International Journal of Botany Studies
ISSN: 2455-541X, Impact Factor: RJIF 5.12
www.botanyjournals.com
Volume 2; Issue 1; January 2017; Page No. 23-27

Comparative analysis of impact of agricultural practices on yield of cereals adopted by Agri-farms and rural peasants of Tehsil Barnala District Bhimber Azad Kashmir, Pakistan

[1] Mubsher Mazher, *[2] Dr. M. Ishtiaq, [3] Waheeda Mushtaq, [4] Tanveer Bashir

[1, 2, 3] Department of Botany, Mirpur University of Science and Technology (MUST), Bhimber Campus Bhimber, Azad Kashmir, Pakistan

[4] Department of Economics, Mirpur University of Science and Technology (MUST), Bhimber Campus, Bhimber Azad Kashmir, Pakistan

Abstract
This study was conducted to investigate impact and significance of agri-farms in comparison with conventional farming system used by local peasants. In this exploration, two model agri-farms: "Heer farm" and "Seengri farm" managed by agriculture department, were selected for study from subdivision Barnala, District Bhimber Azad Kashmir, Pakistan. In analysis, a comparative study designed for assessing local farming practices and know impact its on the yield of cereals. In the analysis, indigenous 30 farmers from neighboring vicinity of each agri-farm region were randomly selected and interviewed using structured and semi-structured using questionnaire methodology. The microstatistical tool Data Matrix Ranking (DMR) showed *Triticum vulgare* L. being 1st in rank. *Arachis hypogaea* L. being 4th in DMR. It was noticed that departmental agri-farms were practicing proper scientific practices and local farmer were not practicing appropriate techniques due to lack of adequate knowledge and unavailability of latest hybrid seeds. Due to such differences in agricultural practices agri-farms produced higher yield as compared to yield of local farmers. Yield of *T. vulgare* in "Heer farm" was 226.66±0.88 kg/kanal and that of local farmers was 189.66±0.33 kg/kanal. "Seengri farm" yield of *Pennisetum typhoidium* was 153.56±0.26 kg/kanal whereas conventional farmers of neighboring area of Seengri were having 109.33±0.33 kg/kanal. This analysis depicted that unawareness, unavailability of latest technological tools, good seeds were main hindrances in obtaining better yield. There must be some immediate measures conducted to provide good resources (Seeds), technological tools, fertilizers and novel agriculture practices' education to masses/ peasants of the area to bring agricultural revolution so that economy of the farmers, area and country may be uplifted.

Keywords: agri-frams; heat; agricultural practices, Barnala; Azad Kashmir

1. Introduction
Pakistan is predominantly an agricultural country, having rich natural resources, suitable climatic conditions, deep soils, favorable topography, and water resources, thus the country has huge potential for crop and livestock production (Rehman *et al.*, 2011) [13]. Agriculture is playing an important role in the economy of Pakistan by contributing about 21.00% to Gross Domestic Product (GDP), employs 45.00% of the total work force, and 60.00% of its rural population depends upon this sector for its livelihood (Ahmad *et al*, 2012) [2]. Agriculture contributes to the growth by providing raw materials to agro-based industries like textile, food processing, sugar, ghee, dairy, paper, leather, etc. (Govt. of Pakistan, 2011) [6]. In spite of such a great importance, agriculture is developing at a very low speed in Pakistan (Rehman 2010) [12]. Agricultural production in Pakistan is much lower than many other countries of the world due to lack of information adapted to local needs and lack of technical knowledge at farm level are the principal factors for the low yield and static production in Pakistan (Abedullah, 2008) [1].

To compete the global market today, our farmers should have latest information regarding new techniques of farming, new methods of cultivation, new crops, seeds, pesticides, water management, marketing of the product, government policies regarding agriculture, export potential of their crops and the information about the allied activities like fish farming, apiculture, poultry, dairy, and weather information on local and regional levels (Singh *et al*. 2011) [14].

Provincial Agricultural Extension Department is responsible for transferring of agricultural technology and providing technical guidance to farmers for improving agricultural practices to increase agricultural productivity. So failing to achieve self-sufficiency in major agricultural products has always been attributed to inefficiency of our agriculture extension services. (Pervaiz, 2001) [10] Despite an increase in yield in other countries, the low productivity of Pakistan's agriculture is one of the major areas of concerns for our planners, policy makers and research workers. Presently there is big difference between the actual and the potential yields of major crops (Govt. of Pakistan, 2011) [6].

The agriculture sector has so far not benefited from the full potential of tissue culture technology except potato and to some extent in banana, as research effort at public and private levels is small. The size of these efforts in term of researchers and financial resources are still very small and unable to reach commercial scale in other plants (Zafar and Malik 2003) [15].

AJ&K comprised of 5.134 sq. miles with 42.6% under forest, 14.4% under crop production and 43% uncultivated or waste land. The major crops include maize followed by wheat, rice and millet while minor as gram, pulses, oilseeds and vegetables. Agriculture farming in AJK is characterized by low yield and production, rising unemployment, larger families and traditional mode of thinking prevail in the society (Qureshi *et al.* 2002) [11].

2. Objectives

- To picture the multifunctional agriculture in the investigated micro-regions.
- To identify differences between department and conventional farming practices.
- To determine the difference between conventional farming and agricultural department yields.

3. Methodology

3.1 Population and Sampling

This study is the descriptive research, the local farmers and responsible of departmental agricultural farms in the study area were the target population. 5 farms (2 in Seengri and 3 in Heer) and the 30 farmers from each region (Heer and Seengri) tehsil Barnala of district Bhimber (AJ&K) were included as the sample population. Respondents were interviewed by the help of questionnaire which consisted of several questions regarding the methods, technologies used and the yields obtained. Multistage plan was used to collect the data.

3.2 Data Collection and Analysis of Data

The respondents were interviewed personally by structured interview schedule. Questionnaire items were coded and entered into the SPSS computer program. Suitable statistical techniques such as percentage analysis, mean, comparison of means (Duncun), standard error and standard deviation were used to analyze and interpreted the data. Crops were also arranged in different ranks by using DMR (Data Matrix Ranking).

4. Results

The results are based field surveys and it clarifies that there is dare need of education and awareness in local farmers of area for sustainable agriculture. That will foster local populations of the area and also generate revenue for the people. The different surveys conducted showed that there less trend of crop rotation in farmers than trained farmers/practitioners. Secondly, there is no use of seed priming or poisoning approach adopted by conventional farmers and which brings attack of fungi and other pathogenic diseases. There is land mark in results of testing of soil and then addition of fertilizers as per requirement of soil of the area or crop sown (Table 1).

Table 1: Differences between agricultural practices used by Agri-farms and Conventional Farmers

Areas	Practices used by agri-farm and conventional farmers						
	Crop rotation (Mean + S.E)	**Check aeration and porosity** (Mean + S.E)	**Seed poisoning** (Mean + S.E)	**Use recommended seeds** (Mean + S.E)	**Use fertilizers** (Mean + S.E)	**Test soil salinity** (Mean + S.E)	**Use modern techniques for harvesting** (Mean + S.E)
Heer Nearby Area	24.66±0.33	11.66±0.33	10.00±0.57	8.33±0.33	29.66±0.33	6.00±0.57	4.00±0.00
Heer Agri-farm	29.00±0.57	29.66±0.33	29.00±0.57	30.00±0.00	29.33±0.33	29.00±0.57	29.00±0.57
Seengri Nearby Area	23.00±0.57	8.66±0.33	6.66±0.33	7.66±0.33	29.00±0.57	2.33±0.33	3.00±0.57
Seengri Agri-farm	29.66±0.33	29.66±0.33	29.66±0.33	29.33±0.33	30.00±0.00	29.66±0.33	29.00±0.57

Table shows difference between the agricultural practices used by departmental and conventional farmers. Table describes mean of the practices used along with the standard error.

Table 2: Duncan multiple Range (DMR) tests for the comparison of agricultural practices

Areas	Practices used by department and conventional farmers						
	Crop rotation (Mean + S.E)	**Check aeration and porosity** (Mean + S.E)	**Seed poisoning** (Mean + S.E)	**Use recommended seeds** (Mean + S.E)	**Use fertilizers** (Mean + S.E)	**Test soil salinity** (Mean + S.E)	**Use modern techniques for harvesting** (Mean + S.E)
Heer conventional	24.66_b	11.66_b	10.00_b	8.33_b	29.66_a	6.00_b	4.00_b
Heer departmental	29.00_a	29.66_a	29.00_a	30.00_a	29.33_a	29.00_a	29.00_a
Seengri conventional	23.00_c	8.66_c	6.66_c	7.66_b	29.00_a	2.33_c	3.00_b
Seengri departmental	29.66_a	29.66_a	29.66_a	29.33_a	30.00_a	29.66_a	29.00_a

Subset for alpha = 0.05

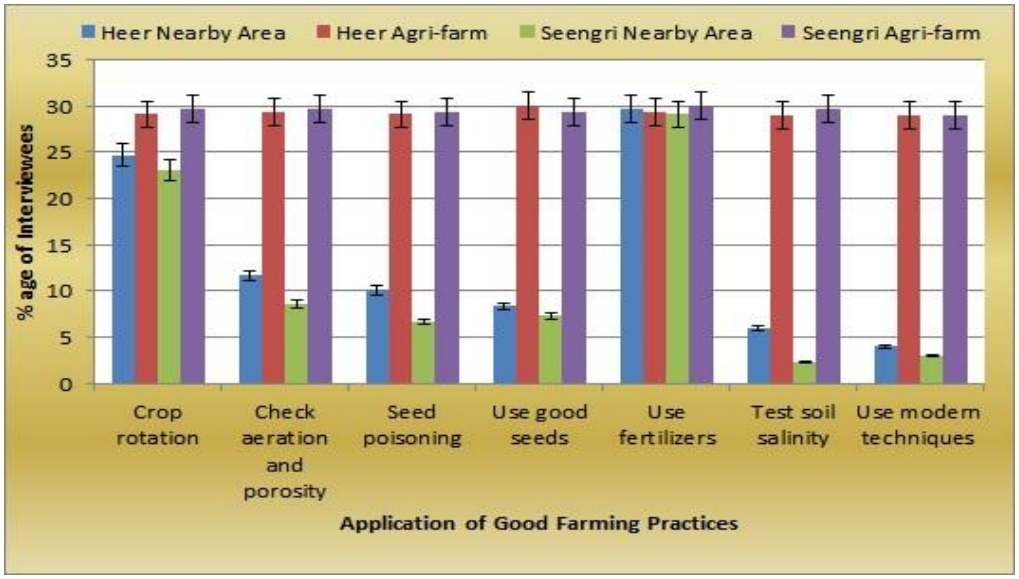

Fig 1: %age Farmers using Good Agriculture Practices in Barnala Area

Table indicates that there is significant difference between agricultural and departmental practices at both the areas, but the agricultural practices used in departments at both places are not significantly different.

In analysis, seven most frequently sown and cultivated crops were taken in consideration. The questionnaire was conducted on each of it. The results showed that wheat crop yield in agri-farms was quite better (226 kg/Kanal) than in conventional farmers fields (196 kg/Kanal). A huge difference was seen in yield of *Sacharum officinarum* where former had yield of 360 kg/kanal in farmers fields while it was 400 kg/ kanal in agri-farmers area (Table 3. Fig 1).

Table 3: Difference between yields of crops between Agri-farms and Conventional Farmers

Area	Yield of different crops sown (kg/kanal)						
	T. vulgare	***P. typhoidium***	***S. officinarum***	***C. arietinum***	***Z. mays***	***B. compestris***	***B. nigra***
Heer Nearby Area	196.00±0.57	110.33±0.57	360.00±0.57	251.00±0.57	410.33±0.33	98.33±0.33	101.48±0.33
Heer Agri-farm	226.33±0.88	150.33±0.66	400.33±0.33	299.66±0.33	450.33±0.33	124.66±1.00	125.33±0.66
Seengri Nearby Area	189.66±0.33	109.33±0.33	251.00±0.57	252.00±0.66	390.00±0.57	105.00±1.00	105.66±0.33
Seengri Agri-farm	226.00±0.57	153.56±0.26	351.00±0.57	302.00±0.57	451.00±0.57	130.33±0.33	135.00±0.57

A comprehensive survey of seven commonly grown crops were conducted and % age yield of each of crop was estimated through statistical analysis and it depicted that sugar can crop and mustard crop were at top in yield difference margin between farmers field and agri-farms. Other crops also do possessed landmark gap of this parameter (Table 3, Fig 2).

Table illustrates the difference in yield of different crops in departmental farms and that of local farmers.

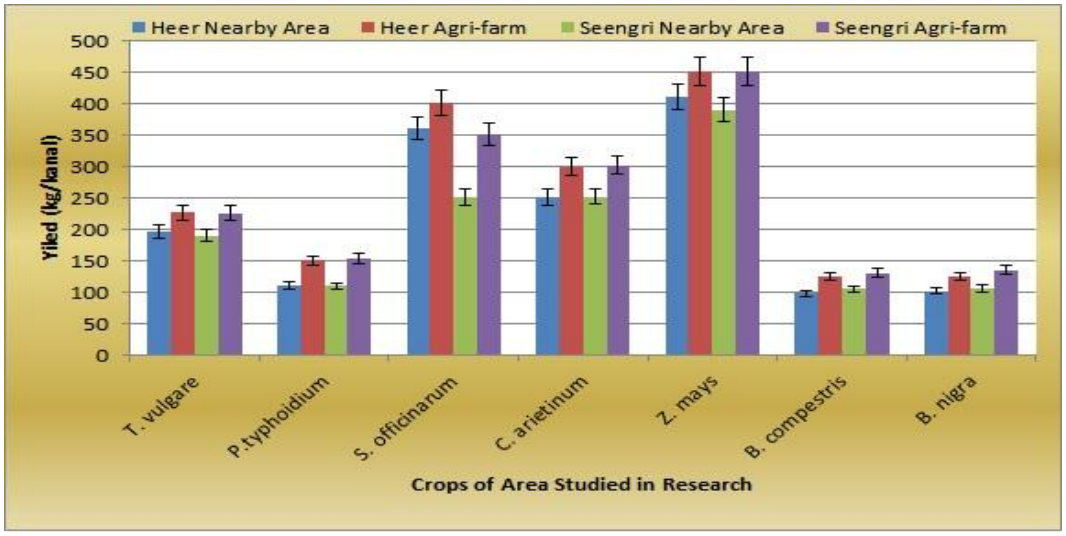

Fig 2: % age Yield of different Crops studied in the Study Area (Barnala)

Table 4: Duncan Multiple Range (DMR) tests for the comparison of yield between Agri-farms and Farmers Fields

Area	Yield of different crops sown (kg/kanal)						
	T. vulgare	***P. typhoidium***	***S. officinarum***	***C. arietinum***	***Z. mays***	***B. compestris***	***B. nigra***
Heer conventional	196.00_b	110.33_c	360.00_b	251.00_b	410.33_c	98.33_d	101.48_d
Heer departmental	226.33_a	150.33_b	400.33_a	299.66_a	450.33_a	124.66_b	125.33_b
Seengri conventional	189.66_c	109.00_c	251.00_d	252.00_b	390.00_b	105.00_c	105.66_c
Seengri departmental	226.00_a	153.00_a	351.00_c	302.00_a	451.00_a	130.33_a	135.00_a

Subset for alpha = 0.05

Table depicts the yields obtained by local farmers and departmental farms are significantly different. It is evident from table that yields of departmental farms are also significantly different as well as yields of local farmers of both areas are also significantly different.

Table 5: Multiple functioning of agricultural crops other than food reported from agri-farm and farmers field's survey determined by data matrix ranking (DMR) tool

Name of crop	Multifunctional uses of agricultural micro-region							DMR Ranking
	Food	**Crop**	**Food**	**Crop**	**Food**	**Crop**	**Food**	
T. vulgare	Yes	Yes	No	Yes	Yes	Yes	No	1st
P. typhoidium	Yes	Yes	No	No	Yes	No	No	3rd
S. officinarum	Yes	Yes	No	No	Yes	No	No	3rd
C. arietinum	Yes	Yes	No	No	No	Yes	No	3rd
Z. mays	Yes	Yes	No	Yes	No	No	No	3rd
B. compestris	Yes	Yes	No	No	Yes	No	No	3rd
B. nigra	Yes	Yes	No	No	Yes	No	No	3rd
A. hypogaea	Yes	Yes	No	No	No	No	No	4th
H. annus	Yes	Yes	No	Yes	No	No	No	3rd
S. vulgare	Yes	Yes	No	No	Yes	Yes	No	2nd

Triticum vulgare, known as wheat or "gandam" in the indigenous communities and it has shown maximum of multifunctional use. It is used in source of food, fodder, feed, thatching and others too (Table 5) is placed on 1st rank because it plays more functions as compared to other crops. Wheat provides grains, it is used for feeding. It is also used for thatching, nomadic and fodder purposes. *Solanum vulgare* are placed in 2nd rank and it is used for grains, feeding, thatching, and fodder purposes (Table 5). *Arahes hypogaea* (pea nut) is placed in 4th rank as it has lowest usage. All other crops under study were placed in 3rd rank for their use as other than food purpose.

5. Discussion

Man cannot live without staple food which is got mostly from cereals around the world. The crops grown for food are of multiple use as well. These crops have been used as source of fodder for livestock and wild rodents. They also provide feed for birds and chicken in the area not only to domestic but also for wild aviana (Fawole, 2006) [5].

The production of any plant or crop depends on its health and genetics. The use of better quality seed and its good growth by using provision good soil for cultivation is key factor in better yield production. Man has been trying to get good output of crops since past times and rural communities depend on method of "error and trial" so they mostly are reluctant to use new methods of cultivation (Omobolanle, (2008) [9].

There are different parameters which are fostering increase or decease in yield of crops. Among these common are good soil preparation, soil composition, soil aeration, soil fertility, good seed and fertilizers. The study revealed that as rural people of the area are mostly uneducated so they do not have awareness for use of latest scientific technologies which is major plethora in obtaining better yield by these peasants as shown above table 1, 3, 5 and Fig 2, 3. It was found that yields of the crops are greatly related to methods of irrigation it is seen that different methods of irrigation give different yield of the same crop. Results of this study are in accordance to Benjamin *et al.,* 2007 [3]. Departmental officials are well educated and aware of modern techniques in agriculture so that they get good yield. Local farmers are usually not aware of better techniques to get good yield. The results of the present study are in accordance with those of Fawole, (2006) [5]; Fajeria *et al.,* 2008; Ofuoku *et al., (*2008); and Omobolanle, (2008) [6, 8, 9] who found that most of the respondents belonging to departments get higher yields than the farmers which use conventional farming practices.

The study revealed that farmers of the area don't know the value of crop rotation some of them don't practice crop rotation due to which particular nutrients are depleting from their lands and due to this reason their crops didn't give them sufficient yield. They don't check aeration and porosity; they don't practice seed poisoning before cultivation, they don't use recommended seed by the department for sowing, they have lesser information about usage of fertilizers either they use greater or lesser quantities of fertilizers which may negatively affect their productions. Local farmers don't use modern techniques for harvesting. In contrast to local farmers departmental farms use

recommended seeds, check aeration and porosity, crop rotation, seed poisoning, use proper fertilizers in adequate and balanced amounts, they regularly check soil salinity and pH, they use modern techniques for harvesting etc. These are the major practices which enhance the production of departmental farms and local farmers which don't use these practices get lesser yields. Departmental farms produce good yields because these are monitored by the government and sufficient budget is given to the farms, also several monitoring comities are formed which guide or utilize the prescribed budget in proper managed way. Contrary to it local farmers usually lack facilities or their budget is much lesser that they can't practice better fertilizers or others. So it is estimated that local farmers lack sufficient facilities that's why the conventional farming yields lesser than the departmental farming. Conventional farmers due to lack of knowledge sometimes use pesticides without having the attack of pests. This may lead to elimination of useful insects which are helpful in pollination and hence reduction in pollination leads to reduced yield.

These findings are very important because on the basis of this research concerned departments and government should take necessary steps to educate the masses of the area and particularly train the farmers by workshops and field practices for getting good potential of crops' yield. There is also need of hour to provide facilities and loans to small farmers so that they have power to buy good seeds and fertilizers in time and may get good crops for their life and country's economy.

6. Conclusion

It was declared by the results that agri-farms or departmental farms' yield is high enough as compared to the yield of local farmers fields per kanal. Local farmers don't know about use of seed priming and use of good genetic seeds trend. The use of awareness workshops, on-field trainings and provision of loans for buy good seeds, fertilizers is also inevitable for economy of the area.

6.1 Suggestions

1. Government should educate the farmers at gross level.
2. Agriculture department should provide recommended seeds to local farmers free or at cheaper rates.
3. Farmers must be given small loans without interest.
4. Local farmers must have approach to market and their products should be sold with good prices, so they may get good reward and recycling may continue.
5. Government must launch broad spectrum programs on media, newspapers and on-field trainings too.
6. Local farmers should be motivated by the organizing authorities to practice technological advances by involving private sector banks and NGOs.
7. Agricultural education must be emphasized, at school level as compulsory subject in all classes up to secondary level.

7. References

1. Abedullah N. The Role of Agriculture Credit in the Growth of Livestock Sector: A Case Study of Faisalabad, Pakistan, Pak. Vet. J. 2008; 29(2):81-84.
2. Ahmad S, Chohan TZ, Saddozai KN. An Investigation into Cost and Revenue of Onion Production in Azad Jammu Kashmir. Sarhad J Agric. 2012; 24(4):737-743.
3. Benjamin NN, Jacques M, Jean SR. Ground water Recharge from Rainfall in the Southern Border of Lake Chad in Cameroon, World Applied Sci. J. 2007; 2(2):125-131.
4. Fageria NK, Ballingar VC, Jones CA. Growth and Mineral Nutrition of Field Crop. Marcel Dekker. New York. 2008, 345-384.
5. Fawole OP. Farmers Utilization of Information in Lagelu Local Government Area, Oyo State of Nigeria. Int. J Poultry Sci. 2006; 5(5):499-501.
6. Govt. of Pakistan, Economic Survey of Pakistan. Finance Division, Economic Advisor's Wing, Islamabad, Pakistan, 2011.
7. Jawed M, Zaeem UA, Shahid A. Proceedings of the Pakistan Academy of Sciences. 2012; 49(4):241-249.
8. Ofuoku AU, Emah GN, Itedjere BE. Information Utilization Among Rural Farmers in Central Agricultural Zone of Delta State, Nigeria. World J Agric. Sci. 2008; 4(5):558-564.
9. Omobolanle OL. Analysis of Extension Activities on Farmers' Productivity in Southwest, Nigeria. Afr. J Agric. Res. 2008; 3(6):469-476.
10. Pervaiz U. Main Factors Affecting Extension Activities; A case study of Malakand Agency, Pak. Vet. J., 2001; (4)2:39-43.
11. Qureshi AH, Saif-ur-Rehman SA, Arshad HH, Najia B, Amina R. Farmers Practices of Maize Production and Consumption in AJK: Implications for Research and Extension. Agr. Eco. Res. Unit Pak. 2002; 3:140-163.
12. Rehman F. Development of a Strategy to Enhance the Role of Print Media in the Dissemination of Agricultural Information Among Farmers in the Punjab, Pakistan, Sarhad J Agric. 2010; (24)1:13-19.
13. Rehman F, Muhammad S, Ashraf I, Hassan S. Factors Affecting the Effectiveness of Print Media in the Dissemination of Agricultural Information. Sarhad J Agric. 2011; 27(1):119-124.
14. Singh R, Priya A, Singh P. Role of ICT in Rural Empowerment. Res. J. Soc. Sci. Mgt. 2011; 1(5):52-65.
15. Zafar Y, Malik KA. Working Paper on Biotechnology in Agriculture National Commission on Biotechnology, Ministry of Science and Technology, Government of Pakistan. 2003.