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PARTICIPATION OF RURAL WOMEN IN CROP AND LIVESTOCK ACTIVITIES: A CASE STUDY OF TEHSIL TOUNSA SHARIF OF SOUTHERN PUNJAB (PAKISTAN)

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Abstract: *This study was structured to analyze the participation of women in agriculture sector (crop and livestock activities). The study was carried out in Tehsil Taunsa of district D.G Khan in South Punjab. Primary data for study was gathered by using a well structured and pre- tested questionnaire. Simple descriptive statistics, participation indices and Linear Regression analysis were used to analyze the data. The study revealed that women were engaged in all types of crop production and livestock management activities. Strength of women participation was high in such activities as cotton picking, cotton lint cleaning, harvesting, watering animals, milking, cleaning sheds, feeding, care of sick animals and preparation of ghee. Grand mean values showed that women participation was rare in agriculture and livestock activities but their participation was higher in livestock management as compared to their participation in crop- production. The regression results revealed that age, education, extension contacts, farm income, access to credit, landholdings, experience, family size and working hours and livestock participation were significant factors influencing the involvement of women in crop production activities. Moreover, age, education, experience, family type, working hours and agricultural participation were significant factors influencing the involvement of women in livestock activities. Women participation in agriculture sector was measured by constructing two indices i.e. crop participation index and livestock participation index in which extension contacts, age, experience, farm income, land holdings, access to credit and working hours came out as significant factors affecting women participation in agriculture sector. It is recommended that training needs of rural women should be realized. Women should be provided with credit facilities, extension services and agricultural education facilities.*

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1. INTRODUCTION

There is a close connection between agricultural growth and economic development. Agriculture is main sector which can contribute to general economic growth in the entire world. The main problems of the world today are hunger and malnutrition. Approximately one third of the world's total population is suffering from undernourishment which is the main cause of many diseases. The only solution to the problem of hunger and undernourishment is the increase in agricultural productivity. Moreover the growth of other sectors is also dependent on the agricultural growth in many countries especially in developing countries. Agriculture performs a key role in the economic growth of developing countries and it is the key source of raw materials, income and employment to the pastoral population of these countries. Agricultural development is a key to food security, poverty alleviation and overall sustainable development (Afzal et al, 2009).

Agriculture sector plays a very important role in economic development of developing countries. Most of the people in poor countries make their living from land. Most of the developing countries have to rely upon their own agriculture sector to produce the food consumed by their people. Agriculture sector plays a major role in the provision of factor inputs to industry and other modern sectors. Agriculture is the backbone of the under developed countries. It accounts for between 30 to 60 percent of the gross domestic product (GDP) of the under developed countries. Agriculture sector employs more people than any other sector, represents a major source of foreign exchange, supplies the bulk of basic food and provides subsistence and other income to more than half of the population of under developed countries.

Rural women play a very significant role in agriculture. A large portion of rural women perform unpaid work in agriculture. However, women's role differs according to geographical zones. Along the coast, women work as agricultural labors in the cultivation of export crops as well as in food production for the household. In the mountain zone, women participate in all the agricultural tasks, especially in land preparation, sowing, banking, weeding, harvesting and irrigation and are responsible for livestock and small scale marketing. In fisheries sector, women are involved in food processing and marketing. As women have the major responsibility for post harvest activities such as processing and storage, they play a key role in household food security. Women also perform a major role

in livestock, especially in regard to shepherding, feeding, milking and calving. Women farmers do not have equal access to resources and this significantly limits their potential in enhancing productivity. They are often at a severe disadvantage when it comes to securing land tenure rights, owning livestock, accessing financial services, receiving the kind of extension services and resources (Amin et al, 2009).

The prosperity and growth of a nation depends on the position and development of its females, as they not only constitute nearly half of its population but also positively influence the growth of remaining half of the population. Rural women play momentous role in many agricultural activities in many countries. They perform almost all types of activities in agriculture and livestock sector. The major constraint for the involvement of women in agricultural activities is the household activities which takes much time to perform it. In Pakistan, majority of population live in rural areas whose source of revenue depends directly or indirectly on agriculture sector. Rural women in Pakistan are among the millions of landless and small farmers (Sadaf et al, 2006). Rural women rely on crop production and livestock sector to fulfill their basic needs of food, clothing and shelter. These women play a key role in agriculture growth, livestock raising, cottage industry and stay busy from sunrise to sunset to provide food to men in the fields, fetching water, collecting fuel wood and management of livestock. While working shoulder to shoulder with men, they really supplement their efforts in the cultivation of the crops right from the preparation of soil to the post harvest operations.

1.1 Objectives of the Study

An attempt is made to examine the rural women involvement in crop and livestock activities in tehsil Taunsa of District D.G. Khan in southern Punjab, Pakistan. The selection of the study area is made on the base that the district D.G. Khan is equally important for crops production and livestock management with larger area under cultivation. Almost all types of crops as cotton, wheat, rice, sunflower, maize etc are being growing in Tehsil Taunsa Sharif of District Dera Ghazi Khan and there is no enough works in this area on the participation of women in agriculture sector.

The purpose of this study is to find out the participation level of rural women in crop and livestock activities and to recognize the factors which can contribute for women

involvement in agricultural activities and to explore the constraints being tackled by the rural women for their involvement in agricultural tasks. Chief objectives of this study are as:

- To identify the socio-economic characteristics of the people in the area.
- To find the contribution level of rural women in agriculture and livestock sector.
- To explore the factors affecting the involvement of women in agricultural and livestock activities.
- To see the constraints faced by the women who play a part in agricultural and livestock activities.

2. REVIEW OF LITERATURE

There is a wide range of literature regarding women participation in agricultural activities. Thus by reviewing the previous studies, the study will make a relationship with existing knowledge available on the matter under the study.

Munyaua (1995) explored the extent to which multiple roles affect rural women's participation in agricultural extension activities in Kenya. A sample size of 200 women farmers was collected by using simple random sampling technique. Data was collected using survey method through an interview schedule. Descriptive and inferential statistics were used to analyze the data and chi square tests of independence were also used for data analysis. Results of the study revealed that participation of rural women farmers in agricultural extension activities in the two divisions was significantly related to farm size in Naivesha but not in Bahati division. It was recommended that extension services should be improved for rural women.

Chizari et al. (1997) assessed the participation of rural women in rice production activities and extension education programs in the Gilani province, Iran. Findings of the study showed that majority of the women were middle aged, married, and illiterate and had household income less than 20 million rials annually. Most of them had land less than three hectors. Only 46% respondents had participation in rice extension and education programs. Their highest level of participation was in the land preparation program. Results showed that women did much work of sifting and cleaning seeds, pulling off crucible seeds from nursery plots. Results revealed that size of rice field, income and education had a significant impact on women participation in rice production.

Parveen and Leonhauser (2004) analyzed the empowerment of rural women in Bangladesh. The aim of the study was to investigate the nature and extent of rural women's empowerment, factors influencing it and to outline a strategic framework for enhancing rural women's empowerment. Women empowerment was measured by constructing a cumulative empowerment index. Results showed that majority of women had no any formal and non-formal education, had low media exposure and low spatial mobility. Results of regression analysis revealed that there were significant positive effects of formal and informal education, sex of children, spousal relations, media exposure and spatial mobility on women empowerment while traditional socio cultural norms had strong negative impact on women empowerment.

Hussain et al. (2004) examined the gender role in livestock rearing and the effect of National Rural Support Program (NRSP) of livestock training course in Kotli, Azad Kashmir. The aim of the study was to find the impact of livestock training course by NRSP on the livestock productivity. Data was collected from 120 respondents from three villages of Kotli through simple random sampling techniques. Data was analyzed by using percentages. Results of the study revealed that rural population of Kotli was mainly dependent on the livestock. Majority of respondents kept sheep followed by buffalo, goat and cow. It was shown that 100 percent respondents were utilizing the training course of NRSP. It was recommended that opportunities for self-employment could be enhanced with freely available training and guidance.

Elizbeth. (2006) assessed the impact of women in agriculture program of Borno state in Nigeria. The main aim of study was to assess the impact of agriculture program (WIA) in Brono state. Data collected from Brono state by using multistage sampling technique. Data analyzed by using simple descriptive statistics and inferential statistics. Correlation was used to find the relationship between socio-economic characteristics of Brono women and production from crops and livestock's. Results showed that there was a weak correlation between socio-economic variables like age, marital status, education, family size and experience of women and income and production level of livestock's and crops, before and after participation in WIA program. Marital status of women had a significant negative relationship with the crop and livestock production of these women. Constraints were found as inadequacy of inputs and high costs of inputs.

Ejembi et al. (2006) explored the food chain activities of women in an agrarian community in central Nigeria. The main purpose of the study was to identify the food chain activities of women and implications for women in agriculture. Primary data was gathered from 300 respondents. Data analyzed by using frequencies and percentages. Results of the survey showed that majority of women were involved in planting, weeding, harvesting, packing and marketing crops. Major post harvest activities of women were milling, Parboiling, pounding, peeling, threshing and grinding. It was recommended that government and non government agencies should encourage women's participation in agriculture.

Sadaf et al. (2006) examined the preferences of rural women for agricultural information sources in district Faisalabad, Pakistan. The aim of study was to find ways to increase the agricultural productivity by providing good information sources to rural women. Primary data collected from 125 female respondents through well structured interview schedule. Data was analyzed by using descriptive statistics. Results showed that meal head / husband, neighbors and fellow farmers were perceived to be the better existing information source. Majority of rural women agreed for the need of agricultural extension services for rural women. Majority of respondents preferred female extension agents to guide them with latest agricultural technologies.

3. METHODOLOGY AND DATA COLLECTION

Our study being empirical demanded data according to the coverage of analysis pertaining to entities. Alternatively, we needed first hand data (primary data) for the identified variables to put them to relevant statistical surgery. This section focuses on the following.

i. The data collected and its nature
ii. The methods kit to derive hidden messages in our sample data
iii. The modeling of the relationships as guided by the store of research at hand and selection of suitable model

Since each one of the above occupies critical place in our study, they need to be addressed in detail which is as under:

3.1 Sampling and Collection of Data

The data for the present study is gathered from 400 women of union council Hairo, Mangrotha, Sokar and Makwal under tehsil Taunsa Sharif, District D.G. Khan, from May to August 2012. Data is collected by using simple random sampling technique. Four villages

were chosen randomly from each union council. A group of 100 women were chosen from each union council, 25 women were chosen randomly from each village out of four villages of each union council. Data is collected by using a well structured questionnaire. A pre-tested questionnaire is used to collect the data. After the structuring of questionnaire through literature review, it is pre tested with 15 respondents randomly. Questionnaire contains a mixture of open ended and close ended questions. 44 questions are included in the questionnaire. As a result of pre testing, minor changes are made in the questionnaire. Questions are asked about the socio economic conditions of respondents. About 25 types of activities are included in questionnaire from crop-production and livestock activities to know the extent of rural women's participation in agriculture sector. Data was collected through personal interview with rural women in their houses. The filling in of questionnaire is carried out by the researcher according to the responses of the respondents because most of the respondents are illiterate.

3.2 Measurements and Methods

The extent of rural women's involvement in crop production and livestock activities is measured by using a three point continuum namely "Mostly", "Occasionally" and "Not at all" which are assigned scores as 1, 0.5 and 0 respectively. The mean scores for each activity are calculated to assign ranks to the activities according the extent of women participation in all activities. The grand mean score of all activities is measured by summing the mean values of all activities and then by dividing the net mean value by the total no of activities to determined the level of rural women's involvement in agricultural production. In order to know the constraints faced by rural women for their involvement in crop and livestock activities, seven types of statements were included in the questionnaire and respondents are allowed to give multiple responses. Frequencies and percentages are measured by using SPSS statistical software to give ranks to the constraint according to the strength of responses.

3.3 Regression Analysis

A linear regression model is used to find out the determinants of female involvement in crop production and livestock production activities by using some selected socio-economic variables. Regression analysis is used to test the two null hypotheses i.e. participation of rural women in crop production and livestock production is not affected by the selected

socio economic variables. Female participation in crop and livestock sectors are measured by measuring crop participation index and livestock participation index for women. Index is measured by summing up the scores of all activities of each respondent and then dividing the sum by the total number of activities.

Following two types of regression models are constructed as:

$$CPI = \beta_0 + \beta_1 EXC + \beta_2 AGE + \beta_3 EDU + \beta_4 EXP + \beta_5 FS + \beta_6 AFI + \beta_7 LH + \beta_8 AC + B9\ WH + \beta\ LPI + \beta\ ui$$

$$LPI = \beta_0 + \beta_1 AGE + \beta_2 EDU + \beta_3 EXP + \beta_4 FT + \beta_5 AFI + \beta_6 AC + \beta_7 WH + u_i$$

Where

CPI = Crop participation index

LPI = Livestock participation index

EXC = Extension contacts / visits dummy (0 = No, 1 = Yes)

AGE = Age (years)

EDU = Education (No of years of schooling)

EXP = Farming experience (years)

FS = Family size (total number of family members)

AFI = Annual farm income (in rupees)

LH = Family land holdings (in acres)

AC = Access to credit (dummy 1 = Yes, 0 = No)

WH = Working hours (total hours of working in a day)

FT = Family type (dummy 0 = nuclear, 1 = joint)

In our models, we have used some proxy variables. We have included the variable “Family size” to measure the effect of fertility rate on the participation of women. So, family size has been used as a proxy for fertility rate. Access to credit and annual farm income has been used to measure the impact of economic development or wealth status of family on the participation. Family landholdings has been used as a proxy for non-labor income because with more landholding, there will be more non-labor income of the family. Working hours has been used to get the effect of use of technology in household activities because more hours shows more time for work which is a result of reduction in the amount of time needed for household activities. Livestock participation index has been used to measure the effect of preferences on the participation rate because more participation in livestock

activities shows that women prefer to work. Extension contacts / visits has been used to account for the effect of expansion of jobs for females because with more extension visits, there will be encouragement for female to take part in labor force. So extension visits has been used as a proxy of creation of jobs for females.

4. RESULTS AND DISCUSSION

Rural women in Pakistan perform an important role in agricultural growth. Their socio-economic background has a vast impact on their participation.. The socio-economic conditions of women in the study area are such as below:

Table 1: Socio-economic characteristics of respondents

Factors	Categories	Frequencies	%age
Age	20-30 years	85	21
	31-40	117	29
	41-50	138	35
	51-60	60	15
Total		400	100
Marital status	Single	34	8.5
	Divorced	28	7.0
	Widow	54	13.5
	Married	284	71
Total		400	100
Education	Illiterate	228	57
	Primary	79	19.8
	Middle	35	8.8
	High	29	7.3
	Above	29	7.3
Experience	0-5 years	83	21
	6-10	99	25
	10-15	52	13
	16-20	69	17
	Above 20	97	24
Total		400	100
Annual farm income	Up to Rs. 30,000	232	58
	Rs. 31,000-80,000	150	38
	Rs. 81,000-150,000	18	4.0
Access to credit	No access	262	65.5
	Have access	138	34.5
Total		400	100
Family land holdings	No land	167	41.8
	< 12.5 Acres	169	42.2
	> 12.5 – 25 Acres	512	13
	Above 25 Acres	12	3

Total		400	100
Ownership of land status	No one had ownership	167	41.17
	Husband only	112	28
	Wife only	18	4.5
	Both	55	13.8
	Others	48	12
Total		400	100
Family size	1-5	90	23
	6-10	211	52.8
	11-15	89	2.2
	Above 15	10	2.2
Total		400	100
Extension contact	No contact	249	62.12
	Have contact	151	37.8
Total		400	100

Our findings about the socio economic background of the respondents shows that best part of respondents i.e. 35 percent were middle aged. The share of young women in agricultural and livestock activities was relatively small (21 percent). This finding agrees with that of Bayola and Intonga (2006) that although women loved animals, they totally disagreed with being used for raising livestock. These outcomes also agree with that of Amin et al. (2009) that majority of respondents related to agriculture sector were of middle age categories. The findings also shows that best part of rural women (71 percent) were married. This agrees with that of Ayoada et al. (2009) and Yasothai et al. (2009) that majority of women related to livestock production were married. Moreover results shows that most of the rural women (57 percent) were illiterate and (19.8 percent) had only primary education. This result is in line with that of Iftikhar (2009) who found that 56.5 percent of rural women in agriculture sector were illiterate and only 17.5 percent had primary education. These findings also agree to the findings of Rasheed (2004) who found in his study that mostly respondents (66.7 percent) were illiterate whereas 20 percent were primary educated and 10 percent were matriculate.

The findings also show that a majority of rural women (25 percent) had 6-10 years of farm experience and 24 percent had above 20 years of farm experience. The study shows that majority of women (38 percent) had low annual farm income as below Rs. 31,000 and 38 percent had moderate annual farm income as Rs. 31000-80000 and only 4 percent had high level of annual farm income as above Rs. 100,000. This finding is partially in line with that of

Normatha et al. (2009) who found in his study that 68 percent of farm women had low level of annual income. Our findings reveal that majority of rural women (65.5 percent) had no access to credit. This outcome is in line with that of Ayoada et al. (2009) who found that 86.7 percent of women related to livestock production had no access to credit facility. This may be due to the fact that rural women rarely considered credit worthy because they have no guarantee. Moreover it was found that mainstream of the heads of rural families were illiterate. Results also reveals that a bulk of the respondents (42 percent) had small area of family land holdings (<12.5 acres), 41 percent had no any kind of land holdings and 13 percent had medium land holdings (> 12.5-25 acres) and only 3 percent had large family land holdings (above 25acres).

Our findings further reveal that the ownership of family land was mostly in the hands of husbands (28 percent), only 4.5 percent wives had the ownership of land and 41.8 percent respondents had no any kind of landholdings. So results reveal that women had lesser hold over the family land than males. Majority of respondents 53 had had 6 to10 family members and 23 percent had 1 to 5 family members and 24 percent had above 11 members in family. This finding agrees to that of Sabo Elizabeth (2006) who found in his study that 52 percent of respondents had 5 to 10 children. This finding reveals that rural women have relatively large families. Our findings further reveal that majority of respondent (62.3 percent) had no any direct or indirect contact to agricultural extension service centers or they were not getting any extension services and only 37.8 percent had access to agricultural extension services.

4.1 Correlation Analysis

Correlation analysis has been done in order to find out that our models are linear models and there is no perfect linear association between explanatory variables used in the model so that the model can be analyzed by using OLS method. According to the assumption of OLS model there should not be perfect linear correlation between explanatory variables used in the model so correlation matrix has been used to show the linear association between explanatory variables.

Table 2: Correlation Matrix for Crop-Participation Model Coefficient Correlations

Correlations	LPI	LH	AGE	WH	FS	AC	EXC	Edu	AFI	Exp
LPI	1.000									
LH	0.092	1.000								
AGE	0.149	0.000	1.000							
WH	-0.184	0.021	-0.010	1.000						
FS	-0.015	0.134	-0.016	0.000	1.000					
AC	-0.128	-0.286	-0.062	0.030	0.033	1.000				
EXC	-0.386	0.060	0.016	-0.049	-0.108	0.028	1.000			
Edu	0.227	-0.018	0.141	-0.066	0.005	-0.092	0.053	1.000		
AFI	-0.055	-0.656	-0.063	-0.091	-0.293	0.139	-0.208	-0.211	1.000	
Exp	-0.237	-0.024	0.628	0.024	-0.087	0.021	0.012	0.226	-0.003	1.000

The above table of correlation matrix shows that there is no any strong correlation among independent variables so crop participation model can be analyzed by using OLS method.

Table 3: Correlation matrix for livestock participation co-efficient correlations

Correlations	AC	Exp	WH	AFI	FT	EDU	Age
AC	1.000						
Exp	0.010	1.000					
WH	0.028	0.002	1.000				
AFI	-0.014	-0.014	-0.064	1.000			
FT	-0.056	-0.028	-0.052	-0.194	1.000		
Edu	-0.103	0.254	-0.055	-0.357	0.175	1.000	
Age	-0.056	-0.628	0.003	-0.110	-0.030	0.125	1.000

Above table of correlation matrix shows that there is no any perfect linear dependency between explanatory variables used in the model as the values of co-efficient of correlation are less than 7%. So we use this model to analyze by using OLS model.

4.2 Determinants of Women Participation in Crop - Activities

Determinants of women participation in crop activities are defined here. Econometric analysis is also carried out to describe the significance of these variables.

Table 4: Determinants of Women Participation in Crop -Activities

(Dependent Variable: crop participation index for female)

	Unstandardized Coefficients β	**Std. Error**	**t**	**Sig.**
(Constant)	5.343E-02	.039	1.364	.173
extension contact	.309	.015	20.226	.000
Land holding in acres	-1.46	.002	1.967	.061
livestock participation index for female	.175	.031	5.733	.000
age in years	-1.936E-03	.001	-2.214	.027
no of years of schooling	-3.694E-03	.002	-2.169	.031
no of years of experience	1.919E-03	.001	1.958	.051
annual farm income	9.350E-07	.000	3.020	.003
access to credit	2.035E-02	.013	1.521	.129
working hours	6.325E-03	.003	2.010	.045
family size	2.167E-03	.002	1.142	.254
		r square	**Adjusted r square**	**F statistics**
		.712	.704	96.121

In above table, regression analysis has been conducted to find that factors which can affect women involvement in livestock and agricultural activities. The results of the regression model show that 71 percent of the variation in female contribution in agricultural activities which is measured through constructing crop participation index for female was explained by the independent variables incorporated in the model.

The results of study exposed that there was a positive and significant connection between women involvement in agricultural activities and extension contacts which means that more the women have contacts with agricultural extension services, the more will be tendency for them to participate in agricultural activities. The more visit by the extension agents to the farm women, the more aware they become of new technologies and use of existing

technologies so there will be more and more chances for their participation in maximum agricultural activities. This result is in line with that of Njoku et al. (2009) who found that extension contacts had a positive and significant relationship with the improved crop production practices by the rural women.

It was found a significant negative relationship between land holdings and female participation in agricultural activities. This reveals that the more the families had land holdings, the less the intension of their females to participate in crop related activities. This may be due to social and cultural norms. People don't think it good to allow their wives to work in outdoor activities. Mostly women work in the farms only because they have no alternate source of income generation so families with more land holdings have no need to send their women to work in farms so with increase in landholdings, women have less intension to take part in agricultural activities.

Age had a significant negative relationship with agricultural participation of rural women. It reveals that the more the increase in age, the less a tendency for females to participate in agricultural activities. This may be due to the reason that aged women get tired soon so they can't participate in hard activities so their participation gets lesser and lesser as they become aged.

Education had a significant and negative impact on the female participation in agricultural activities. This means that the more educated the women, the less tendency for them to participate in agricultural activities. This may be due to the reason that educated women have more changes to get jobs in service sector and they can start their own business so they prefer these jobs than to the hard activities in agriculture sector which are more time consuming, tiresome and less income generating.

Results show that there was a significant positive relationship between years of experience and female participation in agricultural activities with t-value 2.011. This means that as women get longer experiences, they acquire diverse ways of farming. So their participation increases because now they can participate in all activities and have the capability to complete their work in minimum possible time so they have more time to participate in other agricultural activities. Moreover results of regression analysis shows that annual farm income had a significant ($p < 0.01$) positive impact on women participation in agricultural activities. This indicates that more the farm income, the more the tendency for the women

to participate in agricultural activities. This may be due to the cause that with the increase in farm income women are now more capable of using new technologies; they can purchase farm land, can evaluate their farm land and have more intension to participate in maximum crop related activities to earn maximum income.

It was found that access to credit had significant ($p < 0.05$) and positive impact on the crop participation by rural females. This means that more the women have access to credit, the more a trend for them to participate in agricultural activities. This may be due to more access to credit; women have lesser financial constraints and can be capable to purchase better seeds and fertilizers for their lands.

Moreover results reveals that working hours had significant ($p < 0.05$) positive relationship with participation in agricultural activities, which means that more the women spend their time in working, the more tendency for them to participate in agricultural activities. This may be due to the reason that agriculture is a dominant job oriented sector especially in rural areas and rural women have to spend much time in household activities so if they have more time for professional working then there is more chance that they will consume that time for the crop production activities because it is main source of income in rural areas. It was found that livestock participation had a strongly significant ($p < 0.01$) and positive relationship with crop participation. This means that more the females have participation in livestock activities, the more tendencies for them to participate in crop production activities. This may be due to the reason that livestock and crop production are interrelated so women who take part in livestock activities would like to participate in crop production activities because their livestock production is also dependent on the crop production.

4.3 Determinants of Rural Women's Participation in Livestock Activities

Determinants of women participation in crop activities are defined here. Econometric analysis is also carried out to describe the significance of these variables.

Table 5: Determinants of Rural Women's Participation in Livestock Activities

(Dependent variable: Livestock participation index for female)

Variables	Unstandardized Coefficients β	Std. Error	t	Sig.
(Constant)	.240	.058	4.172	.000
age in years	-3.130E-03	.001	-2.292	.022
no of years of schooling	-8.313E-03	.003	-3.110	.002
no of years of experience	5.899E-03	.002	3.921	.000
annual farm income	-7.787E-07	.000	-1.619	.106
access to credit	2.685E-02	.021	1.290	.198
working hours	1.333E-02	.005	2.733	.007
family type	7.869E-02	.021	3.786	.000
		r square	**Adjusted r square**	**F statistics**
		.431	.419	37.002

Results of regression analysis show that 43% variation in livestock participation index is described by the independent variables used in the model. Value of f-statistics shows the overall significance of model. Results reveals that age has a significant $p < 0.05$ negative impact on the participation of rural women in livestock activities that means that the more the women get aged, the less tendency for them to take part in livestock activities. This result agrees with the theory that as the women get older, their wage rate starts reducing due to high reservation wage.

Education was found to have significant ($p < 0.01$) negative impact on the involvement of women in livestock activities. This means that higher education of women will reduce the involvement of women in livestock activities. This is due to the reason that highly educated women don't like to perform livestock activities as these are more tiresome, more time consuming, less income oriented and dirty as compare to some office jobs. So as they get higher education, they prefer to do jobs in services sector instead of livestock sector.

Results further reveals that experience has a significant ($p < 0.01$) positive relationship with participation of rural women in livestock activities. So with increase in experience there will also be increase in the contribution of rural women in livestock activities. This is due to the reason that with more experience women becomes capable of doing maximum activities

and they can work efficiently and perfectly and take less time to perform the activity so with more experience, women participation in livestock activities will increase.

It is found that family type has a significant ($p < 0.01$) positive impact on the participation of rural women in livestock activities. This means that with joint family system, there are more tendencies for women to take part in livestock activities. This result is in accordance with theory as with joint family system women have more helpers in household activities so they get more time to perform livestock activities.

Working hours are found to have significant ($p < 0.01$) and positive relationship with the participation of women in livestock activities, with more working hours, there is greater tendency for rural women to participate in livestock activities. This may be due to the reason that in villages the main professions for the women are crop production and livestock activities and with religious and social constraints they are bound to work within homes so with increase in working hours their involvement in livestock activities will also increase.

Crop participation of women was found to have a significant ($p < 0.01$) and positive effect on the participation of rural women in livestock activities. This means that increase in participation of rural women in crop activities leads to increase in the participation of rural women in livestock activities. This may be due to the reason that crop and livestock sectors are interdependent over each other. Livestock products depend on crop production and crop production depends on livestock production as it provides fertilizer and other inputs for crop production so the women who get involved in crop activities also like to participate in livestock activities.

Annual farm income and access to credit found to have no significant role in determination of women participation in livestock activities. This may be due to the reason that mostly families in the study area get credit for crop production purposes so it has no significant impact on the livestock production and participation. Farm income is mostly under the control of male members so as their income increases, they mostly invest it on the crop production as it is their main source of earning and livestock's are mostly kept by women so there comes no significant relation of annual farm income with women's participation in livestock activities.

4.4 *Level of Rural Women's Participation in Crop -Production Activities*

In bellow table, different types of crop related activities are defined in which women like to participate in tehsil Tounsa Sharif.

Table 6

Activities	Means Scores	Percentages	Rank Orders
Harrowing	0.10	10	12th
Weeding	0.29	29	8th
Sowing of vegetable	0.39	39	5th
Transplanting rice	0.40	40	4th
Harvesting	0.53	53	3rd
Ploughing	0.22	22	9th
Thrashing	0.34	34	6th
Picking of cotton	0.66	66	1st
Cotton lint cleaning	0.54	54	2nd
Manure transportation and application	0.33	33	7th
Transporting the produce	0.14	14	10th
Marketing the produce	0.11	11	11th
Irrigation of land	0.098	9.8	13th
Grand mean	0.32	32	

Scale: 0 = not at all, 05 = occasionally, 1 = mostly

Results of above table shows that rural women in the study area participate in almost all types of crop related activities but the strength of their participation is high for some activities but low for most of the activities. Mean scores of activities shows that rural women in the study area mostly participate in activities as picking of cotton (mean = 0.66), cleaning of cotton lint (mean = 0.54) and in harvesting (mean = 0.53) as their mean values are greater than 0.5. Rural women's participation in rare or occasional in all other activities transplanting of rice, swing of vegetables, thrashing, manure transportation and application, weeding, harrowing, transportation of produce marketing and irrigation of land. Rural women of the study area have maximum participation in cotton picking (66%) with rank order 1. This finding agrees with that of Luqman et al., (2006) whom found in their study that rural women had participation in almost all crop related activities as sowing, weeding, harvesting, cotton picking, selling the agricultural commodities, thrashing etc and their participation was maximum in cotton picking. According to the rank orders of above table rural women of the study area have minimum participation in irrigation of land with rank order 13. The value of grand mean (0.32) indicates that rural women of the study area rarely

participate in crop related activities that is due to their low strength of participation in most of the activities. This result agrees with that of Tibbo et al. (2009) whom found that women participation in crop related activities in Punjab, Pakistan was lesser than males and in most of the activities male participation was higher than females. According to the above table, rural women of the study area have only 32% participation in crop related activities.

4.5 Level of Women Participation in Livestock Activities

In bellow table, different types of livestock related activities are defined in which women like to participate in tehsil Tounsa Sharif.

Table 7

Activities	Means Scores	Percentages	Rank Orders
Feeding	0.56	56	4th
Cleaning of animals and sheds	0.65	65	3rd
Watering	0.71	71	1st
Milking	0.69	69	2nd
Grazing	0.43	43	8th
Egg collection	0.42	42	9th
Fodder collection	0.45	45	7th
Vaccination of sick animals	0.23	23	11th
Care of sick animals	0.53	53	5th
Marketing live animals	0.23	23	11th
Marketing the produce	0.33	33	10th
Preparation of ghee	0.51	51	6th
Grand mean	0.48	48	

Scale: 0 = not at all, 0.5 = occasionally, 1 = mostly.

Results of the above table shows that rural women of the area participate in almost all livestock activities. Their participation is significant in most of the activities rural women of the study area mostly participate in activities as watering milking, cleaning of animals and sheds, feeding, care of sick animals and preparation of ghee as their mean scores are greater than 0.5 and according to the mean scores they rarely participate in other activities as fodder collection, gracing of animals, egg collection, marketing of live animals, marketing the animal produce and vaccination of sick animals as their mean scores are less than 0.5. These results are in line with that of Luqman et al. (2006) and Javed et al. (2006) whom found that rural women's participation was high in activities as cleaning of animal sheds, watering and feeding of animals and they had participation in almost all activities like watering, cleaning of animal sheds, milking, preparing ghee, egg, collection, grazing, feeding,

food cutting etc. According to the above table rural women of the area has maximum participation in activities as watering (71percent), milking (69 percent) and cleaning animals (65 percent) and have ranks as 1, 2 and 3 and they have minimum participation in marketing the lives animals and vaccination of sick animals (23 percent) with rank order 11. This result is somehow similar with that of Javed et al. (2006) whom found that rural in district Faisalabad had maximum participation in activities as cleaning of animal's sheds, feeding and watering with ranks 1, 2 and 3 and they had minimum participation in marketing of animals and animals produce with rank 16.

The value of grand mean score (0.48) shows that rural women of the study area rarely participate in livestock activities as their grand mean is less than 0.5. The participation of rural women in the study area is 48% in livestock related activities. This is due to their low strength of participation in many activities. This finding agrees with that of Ayoade et al.(2009) whom found that rural women of Naswara State of Nigeria had rare participation in livestock production activities.

According to the results of both tables we come to the conclusion that rural women of the study area have participation in almost all crop related and livestock management activities but their strength of participation was low for some activities. Rural women of the study area have more participation in livestock activities (48 percent) as compared to crop production activities (32 percent). This result is in line with that of Tibbo et al. (2009) whom found that women in Punjab, Pakistan had more significant participation in livestock activities as compared to their participation crop production activities. Their participation in livestock activities was found higher than males.

5. CONCLUSION

The present study is conducted to examine the participation of rural women in agricultural activities and to find out the factors which affect their participation in agricultural activities. Women work in agriculture sector is mostly considered as the part of their household activities. The analysis is based on primary data from 400 rural women in tehsil Tounsa Sharif. Data is analyzed by using mean values, percentages, frequencies and by using OLS model. Results showed that majority of rural women rarely participated in crop production and livestock management activities. Women had mostly participation in cotton picking, cotton lint cleaning and harvesting among all selected crop production activities. They had

mostly participation in activities such as watering, milking, cleaning animals sheds, feeding, care of sick animals and preparation of ghee among all selected livestock management activities. Rural women had participation in almost all agricultural activities. Age, education, experience, farm income, access to credit, extension contacts, family type and working hours came out as significant determinants of rural women's participation in all agricultural activities. Rural women have participation in almost all crop production and livestock activities but the strength of their participation is low in most of activities which can be improved by realizing the significance of their participation in agricultural policy development.

6. RECOMMENDATIONS

On the basis of results and conclusion drawn from the study following recommendations and policy implications are extracted:

i. Government should initiate different agricultural development programs for the betterment of rural women.
ii. Significance of women participation in agricultural growth should be recognized in agricultural development planes and policies.
iii. Loans should be provided to rural women involved in agricultural and livestock activities on relaxed conditions through micro finance banks.
iv. There should be training programs for rural women involved in agricultural activities through female extension agents with the help of NGOs.
v. There should be provision of agricultural extension services to rural women and extension programs should take proper care of the interests of rural women.
vi. Rural agricultural women should be facilitated with financial help to seek new skills related with agricultural activities.
vii. The burden of household activities should be lessened by innovations and by encouraging men to assist their women.
viii. Agricultural women should have participation in planning and implementation phase of agricultural policies.
ix. Educated women should be encouraged to participate in agriculture and livestock activities by creating job opportunities in agriculture sector for females.

x. There should be provision of agricultural inputs to rural women by government at subsidized rates.

xi. Women should be encouraged and appreciated by the government and non-governmental agencies for their participation in agricultural development.

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