities as these involve mental rather than physical exercise (Das, 2015).

The education of woman (EDU) is negative and highly significant in all specifications of crop production activities. The negative association between age and women participation is due to the fact as the women get more education, she is not willing to work in the fields or she may have less time to work in the fields due to time constraints. These results are in line with the study (Khan, Sajjad, Hameed, Khan, & Jan, 2012). In non-crop production activities, education of woman (EDU) is positive and highly significant in all specifications except household activities. It suggests that educated women are more inclined to livestock activities and marketing activities. Education women become entrepreneurs easily as they can identify the opportunities and exploit them due to start-up skills, the efficiency of decision making and business management and innovation (Bhardwaj, 2014; Chaudhry, Khan, & Abella, 1987).

Table 8:
OLS Estimates of Women's Contribution in Crop Production Activities

	Aggregated Analysis	Disaggregated Analysis	
Variable	Crop Production Activities (CPA)	Cotton Crop Production Activities (CCPA)	Wheat Crop Production Activities (WCPA)
C	1.7338 (0.0000)	1.4715 (0.0000)	1.9962 (0.0000)
AGE	-0.0014 (0.0948)	-0.0031 (0.0711)	-0.0003 (0.0899)
EDU	-0.0095 (0.0674)	-0.0141 (0.0473)	-0.0048 (0.0787)
DEPB	0.0410 (0.0352)	0.0688 (0.0105)	0.0132 (0.0600)
ADLM	-0.0051 (0.0087)	-0.0053 (0.0444)	-0.0048 (0.0586)
TENSTA	0.0094 (0.0857)	0.0169 (0.0255)	0.0019 (0.0954)
Diagnostic Statistics			
R-Square	0.16	0.27	0.30
D.W	1.90	1.98	1.83
Prob(F-Stat)	0.00	0.00	0.49

Dependency Burden (DEPB) has appeared with a positive sign in all the specifications of crop production activities. The positive association between dependency burden and woman participation maybe since as the number of dependent people in a household increases, the woman face financial constraints and she is compelled to do work or she participates by her will to reduce the economic burden of the household (Faridi, Chaudhry, & Anwar, 2009). In other words, if a household has sound economic and financial status, a woman needs not work In the labour market or her fields (Khan et al., 2012). In non-crop production activities, the Dependency burden is also positive and highly significant in all specifications except household activities. It implies that a woman has to choose rationally from household activities and other non-crop production activities and she chooses other non-crop production activities i.e., livestock and marketing activities as they give them economic rewards rather in household activities, she receives only moral reward. The results are well-matched with Alex (2013).

The number of adult males in the household has appeared with a negative sign. The existence of a greater number of adult males exhibits that the male members can share the economic responsibilities especially in the case of Pakistan, this is the primary responsibility of male members to participate in economic activities as they are considered breadwinners. This results in less participation of woman in crop production activities. In non-crop production activities, it may be observed that woman allocate less time to livestock and marketing activities and dedicate more time to household activities. Our results are in the line with Choudhry, Mutalib, and Ismail (2019).

Table 9:
OLS Estimates of Women's Contribution in Non-Crop Production Activities

Variable	Aggregated Analysis	Disaggregated Analysis		
	Non-Crop Production Activities (NCPA)	Household Activities (HHA)	Livestock Activities (LSA)	Marketing Activities (MKTA)
C	1.1159 (0.0000)	1.6315 (0.0000)	1.1325 (0.0000)	0.4638 (0.0000)
AGE	-0.0092 (0.0216)	0.0083 (0.0500)	-0.0074 0.0951	-0.0336 (0.0009)
EDU	0.0767 (0.0009)	-0.0558 (0.0231)	0.1323 (0.0014)	0.0093 (0.0163)
DEPB	0.1334 (0.0132)	-0.0500 (0.0386)	0.1919 0.0345	0.1162 (0.0840)
ADLM	-0.0061 (0.0777)	0.0077 (0.0838)	-0.0187 0.0470	-0.0213 (0.0023)
TENSTA	-0.0134 (0.0839)	-0.0528 (0.0142)	-0.0072 0.0509	0.0217 (0.0140)
Diagnostic Statistics				
R-Square	0.37	0.25	0.35	0.31
D.W	2.21	1.86	2.14	2.26
Prob(F-Stat)	0.00	0.02	0.02	0.00

The tenure status of woman matters a lot in woman's time allocation in agricultural activities. The results of the study show that if a female is a tenant, she is allocating more of her time to crop production activities than non-crop production activities. In villages, the tenants are under agreement and they have to work according to the conditions prescribed in the agreement otherwise, the owner may give them less money or share in the crops. So, women as tenant allocate more of their time to crop production activities. The results are compatible with Rahman (2000).

5.   Conclusions

The study has probed women's time allocation in agricultural activities in tehsil Mian Channu, Pakistan. The data have been collected from 250 females. We have executed two types of analyses: Preliminary analysis and econometric analysis. In econometric analysis, we have split the agricultural activities into crop production activities and non-crop production activities as aggregated and disaggregated.

The findings of the study show that the participation of females in agriculture plays a major role. Women allocate 6 hours on average for crop production activities and non-crop production activities but their participation is unnoticed in society. In an econometric analysis, women time allocation is determined by five factors i.e., age of the woman, education of woman, dependency burden, and number of adult males and tenurial status of a woman. The age of the woman is negative in crop production activities while it is positive in non-crop production activities. The education of woman (EDU) is negative in crop production activities and positive in non-crop production activities. Dependency Burden is positively related to woman's time in crop production activities and non-crop production activities. The number of adult males in a household is negatively related to woman's time allocation. A tenant woman allocates more time to crop production activities than non-crop production activities.

Authors Contribution
Muhammad Ramzan Sheikh: Conception or design of the work, Critical revision of the article
Fatima Farooq: Introduction, data analysis and interpretation, drafting the article
Hina Ali: incorporation of intellectual content
Sana Khalid: Data collection, literature search, drafting the article

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