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### REVIEW BASED ANALYSIS OF ADOPTION GAP AND TRAINING NEEDS OF FARMERS IN PAKISTAN

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#### ABSTRACT

In Pakistan majority of the population is directly or in directly dependent on agriculture sector, which, has great share in Pakistan economy and also in providing employment but agricultural production fluctuated every year, now a days the major problem in agriculture sector is that resources are being shrinking like land ownership but on the other side population is increasing day by day, there are various reasons behind the low productivity in agriculture sector, first of all, in Pakistan about 85 to 90 percent are the small farmers and they are not able to use the latest agriculture technology due to financial and social constraints. Majority of them are not well aware about the emerging technologies and if some of them have awareness they do not want to adopt recommendations like production technologies because they are still using their ancestral knowledge for the production of crops. The major problem is that the public sector extension department have assumed duty for the dissemination of updated knowledge but they are not working well, they focus only some progressive farmers which are in fewer amount, similarly, after the decentralization of extension system in Pakistan the front line workers (field Assistants) are directed to perform multifarious duties assigned by the District Coordination Officer (DCO) so, they are unable to perform their primary job responsibilities.

**Keywords:** Awareness, adoption gap, information gap, training needs.

#### INTRODUCTION

The economy of Pakistan is basically agrarian and agriculture as a leading sector contributes 20.9 percent in GDP and 45 percent in employment. This sector is also responsible for industrial development because it provides raw material to agro based industries. Government is continuously attempting to enhance agricultural productivity by adopting different strategies (Govt. of Pak. 2015). Since the independence of Pakistan (in 1947) agriculture sector has been continuously contributing to country's economy. In the early years it was consider as a dominant sector but now it is the second largest sector, this decline is due to different factors like environmental, social and political (Raza et al., 2012). Most of the population is living in rural areas and directly or indirectly involved in farming. In these areas agricultural development is constrained due to

inappropriate technologies, institutional weaknesses and problems in management of research, education and extension system (Asenso *et al.*, 2008).

Although agriculture is of supreme importance in Pakistan, its pace of development is rather low. Its agriculture production is low as compared to the other countries; even with in the country production varies among the progressive and conventional farmers. This situation is due to the indifference toward the adoption of latest technologies for improving the crops output (Zia and Khan, 2012), as well as limited success of agricultural extension which is very important for agricultural development (Qamar, 2005). Different factors play their key role in agricultural development and agricultural extension is one of them; effective extension system is just like the bridge between latest research and farmers. In Pakistan both public and private extension services are engaged in providing extension services (Birkhaeuser *et al.*, 1991; Haq *et al.*, 2009). Agricultural extension services have a pivotal role

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in agricultural and rural development. It is the major source of technology dissemination and helps the farmers to rationalize the use of natural resources for a sustainable agricultural development. In agricultural relevant and timely delivering of information packages to the farmers play crucial role in improving the agriculture production and marketing strategies. Dissemination of information is now much easier due to information and technology (Cartmell *et al.*, 2004). Information source categories as interpersonal and impersonal, face to face contact between individual fall in interpersonal whereas mass media source fall in second category (Muhammad, 2005). Okunade (2007) found various sources of information in agriculture, which are mainly result demonstration, general meetings, group discussion, lecture, television, radio, cinema, leaflets, bulletins, letter and circulate. In order to meet the requirements of rapidly growing population, agricultural production has to be increased. This can be done by adopting modern techniques of farming. So, on the behalf of above facts these objectives are design for the review based study.

**Contemporary Debates on Adoption and Awareness of Agricultural Innovations:** Adoption of improved agricultural technologies has a significant positive impact on crop income although the impact on consumption expenditure is mixed. This confirms the potential direct role of technology adoption on improving rural household welfare, as higher incomes from improved technology translate into lower income poverty (Asfaw & Shiferaw 2010). Green revolution in Asia is an indication that improved agricultural technology adoption have pivotal role in poverty reduction further more technical change in the form of adoption of improved agricultural production technologies has been reported to have positive impacts on agricultural productivity growth in the developing world (Nin *et al.*, 2003). Decision for the adoption of latest production technology depends upon the farmers' income. So that if the technology is expensive for the farmers its adoption rate probably will be low because farmers will not compromise on the losing of their livelihoods (Caswell *et al.*, 2001).

There are many other hindering factors in adoption rate and these factors are generally grouped respectively into economic, social and institutional factors. Economic factors include farm size, cost of technology or modernization, expected benefits from adoption of the

technology, and off-farm activities. Farm size and the expected benefits are the only significant economic factors that influence the decisions of farm households (Akudugu *et al.*, 2012).

Another study concluded that farmers have low level of adoption regarding improved production practice in rice crop. Therefore it is necessary that extension organization actively work for changing the farmer's behavior. The findings also disclosed that except age, other variables such as education, extension contact, annual income, innovation proneness, and attitude towards farm diversification had significant impacts on extent of adoption of improved rice cultivation practices (Singha & Baruah, 2011). Farmers effectively adopt the latest technology through technical trainings, group meetings and discussions. There are various factors which effect on adoption process positively and negatively, education and young farming community trigger the adoption while conservative old farmers and feeble belief on latest technologies are the limiting factors. Although farmers are willing for the adoption of latest technology but they are not able to apply due to the lack of capital, lack of guidance from the public, private sector and lack of farmer's favor polices (Truong *et al.*, 2002).

Awareness is the knowledge of existence of a phenomenon. To create awareness on government policies and programmes, public enlightenment organs such as the mass media, National Orientation Agency (NOA), Ministry of Information and Agricultural Extension Service were formed, funded and charged with the responsibility of information dissemination. Without awareness campaigns, knowledge and ideas may hardly reach those in need of it (Ofuoku, 2011). Agriculture extension wing has many important tasks like introducing new ideas and technologies, but most important is to create awareness. While, introducing any new technology or idea awareness is the initial and important step in adoption process. At the awareness level various attractive print and electronic media being used to introduce new idea. Although the awareness stage gives little information about the idea it portrays, it serves as an appetizer, catalyst or stimulant that rouse client's interest to seek the additional information. The success or failure of the other stages of the adoption process which include interest, evaluation, and, trial depends on how the awareness stage is managed. Awareness creation is therefore a critical issue that

needs to be considered before selling any idea to its consumers (Ephraim, 2009).

**Training need assessment:** Training is a process of attaining new skills, attitude and knowledge in the context of preparing for entry into an occupation or improving ones productivity in an institute or activity. Effective training requires a clear picture of how the trainees will need to use information after training in place of local practices what they have adopted before in their situation. Training has an essential role in the progress of human performance because it provided systematic improvements of knowledge and skill and these improvements are helpful in the working efficiency of trainees (Sajeev, 2010). Training has well planned opportunity for the contributors to get important knowledge and skills. The basic objective of farmer's trainings is to improve the farming operations in field. The purpose of training is not for knowing more but its objective to behaving different (Lynton & Pareek, 1990). Training is an organized activity designed to enhance the knowledge, skill and competencies to a person for improving his/her performance, and this might be helpful for attaining the required level of knowledge and skill (Shibu & George, 2013).

**Sources of information:** In agriculture, the role of information cannot be over emphasized in enhancing the agricultural development because information is critical factor for good agricultural production, improving marketing and distribution strategies, with the agricultural extension print media and fellow farmers are the sources of information for farming community. Further results of study show that education and size of land holding has significant positive relationship with admittance to agriculture information (Rehman *et al.*, 2013). Information sources are mainly separated into two different groups namely interpersonal (face to face sharing of information) and impersonal (exchange of ideas and information through mass media) (Muhammad, 2005). Okunade (2007) found a variety of sources of information dissemination in agriculture including result demonstration, general meetings, group discussion, lectures, television, radio, cinema, leaflets, bulletins, letters, and circulars.

Pakistan is primarily an agricultural country and having abundance of natural resources, climatic conditions, rich soil and better water resources; therefore Pakistan has great potential to give good production in crop and livestock sector (Khan, 2006; Rehman *et al.*, 2011) in

spite of this importance, agricultural progress is in very low speed in Pakistan (FAO 2008). According to Rehman (2010) agriculture production in Pakistan is lower as compared to neighbor countries. Primary factor of low production is lack of adoption level of latest agricultural information and using local technical knowledge (Abbas *et al.*, 2008).

**The role Extension services:** Agricultural extension is as an efficient means and a system, which helps farmers to help themselves. Farmers are exposed to various educational procedures to equip and facilitate them to enhance their farming practices, cultivation techniques; increase production efficiencies and enhance income levels; improve livelihoods, and up lifting the social, economic and educational standards (Antholt, 1991; Van den Ban & Hawkins, 1996; Anderson & Feder, 2004). In the developing countries most of the population is associated with the agriculture sector. On one hand due to various technical obstacles agriculture sector is not producing according to its potential, whereas on the other hand new challenges are emerging in this sector. In Asia, agricultural extension has played a very essential role in realizing higher crop yields in the era of green revolution. Agriculture extension is considered as the enormous means for technical guidance, information delivery and problem solving of farming community. The main role of extension department is information delivery but they are not working well in many Asian countries due to various flaws in the system like lack of participatory approach, better incentives and weak communication among farmers and workers. Davis (2008) described that extension have responsibilities regarding the technology transfer in the past, but nowadays extension goes beyond training, learning and helping farmers in forming farmer groups. Now in its wider working sphere, it also takes initiatives to address the marketing issues and joins hands to enter into partnerships with the wide-range of service providers and other related organizations. Agriculture extension builds partnership with all those organization who are working for the facilitation of farming communities via providing various services and inputs (Birnor *et al.*, 2006). In Pakistan population increases day by day meanwhile food requirement also increases accordingly, so extension services have responsibility for the development of agriculture in Pakistan with information that enable the farmers to take better decision in farming (Subedi & Garforth, 1996).

Accordingly government has launched different developmental programmes at national level, e.g. Village Agricultural and Industrial Development Programme (Village-AID), Basic Democracies System (BDS), Integrated Rural Development Programme (IRDP), Training and Visit System (T & V) and Devolution Plan for the uplift of local people's economic status through pooling all the national resources (World Bank, 2003). In Pakistan private sector is prominently involved in providing the extension services to the farming communities, further more from that private sector pesticides have major role to play in these services. These pesticides companies facilitate the farmers by providing agricultural inputs and extension services. A study resulted that 90 percent farmers get information from the private extension workers (Shouqat *et al.*, 2011).

#### **METHODOLOGY**

Methodology of this paper is being divided in to various phases;

In the 1st phase from the several sources review data related to the objectives of the working paper. Data was reviewed form the various research papers, articles and some reports by Pakistani authors as well as by international authors

In the 2<sup>nd</sup> phase, on the bases of reviewed data an initial report was written. A list of various theses (2002 to 2014), relevant to the objectives, which were done under the Institute of Agricultural Extension and Rural Development, University of Agriculture Faisalabad, Pakistan, was prepared.

In 3rd phase the data analysis sheet was constructed for collecting the data from various theses drawn in the list. So content analysis sheet was being used as the data collection tool

In last phase major findings of concerning theses was rephrased and written in description form to finalize the working paper in proper context.

#### **Findings of Review Based Analysis**

**Awareness and adoption:** Kamran (2004) conducted a study entitled "A study into the gap between research recommendations and adoption level of the farmers regarding sugarcane crop production technology in Toba Take Singh" in the study area about 86% respondents were land owners but only 33% respondents have above 12 acre land where majority (37%) were small farmer furthermore, half (55%) respondents have less than 2 acre land under the sugarcane cultivation. Almost all the

respondents were aware of recommended sowing time for spring crop and 97% respondents adopted this recommended time of sowing while 92% respondents were well aware of the September sowing season but negligible amount of respondents (2.4%) adopted September sowing recommendation. The results shows that awareness regarding the verities was very poor, most of verities were not known by the respondents some varieties were available but respondents were not ready to adopt them only two verities which were more popular are SPSG-26 and CPF-237 among the respondents. Only 16% respondents knew the recommended seed rate and no one know about the seed treatment. Almost half of the respondents were aware of recommended dose of farm yard manure but only 44% adopted this practice, awareness and adoption level regarding the potash application was nil while the recommendation and adoption level regarding the Urea and DAP application were at satisfactory level. Awareness level of respondents pertinent to various insects, pest were at medium to high level but no one aware and adopted recommended plant protection measures. Toward the information dissemination sources fellow farmers were ranked 1st with mean score 3.17 while electronic and print material ranked 2nd and 3rd with mean scores 2.52 and 2.06 respectively. Extension field staff ranked at lowest level (4th rank). According to the respondents various hindering factors in the adoption of recommended practices were lack of finance, high cost of fertilizers, farm machinery, and pesticides, non-availability of recommended verities and poor information services from public and private sector. The most prominent problem which highly affected the farmers' attitude toward the cane cultivation was the in efficient marketing chain of cane crop.

Zafar (2005) conducted research entitled "A study into the gap between research recommendations and adoption of maize production technologies by farmers of Tehsil Sahiwal" results of the study concluded that majority of the respondents (56%) were illiterate and 52 % were owner of land. Majority of the respondents (68 to 73%) were aware of recommended verities however no one adopted them. The gap between research recommendation and the awareness level of imported hybrid varieties was nil. Large majority (76%) of respondents was aware of recommended seed rate but adoption rate was 68% further respondents were well

aware regarding the recommended application of FYM and fertilizers but adoption level was low. In the irrigation application perspective there was low gap between recommendation and adoption level. Most of

respondents got information from fellow farmers and pesticide dealers. The most hindering factors in the adoption of recommended practices in maize crop were tabulated in Table 1.

Table 1. Factors hindering adoption of recommended production practices of Maize crop.

Hindering factors	Rank order
High cost inputs	1st
Lack of information	2nd
Non-availability of credit	3rd
Non-availability of fertilizer	4th
Non-availability	5th
Poor extension services	6th
Market uncertainty	7th

Data depicted in Table 1 indicated that high cost of inputs appeared as the major hindering factor in the adoption of recommended improved maize production technologies among the farmers. Zahid (2006) conducted a study on "A study into the adoption gap of weed management practices among wheat growers of Tehsil Faisalabad" from the selected respondents' majority of the respondents (62%) fall in the category of small farmers, 76% respondents cultivated wheat. Results shows that about half (49%) respondents obtained less yield (1482-2946 kgs/hectare). Almost all the respondents well aware about the various weeds like Bathu, Billi, Booti, Dumbi Sitti, Jangli Jai, Pohli, Jangli Palk and Lehli. Regarding the extent of damage of weeds Lehli Jangli Jai Dumbi Sitti Pohli, Bathu, Jangli Haloo, Billi, Booti, Jangli Palk and Shahtra were ranked as 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, and 9th. Almost 92% respondents had adopted crop rotation to control the weeds while other fewer amount of respondents had adopted other practices like manual hoeing, burning and dab methods it means there is a big gap between recommendations and adoption of cultural practices except crop rotation. Results show the direct relationship between the age, education and awareness level of weeds control among the respondents, mean to say with increasing the age and high education increases the awareness level of weeds management practices, but age and adoption of recommended weeds management practices has no significant relationship, it means with increase in age of the respondents, the level of adoption did not increase while education and adoption of recommended weed management practices have positive relationship, educated respondents were more likely to adopt the weed management practices than those who had less or no education. Muneer (2007)

conducted a study on "An investigation into the adoption of water management practices by the farmers in Tehsil Burewala District Vehari", results of the study show that all the respondents were aware about the water management practices in general, 85% respondents were aware of the traditional land leveling practices and irrigation scheduling turn according to the crop needs however only 40% respondents were aware of the laser land leveling practices. There were about 40% respondents who did not adopt hoeing and intercultural practices for increasing moisture holding capacity and exactly same proportion of respondents did not adopt the maintenance of optimum plant population for the maximum use of irrigation water. The major factors that impede the adoption of water management practices were found to be the lack of technical knowledge, un-economical technologies and non-cooperation of extension field staff. There was significant positive association among age; education and awareness level about water management practices and also shows the direct relationship with adoption of recommended water management practices.

**Training Need Assessment:** Adil (2008) conducted a study on "Training needs assessment of cotton growers for quality cotton production in Tehsil Rajanpur" which resulted that farming community in the study area have low knowledge regarding the various aspects of production technology from land preparation to harvesting and storage. Almost in all the aspects of production technology possessed knowledge of respondents is less than the required knowledge mainly in the fertilizer application and various varieties possess and required knowledge resulted huge difference due to education and training factor, possessed and required knowledge regarding the various insects and pest was

0.79, 0.93, 0.08, 0.23, 0.06, 0.73, 0.80 and 0.09, American boll worm, pink boll worm, spotted boll worm, army worm, jassid, thrips, cotton mealy bug, termites, aphids, white fly and mites respectively. Some of other important findings of research study are tabulated in Table 2.

Table 2. knowledge gap of Farmers regarding production practices of Cotton crop.

Production Technologies	Possessed knowledge (mean value)	Required knowledge (mean value)	Difference
Seed bed preparation	1.95	2.04	0.09
Planting method	1.58	2.45	0.87
Seed rate	1.95	2.05	
Sowing time	1.85	2.15	0.30
Irrigation	1.94	2.02	0.08
Picking time	1.90	2.10	0.20
Transportation	1.90	2.09	0.19
Marketing	1.72	2.27	0.55

(Scale: 0=0% Knowledge, 1=25% Knowledge, 2= 50% Knowledge, 3= 75% Knowledge, 4=100% Knowledge)

The results in the table show that in all the aspects, farming community required education and training for attainment of the required knowledge of technology. About half (50.8%) of the respondents suggested that extension education activities must be increased for achieving agricultural developmental goals. Masood-ur-

Rehman (2010) conducted a study entitled "Training needs assessment of sunflower growers in Tehsil Vehari" which revealed that majority (55.20%) of the study respondents were small farmers and about 37% of the respondents were tenants. Major findings of the study are tabulated as in Table 3.

Table 3. knowledge gap of Farmers regarding production practices of Sunflower crop.

Production Technologies	Possessed knowledge (mean value)		Required knowledge (mean value)		Difference	
	Spring	Autumn	Spring	Autumn	Spring	Autumn
Seed bed preparation	2.07	1.84	1.98	2.10	0.09	0.26
Seed rate	1.88	2.09	2.03	2.30	0.15	0.21
Sowing time	2.50	2.36	2.80	2.79	0.30	0.43
Irrigation		2.42		2.79		0.37
Harvesting		1.62		2.28		0.66
Threshing		1.53		2.49		0.96
Storage		1.64		2.35		0.71
Marketing (Factory)		1.62		2.17		0.55
Marketing (Middleman)		1.90		2.10		0.20

Scale: 1=20% Knowledge (Poor), 2=40% Knowledge (Fair), 3=60% Knowledge (Good), 4=80% Knowledge (Very Good), 5=100 % Knowledge (Excellent)

Data mentioned in Table 3 highlighted that in all the aspects respondents are required training for better production. Regarding the marketing of produce, majority of the farmers are on the blessing of middleman, who gets maximum profit from the producer and also from consumer. In the suggestion about 65 to 70% respondents prefer the demonstration

methods of extension education for improving their knowledge.

Munawar (2011) conducted a study on "Identification and prioritization of training needs of wheat growers in Tehsil Hasilpur" results explored that 70% of the respondents operated up to 12 acres land. Major findings of the study were tabulated in Table 4.

Table 4. knowledge gap of Farmers regarding production practices of wheat crop.

Production Technologies	Possessed knowledge (mean value)	Required knowledge (mean value)	Difference
Seed bed preparation	2.52	3.32	0.8
Drill sowing	3.09	2.91	0.18
Seed rate	2.99	3.04	0.05
Certified seed	2.28	2.64	0.36
Sowing time	3.36	2.40	0.04
Irrigation	2.98	2.52	0.46

Intercultural operation	2.93	2.88	0.05
Harvesting	3.26	2.73	0.53

(Scale: 1= Some Knowledge, 2= Medium Knowledge, 3= Good Knowledge, 4= Excellent Knowledge)

The results of study showed that education have positive impact on the production technologies of crops. Especially respondents well aware regarding the certified seed of wheat crop but regarding the fertilizer application and insects pest control respondents have little knowledge according to these results respondents required awareness, education and trainings in those field in which they feel lack of knowledge.

**Sources of information:** Farooque (2004) conducted a study on “The present and prospective role of print media in the dissemination of agricultural information among the farmers of Tehsil Tando Allahyar District Hyderabad” and concluded that majority of respondents get agricultural information from print media and fellow farmers, but farmer needed information in descending order. In the results of this study respondents ranked pamphlets, posters and newspaper 1st, 2nd and 3rd respectively among various print media because they have easy access to newspaper and pamphlets. Furthermore, from newspaper they get information related to marketing and poster which are useful for providing information related to plant protection measures. Low literacy and lack of resources were the major hindering factors in the spreading of information through electronic and print media.

Samad (2005) conducted a study entitled “An appraisal of zarat Nama as a source of information for farmers in the Punjab Province” resulted that majority of the respondents depends upon Zarat Nama to seek the agricultural information. In the ranking Zarat Nama is at top while Television placed at lowest. According to 48% of respondents’ contents matter of Zarat Nama are useful while 35% and 8% said less useful and not useful respectively, 55% respondents satisfied to understanding the published material in Zarat Nama and only 24% feeling difficulty in understanding. In response of charges of Zarat Nama more than 70% respondents satisfied against the charges.

Gill (2012) conducted a study on “Comparative evaluation of web based (PARC, Pakistan) and printed (Zaraii Digest, Nida-e-Kissan) agricultural information” which, resulted that educated and young people use internet for getting the agricultural information and also Government servants who have better internet facility use web based information in contrast to printed

material that was used by the middle and old age category for seeking information. Furthermore most of respondents argue that print media like magazines are the easy way to get information because internet facility is not easily available to them. According to other group of respondents magazines have limited pages and published on monthly basis so it is not possible to cover all aspects of subjects and issues concerning crops and livestock on the other hand electronic media have huge amount of data related to any field of agriculture and much faster source of information.

**Extension services:** Mushtaq (2001) conducted a study “An investigation into the effectiveness of extension work conducted by the private sector with special reference to sugarcane crop in District Jhang”. Major findings of the study are that almost all the respondents were well aware regarding the land preparation, 81% respondents aware about single set while 72% and 27% were aware about the double and triple set of sowing. Regarding the latest varieties of sugarcane almost above 90% respondents were well aware while regarding the fertilizer application almost all of the respondents were aware. Most of the respondents (74%) got information from fellow farmers while fewer numbers of the respondents get information from extension workers.

Shahzad (2008) conducted a study “Role of pesticide companies in the dissemination of plant protection technology among the potato growers of Tehsil Chiniot District Jhang”. According to the study majority of the respondents (70%) got information related to plant protection from the private pesticide dealers. Awareness regarding various pesticides falls between medium to low level among the farmers. Almost all the respondents were aware about the cultural control of weeds. About the recommended dose of pesticide application half of the respondents were well aware but only 18% were adopting these recommendations. According to the respondents Syngenta was considered as the most effective company as compared to other companies.

Iqbal (2004) conducted a study “An assessment of the competency level possesses by extension personnel of the department of agricultural (extension) regarding the use of demonstration technique in District Sialkot”. Results of the conducted study shows that majority of respondents (field assistant) perceived their

competency at medium level in the planning and conducting of demonstration, while only 4% respondents have high competency level in the preparation skills related to the demonstration plots. All of the respondents claimed that lack of better incentive is the major hindering factor in the performance further they said that weather and inputs availability were also the major problems during the demonstration process.

#### CONCLUSION AND RECOMMENDATIONS

On the basis of review and results it is concluded that awareness level of farmers regarding production technology of various crops falls between the high to medium range like knowledge about land Preparation seed, fertilizer, pesticide application, different varieties of crops and also related to protection and water management strategies, but the adoption level of recommendations was low due to various factors. Production of various crops was low as compared to production potential, the reason behind it was that farmers need trainings in various aspects of production technology because they have better awareness level regarding the latest technologies but they have lack of skills. Among the farming community majority of the farmers were illiterate so this was the main hindering factor in attaining the information from better and reliable source related to their field problems, most of farmers were getting information from their fellow farmers some of them also from the private sector like pesticide dealer or workers. On the other hand educated and young farmers also use various source of information like print media (Zarat Nama) and electronic media. It was very astonishing that very fewer numbers of farmers have contact with public sector for getting information like public extension department. Farmers perceived that field assistants (Public Extension Department) never visited fields of small farmers, they were focusing on the progressive farmers only. On the basis of conclusion following recommendations are made;

- Public and private sector should collaborate to conduct the training programmes for enhancing the adoption level of farmers.
- Farmers have mostly low level of education or illiterate so information providers must use that type and ways which are effective for illiterate farmers.
- Public extension department should strictly follow their schedule of farmers gathering for minimizing

the gap and improving the interaction.

- Future research might be focus on the working capabilities of public Agriculture Extension Department.
- Identification of numerous information providers in various areas

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