Gender Role in Agricultural Productivity Training Programs: A Case Study of Sindh Wheat Production Pakistan

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Abstract
Agriculture remains the mainstay of Pakistan economy and wheat is the one of major crop which highly contributes towards economic development of the country. Wheat is a staple diet for majority of the population and the dependents are higher on its consumption. However, due to lower labor force wheat production is declining and cannot meet the underlying demand of population. Thus the study aims to investigate the role of gender for wheat growers in agricultural productivity training program: a case study on Sindh wheat production Pakistan. The study used questionnaire for data collection and 360 sample size taken from the target population. The logit model of regression was also tested for investigating the factors that influence genders participation in Agricultural productivity training program. The result showed that males are more participated in the agricultural productivity training programs rather than female’s participation. The response of the female’s participation is less than male due to some barriers of culture and society in Pakistan. Frequently female’s over shadow men in many spheres of agricultural tasks in terms of their productive participation but usually their efforts gone unrecognized at national level. The due recognition of their role is constraint by many factors but gender is on the top. This scenario is further aggravated by negligence on the part of the policy makers who did not attempted any gender segregated moves to recognize and promote women’s participation in agriculture, resultantly the country is deprived to fully benefit from the productive talents and efforts of women. The research also suggest that to overcome this trend Pakistan has to develop women labor force in agriculture on preferred basis in order to fulfill the increasing population food demands.

Keywords: Gender Role, Agricultural Productivity Training Program, Wheat Production, Sindh, Pakistan

1. Introduction
Agriculture is the backbone of Pakistan 75% of population of Pakistan is living in rural areas and depends upon agriculture. While the major crops of Pakistan are wheat, sugarcane, cotton and rice. Pakistan largest food crop is wheat Pakistan ranks 8th worldwide on farm foods and its 9th largest wheat producing country accounting for 3.04% of the world’s wheat production from an area of 3.57% of the World Food and Agriculture Organization (FAO). It contributes 14.4% to the value added in agriculture and 3.1% to GDP. Wheat is the leading food grain of Pakistan and being staple food used to make flour for leavened, flat and steamed breads biscuits cookies cakes, breakfast, cereal, pasta, noodles without this Pakistan cannot be able to survive is as important as rice and noodles in China (Abbas, Lodhi, Aujla, & Saadullah, 2009).

It is well known that developing countries are much less productive in agriculture than in the rest of the economy. In Sindh region of Pakistan, wheat was grown in an area of about 1.106 million hectares (9.59% of the national acreage), with a production of about 1.204 million tones (14% of national production) during the year 2014–2015. Although Sindh province was known by wheat producing region, but due to future population growth, dietary shifts and growing consumptions demand for the wheat is going to increase continuously over the coming decades (Godfray et al., 2010). Although wheat is the leading food grain but its production is being declining from the last few decades due to lower labor productivity.

Regardless of the complexity and diversity of the gender systems, the role of gender in agriculture is considered a ‘prerequisite’ for enhancing agricultural productivity and production. In essence the agricultural sector acquires more labor force to boost agricultural productivity. Male labor participation is not enough for enhancing the wheat production thus female labor force is also obligatory (Lambin & Meyfroidt, 2011). Females are half of the population in Pakistan and contribute only about 30% to the agriculture produce, marginalizing or excluding female’s labor from agriculture might not solve the food security and inefficient production problems.

The role of female in agriculture has become increasingly important in most countries. Even though women agricultural laborers account for 43% of the world’s agricultural labor force (FAO, 2011), they do not demonstrate their skills to the best of their abilities. In developing countries, the gender gap mainly manifests itself as women’s lower access to inputs,
resources, and services for agricultural production, and greater vulnerability in land ownership compared to men, owing to a range of institutional- and norm-based constraints (Croppenstedt, Goldstein, & Rosas, 2013; Djurfeldt & Hillbom, 2016; Kalabamu, 2006). In Pakistani culture, only about 18% females do most of the work in the subsistence agricultural sector in most localities, women are responsible for fetching water, gathering firewood, transporting harvested produce to the homestead and market, agricultural production (particularly in wheat production) and carrying wheat crops and other to the mills for processing. However, the sharia laws and some non-scheduled caste create constraints in women participation in agricultural produce which leads to lower labor productivity.

The nature and extent of gender discrimination and the conditions necessary to empower females varies across communities, regions, and countries (Akter et al., 2017). However, women empowerment is proven to have a significant impact on agricultural productivity improvement and household welfare (Alkire et al., 2013). Without women’s active participation, the production of high-value crops is difficult in developing countries (Malapit & Quisumbing, 2015; Mason & Smith, 2003). The training of village-based female workers is an effective way to reach and actively involve women in development activities as it ensures that appropriate communication strategies are used to interact with women. Women, in fact, may find it more difficult to participate in formal training activities outside the village because of a lack of self-esteem and education. Weak self-esteem can hinder women’s capacity to speak out freely in group meetings and interact with extension agents (Quisumbing & Pandolfelli, 2010).

Government design Agricultural Productivity Training Programs (APTP) for major crops (particularly for wheat productivity) to empower female’s labor productivity for wheat growers. In Sindh, Pakistan, only about 18% of the females participated in APTP found as compare to their male counterparts this indicated that the participation of females is very low. Females are discouraged and disempowered from participating in agricultural-education programs due to programs designed factors and self-factors which leads to low participation (Chouichom, 2014; Davis et al., 2012). Therefore attention towards females’ participation should be considered and encouraged by avoiding gender-related constraints. If women’s skills and talents were used more fully, gender differences in agricultural productivity would disappear, and productivity would increase (Bank, 2012; Khandker & Koolwal, 2016). As a result, the involvement of females is necessary for any development intervention. Thus, this study is essential in order to understand those factors that influence females’ participation in the agricultural productivity training program so that whenever decisions related to agricultural training programs are made for increasing wheat production through improvement in productivity, these factors will be taken into consideration.

Additionally, APTP comprises of such approaches for mitigating females labor force in wheat production as, women’s productivity training program, Rural women household program, Women’s motivational programs etc. Agricultural Productivity Training Programs are affective for women’s empowerment and even in productivity improvement these programs plays a vigorous role. Females should be encouraged to participate in APTP because training helps to increase income, productivity, production and household welfare from the farm. In the past the Sindh women have been known to play an important role in agricultural activities, despite their role in agricultural activities, their contribution for high-value crops (e.g., wheat, rice, sugarcane) and participation were not recognized and so they were left out in development programs this has led to decrease the agricultural productivity (Aguilar, Carranza, Goldstein, Kilic, & Oseni, 2015; Odebo, 2012).

In Sindh, Pakistan there stood weak participation of genders in APTP (Dercon et al., 2009; Kumbhar, Sheikh, Soomro, & Khoharo, 2012) and no empirical study conducted so far to assess the factors that influence the participation. In this context, our study sought to fill the gap in gender participation and identify the determinant factors for a decision to participate in training by using cross-sectional data collected from 360 farmers. Our empirical result confirmed that household characteristics of (Gender, Age, education), annual wheat income, households wheat farming experience, access to information about APTP training are significantly influenced females participation in training programs (Chouichom, 2014; Deere & León, 2003). The findings from this study suggest to policy makers, governmental and private sectors to improve the APTP, ought to be equitably for males and females. The next sections of the paper are presented as follows. Section 2 and 3 deals on literature review and data and variable description respectively. The estimation strategy and relevant estimation results are discussed in section 4 of the study. The last section 5 presents the Conclusion of the study and policy recommendation issues based on key findings.

2. Literature Review

Globally, women have fewer opportunities for economic participation than men, less access to basic and higher education, greater health and safety risks, and less political representation. Guaranteeing the rights of women and giving them opportunities to reach their full potential is critical not only for attaining gender equality, but also for meeting a wide range of international development goals. Empowered women and girls contribute to the health and productivity of their families, communities, and countries, creating a ripple effect that benefits everyone. The word gender describes the
socially-constructed roles and responsibilities that societies consider appropriate for men and women. Gender equality means that men and women have equal power and equal opportunities for financial independence, education, and personal development. Women's empowerment is a critical aspect of achieving gender equality. It includes increasing a woman's sense of self-worth, her decision-making power, her access to opportunities and resources, her power and control over her own life inside and outside the home, and her ability to effect change. Yet gender issues are not focused on women alone, but on the relationship between men and women in society. The actions and attitudes of men and boys play an essential role in achieving gender equality. The study conducted by Jalal-ud-Din & Khan, (2008) in Pakistan on gender cultural differences, they pointed out that Pakistan is a cultural bounded country where the women participation in paid labour is still very low. They also showed the factor for low female participation in paid labour, the factor is that like most other underdeveloped countries, in Pakistan the labour force data tend to underestimate the number of economically active women especially in the category of unpaid helpers on farms and other family operated enterprises. In Pakistan the Muslim custom of Purdah also inhibits the employment of women. Women are still largely responsible for domestic work and child rearing. They are not as free as men to enter the labour market Majority of women prefer to stay at home and look after their children. Also the cultural traits not only affect the extent to which women actually engage in income generating activities, but also the reporting of activities during the time of labour force surveys.

The role of gender in agriculture has become increasingly important in most countries. Even though women agricultural laborers account for 43% of the world’s agricultural labor force (FAO, 2011), they do not demonstrate their skills to the best of their abilities. In developing countries, the gender gap mainly manifests itself as women’s lower access to inputs, resources, and services for agricultural production, and greater vulnerability in land ownership compared to men, owing to a range of institutional- and norm-based constraints (Croppenstedt, Goldstein, & Rosas, 2013; Djurfeldt&Hillbom, 2016; Kalabamu, 2006). If access to, and use of productive inputs were taken into account, and women’s skills and talents were used more fully, gender differences in agricultural productivity would disappear, and productivity would increase (Bank, 2012).

Agriculture is major sector of not only Pakistan but of all developing and less developed countries and a large portion of the population of these countries is engaged in agriculture and agro based activities (Razia Begum 2011). Women, which are the almost half of the population are as important labor force of the agriculture sector as men but their importance is not recognized in our country as it should be. There constraints and obstacles like malnutrition, low education, migration, poor technical facilities, on the top gender issues which are not allowing a huge portion of female labor force to contribute according to their capabilities.

Prakash (2003) described that there are many constraints that discourage the women in development and thus major sex of the world cannot contribute their power in economic sector. There is patriarchal system that is existed in some societies which does not allow women to work with other male workers. There are also cultural barriers and religious interpretations that create hurdles in women social mobility. These factors are resulted the less women participation in agriculture sector. This portion of human being is generally invisible in development activities.

Rural women not only in Pakistan but in all developing countries face many constraints instead of working more and harder. These constraints are of many kinds i.e. social, economic, gender biasness, low education, lack of access to prior opportunities and facilities etc. They do all the agricultural work except ploughing besides household responsibilities, they are also efficient in agriculture allied fields but are being rewarded according to their efforts and devotion (Dr. Roshan Lal, Dr Ashok Khorana 2011).

The gender participation in various sectors and in many developing countries imposes real costs on society in terms of untapped potential in achieving agricultural output, food security and economic growth. The gender in agricultural productivity such as women play in bulk in agricultural productivity in different countries but there is a Inconsiderable gender gap in Pakistan. Men are commonly considered to perform the bulk of work in Pakistan agriculture which is opposite of other countries like China, Africa etc. Combined with new evidence of a non-negligible gender gap in agricultural productivity, food security, (poverty) income of wheat, this has motivated increased attention to raising agricultural wheat productivity through genders participation (Dasgupta, Meisner, & Huq, 2007). Doing so is not only seen as important for empowering Pakistani women and men and improving the development outcomes of the next generation, but also as an important vehicle to improve Pakistanis wheat production and income by fulfilling the gender gap (Peterman, Behrman, & Quisumbing, 2014). In the future, a strong increase in demand for grain is expected, which may be filled with further intensification of agriculture farmers rather than expansion of agricultural land. For increase and improvement in wheat production, there is a need to aware females farmers with new agricultural technologies and educate them regarding productivity, and empowering the genders to work and improve the wheat production by working together with some training sessions, otherwise the consumption and production will be reciprocal of each other. Hence
there is a need to know about the participation of both gender working in agricultural productivity which plays an important role in economic development of the country (Doss, C. R. 2018). According to Agbonlahor, M. U. et al., (2012) participation in training program entails the ability of individuals to have an input in the decision making process and to play a role in measures aimed at improving their quality of life. However, despite the perceived success of this program the drift of gender role from farming to less tedious and more lucrative jobs are on the rise, which creates the need to ascertain the level of participation and identify the determinants of participation in the program. Furthermore, if agricultural extension is to be repositioned for effective agricultural economic development there is need to identify predictors for gender participation to increase level of productivity in agricultural training programs. While gender as a concept is used in social science to define the roles and participation of men and women; these roles are defined by the tradition and beliefs of a particular culture. Gender is therefore not synonym with sexual differences which are only based on biological characteristics, the gender construction is culturally specific and assigns different identities and roles of men and women (Olawoye, 2002). However, gender division of labor has been internalized by the society, many reasons have been put forward for why women often find themselves at a disadvantage when it comes to accessing agricultural training and defining farm work the work that women do is often left out, and this influences the structuring of agricultural training. It has also been noted that men are highly dominate some public spaces where they can have access to agricultural knowledge and information, unlike women who are usually bound to their households (Karbasioun, Biemans, & Mulder, 2008). In some instances, women are regarded, and may regard themselves, as helpers not as farmers, thus diminishing the perceived significance of their role as well as their authority and decision-making power in agricultural process. The devaluing of women’s work and women’s role in agriculture may negatively impact the ability of women to access information at the same level as men. This is because male extension officers may regard training as unnecessary for women if they do not consider them as farmers, as well as in Pakistan faced constraints due to social and cultural barriers (Behrman, & Quisumbing, 2014). Thus for enhancing gender division of labor there is need for encouragement of women’s in agriculture by avoiding the influential factors happening on the ground (Rehman et al., 2016). Globally female face certain constraints in agriculture, but Pakistani women presents a more grey picture because of unique circumstances created by social, cultural, legal, political, financial factors applied to gender discrimination. Some of the most pressing problems are: In rural areas where women’s status is grossly neglected, health is on the top. She often does not receive proper nutritive diet in her life span which causes her low health status and prone to diseases (Abbas, Lodhi, Aujla, & Saadullah, 2009). When she becomes economic worker in agriculture, it negatively affects her productivity that is automatically low. Rural female in Pakistan are mostly illiterate because of lack of access to educational facilities, conservative cultural codes and early marriages which deprives them to attain basic education. Therefore they relies mainly upon their informal learning, traditional knowledge most of which is outdated and their own experience from agricultural activities (Evans et al., 2014). This section provides the literature on the gender role, culture and constraints. However the study attempt to summarize its main points related to the gender issues in agriculture. This chapter encapsulates the literature on the concepts used in the study, including the constraints females faced, inequity in agriculture. There are many prospects for increasing the agricultural production but still their lack of literature documented towards females labor productivity and participation in agriculture.

3. Methodology

3.1 Study Area

The study was carried out in the Sindh province of Pakistan where wheat is most widely grown and harvested, the province is known for its agricultural production, the study area is located in southeast part of the country. The province has Pakistan’s second-largest economy the remainder of this provinces has an agricultural based economy and produces fruits, vegetables, and other major crops like sugarcane, wheat, rice, cotton. However, the Economic development of Sindh largely depends on the progress and growth of the Agriculture Sector. The study area are (Karachi, Hyderabad, Thatta, Dadu, Mirpurkhas, Nawabshah, Sanghar, Noosheroferoz, Umerkot and Badin).

3.2 Data collection

A semi-structured questionnaire is used as a survey instrument for data collection. Face to face interviews with farmers was conducted in the months of wheat harvesting from June to September 2018. The purposive sampling was used to choose the study areas. The sample size of 360 from respondents of 9 districts, from each district (40 samples) was randomly selected as the target group of the study area. The questionnaire was designed in three groups, in the first section the respondents were asked about the general farm information. The second section includes in-depth about the participation in agriculture productivity training programs of male and females farmers. The main factors that influence
gender participation. The third section covered detailed household general information. After a purposive sampling, a proportionate allocation sampling method was used to incorporate both males and female-headed household in interviews. The information provided by the wheat cultivators and their families is very detailed and also includes social and technical variables, such as age, gender, education, farm size, and total income. Before data collection, the field observation was done. The quantitative method was used to achieve complementarity results. The key informant's interviews and pre-test with agronomists officers at the sector and district levels along with 18 farmers focus group discussion (not included in the sample size) was done, for questionnaire validation to obtain the APTP information (Extension, services, farmers productivity, agricultural inputs, and their participation). After minor adjustments, the final instrument was adopted in order to measure the desired variables accurately. The questionnaire which was developed initially in English and was translated into the local language (Urdu) administered orally.

3.3 Model Specification

3.3.1 Econometric Model

The binary logistic regression method was used to model the role of gender in agriculture training program. The outcome variable, the participation of genders in agriculture training program was dichotomous taking the value of 1 if participate in the agriculture training program and 0, otherwise (for not participating). The mathematical representation of logistic regression model is as follows (Gujarati 1995).

\[
P_{Yi=1} = \frac{P_i}{1-P_i} = e^{(\beta_0 + \beta_1X1i + \beta_2iX2i + \cdots + \beta_kXki)}
\]

(1)

Where, \(P_i\) is the probability that \(Y_i\) takes the value 1 (participation in agriculture training program); \(1-P_i\) is the probability that \(Y\) is 0 (no participation in agriculture training program); \(e\) is the exponential constant. Taking the natural log of both sides of eq. (1), we get:

\[
Li = \ln \left( \frac{P_i}{1-P_i} \right) = \beta_0 + \beta_1X1i + \beta_2iX2i + \cdots + \beta_kXki
\]

(2)

Where, \(Li\) stands for logit model, which is linear in \(Xi\) as well as in \(\beta\); subscript \(i\) denotes the \(i\)th observation in the sample; \(P\) is the probability of the outcome; \(\beta_0\) is the intercept term; \(\beta_1+\beta_2+\cdots+\beta_k\) are the coefficients associated with each independent variable \(X1, X2, \ldots, Xk\).

3.3.2 Description of variables

The dependent variables is participation of gender in training. We use \(Li\) that represents the participation status of gender, \(Y_i = 1\) (if participated) and \(Y_i = 0\) (if participated). While the independent variables that influence the participation status are represented as, The demographics variable \(X1\) represents gender of participant in the training programs, which gender more likely to participate male or female (If female = 1 and if male = 0). The variable \(X2\) presents the age of the participants and \(X3\) represents the household size of the respondents, to distinguish whether household size have an influence on genders to participate in Agricultural training or not. Whereas the educational level of household \(X4\) indicates the educational level of the household will show likelihood to participate or not participate in training. The variables \(X5\) indicates the farming income that earn from wheat farm, \(X6\) represents the farm size and \(X7\) indicates the training programs that participant is been attended, However the variable \(X8\) represents the labor used in wheat farm and \(X9\) indicates the total wheat production of farm.

4. Results and Discussion

4.1 Characteristics of Respondents

Table 1 shows characteristics of the respondents. The result of the survey showed that about 70.6 % of the respondents agreed that agricultural training program such as APTP help them to increase their income from the wheat production. Whereas male respondents are more dominant in participation rather than female respondents which shows the frequency of 88.9% overall and females frequency is only 11.1% participation in training program, which is quite low. The education level of the respondents is low overall because they belongs to farmer’s family and did not get higher education. Table 1 also shows that maximum 28.9% of the respondents attended APTP while about 25% of respondents attended agricultural training program, 21.4% of the respondents attended the Sindh development program, 14.2% of the respondents attended the pesticides training program and only 10% respondents attended the Sindh training program.

<table>
<thead>
<tr>
<th>Table 1: Characteristics of the respondents.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>320</td>
</tr>
<tr>
<td>Female</td>
<td>40</td>
</tr>
<tr>
<td>Who is the wheat grower in your family</td>
<td></td>
</tr>
</tbody>
</table>

http://www.ijmsbr.com
Husband 306 85.0
Wife 49 13.6
Brother 5 1.4

Marital Status
Single 3 0.8
Married 322 89.4
Divorced 10 2.8
Widow 25 6.9

Educational level
No school attended 193 53.6
Primary school attended 137 38.1
Secondary school attended 26 7.2
College/university 4 1.1

Express your household income per month
3000-5000 22 6.1
5000-10000 187 51.9
15000-20000 114 31.7
20000-25000 37 10.3

How far is the training place from your area
1km-3km 126 35.0
3km-6km 106 29.4
6km-9km 88 24.4
9km-12km 37 10.3

Who participates in the training program from your family
Male 294 81.7
Female 66 18.3

Which training or workshops have you been participated in the previous year
Pesticides training program 51 14.2
Agricultural productivity training program 90 25.0
Farmers productivity training program 104 28.9
Sindh development program 77 21.4
Sindh training program 38 10.0

Participating in Agricultural productivity training program helps to increase your income from the farm
Yes 252 70.6
No 104 29.4

What is your understanding and awareness about the term training
I am not well informed 121 33.6
I believe I am well informed about training program 114 31.7
I want to gain additional information about productivity training program 80 22.2
I understand very well what training is 45 12.5

Total 360 100.0

4.2 Participation Status of Gender
The below tables show how often respondents participate in APTP in a year. Through this, we could generalize the impacts of the training on wheat productivity. It illustrates that more men attended the productivity training than women. In essence, more men are engaged in farming compared to the female. However, the female number increased equivalently compared to the previous years. Using the total percentage, only 15.2% of the female have participated in the APTP.

Table 2: Participation status of Gender Agriculture Training Programs

<table>
<thead>
<tr>
<th>Participation</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>174</td>
<td>54</td>
<td>228</td>
</tr>
<tr>
<td>Percent (%)</td>
<td>48.3</td>
<td>15.2</td>
<td></td>
</tr>
<tr>
<td>Total Participation</td>
<td></td>
<td></td>
<td>228</td>
</tr>
</tbody>
</table>

4.3 Motivational Factors of Genders Participation
Table 3: Motivational factors for participation in Agriculture Productivity Training Program

<table>
<thead>
<tr>
<th>Motivational factors</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Want to learn new ways of farming</td>
<td>44</td>
<td>12.2</td>
</tr>
<tr>
<td>The desire to get the knowledge to apply on farm</td>
<td>73</td>
<td>20.3</td>
</tr>
</tbody>
</table>
Increased premium 65 18.1
Beware of the farm input subsidies in area 49 13.6
Want to get awareness on market issues 26 7.2
Get information on weather alerts for the seasons 17 4.7
Convinced by friend 20 5.6
Village policy 27 7.5
Good technical practices 22 6.1
Improved seeds 4 1.1
Awareness about fertilizers 4 1.1
Subsidy offer by trainer 8 2.2
Others 1 0.3

Table 3 shows the motivational factors for farmers and what reason and purpose for attending the training program. The 73 (20.3%) participants attended agricultural productivity training for getting desire knowledge to apply on their farm for gaining maximum wheat production and income. 65 (18.1%) farmers attended this training for increasing their premium, 49 (13.6%) farmers attended training for beware of the farm input subsidies in their areas of farming, 44 (12.2%) farmers went to learn regarding new ways of farming and wheat production. 27 (7.5%) farmers attended an agricultural training program for village policy, and 26 (7.2%) farmers attended training for getting appropriate awareness on market issues related to the wheat production. Only a few farmers attended training for good technical practices, improved seeds, getting information on weather alerts for the seasons, awareness about fertilizers and subsidy offer by the trainer for wheat production. However, the motivational factors are beneficial for genders for improving their income from the farm.

4.4 Factors Affecting Gender Participation in Agriculture Training Program

Table 4: Analysis of Variables used in Binary Logistics regression

<table>
<thead>
<tr>
<th>Variables</th>
<th>Codes</th>
<th>Categories</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (X1)</td>
<td>1</td>
<td>Male</td>
<td>0.612</td>
<td>0.212</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (X2)</td>
<td>1</td>
<td>15-25</td>
<td>0.351</td>
<td>0.181</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>26-35</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>26-45</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>46-55</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>56-above</td>
<td></td>
<td></td>
</tr>
<tr>
<td>House Hold (X3)</td>
<td>1</td>
<td>1-2</td>
<td>1.452</td>
<td>0.632</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>5-6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education (X4)</td>
<td>1</td>
<td>No school attended</td>
<td>0.132</td>
<td>0.090</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>primary school attended</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>secondary school attended</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>college/university attended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farm Income (X5)</td>
<td>1</td>
<td>10000-40000</td>
<td>2.861</td>
<td>0.562</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>41000-80000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farm Size (X6)</td>
<td>1</td>
<td>1-20</td>
<td>0.535</td>
<td>0.241</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>21-40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>41-60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training Program (X7)</td>
<td>1</td>
<td>Participated</td>
<td>0.981</td>
<td>0.194</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Not Participated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor (X8)</td>
<td>1</td>
<td>5-10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>10-15</td>
<td>1.481</td>
<td>0.912</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>15-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>20-25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mean and standard deviation analysis of the data indicated in Table 4 that nine of the variables were significantly related to level of participation of gender farmers in Agricultural training programs. The variables were gender, age, household, education, and farm income, farm size, training program, and labor, wheat production. Any new agricultural program that would bring this improvement, the farmer wants to be associated with it and have greater desire to participate in it. With
regards to gender, the mean value implies that role of gender increases the participation in agricultural training program. The higher the educational level of the farmer, higher the chances of participation in agriculture training program. In general, this study re-affirms the position of many other studies, including that of Chukwu (2014) that age and educational level are the factors affecting women participation in agriculture. Most of the successful women’s’ participants in agricultural training program extension program opined that they have a good understanding, support and encouragement from their husbands in terms of participation in trainings. Mean for household size, farming experience and farm size were however is significant with level of participation. One possible explanation with regard to household size for this relationship with level of participation might be that most of the participants now courage the over reliance on family labor on the farm in order to enable their children have access to formal education. In the case of farming experience, it might be that most of the experienced farmers tend to invest their resources and incomes into other ventures instead of increasing their level of participation in agricultural training program.

4.5 Empirical Results: Binary logistic regression

The Table 5 represents the Binary logistic regression model which applied in the study to analyze the influence of independent variables on the farmers’ participation in agriculture productivity training program. The statistical results from the analysis show that values of the model chi-square 56.627*** indicated that the selected variables are fit with the overall model. Additionally, considering the tolerance and the variance inflation factor values, there was no collinearity among the independent variables of the estimated model. Results in Table 6 show that the factors that significantly influenced the farmers’ participation in the agricultural productivity training program include gender, household size, age group, education, farm net income, training benefits and wheat production are the factors that significantly influence the gender participation status in Agricultural trainings for wheat farmers. In addition, the study also found that only about 63.5% of interviewed farmers participated in the agricultural productivity training program.

Considering the gender, the analysis of study revealed that male-headed are 48.3 more likely to participate in the agricultural productivity training program than female-headed 15.2. This is probably due to the fact that agricultural activities require more physical work. So, male-headed households are more physically fit to invest in agriculture than female-headed. Similar study by Nxumalo & Oladele (2013) also indicated that the male farmers are more likely to participate in an agricultural project than their female counterparts. Moreover, Charatsari, Papadaki-Klavdianou, Michailidis, & Partalidou (2013) showed that the gender equality regarding the participation in agricultural extension program is not well fulfilled even though the female farmers show a very high desire to participate in such activities. Further, Charatsari, Istenič, & Lioutas (2013) proved that the female farmers are highly willing to participate in agricultural extension program and are more self-actualized than their male counterparts. Results showed that through participation in agricultural productivity training program it significantly increases the wheat production. Considering the household size, it positively and significantly influenced the farmers to participate in agricultural productivity training program. Further, André and Plateau (1998) stated that the age groups also important factor to identify the participation in agricultural productivity training program. However, Wilson & Tisdell (2001) found no significant correlation between the tenancy and the participation in age group and agricultural productivity training program. On the education, it is also positively influenced the participation in the agricultural productivity training program. This result is corroborated by Miranoswki (1983) who reported that education of farmers are more likely to rely on the new farming practices than the uneducated ones. Labor is also involved in the agricultural productivity training program and significantly influenced the wheat production for farmers. Therefore, the agricultural productivity training program service providers should play a positive role for farmers’ participation in the wheat production. Another study by Bouma (2008) indicated that farmers with agricultural productivity training program likely to contribute willingly to the community resources management. On the wheat production it is also positively and significantly influenced the farmers’ participation in the agricultural productivity training program. However, Sithole et al., (2014) found out that genders participation in trainings have significant influence on production of high value crops.

Table 5: Binary logistic regression estimates of the factors affecting the genders participation in agriculture training program.

<table>
<thead>
<tr>
<th>Variables</th>
<th>β</th>
<th>S.E.</th>
<th>Sig.</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.471</td>
<td>0.250</td>
<td>0.004***</td>
<td>3.241</td>
</tr>
<tr>
<td>House Hold size</td>
<td>0.342</td>
<td>0.162</td>
<td>0.006***</td>
<td>0.482</td>
</tr>
<tr>
<td>Age Group</td>
<td>0.213</td>
<td>0.215</td>
<td>0.0221*</td>
<td>0.563</td>
</tr>
<tr>
<td>Education</td>
<td>0.328</td>
<td>0.222</td>
<td>0.0542*</td>
<td>1.822</td>
</tr>
<tr>
<td>Farm Net-Income</td>
<td>0.412</td>
<td>0.131</td>
<td>0.002***</td>
<td>0.452</td>
</tr>
</tbody>
</table>

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The aim of this study was to identify the gender role in agricultural productivity training program, evidence from Sindh wheat production Pakistan. The study concludes that participation and agricultural productivity training program has positive impact on the gender improvement in wheat production. The study also conclude that role of gender in training participation of male is higher than female participation because female has different cultural and societal barriers in the environment of Pakistan. So males are more dominant in participation of agricultural productivity training program in Sindh wheat production rather than female’s participation. There are also some barriers for female while training participation which was lack of knowledge, lack of management, husband is not agree to participate, have no time, no financial benefits, charges for attending training lectures, don’t know about the time and place where training is conducting. Furthermore, in the findings of present research, authors suggest policy guidelines related to enhancement educational as well as skill level of rural women through education and trainings to narrow the gender gap /inequality in agricultural extension or information, in order to achieve the targets of women empowerment at national level. In this context, government should established women training centers at union council level. In addition to that hiring female agricultural extension agents are very much compulsory to attain the objective of gender equality in agricultural extension and rural development services.

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