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Role of Agricultural Extension Worker in Improving Livelihood of Small Farmers in Kama District Afghanistan

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Abstract

This current research study was designed to assess the role of extension workers in improving the livelihood of small farmers in Kama district. The major objectives of the study were to know the current situation of small farmers' involvement in farming practices and livestock management and identify the role and contribution of extension worker to improving of livelihood of small farmers in the study area. This study was conducted through a survey method across the District Kama from 200 small farmers of 4 villages from the selected 120 respondents. Regarding crop cultivation, majority of wheat grown on an area of 1.8 acres with the yield of 1819 Afs/acre at the prevailed 27 Afs/kg, and sugarcane was grown on an area of 0.3 acres the yield 13409 Afs/acre and price availed 11 Afs/kg. Additionally, vegetables cultivation, majority the respondents have grown Okra on area 0.4 acres, tomatoes, grown on an area of 0.3 acres, onions, 0.4 acres and bitter gourd, on regarding 0.2 acres in the study area. Around 77.3% of the respondents acquired information about the Agriculture Extension Department from agricultural extension workers; about 61% identified pest management as the primary reason directly affecting their crop yields. The results depend that there is significant association between educational status and satisfaction with livestock department. There is also a significant association between tenure status and frequency of visit by extension workers. It was concluded that majority of the small farmers uneducated and they were not aware of the new technologies and inputs. Major marketing problem faced by small farmers were marketing, transportation and small land did not take care of their land. It is recommended, agriculture and livestock extension department should make use of every available source of information to reach practically to everyone who can benefit from it. Technical trainings should be organized by government and other stakeholders in view of improving the livelihood of small farmers. Smallholders' agricultural development programs need to be developed and implemented to different cropping situations of Afghanistan.

Key Words: Agriculture, Extension worker, livelihood, kama district, Afghanistan

Introduction

Afghanistan's agriculture sector is the backbone of the country economic development. Most of Afghan's economic output comes from agriculture, so mostly Afghanistan's economy is based on agriculture sector. Afghanistan agriculture sector accounted for around 31% of the Gross Domestic Product (GDP) in 2020 and more than 60% of workforce depend on agricultural sector as well as 80 percent of rural residents depend on it for their living. Afghanistan is an agricultural country, which is providing a source of income for more than 80% of the people who depend on agriculture. Agriculture is also crucial for ensuring the country's food security. It provides the majority of the people's food and is the primary source of income for 44 percent of households (Khudadad et al.,

2021). Afghanistan has mountains, hills, plains, and deserts. As a result, its climate is harsh, with dry, extremely cold winters, exceptionally hot summers, snowfall at higher altitudes, and dust storms occur in dry places. The temperature varies significantly throughout the day and at night. Most of the rain falls between October and April. But the agriculture sector remains of more importance in building Afghanistan's economy, despite the fact that just 12% of its land area is arable, with only approximately half of that being cultivated. The majority of farms are very small, with around 69% of these farms are below 12.5 acres. Only about 16% of farms have more than 25 acres of arable land, either irrigated or rain-fed, and only 6.5% have more than 125 acres, approximately 33% of irrigated and 50% of rain-fed land. The main crops are wheat, maize, barley, sugarcane, and cotton. The most important vegetable crops and fruit are pomegranates, apricot, almond, walnut, mulberry and grapes, as well as onion, potato, tomato, watermelon and melon. Water requirements are typically met by rains in spring and melting snow in winter. Animals include cattle, karakul sheep and poultry, which play a vital role in enhancing the income of farmers. The development of agriculture suffers from, among some other factors, a lack of proper irrigation, weak extension services, and poor marketing. Putting effective ban on opium cultivation by farmers, who are tempted by the high income from this crop, remains a serious problem for the government. (Qamar, K. M., 2012).

Livelihood

Livelihood is the means, assets, and capability for the survival of life. There are three main strategies used for survival: intensification of agriculture, livelihood diversification, and migration. Different sources are used for the purpose of livelihood. Among these, natural, social, physical, financial, political, etc. are very well known in this world. These resources are used for the purpose of livelihood, where these resources are richer, and the economy of that country is boosted, where the entire situation in the country is poor, and as in a vicious circle, they are always poor. Some countries in the world have rich resources, but they do not know how to utilize them. Through livelihood, money is earned, which they then use for consumption and production in the country. The purchasing power of the people is increased, which further increases the demand for the goods. In this way, producers earn more than before, and the producers then set up other machines in the country, which increases the livelihood means in the country. The objective of the Sustainable Livelihood Program is to reduce poverty and inequality by generating employment among poor households and by moving highly vulnerable households into sustainable livelihoods and toward economic stability. All around the world, people try for jobs, and they get the job in different forms (Khan at al., 2020).

Extension services in Nangarhar province

The extension services in Nangarhar province, similar to those in other provinces in Afghanistan, are primarily under the jurisdiction of the public sector. However, non-governmental organizations, commercial companies, and mass media organizations also provide extension services. The agricultural extension department in Nangarhar plays a crucial role in providing services and operates under the guidance of the Director General of Agriculture Extension. Field assistants and field workers, who have direct interaction with farmers, have a significant role within the extension hierarchy. They are positioned at the grassroots level and engage with farmers on a regular basis. To equip them with the necessary skills and knowledge to promote modern agricultural technologies, Nangarhar has agricultural training institutes and extension departments that offer training program for extension agents. Extension organizations acquire information from various sources, including agricultural research, policy decisions, and social and psychological research. This information is then disseminated to farmers through a network of extension agents. The provision of such knowledge is expected to drive the transformation of conventional farming practices. In this system, there is a two-way flow of information. Scientific information is conveyed to farmers, and any feedback or problems encountered by farmers are referred to scientific institutions for potential solutions. The importance of agricultural extension in Afghanistan cannot be emphasized enough, as

a significant portion of the population depends entirely or partially on agriculture for their livelihoods. Strengthening connections among farmers is vital for enhancing agricultural practices and ensuring food security. The study mentioned focuses on examining the efficiency of the agricultural extension system in Nangarhar and identifying both its strengths and weaknesses from the perspectives of both supply and demand (Jan et al., 2008).

Materials and Methods

The universe of the study is District Kama, which belong to Nangarhar provinces, Afghanistan. In Kama District, there are total 52 villages, from which four villages were purposively selected due to high concentration of small farmers in this village. The records of the District Agriculture Office (DAO) were used to prepare a list of all the small farmers selected from four villages. A total of 200 small farmers were listed in the record of DAO, while for data collection, 60% of the small farmers, which gives a total of 120 farmers, were selected from the four villages. Using a proportionate allocation sampling procedure as follows:

$$ni = \frac{Ni}{N} \times n$$

The acquired data was evaluated via statistical package of social science tools (SPSS v.20). A Chi-square test was used to determine the relationship between two variables, and the link between variables was investigated. Likert scale was used.

$$\chi^2 = \sum_{i=1}^{r}\sum_{j=1}^{c}\frac{(O_{ij}-e_{ij})^2}{e_{ij}} \quad \text{.....(3.1)}$$

x^2 = Chi-square value

O = observed frequency while, e=expected frequency

Results and Discussion

This chapter provides the findings and analyses of the research study which were investigated that how farmers perceives extension workers' knowledge in enhancing improving livelihood of small farmers in the study region. The purpose of this part is having a significant impact on the survey's result. Any research undertaking should aim to analyze and present data in an engaging manner, emphasizing the collection of firsthand information. This section of the chapter provides the final analysis of the primary data along with its interpretation. The acquired data has been demonstrated using simple frequencies and percentages. All the variables selected for this chapter were chosen to align with the study's objectives.

Age of the Respondents

In every aspect of human life, age is an important factor. Age has an impact on every aspect of a person's life. Young people are more willing to accept innovations since they have greater decision-making and creative capacity, particularly understanding in communication. Age has an impact on human behavior and is a part of the development process (Khan and Akram, 2012). The data regarding age is described in Table. 3.1.

Table 3.1 Distribution of respondents based on their age

Village	Age of respondents					Total
	Up to 30	31-40	41-50	51-60	above 60	
QuliAkhund	17 (14.2)	13 (10.9)	4 (3.3)	2 (1.7)	0 (0.0)	36 (30)
Deh Ghazi	13 (10.9)	4 (3.3)	4 (3.3)	2 (1.7)	1 (0.8)	24 (20)

Wata Poor	11 (9.2)	6 (5.0)	7 (5.8)	6 (5.0)	0 (0.0)	30 (25)
Sangar Sri	14 (11.7)	5 (4.3)	4 (3.3)	4 (3.3)	3 (2.5)	30 (25)
Total	**55 (46.2)**	**28 (23.5)**	**19 (15.3)**	**14 (11.7)**	**4 (3.3)**	**120 (100)**

Literacy status of the respondents

As community perspectives evolve, assessing respondents' knowledge positions becomes crucial in evaluating the quality of human resources and societal development stages. The influence of education on human performance is evident, both directly and indirectly. According to Iqbal and Nawab (2013), individuals with higher literacy levels are more inclined to harbor positive attitudes toward agricultural technology, skill adaptation, and possess enhanced knowledge and information.

Table 3.2 Distribution of the respondents regarding their literacy status

Village	Education Level						Total
	Literate	Illiterate	Primary	Middle	Metric	Above Metric	
QuliAkhund	17(14.1)	19 (15.8)	1 (1.58)	5 (7.93)	6 (9.52)	5 (7.93)	17(26.98)
Deh Ghazi	13(10.7)	11 (9.2)	0 (0.0)	4 (6.34)	6 (9.52)	3(4.76)	13(20.63)
Wata Poor	20(16.5)	10 (8.3)	9 (14.28)	6 (9.52)	4 (6.34)	1(1.58)	20(31.75)
Sangar Sri	13(10.7)	17 (14.2)	2 (3.17)	2 (3.17)	5 (7.93)	4 (6.34)	13(20.63)
Total	**63 (52)**	**57 (48)**	**12 (19.13)**	**17 (26.96)**	**21 (33.31)**	**13 (20.60)**	**63(100)**

Size of land holding of the respondents

The size of the landholding area pertains to the piece of land cultivated by each respondent. They are rarely selling their harvest due to their low production and they mostly use farm products as per their own needs and requirements. Small landowners have less interaction with extension agents and less likely to incorporate contemporary cultural practices into their farming. Since they can effort new technology for improved output while remaining an expensive lifestyle, farmers with larger landholdings are often thought to be an enthusiastic about adoption innovations.

Table 3.3 Distribution of the respondents regarding their cultivated area

Village	Area Under Cultivation			Total
	Up to 3 Acre	3-5 Acre	Above 5 Acre	
QuliAkhund	13 (10.8)	14 (11.7)	9 (7.5)	36 (30)
Deh Ghazi	14 (11.7)	8 (6.7)	2 (1.7)	24 (20)
Wata Poor	20 (16.7)	5 (4.2)	5 (4.2)	30 (25)
Sangar Sri	10 (8.3)	11 (9.2)	9 (7.5)	30 (25)
Total	**57 (47.5)**	**38 (31.67)**	**25 (20.83)**	**120 (100)**

Composition of household members by occupation

Occupation describes the person's job. It is the type of work done by the persons employed (or the kind of previous work done if unemployed) during the reference period, irrespective of the industry or the status in employment of the person (GoP, 2018). Occupation of the household members said the strategy of household that how household members are supporting their families in the available resources.

Table.3.4 Household income by major source of sample respondents in the study area (Afs/year)

Village	Family	Agriculture	Livestock	Wages/shop	Business	Remittance
QuliAkhund	585660	398310(68)	69256(12)	47697 (8)	16425(3)	53972 (9)
Deh Ghazi	391515	330921(85)	17385 (4)	9650 (2)	9808 (3)	23750 (6)
Wata Poor	379258	325037(86)	23515 (6)	12020 (3)	6487 (2)	12200 (3)
Sangar Sri	406873	374932(92)	23742 (6)	0	0	8200 (2)
Total	450534	360669 (80)	36068 (8)	19244 (4)	8511 (2)	26042 (6)

Crops grown in the study area

Quality seeds play a crucial role in achieving high yields, with input dealers being the primary source for wheat and maize crops. Additionally, respondents in the study area predominantly utilized home-based sugarcane sets as seeds.

Table. 3.5 Area yield and price of cereal and sugarcane crops grown during 2021-2022 in study area

Crop		Unit	QuliAkhund	Deh Ghazi	Wata Poor	Sangar Sri	Total
Wheat	Area	Acre	1.87	1.57	1.37	1.58	1.8
	Yield	Kg/acre	1746	1753	1784	1667	1819
	Price	Afs//kg	27	28	27	27	27
Rice	Area	Acre	0.52	0.35	0.25	0.45	1.4
	Yield	Kg/acre	674	585	513	383	1955
	Price	Afs / kg	0.14	0.14	0.14	0.14	14
Maize	Area	Acre	1.1	1.17	0.80	0.62	1.4
	Yield	Kg/acre	1407	1453	973	886	1777
	Price	Afs / kg	23	23	23	23	23
Sugarcane	Area	Acre	0.23	0.29	0.30	0.18	0.3
	Yield	Kg/acre	7313	3923	5717	4447	13409
	Price	Afs / kg	11	11	11	11	11

Types of livestock

Livestock plays a vital role in securing both food and cash income for the rural poor in Afghanistan, primarily owned by smallholders. However, the overall livestock production in Khyber Pakhtunkhwa is reported to be low (Hassan et al., 2014). This limited output is attributed to factors such as less nutrition, poor infrastructure, lack of financial facilities, among others, which collectively hinder the animal's outputs of farmers (Ishaq et al., 2016).

Table. 3.6 Cows (number) owned by the sample respondents in study area

	Unit	Villages			
		QuliAkhund	Deh Ghazi	Wata Poor	Sangar Sri
Male young adult	Number	1	1	1	1
Female young dry	Number	2	2	2	2
Pregnant	Number	2	1	2	2
Lactating	Number	2	1	1	1
Lactation days	Days	208	169	165	144
Milk Production	Liter/day	15	9	8	8
Milk price	AFS/Liter	35	30	25	30
Animal sold Cow	Number	2	1	1	1
Selling amount	AFS/animal	81754	32713	44155	36750

Livestock activities

The objective of this section is to provide a description of livestock supervision in the study area. Livestock management activities such as feeding, watering, milking, making yogurt, cleaning sheds, and making dung cakes, as well as feeding, cleaning animals, cutting green fodder, and bringing dry fodder, are the primary responsibilities undertaken by farmers. Table 3.7 provides a clear indication of the specific tasks and responsibilities that farmers have in livestock management activities in research area.

Table 3.7 Distribution of respondents regarding their livestock activities

Village	Types of livestock activities					Total
	Watering	Milking	Feeding	Feeding	Cutting fodders	
QuliAkhund	1 (0.8)	14 (11.9)	3 (2.5)	11(9.3)	0 (0.0)	36 (30)
Deh Ghazi	2 (1.66)	10 (8.44)	2 (1. 66)	4 (3.3)	6 (5.0)	24 (20)
Wata Poor	3 (2.49)	12 (9.96)	2 (1.66)	10 (8.3)	3 (2.5)	30 (25)
Sangar Sri	5 (4.15)	21 (17.6)	1 (0.8)	1 (0.8)	9 (7.2)	30 (25)
Total	**11 (9.1)**	**57 (47.89)**	**8 (6.62)**	**26 (21.68)**	**18 (14.7)**	**120 (100)**

Knowledge about modern practices/technologies

Knowledge of modern agricultural practices and technologies empowers farmers to adopt efficient cultivation techniques, leading to increased agricultural and livestock productivity. Farmers often focus on optimizing the use of resources such as water, fertilizers, and pesticides, while farmers with knowledge of these practices can reduce resource waste and improve overall efficiency (woodhill et al, 2022).

Table 3.8 Distribution of respondents regarding their knowledge about modern practices/technologies

Village	Do you know about modern practice technology		If yes Identify			Total
	Yes	No	Recommended. Varity	Appl. Fertilize	Applying. Insecticide/pesticide	
QuliAkhund	34 (28.22)	2 (1.7)	23 (19.10)	10 (8.3)	1 (0.8)	34 (28)
Deh Ghazi	22 (18.26)	2 (1.7)	15 (12.45)	7 (5.81)	0 (0.0)	22 (18)
Wata Poor	26 (21.58)	4 (3.32)	13 (10.79)	9 (7.43)	4 (3.32)	26 (22)
Sangar Sri	27 (22.41)	3 (2.49)	15 (12.45)	9 (7.5)	3 (2.49)	27 (23)
Total	**109 (91)**	**11 (9)**	**66 (55)**	**35 (29)**	**8 (7)**	**109 (91)**

Reason of low production

Table 3.9 presents the results of a Chi-square test analyzing the association between reasons for low production and the education level of small farmers. The chi-square value recorded was 18.514, with an association P-value of 0.101. Since the P-value was higher than significance level of 0.05, it can be concluded that the relationship between education level and the given reasons of low production is not statistically significant.

Table 3.9 Association of respondents educational status with the causes of low production

Education	Reason of low Production				Total
	Pests	Shortage of water	Seasonal H	High Cost	
Illiterate	31 (25.8)	6 (5.0)	1 (0.8)	19 (15.8)	**57 (47.5)**
Primary	11 (9.2)	1 (0.8)	0 (0.0)	0 (0.0)	**12 (10.0)**
Middle	10 (8.3)	2 (1.7)	0 (0.0)	5 (4.2)	**17 (14.2)**
Metric	15 (12.5)	1 (0.8)	0 (0.0)	5 (4.2)	**21 (17.5)**
Above Metric	6 (5.0)	2 (1.7)	2 (1.7)	3 (2.5)	**13 (10.8)**
Total	**73 (60.8)**	**12 (10.0)**	**3 (2.5)**	**32 (26.7)**	**120 (100.0)**

Chi-square value= 18.514, P-value= (0.101)

Association of respondents' age with services provided by livestock extension agents

Based on the data presented in Table 3.10, the facilities provided by livestock extension workers show a non significant relationship with respondents' age, as indicated by the Chi-square value of 3.88 and the associated P-value of 0.867. It was found that the relationship between the facilities provided by extension workers and respondents' age was highly non-significant, as the P-value exceeded the threshold of 0.05. In other words, there is no strong evidence to suggest a significant association between the facilities given by livestock extension workers and respondents' age.

Table 3.10 Association of respondents' age with services provided by livestock extension agent

Age of respondents/year	What types of livestock facilities do you have			Total
	Hospital	Advice from other	Doctor visit to home	
Up to – 30	37 (30.8)	3 (2.5)	15 (12.5)	**55 (45.8)**
31-40	19 (15.8)	0 (0.0)	9 (7.5)	**28 (23.3)**
41-50	11 (9.2)	1 (0.8)	7 (5.8)	**19 (15.8)**
51-60	10 (8.3)	0 (0.0)	4 (3.3)	**14 (11.7)**
above 60	2 (1.7)	0 (0.0)	2 (1.7)	**4 (3.3)**
Total	**79 (65.8)**	**4 (3.3)**	**37 (30.8)**	**120 (100.0)**

Chi-square value= 3.888, P-value= (0.867)

Conclusions and Recommendations

It is concluded that more than half of the respondent were literate. Had a small land holding for farming practices. Maximum of respondent were living joint family system. Majority of male household member were involve in agriculture activity as full time, similarly female household member involve in agriculture activity as part time. The predominant occupation of the study area was agriculture, livestock, wages/shop, small business and remittances. Majority of earning individual were involve in agriculture and only least of respondent depend on remittances. Extension workers were found mostly not visit from farmer's field which result is less satisfied on a farming community. Most of the small farmers especially uneducated were unaware of the new technologies and inputs and they were not registered with extension department. They were also provided trainings about the management practices of Agriculture activity and livestock management. Agricultural extension in the fields of increased marketing information, awareness of economic growth, work opportunities and empowerment levels Better life quality in rural areas for families and work for social life. Among reason of low production the respondents identified that pest management impact of their crop yield. Main problems faced during marketing were lack of storages, lack of sufficient information, transportation problems and fertilizer problems respondent needs. Extension workers experience in difference aspect of agriculture activities and diseases such as insect/disease pests virus

their causes and ability in fruit fly forecasting maturity and yield, knowledge of post-harvest and aware from climate change, while knowledge about biological control of pest, soil test result and knowledge about natural control of pest management.

Based on the research results, the following recommendations have been formulated: Extension department should make use of every available source of information to reach practically to everyone who can benefit from it, Technical training organized by government, effort of agriculture extension department, programme for small holders, quality of education to educate small farmers, The government should take measures to establish market facilities in close proximity to the small farmers of the study area.

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