

COMPARATIVE ANALYSIS OF PRODUCTIVITY OF AGRICULTURAL RESEARCH FARM OF THE UNIVERSITY OF AGRICULTURE PESHAWAR AND PRIVATE FARMS OF UNION COUNCIL PALOSI PESHAWAR

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ABSTRACT

This study was conducted with the comparative analysis of productivity of agricultural research farm of The University of Agriculture Peshawar and private farms of union council Palosi Peshawar. An interview schedule was prepared to collect information from the respondents (3 farm Managers and 40 farmers). The last 5 years record was also studied for the production, expenditure and income of the agricultural research farm of The University of Agriculture Peshawar. The present study was conducted to examine the productivity, income and expenditure of the agricultural research farm, analyzing the costs and returns encored on the farm and comparison of per acre yield of agricultural research farm with union council Palosi. After comparing the yields of different crops, it was found that wheat production at agricultural research farm was 1400 kg/acre while in union council Palosi it was 800 kg/acre. Maize production in agricultural research farm was 1000 kg/acre, while in union council Palosi it was 450 kg/acre. Berseem production was 4040 kg/acre in agricultural research farm while 3400 kg/acre production in union council Palosi. Oats production in agricultural research farm was 1200 kg/acre while 500 kg/acre production in union council Palosi. The production at agricultural research farm was high due to the use of quality seed, judicious fertilization, proper tillage and irrigation, proper seed rate and sowing time and presence of learned personnel at farm as compared to union council Palosi. Most of the farmers were illiterate 67.50%. 47.50% farmers were tenants. Use of machinery like tractor and thresher 100%, use of pesticides 80% but most of them felt difficulty in the selection and proper use of pesticides. Majority of farmers 32.50% had personal contacts with progressive farmers. There were no farmer's society and no farmer was getting formal training from any organization. The yield of farmers of union council Palosi can be increased if they make more use of modern agrotechnology but with best management techniques and strategies. Farmers should start training facilities

through extension department which may educate them about proper and timely use of pesticides, fertilizers, irrigation water, timely sowing of the crops, acquiring high yielding varieties from different centers, methods of integrated pests and nutrient management, acquiring loan facilities and utilization of mass media.

Key words: Survey, Production, Union council, Palosi, The University of Agriculture, Peshawar

INTRODUCTION

Agriculture is a branch of applied science. The term agriculture has been derived from the Latin word “ager” meaning land or field and “culture” meaning cultivation i.e. “The science of producing crops and raising livestock”. Agriculture is a science of managing the growth of plants and animals for human use. In a broad sense, agriculture includes cultivation of the soil (soil management), growing and harvesting of crops (crop farming), breeding and raising of livestock (animal husbandry), dairy farming, forestry, and poultry farming. Regional and national agriculture are covered in more detail in individual country and continent articles. Modern agriculture depends heavily on engineering and technology and on the biological and physical sciences. Irrigation, drainage, conservation and sanitary engineering, each of which is important in successful farming, are some of the fields requiring the specialized knowledge of agricultural.

The use of the word “extension” derives from an educational development in England during the second half of the nineteenth century. In a Literal sense extension education means “a program that extend educational resources of an institution by special arrangements to people, otherwise unable to take advantages of such resources”. The term agricultural extension may be defined as “the process of bringing about desirable changes in farming practices through persuasion or motivation”. Extension plays important role in the improvement of agricultural production and productivity in the present technological era. Apart from the importance of farmers and agriculture in the society and economy concerned, several conditions appear to be necessary for the initiation and organized development of agricultural extension work.

The prime condition is that information has been assembled, systematized, and made available on good or progressive or new agricultural practices suited to a particular environment, and is based on either (or both) the accumulation of experience or findings from research (however rudimentary).

Second, this information is used, among other things, to educate professional agriculturists who may further enlarge or refine this body of knowledge or become active promoters and disseminators of it.

Third, an appropriate administrative or organizational structure exists by and within which the dissemination activities may be established and conducted.

Fourth, there is a legislative or some other official mandate or influential proponent, which prescribes or enables that agricultural extension work, is desirable and must occur.

Fifth, there are invariably a variety of antecedents, which have attempted protoforms of agricultural information and advice dissemination. In addition, the incidence of critical situations, such as famine, crop failure, soil exhaustion, or altered economic conditions or relationships, may create an immediate cause for initiating the organization of extension work. All or several of these conditions have been present in the evolution of modern forms of agricultural extension.

Agriculture in Pakistan

A farm is the smallest unit of agriculture, which may consist of one or more plots cultivated by one farmer or a group of farmers in common for raising crops and livestock. It is both a producing unit as well as a consuming unit.

Agriculture plays a pivotal role in the economy of Pakistan. In Pakistan agriculture remains in many ways the most dominant economic activity. Agriculture sector provides employment to 38.5% of the labour force; contribute 45% of export earning and accounts for 19.2% of Gross Domestic Product. The agricultural production units of Pakistan comprise farms of many sizes, which follows many different systems. Summarises the farm sizes over all Pakistan, just on 51% of farms had less than 3 ha land and 73.5 % had less than 5 ha land and only 0.3 % had over 60 has land. This pattern of change in the farm size structure in Pakistan naturally has an impact on crop assemblage, fertilizer use, credit requirements and extension needs. Different parts of Pakistan have distinctive cropping patterns. Per acre yield of various crops is still below as compared to other countries. This is because of the prevalence of traditional farming practices and inadequate use of inputs by the farmers.

Reasons of Low Per Acre Yield

There are many reasons of low per acre yield like; land size, literacy ratio, poor extension services and provision of training, poor financial conditions of farmers, lack of modern agro-technical practices, poor utilization of the available resources, low credit to farmers, reluctance towards adoption of new techniques, unawareness about inputs and their unavailability; like fertilizers, irrigation water, pesticides, improved seed varieties, advanced machinery, poor information sources, poor knowledge about marketing, government top down programs, political interference and many other constraints are faced by farmers.

RESEARCH METHODOLOGY

The basic objective of the research study was comparative analysis of productivity of Agricultural Research Farm. The University of Agriculture Peshawar and private farms of Union Council Palosi Peshawar. In the research, procedure of sampling structure, administration of questionnaire and data collection mechanism is presented. The analyses of primary data collection, discussion methods and recommendations are also part of the research. The universe of the research comprises the Agricultural Research farm of The University of Agriculture Peshawar and Union Council Palosi, Peshawar. The Union Council Palosi, Peshawar consists of four villages; so equal number of respondents (10) from each village was purposely selected. Keeping in view the objectives of the study, an interview schedule was prepared to collect information from the respondents (3 farm Managers and 40 farmers). Also the last 5 years record was studied the production, expenditure and income of the agricultural research farm of The University of Agriculture Peshawar. The Interview schedule was pre-tested in order to check its validity. Some of the questions were added, changed or modified, as a result of pre-testing then final interview schedule was prepared as needed. The respondents were interviewed on their field/farm in a relaxed environment. The respondents were interviewed individually. Most of the questionnaires were filled from the farmers by the author himself. The secondary data was collected from published and unpublished materials. Data collected from primary and secondary sources were analyzed carefully by using software programmes SPSS and Excel.

RESULTS AND DISCUSSION

Agronomy Farm

A farm is the smallest unit of agriculture, which may consist of one or more plots, cultivated by one farmer or a group of farmers in common for raising crops and livestock. It is both a producing unit as well as a consuming unit. The agronomy research farm of The University of Agriculture Peshawar, comprising of 167 acres. The agronomy farm is supervised by farm manager. He was responsible for every activity in the farm; further the chairman of agronomy department The University of Agriculture Peshawar supervises the farm manager. The main objectives of agronomy farm are to Impart training to agriculture graduates, demonstration of improved practices to the students, model farm activities for adoption by the growers to enhance crops yield, conduct of research at B.Sc. (Hons), M.Sc. (Hons) and Ph.D level and multiplication of high yielding varieties and distribution of their seed to the growers. There are 26 workers working in agronomy farm. About 20 acres land has been allocated for students and faculty research. The students B.Sc. (Hons), M.Sc. (Hons) and Ph.D conduct research at farm for the partial fulfillment of their respective degrees. The farm manager helps the students in field layout, field demarcation, data collection and other research related activities. The agronomy farm produces

quality seed of wheat and maize and disseminate it to the surrounding farmers community and throughout the province, which is bringing good name to this varsity. The year wise income of agronomy farm for the years 2016-2020 is given in the table 1.

Table 1 Year Wise Income of Agronomy Farm (2016-2020)

| S.No | Name of Item | 2016-2017 (Rs) | 2017-18 (Rs) | 2018-19 (Rs) | 2019-20 (Rs) |
|------|---------------------|-------------------|-------------------|-------------------|-------------------|
| 1 | Sale of wheat | 1638732 | 1349296 | 1270440 | 1358074 |
| 2 | Sale of Bhoosa | 350650 | 326345 | 308100 | 362850 |
| 3 | Vegetable | 5620 | 00 | 6600 | 10320 |
| 4 | Sale of maize | 259950 | 56896 | 115760 | 37500 |
| 5 | Maize fodder | 13400 | 00 | 84400 | 21000 |
| 6 | Sale of sugarcane | 00 | 00 | 00 | 00 |
| 7 | Sale of sour orange | 16000 | 16500 | 17000 | 17500 |
| 8 | Use of tractor | 5328 | 8150 | 16020 | 11500 |
| 9 | Land lease | 00 | 17000 | 30000 | 00 |
| 10 | Sale of ex. Produce | 18200 | 14800 | 20000 | 00 |
| 11 | Sale of fertilizer | 25448 | 824 | 00 | 00 |
| 12 | Sale of barseem | 13300 | 173900 | 124000 | 276000 |
| 13 | Sale of Mungbean | 00 | 173900 | 25650 | 44689 |
| 14 | Sale of calocacia | 00 | 00 | 00 | 38000 |
| | Total | Rs.2466328 | Rs.2137611 | Rs.2044570 | Rs.2197433 |

Table 1 reveals the year wise income of the agronomy farm from 2016 - 2010. The total income were Rs.2466328, Rs.2137611, Rs.2044570 and Rs.2197433 for the years 2016-2017, 2017-18, 2018-

19 and 2019-20 respectively. Total income was mainly contributed by sale of wheat and wheat bhoosa. While sale of maize, maize fodder and berseem are also playing important role in the income of agronomy farm. There was no sale of vegetable in the year 2017-18, while sale of vegetable in year 2019-20 occurred mostly. The income was increased with laps of time mainly due to increased production and also inclusion of legume crops in cropping system of the farm.

The year wise expenditure of agronomy farm for the years 2016-2020 is given in the table 2.

Table 4.1.2 Year Wise Expenditure of Agronomy Farm (2016-2020)

| S.No | Name of Item | 2016-2017 (Rs) | 2017-18 (Rs) | 2018-19 (Rs) | 2019-20 (Rs) |
|------|-----------------------|----------------------|----------------------|----------------------|-----------------------|
| 1 | Transport & Machinery | 105064 | 140010 | 45521 | 57383 |
| 2 | Seed | 98643 | 52895 | | 28400 |
| 3 | Fertilizers (Bags) | 195625 | 250725 | 248062 | 239911 |
| 4 | Water rates | 28951 | 19723 | 31376 | 80244 |
| 5 | Pesticides | 154474 | 9305 | 140830 | 11715 |
| 6 | Diesel oil | 148645 (13700) | 201389 (14808) | 157256 (8800) | 174428 (8600) |
| 7 | Engine oil | 39302 (86 Gallon) | 47940 (102Gallon) | 38760 (76 Gallon) | 97920 (148 Gallon) |
| 8 | Other contingents | 46490 | 31198 | 18040 | 22860 |
| | Total | Rs.817194 | Rs.753185 | Rs.679845 | Rs.864461 |

The table 2 shows the whole year wise expenditure of Agronomy farm from 2016-20. The total expenditure was Rs.817194, Rs.753185, Rs.679845 and Rs.864461 for the years 2016-2017, 2017-18, 2018-19 and 2019-20 respectively. The main item contributed in total expenditure includes fertilizers, diesel oil, engine oil, transport and machinery. Total expenditure was decrease from 2016 to 2019 then increased in the 2019-20. The decrease in expenditure might be due to less cost on seed purchase, less pesticide

application cost and other less contingency cost, while measured water rates; engine oil and diesel oil etc had resulted in more expenditure during 2019-20.

The year wise income of agronomy farm for the years 2019-20 is given in the table 3.

Table 3 Income of Agronomy Farm (2019-20)

| S.No | Name to Item | Total area | Per acre production | 2019-2020 (Rs) |
|------|---------------------|-------------|---------------------|----------------|
| 1 | Sale of wheat | 80 Acre | 1400 Kg/Acre | 1312500 |
| 2 | Sale of Bhoosa | 80 Acre | 3000 Kg/Acre | 239350 |
| 3 | Sale of maize | 10 Acre | 1000 Kg/Acre | 72000 |
| 4 | Maize fodder | 10 Acre | 5000 Kg/Acre | 82200 |
| 5 | Vegetable | 5 Acre | ----- | 18000 |
| 6 | Sale of orange | 1000 Plants | ----- | 25500 |
| 7 | Use of tractor | ----- | ----- | 46310 |
| 8 | Land lease | 4 Acre | 10000 per Acre | 40000 |
| 9 | Sale of ex. Produce | ----- | ----- | 16000 |
| 10 | Sale of fertilizer | ----- | ----- | 20250 |
| 11 | Sale of berseem | 20 Acre | 4040 Kg/Acre | 240000 |
| 12 | Sale of Mungbean | 17 Acre | 100 Kg/Acre | 44100 |
| 13 | Sale of calocacia | 8 Acre | | 32200 |
| 14 | Sale of oats | 9 Acre | 1200 Kg/Acre | 90000 |
| 15 | Sale of canola | 10 Acre | 150 Kg/Acre | 55000 |
| 16 | Sale of barley | 4 Acre | 250 Kg/Acre | 20000 |
| 17 | Sale of garlic | 5 Acre | 266 Kg/Acre | 4000 |

| | | | | |
|--|---------------------|-----------------|--|-------------------|
| | Total amount | 167 Acre | | Rs.2357410 |
|--|---------------------|-----------------|--|-------------------|

Total income of agronomy farm during 2019-20 reported in table 3. The table revealed that total income of agronomy farm 2019-20 was Rs.2357410, mainly contributed by sale of wheat, sale of bhoosa, sale of maize, sale of oats, legume crops sale and use of tractor. The total income during 2019-2020 was more than the previous years. This puff up increase in total income is due to increase in per acre area, reduction of expenditure on various items and allocations of more land to wheat and other more productive legume crops.

The year wise expenditure of agronomy farm for the years 2019-20 is given in the table 4.

Table 4 Expenditure of Agronomy Farm

| S.No | Name of Item | (Rs) |
|-------------|-----------------------|-------------------|
| 1 | Transport & Machinery | 9021 |
| 2 | Seed | 58700 |
| 3 | Fertilizers | 279430 |
| 4 | Water rates | 41673 |
| 5 | Pesticides | 20250 |
| 6 | Diesel oil | 164818 (7400) |
| 7 | Engine oil | 10200 (48 Gallon) |
| 8 | Other contingents | 48364 |
| | Total amount | Rs.632456 |

Total expenditure of agronomy farm during 2019-20 presented in table 4. The table shows total expenditure Rs. 632456 was mainly due to the use of diesel oil, seed purchase, fertilizer, pesticides and engine oil respectively. Total expenditure in 2019-2020 was decreased as compared to previous years. This reduction in expenditure is due to less transport and machinery, engine oil, pesticide and diesel oil.

The year wise net income of agronomy farm for the years 2016-2020 is given in the table 5.

Table 5 Year Wise Net Income of Agronomy Farm

| Year | 2016-2017 | 2017-18 | 2018-19 | 2019-20 | 2020-2021 |
|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Income | 2466328 | 2137611 | 2044570 | 2197433 | 2357410 |
| Expenditure | 817194 | 753185 | 679845 | 864461 | 632456 |
| Net Income | Rs.1649134 | Rs.1384426 | Rs.1364725 | Rs.1332972 | Rs.1724954 |

The table 5 reveals the net income of agronomy farm from the last 5 years. The net income were Rs.1649134, Rs.1384426, Rs.1364725, Rs.1332972 and Rs.1724954 gained in the years 2016-2017, 2017-18, 2018-19, 2019-20, and 2020-21 respectively. Minimum income was gained in 2019-2020 as compared to other years. The lower income in 2019-20 is due to less income of wheat and more expenditure various items. Similarly increased income in 2020-21 is due more income in wheat and Bhoosa, more production of leguminous crops and less expenditure on machinery, engine oil etc.

CONCLUSION AND RECOMMENDATIONS

There were no farmer's society and no farmer was getting formal training from any organization. The yield of farmers of union council Palosi can be increased if they make more use of modern agro-technology but with best management techniques and strategies. Farmers should start training facilities through extension department which may educate them about proper and timely use of pesticides, fertilizers, irrigation water, timely sowing of the crops, acquiring high yielding varieties from different centers, methods of integrated pests and nutrient management, acquiring loan facilities and utilization of mass media.

REFERENCES

- Ali, A. 1972. A study of some selected socio-economic factors, which influence the adoption of improved agricultural practices by the farmers in Tehsil Lyllpur. M.Sc. (Agri.Ext.) Thesis, U.A. Lyllpur.
- Ali. 1987. A study of the productivity constraints of major crops in Islamabad capital territory. M.Sc. (Hons) Thesis, A.U. Faisalabad, Pakistan.
- Chaudry, S.M. 1980. A study in to problem faced by the farmers regarding plant protection measures on sugarcane crop in the Krialia project area. M.Sc. (Hons) Agri. Ext. Thesis, A.U. Faisalabad, Pakistan.

- Chauhan, K.S. 1997, Trends and perspectives in agricultural education in Asia Pacific. Report of the APO symposium on agricultural education system held in Tokyo, Japan from 29(5): 219-230.
- Chou, Z. and Z.N.N.N. Chou. 1999. Trends and perspectives in agricultural education in Asia Pacific. Report of the APO symposium on agricultural education system held in Japan from 29 July to 5 August 1997. 1999: 197-207.
- Hayat. 1982. A study of the extent of adoption of recommended insecticides by cotton growers of tehsil Mailsi, District Vehari. M.Sc. Agri. Ext. Thesis, U. A. Faisalabad, Pakistan.
- Hussain, M. 1987. A study of the adoption of Agricultural Extension recommendations and their effectiveness in the development of rural community. M.Sc. Agri. Ext. Thesis, U. A. Faisalabad, Pakistan.
- Hussain, S.S. and O. Erenstein 1993. Monitoring sustainability issues in agriculture in Swat valley, Northern Pakistan. Journal of the Asian farming systems association 2(1): 15-28.
- Jamil. 1973. A study on the extent of adoption of AC-134 by farmers in tehsil Kabriwala, District Multan. Twenty Years of Research Book in the Division of Education and Extension (1961-81) U. A. Faisalabad, Pakistan.
- Khan, H. 1971. A study of techniques used by the agricultural extension staff to popularize different commercial fertilizers in Lyallpur district. M.Sc. (Hons) Agri. Ext. Thesis, W.P.A.U., Lyallpur, Pakistan.
- Khan, A. 1987. To study the adoption of improved farming practices with special reference to gain in Mianwali district. Agri. Ext. Thesis, U.A., Faisalabad, Pakistan
- Khan, S.A. 1995. Wheat growers exposure to and adoptability of new technology through extension services in F R Bannu. M.Sc. (Hons) Agri. Ext. Deptt. of Agri. Ext. Edu&Comm, NWFP Agri. Univ. Peshawar, Pakistan.
- Knickel, K. 1995. A systems approach for better understanding of policy impact: the vulnerability of family farms in Western Europe. Journal for farming systems research extension 5(1): 129-141
- Leong, P. and P.L.F. Leong 1999. Trends and perspectives in agricultural education in Asia Pacific. Report of the APO symposium on agricultural education system held in Japan from 19 July to 5 August 1997. 1999. 298-321.
- Lombardo, P. and M. Gonella. 1995. Soil management in the soybean in the soybean area. Realidad Economica. No.134, 134-143.
- Low, A., J. D. Macarthur and J. Weiss 1994. Incorporating a participatory perspective into research, extension and development planning: experience from southern Africa. Agriculture, projects and development: papers in honour of David Edwards.
- Mbata, J. N. 1994. Fertilizer adoption by small-scale farmers in Nakuru District, Kenya. Fertilizer Research. 38 (2): 141-150.

- Moody, K. 1988. Developing appropriate weed management strategies for farmers. Weed management in agro ecosystems. Ecological approaches {edited by Altieri, M.A., Liebman, M.}. 319-330.
- Muchagata, M. G., V. Reynal, I. J. Veiga and V. De Reynal. 1994. Building dialogue between researchers and farmers: the experience of the Centro Agro-ambiental do Tocantins. Recherch-international, Montpellier, France 21-25 November 1994. Communications. 768-772.
- Mathur, P.N., V.S. Vyas and P. Bhargava 1997. Technology and Extension. Policies for agricultural development: perspectives from states.
- Parr, J. F., and R.I. Papendick 1997. Soil quality: relationships and strategies for sustainable dry land farming systems. Annals of arid zone 36(3): 81-191.
- Qayyum, A. 1981. A study of the factors responsible for decrease in the sugarcane in the university project area, Shakhkot. M.Sc. (Hons) Agri. Ext. Thesis, U. A. Faisalabad, Pakistan.
- Salinger, M.J., C.J. Stigter, H. P. das, M.V.K. Sivakumar and D. Rijks. 2000. Agro meteorological adoption is strategies to increasing climate variability and climate change. Agro meteorology in the 21st century: needs and perspectives Accra, Ghana, 15-17 February 1999. Agricultural and forest Meteorology. 2000, 103(1-2): 167-184.
- Strand, J. F., M.V.K. Siva Kumar, C.J. Stigter and D. Rijks 2000. Some agro- meteorological aspects of pest and disease management for the 21st century. Agro meteorology in the 21st century: Needs and perspectives Accra, Ghana, 15-17 February 1999. Agricultural and forest Meteorology. 2000, 103(1-2): 73-82.
- Surendra, S. V. K. Mittal, M.P. Singh, C. J. S. Pannu, B. S. Bhangoo and S. Singh. 1992. Farm power and machinery availability and utilization in a selected village of Punjab. Journal of Research Punjab Agricultural University. 29 (3): 378-386. India.
- Wanapat, M., O. Pimpa, A. Petlum, C. Wachirapakorn and C. Yuanklang. 2000. Participation scheme of smallholder dairy farmers in the Northeast Thailand on improving feeding systems. Asian Australasian Journal of Animal Sciences 13(6): 830-836.
- Trillo, F. S. and H. Gast. 1996. Promoting a small farmers seed program at El Tigre, Anzoategui State, Venezuela. Organization and management of national seed programmes. Proceedings of a follow-up seminar-workshop held from 12 to 24 November 1994 in Aleppo, Syria. 54-56.