

# Agricultural Extension Services as Private Sector in Poultry Production: A Case Study of *Aljafarah* and Surrounding Areas, Libya

Adam Elradi Mohamed Ali<sup>1</sup>, Mohammed Adam Abbas Hamad<sup>2,\*</sup>,  
Adil Abdulkabeer Eltahir Abdulkabeer<sup>3</sup>, Musa Hago Elfaki Ahamed<sup>1</sup>

<sup>1</sup>Department of Agricultural Extension and Training, University of Gezira, Wad Madani, Sudan

<sup>2</sup>Department of Rural Extension and Training, University of Kordofan, El Obeid, Sudan

<sup>3</sup>Ministry of Agriculture, Agricultural Extension Directorate, Aljafarah, Libya

## Email address:

abugitaf2013@gmail.com (M. A. A. Hamad)

\*Corresponding author

## To cite this article:

Adam Elradi Mohamed Ali, Mohammed Adam Abbas Hamad, Adil Abdulkabeer Eltahir Abdulkabeer, Musa Hago Elfaki Ahamed.

Agricultural Extension Services as Private Sector in Poultry Production: A Case Study of *Aljafarah* and Surrounding Areas, Libya. *American Journal of Life Sciences*. Vol. 8, No. 2, 2020, pp. 23-33. doi: 10.11648/j.ajls.20200802.12

**Received:** July 3, 2020; **Accepted:** July 20, 2020; **Published:** August 13, 2020

**Abstract:** The present work was conducted in poultry production units in *Aljafarah* area, Libya. The objective of this paper was to illustrate the role that played by the private agricultural extension represented in units of veterinary services consultations, the veterinary pharmacies and advisory services offices in the field of poultry production. The population of this paper represented by total number of actual producers of poultry in the site, total number of units of veterinary services, and advisory guidance of the private sector. A number of 30 extension worker at private sector extension units and 138 from poultry producers were selected as sample size. A closed ended questionnaire was designed to collect the data from the two groups of the study. The collected data were analyzed using frequency distribution, percentage and chi square test. Results showed that more than 50% of the poultry producers have depended only on the private sector agricultural extension units as a main source of information concerning their work; also most of the respondents (98.6%) had a positive assessment for the private sector extension. Most of the private extension (76.6%) offered no training to their staff members. Half of the respondents in private extension were sometimes involved in dissemination of innovations. The results extended to reveal that there was a significant association and dependency in the positive direction between research centers and dissemination of research results by private extension among poultry producers. Also, there was a very high significant association between techniques adopted by the poultry producers and the techniques which had been promoted by the private sector extension. The findings of this paper revealed that the private agricultural extension has played an important role and resulted in a positive impact in the field of poultry production. It helped to disseminate, promote innovation, new techniques and training to producers in addition to their supervision and follow up of poultry producers. This had led producers to increase production and increase their incomes. It is recommended that the ministry of agriculture should improve the activities of the public agricultural extension, facilitate and support the private extension work. Also the private extension units should train their staff and equip them with appropriate knowledge and skills.

**Keywords:** Assessment, Extension Unit, Private Sector, Poultry, *Aljafarah*, Libya

## 1. Introduction

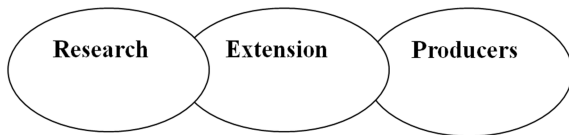
The idea of extension education as a term emerged in 1873 at the University of Cambridge (UK) and its philosophy was

based on the transfer of the results of research to farmers and their rural environments for increasing their income and improving their living standards. Agricultural extension is defined by different authors [9, 4, 16], and [17] All these authors agree on a common form of definition which is

agricultural extension the one of the largest non- formal problem- solving educational system in the World, it is generally concerned with transfer of Knowledge and research results to farmers and it is also includes two services to other target groups as farm family, rural youth.

The appropriate way to transfer technology and scientific knowledge from researchers to producers is the optimal extensional means [18].

Extension is illustrated as a link between researchers and poultry producers. (Derived from [20]).



**Figure 1.** Link between researchers, extension, and poultry producers.

Swanson in 1984 reported that one of the characteristics of a strong extension system is the effective's linkage between researchers and producers. Agricultural extension is a general term meaning the application of scientific research, new knowledge and agricultural practices through farmer education. It is not known where or when the first extension activities took place. It is known however those Chinese officials were creating agricultural police, documenting practical knowledge and disseminating advice to farmers at 2000 years ago [22].

The term extension was first used to describe adult education programs in England in 1873, these programs helped to extend the work of universities beyond the campus and into neighboring community. The term was later adopted in the United States of America while in UK it was replaced by advisory services in the 20<sup>th</sup> Century [7].

Extension role were not limited to message on agricultural knowledge of the carrier, but exceed it to contribute effectively in simplifying the results of agricultural research and reaching the majority of the farmers [11].

Professor (Seman knap) in the United States of America in the late Nineteenth Century had a leading role in highlighting and implementing the idea of extension education through home visits, field visits and field demonstrations [21].

In 1914 the American Congress passed the Act of Smith which adopted the idea of coordinating the work of extension between the faculties of agriculture and agricultural research centers and the activities of the Ministry of Agriculture for the dissemination of ideas and information developed in agricultural research centers [8]. Adopted philosophy of the majority of extension programmes were beginnings on education caravan. Extension workers and researchers used to conduct on farm trial to verify results of whatever experiments and disseminated its positive results to be adopted by farmers [3].

The lack of established policies and specific blueprint to great lengths to develop the agricultural field for majority of developing countries has led to the decline in the agricultural sector which is basic and vital to those countries and led to increase reliance on imports of most fundament of food from abroad despite the availability of water and fertile land and

vast numbers of herds and livestock.

There is no doubt that the agricultural extension has a prominent role in the link between agricultural research and farmers. Therefore any default in the agricultural extension will have a side effect on the agricultural services and rates of production particularly when the role of agricultural extension of the government institutions began to decrease [19].

[10] Cited that the American scientist [13] has confirmed that agricultural extension is one of the driving factors for the survival and continued agricultural development. Due to reduction of government spending on extension activity despite the rapid progress in science and technology, agriculture which is supposed to be accompanied by the development and progress of extension services but that rubbing did not happen especially in the Arab Countries and developing countries in general.

This situation has led to orientation of many farmers to get extension support and extension services through their own means, through references, internet or through private agricultural services units. These units provide advisory services and technical support for farmers over time and according to demand and need and keep pace with all modern and new art experiences and scientific agricultural research and helps the flow of results to the farmers environment in line with the size of farms or herds and the quality of production and the prevailing economic environment [14].

Advisory services for major export crops have been in existence since times and are still common in many developing countries. In most cases financing of both research and advisory services for those export crops is generated by cooperation extension societies system (CESS) or tax which is paid by the participant farmers, based on quantity and value of products being sold. The best example of a fully demand – driven extension is the one that is directed, operated and financed by farmers depending on the country, those extension systems [6]. Generally operate under different management structures and with different sources of financial support. It is important to note that large scale commercial farmers who have better leadership and better organizational and technical skills as well as more economic power frequently dominate these farmer controlled extension systems. Most of the farmer – operated extension systems are found in industrially developed countries [15].

## 2. Materials and Methods

### 2.1. Area of the Study

This study was conducted in Aljafarah area and its agricultural surrounding areas namely Gharyan and Zawiah. This area is considered as a major agricultural area in Libya of intensive interesting in poultry production.

Geographical location: Al Jafarah area is located between latitudes (15, 32 N and 13 E) on flat area and spread out farms and modern barns. This area is located to the south of the province of Tripoli. It is bordered to the East by Tarhunnah area, on the West by Zawiah area, on the south by

Gharyan and on the North by Tripoli. It has an area of 1940 square km and population of 458376 people, and the majority of the population depends on agriculture and livestock production. The neighboring areas which were included in the study are the areas of Gharian and Zawiah.

Gharyan area:

It is located on the mountainous area called western mountain and it is bordered to the North by Jafarah area (area of the study), to the South by area of mizdah, to the West by the area of Alassabah and to the East by the area of Tarhunnah. It has an area of 4660 square km and population of 161408 people. The population of this area was famous for the profession of ceramic industry as well as rain-fed agriculture and animal production.

Zawiah area:

This area is located on the coastal area and it is bordered to the North by the Mediterranean Sea, to the East by Tripoli, to the West by Surmman and to the south by the West Mountain. It has an area of 1520 square km and population of

290637 people. It is one of the major agricultural areas on the Libyan coast.

## 2.2. Population and Sampling Procedures

Populations of the study represent the total number of actual producers and breeders of poultry in the site of the study and also the total number of units of veterinary services and advisory guidance of the private sector. It was not easy to determine the population of the farmers and their distribution due to lack of data and information sources regarding the number and distribution of the poultry producers. Based on some documents as well as the annual reports and brochures of statistics released by the Department of Statistics and Census [5] The population and distribution of poultry producers in the area of the study was estimated to be 1032 farmers (breeder, producer) this number represents those who are actually registered in the Ministry of Agriculture And Animal resources [12].

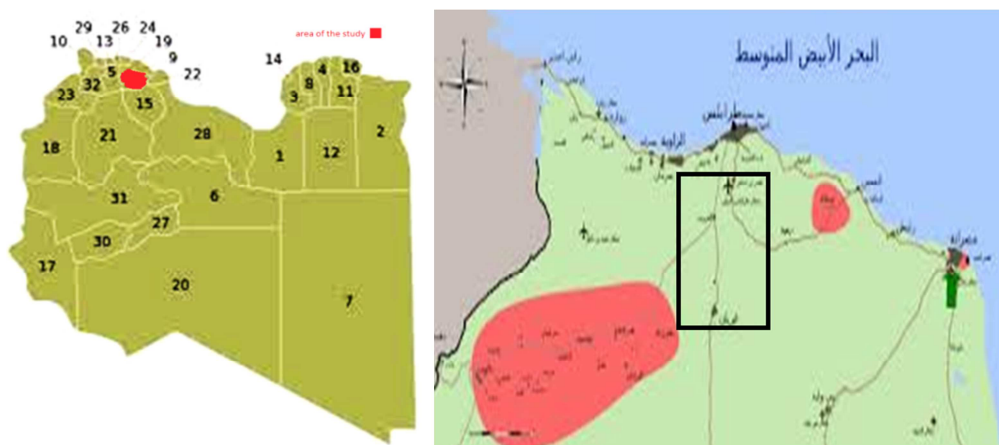


Figure 2. Area of the study.

## 2.3. Sample Size

The general rule is that increasing of the sample size will lead to increasing accuracy and precision [1]. Taking the whole population of farmers or poultry producers in AlJaffarah and surrounding agricultural areas which was actually found during the study period 597 producer then to calculate the sample size the following equation was used:

$$n = t^2 \times p \times (1-P) \times m^2$$

Source [2]

t = Confidence Level at 95% (standard value of 1.96)

m = margin of error at 5% (standard value of 0.05)

P = estimated prevalence of the variable of interest (this estimated ratio was obtained from the national statistics also from the previous studies and from media).

$$n = \frac{(1.96)^2 \times (0.10) \times (1 - 0.10)}{0.05^2}$$

$$\therefore n = 138.24$$

$\therefore$  The sample size of Producers = 138~

And it represents 23% of the population of actually poultry producers.

The sample size of the private sector extension units.

$$n = \frac{(1.96)^2 \times (0.02) \times (0.98)}{0.0025} = 30.1$$

$$\therefore n = 30$$

The sample size of the private sector extension units is (30) and it represents 33% of the population of private sector extension in the study area.

A simple random sample method was used to collect the required samples of 138 sample, where we used a field survey in targeted areas and also as well as the distribution of a large number of questionnaires to some factories of feed and some activists of veterinary to collect samples that is with regard to producers of poultry or farmers as for the units and service centers of veterinary extension the population divided into (30) classes after numbered the units in the list from 1 to 89 with an interval = 3 by using the systematic samples type then use the list to select randomly unit in the interval (1-3) and then automatically add the interval size to

determine the other units of sample from (2-30).

## 2.4. Data Collection

Primary data:

A closed ended questionnaire was designed to collect the data from the two variables of the study. The first questionnaire was developed for collecting data from the private sector extension units (veterinary services centers, advisory services offices and veterinary pharmacies). This questionnaire was composed of 17 questions addressing some personal characteristics, equipments, services provided, dissemination of innovations, training, dissemination of

research results and the cost of services.

The second questionnaire was developed for collecting data from the poultry producers and their related activities.

## 2.5. Data Analysis

The collected data was coded and then fed to computer, analysis of data was carried out by using the Statistical Package for Social Sciences (SPSS), descriptive analysis (tables, frequencies and percentages) and chi square test was used to determine the dependency between the variables of the study.

# 3. Results and Discussion

## 3.1. Descriptive Analysis of the Results of the Producers

**Table 1.** Distribution of the poultry producers according to the size of their poultry houses and type of poultry breeds.

poultry houses and poultry breeds:		Frequency	Percentage (%)
Poultry houses capacity	2000-4000 birds	3	2.2
	5000-7000 birds	36	26.1
	8000-10000 birds	56	40.5
	more than 10000 birds	43	31.2
Type of production	Egg breed	21	15.2
	Meat breed	72	52.2
	Mixed egg an meat poultry breeds	45	32.6
	Total	138	100.0

The results in above table 1 illustrates that most of the respondents 71.7% their poultry houses capacity more than 7000 birds. Generally large poultry houses are known more profitable than small ones for the producers. Those owned poultry houses with capacities less than 8000 birds represented only 28.3% of the respondents. Those producers are probably new investors in this sector and they are expected to expand their poultry houses in the future, as most of them agree that Poultry production is a very good and profitable investment in the country due to the availability of ample consumers for this type of products.

The results extended to depicted that most of the respondents (52.2%) were interested in meat production (broiler breeds), because meat production has a very short cycle for production (6-7 weeks) compared to egg production and has a very high demand in the market. About one third (32.6%) of the producers were found to invest in mixing enterprises (egg& meat), this type of production to avoid uncertainly of the market prices. The last group represented by 15.2% was interested to invest in egg production, which has relatively a long cycle of production and need more fund to operate.

**Table 2.** Distribution of the poultry meat producers according to the average of production (bird weight when marketing).

Chicks weight	Frequency	Percentage (%)
Not broiler producers	21	15.2
1.600 kg	7	5.1
1.750 kg	36	26.1
2 kg	41	29.7
More than 2 kg	33	23.9
Total	138	100.0

Table 2 above reveals that most of the total respondents (84%) their chicks weight during the marketing time not less than 1.6 kgs, 23% of them their chicks weight more than 2 kgs, 63.2% of broiler producers their chickens weigh from 2 kgs and more, this variation may be due to the difference in the breed and quality of feed in addition to contractibility with veterinarian and extension workers in the area of the study.

**Table 3.** Distribution of the respondents (poultry producers) according to daily production of eggs per 1000 chickens.

The daily product	Frequency	Percentage (%)
Non producer of eggs (broiler breed)	72	52.2
700- 749 eggs	17	12.3
750- 799 eggs	18	13.0
800-849 egg	10	7.2
850- 899 egg	7	5.1
900-949 egg	4	2.9
more than 950 egg	10	7.3
Total	138	100.0

Table 3 shows that the production per (1000 chicken) was as following: 13.0% produced about (750-799 eggs/day/1000 chickens), 25.3% of the respondents their poultry houses produce less than (800 eggs/day/1000 chickens), those represents about 53% of the eggs producers, 7.2% of the respondents have daily production of egg about (800-849 eggs/day/1000 chickens), 5.1% of the producers were produced of (850-899 eggs/day), 2.9% of the respondents produce (900-949 eggs/day). Then productivity of eggs of 74.2% of the egg producers were found more than (749 eggs/day), this shows the average monthly level of the

productivity of the eggs in a fairly good situation.

**Table 4.** Distribution of the poultry producers according to the average monthly in income of the products of poultry meat.

Monthly income in L dinars	Frequency	Percentage
Not broiler producers	21	15.2
1501-2000 L.d	43	31.2
2001-2500 L.d	34	24.6
2501-3000 L.d	6	4.3
3001-3500 L.d	16	11.6
More 3500 L.dinars/month	18	13.0
Total	138	100.0

Table 4 above shows that about 31.2% of the respondents has an average monthly income of about (1501-2000, L d) 15.9% of the poultry producers have an average monthly income of more than (2500, L.d), 13.0% of them have an average monthly income of more than (3500, L d). This shows that 24.6% of the producers have an average monthly income of less than (2501 L d). Variation in income may be due to variation in production system, producers experience and management capabilities and this rate means the average monthly income, while the breeding cycle of the chicken meats lasting up to a month and a half as well as the producers usually do not provide accurate information regarding their actual monthly income.

**Table 5.** Distribution of the respondents by the average monthly income of poultry eggs.

Monthly income	Frequency	Percentage (%)
Not eggs producers	72	52.2
1000-1499 L. dinars	3	2.1
1500-1599 L D	23	16.7
2000-2499 L D	12	8.7
3000-3499 L D	12	8.7
3500 -3999 L D	4	2.9
more than 3999 L dinars	12	8.7
Total	138	100.0

Table 5 above shows that 27.5% of the total respondents have an average monthly income Less than (3000 L, d), and those represented about 57.5% of eggs produces. 60.6% of eggs producers their average monthly income was more than (1599 L, d) and also 8.7% of all poultry producers have an average monthly income of (3000-3499 L.d) those were represented 18.1% of eggs producers. And also only 20.3% of all poultry producers have an income exceeding (3000, L, d) and those represented 42.4% of eggs producers, also 52.2% of the respondents non eggs producers (broiler). May note that the disparity in the averages monthly income of course due to variation in the capacity of barns and the production potential, the variation in the experience and the adoption of innovations from agricultural extension, veterinary services that offered to producers. Also some producers whose there are relatively low monthly income in order to lower the price of their products because of competition from imported eggs from neighboring countries.

**Table 6.** Distribution of the poultry producers by their experiences in poultry production.

Experience time	Frequency	Percentage (%)
No answer	4	2.9
Less than two years	7	5.1
3 years	20	14.5
4 years	7	5.1
5 years	12	8.7
6 years	14	10.1
more than 6 years	74	53.6
Total	138	100.0

As clear in table 6 above most of the respondents (72.4%) their experiences in poultry production was five years and more, this means that most of them are supposed to the professional in this type of industry, and they depend in their livelihood on this sector to gain money. Only 27.6% of them their experiences were less than five years in poultry production, this group may represent small farmers whose professional in open system and newly introduced to practice this type of enterprises.

**Table 7.** Distribution of the respondents by their assessment of the services provided by co-operatives, associations and governmental agricultural extension for the poultry producers.

Assessment degree	Frequency	Percentage (%)
Has no answer	57	41.4
Very Good	6	4.3
Good	21	15.2
Fair	14	10.1
Weak	40	29.0
Total	138	100.0

Table 7 shows that more than half of the poultry producers have depended only on the private sector agricultural extension units and private veterinary services as a main source of information and advices, represented by 52.9%, while only 2.2% was dealing with the local departments of agricultural extension. There were 2.2% of the respondents had no answers for this inquiry, 17.4% of them were depending on both the private and public agricultural extension, 6.5% were dependent out on the media and information sources of public magazines and the internet, 10.1% were depending on themselves and their experiences, about 8.7% depending on their colleagues who had good experience in the field. Generally there is clear tendency and shift to the private sector extension services in the field of poultry production.

**Table 8.** Distribution of the poultry producers by their evaluation for the public and private agricultural extension in the field of poultry production.

Evaluation		Frequency	Percentage (%)
Public extension services	No answer	30	21.7
	Excellent	3	2.2
	Very Good	8	5.8
	Good	19	13.8
	Fair	16	11.6
	Weak	62	44.9
Private extension services	Excellent	25	18.1
	Very Good	52	37.7
	Good	51	37.0
	Fair	8	5.8
	Weak	1	0.7
	Total	138	100.0

Table 8 above shows that 44.9% of the producers approved that official agricultural extension services in the field of poultry production was weak, 13.8% of them said it was good, 11.8% said it was fair, 5.8% said it was very good and only 2.2% said it was excellent and 21.7% did not answer. The total evaluation of more than half of the producers who's said it was weak and fair, and about 56.5%. And those whose see it was good, very good or excellent represented only by 21.8% out of the total number of the respondents which give an indication of the weakness of the general performance of the governmental agricultural extension. This result indicates that the public agricultural

extension services offered to the poultry producers is relatively weak as the respondents pointed that in the previous discussion.

Also results reflected in the same table above most of the respondents (98.6%) their assessment for the private sector extension is relatively positive and they agreed that; this sector has offered a good service for poultry producers. Their assessment is ranging between excellent and fair with vast majority between excellent and good. This result reflects the need for the private sector extension and that it should be enforced by producers as well as by the government.

**Table 9.** Distribution of the poultry producers according to the new techniques, innovations and research results that obtained from the private sector extension units.

Number of techniques or innovations	Frequency	Percentage (%)
Those who were provided 3 techniques.	50	36.2
Those who were provided 5 techniques.	88	63.8
Total	138	100.0

Table 9 above shows that 36.2% of the respondents said benefited from three innovations which have been offered by private sector extension, which were improved breed & feed additions and modern system of barns. 63.8% of the respondents said that, the private extension service provided

them with five innovations as follows:

Long active antibiotic, routine schedule of vaccination, new ideal method of temperature adjustment, methods of early diagnoses and sub-antibiotics.

**Table 10.** Distribution of the poultry producers by their assessment of the cost of advices and veterinary services which offered to them from the private agricultural extension sector.

The cost value	Frequency	Percentage (%)
Little	32	23.2
Suitable	72	52.2
High	22	15.9
very high	12	8.7
Total	138	100.0

As shown in the table 10 above more than half of the respondents (52.2%) noted that the value of the services offered to them by the private sector agricultural extension is suitable and affordable for them, 23.2% of them agreed that the value of these services is relatively little, 15.9% of them

said that the cost of these services was high, and lastly 8.7% of the respondents said that the cost of these services is very high and beyond their affordability and it is very difficult for them to obtain these services.

**Table 11.** Distribution of poultry producers according to types of veterinary services provided by private extension sector.

Type of services	Frequency	Percentage (%)
General advices only	29	21.0
Anatomy diagnostic, immunization, cleaning of barns and barns accessories.	39	28.3
Diagnosis, vaccination drugs, fixed vaccination schedule and general extension supervision.	70	50.7
Total	138	100.0

Dealing with table 11 the results shows that 50.7% of the respondents agreed that the type of the services offered to them from the private sector extension is composed of diagnosis, vaccination, routine schedule vaccination and general supervision. This group of producers follows the advices of the specialists in the private extension sector in all

their hygiene requirements in their barns. 28.3% of the respondents said that the services provided were composed of diagnosis, immunization, cleaning of barns, and barn accessories. 21% of the respondents said that they received only general advices.

### 3.2. Descriptive Analysis of the Results of Private Extension

**Table 12.** Distribution of the respondents in the private extension sector by their contribution in providing innovations and type of services to farmers and poultry producers.

		Frequency	Percentage (%)
Condition	Periodically.	2	6.7
	Sometimes in certain cases.	15	50.0
	Just to supervise and the follow-up health status of the herd and barn.	10	33.3
	Provide new product and the results of research and innovations in the field of production according to the desire of breeder.	3	10.0
Type of services	Agricultural extension services and veterinary services together.	3	10.0
	Only veterinary extension services.	27	90.0
	Total	30	100.0

Table 12 above delineate that 6.7% of the private sector extension provided innovations to the farmers periodically in the season of using these innovations, 50% of the private sector extension said that they offered innovations to the farmers sometimes in certain cases or just when the farmers and poultry breeders request these innovations in spite the availability of these innovations, 33.3% of them agreed that they did not provide materialistic innovations but they support farmers by supervision and following up of the herds in the barns. Only 10% of the private sector extensions were found to provide the farmers and poultry breeders with new products and up to date results of scientific research and sometimes all

these services were provided to the breeders on request. These results indicate that the innovations are available and can be provided if producers need them and requested them.

The results extended to show that only 10% of the private sector extension units in the area of the study have delivered two types of services provided together to farmers (agricultural and veterinary extension services).

However the majority of the private sector extension units (90%) provided only veterinary extension services. This is probably because there is a high density of poultry production and animal production activities were generally concentrated in this area.

**Table 13.** Distribution of the respondents in the private sector extension according to the type of equipment's they used in their work and possession of veterinary laboratories.

		Frequency	Percentage (%)
Type of equipment's	Those who had traditional equipment's	16	53.3
	Those who had modern equipment's	12	40.0
	Those who had both traditional and modern equipment's	2	6.7
possession of veterinary laboratories	Those with no laboratories	26	86.7
	Those with laboratories	4	13.3
	Total	30	100.0

The results shown in table 13 above most of the private sector extension units (53.3%) have traditional equipment's such as systems of diagnosis and treatment, work uniforms and measurement and anatomy equipment's, while 40.0% of them had modern equipment's for their services and only 6.7% had both the traditional and modern equipment's. This result may be due to the disparity in equipment's using or the scarcity of work equipment in the local market, also due to the focus on extension work field visits and direct workers in the poultry houses and provide consulting and advises them while relying on veterinary laboratories in diagnostics and handling specimens. However these equipment's are very important for any veterinary extension services and should be obtained by all veterinary

extension units, then this result reflected that private sector extension units have not developed or improved their services

Also as shown in the same table 13 above most of the respondents (86.7%) in the private extension sector agreed that they had no laboratories, that can be used in the diagnosis of any diseases that infect the breeders poultry, but sometimes they rely on the governmental general laboratories and this may affect the hygienic order in the poultry houses and leads to acute infection by diseases. On the other hand 13.3% of them were found to have laboratories that aid them in diagnosis of the poultry and animal diseases and thus avoiding them being late in diagnosis which is very risky situation in their work.

**Table 14.** Distribution of the private sector extension by the availability of technical support from others and dissemination of updated information in the field of poultry production.

		Frequency	Percentage (%)
Availability of technical support	There were logistical support and cooperation when needed.	11	36.7
	Depend on the potentiality of the center only.	19	63.3
	Periodically.	2	6.7
	Sometimes in certain cases.	15	50.0
The type of contribution	Just to supervise the education program and follow-up health status of the herd in barn.	10	33.3
	Provide new products and the results of research and innovations in this field according to the demand of the breeders.	3	10.0
	Total	30	100.0

Table 14 above shows that 63.3% of the respondents in the private sector extension said there is no cooperation or technical support with other parties and only they depend on their special means. 36.7% of them said that they receive logistic support and have co-operation with some governmental institutions when needed. This disparity between the private sector extension units services in the co-operation and the receiving of logistic support from other parties may be due to many reasons one of them is the absence of co-operative services role and the second is a lack of concourse between specialists and absence of co-ordination between the official sector and private sector, this

also has a negative impact on the agricultural extension services both the governmental and the private extension.

The results in same table 14 above shows that about 6.7% of the respondents were continuously involved in dissemination of innovations and research findings related to the field of poultry production, 50% of the respondents sometimes involved in dissemination of innovations, 33.3% concentrated their efforts on supervision and following up the health situation in the barns, and only 10% who provided innovations and research findings according to the demand of the producers.

**Table 15.** Distribution of the respondents in the private sector extension according to their opinion about the desire of the poultry producers to adopt the innovations.

opinion of private sector	Frequency	Percentage (%)
There is no desire by the producers to adopt innovations and work in the field of poultry production.	11	36.7
Poultry producers always wish to adopt innovations so as to develop and improve their farms productivity.	7	23.3
Depending on the economic situation and the financial capabilities of the producer.	12	40.0
Total	30	100.0

The results in table 15 above showed that 36.7% of the respondents said the producers have no desire to adopt the innovations in the field of poultry production. 23.3% of the respondents said that the producers have a desire to adopt innovations, and 40% of the respondents agreed that the respond of the producers to adopt innovations depends on

their economic situation.

According to the above results there are weaknesses in extension to persuade the poultry producers to adopt the innovations and the findings of the research so as to improve their barns and farms productivity.

**Table 16.** distribution of the private sector extension units according to the provision of training services to poultry producers (Clients) and their staff members.

		Frequency	Percentage (%)
Frequency of training for producers	Sometimes.	3	10.0
	Always.	7	23.3
	No training courses.	20	66.7
training for staff members	Those who have trained their staff inside or abroad.	2	6.7
	Those who have no training for their staff.	23	76.6
	Those who only sometimes train their staff.	5	16.7
	Total	30	100.0

The results showed in table 16 above indicated that 10% of the private sector units had provided training services to their clients (poultry producers) some times. 23.3% said the provision of training services to their clients of poultry producers was always, and 66.7% of the respondents don't have any training programmes for their clients, This means that 66.7% of the private sector extension did not provide training to poultry producers, and only one third provided

training services sometimes or always to their beneficiaries.

The results extend to revealed that only 6.7% of the respondents had provided training services to their staff members, but the majority of the private sector extension units (76.6%) had no any type of training to their staff members, and 16.7% of the private sector extension units provided training services only to build their capabilities for better performance and effective extension work.

**Table 17.** Distribution of the private sector extension units by the practices which they offered to poultry producers (five practices at most) and their co-operation with research centers.

		Frequency	Percentage (%)
Type of practices offered	No practices.	12	40.0
	Ideal use of antibiotics.	7	23.3
	Technique of poultry feeders.	1	3.3
	Technique of egg saving and vaccination methods.	3	10.0
	Ventilation system of poultry houses.	2	6.7
	Poultry houses decontamination.	5	16.7
	National center of animal health.	25	83.3
Research centers	Central veterinarian department.	3	10.0
	Other research centers.	2	6.7
	Total	30	100.0



As shown in table 17 above 40% of the respondents in the private sector extension said that they have not conducted any type of practical training to the poultry producers and that may be due to many factors one of them is the financial support as they agree. 23.3% of the respondents offered practical training in a form of an ideal use of antibiotics by the producers, because there are many producers who did not know the ideal use of antibiotics for birds and this may lead to losing of resources in absence of training. 10% of the respondents said that the type of training offered to the poultry producers consisted of techniques of eggs saving and new vaccination methods, 6.7% of them offered to the producers how to maintain ventilation system of barns and 16.7% of the respondents has given the poultry producers some practical training on poultry houses decontamination, because most of the practices are very important in the process of poultry manufacturing.

On the other side most of the respondents (83.3%) dealing with the national center of animal health, which is a governmental body work in general animal research, this result indicate that the government research centers co-ordinate with the private sectors all over the country and appreciate the role of the private sector extension in serving poultry producers. 10% of the respondents were well joined and co-operate ideally with central veterinarian department in serving the private sector producers, and only 6.7% of the respondents were directly deal and co-operate with other research centers and institutions, such as Tripoli University (department of animal production), Arabs poultry magazine, world poultry magazine, world poultry web site and others. This reflects that the co-operation and coordination with these bodies to serve positively the field of poultry manufacturing and lead to increasing of productivity and the general improvement and development of the sector.

### 3.3. Results of Chi-square Test

**Table 18.** Chi-square test for association between linkage with research centers and dissemination of research results between poultry producers.

The research centers which the private extension deals with it.	research results					Sign
	Using mineral supplement	I deal lighting.	Diseases in Libya.	Using chlorine as avirocical in water.	Research on role of bio-security in protecting animals.	
National center of animal health.	3	15	5	1	1	.04*
Central veterinarian department.	3	0	0	0	0	
Other research centers.	2	0	0	0	0	
Total	8	15	5	1	1	

The results in table 18 above showed that there is a significant association between linkage with research centers and dissemination of research results by private extension among poultry producers.

**Table 19.** Chi-square test for association between research results dissemination and the techniques adopted by poultry producers.

Research results	Adopted techniques that were promoted by private sector extension				Sig.
	New modern techniques of feeding system	New methods to improve lighting system for egg poultry to increase productivity	Medical system to raise the immune ability of poultry	An effective feeding system for broilers	
1-Using minerals supplement	0	4	3	1	0.01**
2-Ideal lighting	5	10	0	0	
3-Poultry disease in Libya	5	0	0	0	
4-Using chlorine as avirocical in water.	1	0	0	0	
5-Research on role of bio-security in protecting animals.	1	0	0	0	
Total	12	14	3	1	

The results table 19 above showed that there is a high significant association between research results dissemination and the techniques adopted by poultry producers.

**Table 20.** Chi-square test for association between the average monthly income of poultry meat and the evaluation for the role of public agricultural extension in the field of poultry production.

The average monthly income of the product or jam for poultry meat	The evaluation for the role of agricultural extension in the general field of poultry production						Total	Sign
	0	Excellent	Very Good	Good	Fair	Weak		
Now answer	3	0	3	1	3	11	21	0.00***
1500- 2000 LD	14	0	0	3	7	20	44	
2001-2500 LD	8	3	1	3	2	16	33	
2501-3000 LD	2	0	2	2	0	0	6	
3001-3500 LD	1	0	2	7	3	3	16	
More 3500 L.dinars / month	2	0	0	3	1	12	18	
Total	30	3	8	19	16	62	138	

The results in table 20 above show that there is a very high significant association between the average monthly income of

poultry meat and the evaluation for the role of public agricultural extension in the field of poultry production.

**Table 21.** Chi square test for association between the dissemination of research results and the technique that promoted by the private sector extension.

Some of the Research results which were disseminated by private sector extension.	Technique that promoted by poultry producers					Sign
	Preventive doses of antibiotics.	Awareness of the importance of changing the type of the vaccines.	Method of add corn oil to feed to gain more weight.	New techniques for keeping eggs.	Effective incubation system.	
1-Using minerals supplement	2	6	0	0	0	.04
2-Ideal lighting system for egg poultry. Barns	0	3	2	3	7	
3-Poultry disease in Libya.	0	0	0	0	5	
4-Using chlorine as avirocical in water.	0	0	0	0	1	
4-Research on role of bio-security in protecting animals.	0	0	0	0	1	
Total	2	9	2	3	14	

The results in table 21 above showed that there is a significant association between the dissemination of research results and the techniques that are promoted by the private sector extension.

**Table 22.** Chi square test for the association between evaluation for the role of private agricultural extension in the field of poultry production and the type of poultry production.

The evaluation for the role of the private sector agricultural extension in poultry production.	Type of the poultry breeding			Sign
	Whiteness	Meat	Both egg and broiler poultry houses.	
No answer	0	1	0	*.03
1. Excellent	4	16	5	
2. Very Good	10	31	11	
3. Good	7	22	22	
4. Fair	0	1	7	
5. Weak	0	1	0	
Total	21	72	45	

The results in table 22 above showed that there is a significant association between evaluation of the role of private sector agricultural extension in the field of poultry production and the type of poultry production.

## 4. Conclusion

The findings of this paper have revealed that the private agricultural extension sector has played an important role and resulted in appositive impact in the field of poultry production in Libya. It was found that the government official extension services were ineffective and the producers did not relay on it. However the private extension represented by private veterinary extension units, veterinary pharmacies and advisory and consultancy veterinary offices have filled the vacuum created by the ineffective public extension, and managed to disseminate and promote innovations and new techniques. In addition to their supervision, training and following up of poultry producers. This has led producers to increase their productivity and enhance their incomes and improved their standards of livings.

## 5. Recommendations

Based on the outputs of this paper, the recommendations formulated as follow;

For the Central Government: the national polices should be directed towards the promotion and facilitation of poultry production field and be most concerned with agricultural production which is considered the single and the main

source of livelihood and food security as well as another sources of the national income.

For the Ministry of Agriculture: Establishing especial offices for the monitoring and the support of the private sector agricultural extension and private sector veterinary extension services, The ministry should improve and enhance the activities of the general agricultural extension through supporting the national center of agricultural extension and the national center of animal health with high trained extension staff and technical support, and the ministry should co-ordinate with agricultural bank to give seasonal support and credit for poultry producers.

For the local administration of agriculture: Should enhance the activities of the local agricultural extension units through supporting it by more number of trained workers and intensify the routine visits to farmers and producers with fixed system and with coordination by the cooperatives associations.

For veterinary headquarters: To pay routine visits to the poultry producers and give them advices of how to improve their productivity and how to conserve the health of their herds, establishing the agricultural insurance system program for the producers to save and to protect them from losses caused by epidemic diseases.

For the private agricultural extension units: Private extension units should train their staff, equip them with appropriate knowledge and skills so as to remain credible in the eyes of their clients

For poultry breeders and producers: Producers should be active participants, innovative and always interested in the

adoption of innovations which are feasible economically saved environmentally and socially acceptable so as to increase their productivity and raise their income.

## References

- [1] Alhuni, A. A. D., (2000). Lectures in methods of presentation, preparation and conduct of the biological research. Elcea press Tripoli Libya.
- [2] Altae, Iman Hassan, 2012, How to Determine Sample Size, Faculty of Education, University of Bagdad, Iraq.
- [3] AOAD, (2012-2013). The annual report of Arabian organization of agricultural development. Khartoum Republic of Sudan.
- [4] Bradfield, D. J. (1966) Guide to extension Training, Food and Agriculture Organization of the United Nations, Rome.
- [5] Bureau of statistics and census, Libya,(2010). The year book national statistics, Bureau of statistics and census Tripoli Libya.
- [6] Burton, E. Seanson, Rajahahati. R., (2010). Strengthening Agricultural extension and advisory systems procedures for assessing, transforming and evaluating extension system. The World Bank Washington D. C.
- [7] F A O, (2011).: Food and Agriculture Organization: annual report, Rome.
- [8] Garforth. C. and Jones. G. E (1997) The development, and future of agricultural extension. FAO, Rome.
- [9] Kelsey, L. D, Hearne, C. C (1963). Cooperative extension work, Cornell University, Press Thaca New York.
- [10] Khaffaji, A. A. K, Shalluf, F. M., (1990). Agricultural extension in Libya and the ways to develop of it. Publisher Omar Almokhtar University, Libya.
- [11] Khaffaji, A. A., (1990). Agricultural extension between the philosophy and application. Publisher Tripoli University Libya.
- [12] Ministry of Agriculture and Animal Resources Libya. (2013) annual reports, annual statistics.
- [13] Mosher, A. T., (1965). Getting Agriculture moving essentials for development and modernization. Published for the Agricultural Development Council by Praeger- Agriculture and state – 191. N. VANHOVE. USA.
- [14] Musa, B. A., (2004). Delivery of veterinary services to refugee communities in eastern Sudan. Thesis Submitted for the requirements for M. Sc. Degree University of Khartoum Sudan.
- [15] Nagel, U. J., (1997). Alternative approaches to organizing extension. In improving Agricultural extension: A references Manual FAO Rome.
- [16] Rogers, E. M., (1983). Diffusion of Innovation 3<sup>rd</sup> edition New, York Free press USA.
- [17] Rogers, W. L (1987). The private sector: Its Extension system and public / private coordination, W. Rivera and S. Sharm (eds) in Agricultural Extension Worldwide: Issuse, practices and Emerging. New York croom helm pp 13-21.
- [18] Rogers, E. M. (2003). Diffusion of innovations (5th ed.). New York: Free Press.
- [19] Rolling N. G., (1988). Extension science information system in Agricultural development. Cambridge University Press, UK.
- [20] Swanson, B. E., (1984). Extension science information system in agricultural development, Cambridge University Press, UK.
- [21] Swanson, B. E. Rajalahti. R, 2010. Strengthening Agricultural Extension and Advisory Systems. Washington, D. C.: The World Bank.
- [22] Tannubi, m. M., (1993). The Reference of agricultural extension, Faculty of Agriculture Alexandria University. Alahd Alarabia for press and diffusion. Egypt.