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# Assessment Of In-Service Training Needs And Working Modalities Of Extension Field Staff For Sustainable Agricultural Development

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**Abstract**

*This research targeted to assess the in-service training needs, strengths and weaknesses of working modalities of extension field staff (EFS) for sustainable agricultural development. The research was conducted in the Department of Agriculture Extension, Punjab. A sample of 320 respondents was selected purposefully with the help of Morgan table. A pre-tested, detailed and validated questionnaire was used as an instrument for the purpose of data collection. The collected data were analyzed through computer software Statistical Package for Social Sciences (SPSS). The data showed that farm management, water management and risk management were the prominent areas in which EFS needed in-service trainings. Assistance in coping future threats, facilitated in solving farmers' problems and improvement in knowledge were the leading aspects regarding the impact of in-service training on the working of EFS. Farmers' appreciations, need oriented e[1]xtension programs and give economical solutions to farmers were the important strengths of extension modalities of EFS. On the other hand, political interference, single line command, lack of skilled experts and lack of training facilities were the leading weaknesses of extension modalities of EFS. It is suggested that continuous in-service trainings must be conducted to improve the weaknesses and address the training needs of EFS. Weaknesses in extension modalities must be sorted out and they must be addressed on priority basis to remove hurdles causing difficulties in successful field activities. Quality of in-service trainings must be improved to enhance the working efficiency of EFS in the extension department for sustainable agricultural development.*

***Keywords:*** *training needs, extension field staff, in-service trainings, sustainable agriculture.*

## 1. Introduction

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Agricultural extension system provides basic agricultural education to rural communities and is a major tool for supporting farmers in improving their skills by adopting as well as distributing agricultural technology (Betz, 2009). It is a planned and organized exchange of information with and among farmers with the intention of assisting them, according to Farooq et al. (2010). Its goals are especially geared toward a better understanding of farmers' needs, their behaviors, and the identification and resolution of problems (Havrland & Kapila, 2000).

Agricultural extension services have become the most significant systemic component in the farming sector in recent decades, particularly following the green revolution. One of the most important parts of the Agriculture Knowledge and Information System (AKIS) is agricultural extension, with research and education making up the other two parts. The majority of researchers concur that the effectiveness of AKIS depends on the strength of the connections between its three main components—research, education, and extension (Qamar, 2005; Ashraf et al., 2007). Today, extension education is a fully developed field with its own ideology, set of guiding principles, and objectives (Moayedi & Azizi, 2011). Priorities for extension services include maximizing the resources of rural populations, boosting the economies, and carrying about positive behavioral modifications (Rivera & Alex, 2004). A wide range of extension teaching techniques are used by agricultural extension organizations to accomplish the primary aim of farmers' education and technology diffusion (Muhammad, 2005; Bajwa et al., 2010). Agriculture extension is one of many strategies that contribute to improving food security and reducing poverty (Farooq et al., 2010). Additionally, it may help farmers use natural resources wisely to create agricultural production (Ikram-ul-Haq et al., 2009).

Extension and consultancy services might be helpful to smallholder farmers, who continue to be the cornerstone of the food and agricultural supply networks in developing countries (Francis, 2014). Giving farmers access to loans, timely information, and better market pricing could all help reduce world poverty and boost agricultural productivity. The significance of timely and relevant information has received a lot of attention over the past ten years, particularly in relation to the role that knowledge, interaction, and technologies play in giving farmers the information they need. A growing body of literature provides lessons on the prerequisites for Ict tools in extension services as well as how ICT may improve the behavior of disadvantaged farmers (Mark Bell, 2015).

The Village Agricultural and Industrial Development Program (V-AID Program), the Basic Democracy System (BDS), the Rural Works Program (RWP), the Integrated Rural Development Program (IRDP), the People's Works Program (PWP), the General Extension Approach, the Training and Visit System (T&V), and Decentralized Extension are just a few of the extension models that have been tried in Pakistan. The improvement of the standard of living in rural regions is the main goal of all the programs. These initiatives all had only modest success and were all eventually discontinued (Asim, 2005).

Due to the poor performance of the public sector extension, the government of Pakistan was obliged to include other parties in order to share the responsibilities of informing rural areas. The decision was made in response to the National Commission on Agriculture's 1988 recommendation that the government improve and broaden the private corporate sector's traditional role in providing material agricultural inputs and services to cover newly emerging needs like highly specialised agricultural production operations, spraying, and harvesting and to provide complete package services rather than single inputs (Government of Pakistan, 2008).

Extension agents are frequently the only link to the greater body of agricultural knowledge in many countries across the world. Extension agents are sought out for information and assistance on a variety of topics, including farming, community organization, finance, marketing, and other matters that have an impact on rural communities' quality of life (FAO, 2000).

Poor technical proficiency and insufficient training are the main causes of low production (Baksh et al., 2007). Building farmers' capacity, increasing awareness of issues, and

providing them with the most recent information are all facilitated by training (Al-Shadiadeh, 2007). Through trainings, farmers' technical knowledge has improved, and their on-farm production has improved as well. A dynamic tool for identifying gaps, training needs assessment (TNA) may suggest one resource and activity at one location while including many and distinct resources and activities at other locations (Nickols, 2005). A proactive approach to in-service training will improve county staff members' abilities and keep them current. Assessments of training needs should be carried out on a regular basis since the training requirements for extension staff change over time. Therefore, it should be considered while creating training for extension staff (Saleh et al., 2016).

Being frontline workers, challenges and problems faced by extension staff needs to be explored for making authorities to realize about these issues. While planning future projects, these issued must be viewed critically. To explore the weaknesses and strengths in present extension model implemented is also required for adequate measures for removing such hurdles. The need also exists identify anomalies in the in-service training system of the country. Keeping this in view, it is important to assess the in-service training needs of EFS for sustainable agricultural development. The study further assessed the impact of in-service training needs on the working of EFS. The study also investigated the strengths and weaknesses of working modalities of EFS working in the department of Agriculture Extension. The study recommended the measures for the improvement of working efficiency of extension field staff working in the department of Agriculture Extension for sustainable agricultural development.

## 2. Methodology

### 2.1 Study population

The study was conducted in the Department of Agriculture Extension, Punjab. All the Assistant Directors Agriculture (ADAs) and Agriculture Officers (AOs) working in the agriculture extension department were the population of the study.

### 2.2 Sample selection

Out of 145 Assistant Directors, a sample of 105 ADAs was drawn with the help of Morgan table. Similarly, out of 476 Agriculture Officers, a sample of 215 AOs was drawn using the same table, thereby making a total sample of 320 respondents (105 ADAs & 215 AOs).

### 2.3 Instrument development

A questionnaire was developed as an instrument for the purpose of data collection. Validity and reliability were checked before going for complete data collection for study. With the aid of the subject-matter experts, validity was examined. The reliability was assessed using the test-retest approach. To investigate the experts' perspectives, a five-point scale was employed. The data were then examined using the program SPSS.

## 3. Results and discussion

**Table 1: In-service Training Needs of Agricultural Extension Field Staff**

| In-service training needs regarding: | Mean | SD | Rank |
|---|---|---|---|
| Computer skills | 2.83 | 0.78 | 9 |
| Inter-personal skills | 3.29 | 0.91 | 1 |
| Crop management | 3.15 | 0.98 | 2 |
| Pest management | 2.92 | 0.97 | 7 |
| Farm management | 3.03 | 0.93 | 3 |

| | | | |
|---|---|---|---|
| Program planning | 2.53 | 1.06 | 12 |
| Water management | 2.80 | 0.83 | 10 |
| Agronomic practices | 2.66 | 0.94 | 11 |
| IPM | 2.47 | 0.88 | 13 |
| Communication skills | 2.89 | 0.94 | 8 |
| Rural development | 2.96 | 1.07 | 6 |
| Risk management | 2.98 | 1.07 | 5 |
| Use of ICTs | 3.02 | 1.17 | 4 |

The above table indicates the ranking of various in-service training needs of the agricultural extension field staff. The data shows that computer skills was rated low to medium with average score of 2.83 having standard deviation 0.78 whereas inter personal skills were also rated between medium to high by the respondent with average score of 3.29 having standard score 0.91. However, crop management were rated between medium to high by the respondent with average score of 3.15 having standard score 0.98 while pest management was rated between low to medium with average score of 2.9 with standard score of 0.97. Farm management were rated between medium to high by the respondent with average score of 3.03 having standard score of 0.93 and program planning were rated between low to medium by the respondent with average score of 2.53 having standard score of 1.06 whereas water management were rated between low to medium with average score of 2.80 with standard score of 0.83. Agronomic practices were rated between low to medium by the respondent with average score of 2.66 having standard score of 0.94 and integrated pest management were rated between low to medium by the respondent with average score of 2.47 having standard score of 0.88 and communication skills were rated between low to medium with average score of 2.89 with standard score of 0.94.Rural development were rated between low to medium by the respondent with average score of 2.96 having standard score of 1.07 and risk management were rated between medium to high with average score of 2.98 with standard score of 1.07. Use of ICTs was rated between medium to high with average score of 3.02 with standard score of 1.17. In a study training requirements of agriculture extension was done by using assessment models that ranked only 83.7% forming a weak link because absence of effective policies. The mean of their pest and disease control was 1.61 with a standard deviation of 1.94 but in our study the mean for pest management was 2.92 (Saleh & Man, 2016).

**Table 2. Impact of In-service Trainings on the Working of Agricultural Extension Field Staff**

| **Aspects regarding impact of trainings:** | **Mean** | **SD** | **Rank** |
|---|---|---|---|
| Helped in the field observations | 2.45 | 0.95 | 9 |
| Improved knowledge | 3.10 | 0.95 | 3 |
| Facilitated in skill development | 2.21 | 1.01 | 10 |
| Abreast with latest practices | 2.17 | 1.10 | 11 |
| Strengthened farmers' contact | 2.93 | 1.17 | 4 |
| Strengthened extension-research linkage | 2.61 | 1.11 | 8 |
| Helped to work in team | 2.65 | 1.02 | 7 |
| Helped in ICTs usage and management | 2.69 | 1.02 | 6 |
| Helped to face emerging challenges | 2.80 | 0.99 | 5 |
| Facilitated in solving farmers' problems | 3.19 | 0.91 | 2 |
| Assisted in coping future threats | 3.24 | 1.26 | 1 |

The above table indicates ranking of various aspects regarding the impact of in-service training on the working of agricultural extension field staff. The data shows that helped in the field of

observation was rated low to medium with average score of 2.45 having standard deviation 0.95 whereas improved knowledge were also rated between medium to high by the respondent with average score of 3.10 having standard score 0.95. However, facilitated in skills development were rated between low to medium by the respondent with average score of 2.21 having standard score 1.01 while abreast with latest practices was rated between low to medium with average score of 2.18 with standard score of 1.13. Strengthened farmers contacts were rated between medium to high by the respondent with average score of 2.93 having standard score of 1.17 and strengthened extension research linkage were rated between low to medium by the respondent with average score of 2.61 having standard score of 1.11 whereas helped to work in team were rated between low to medium with average score of 2.69 with standard score of 1.02. Helped in ICTs usage and management were rated between low to medium by the respondent with average score of 2.80 having standard score of 0.99 and helped to face emerging challenges were rated between low to medium by the respondent with average score of 3.19 having standard score of 0.91 and facilitated in solving farmers problems were rated between medium to high with average score of 3.19 with standard score of 0.91.Assisted in coping future threats were rated between medium to high by the respondent with average score of 3.24 having standard score of 1.26.

**Table 3. Strengths of the extension modalities of the agricultural extension field staff**

| Strengths: | Mean | SD | Rank |
|---|---|---|---|
| Strengthen farmers' contact | 2.08 | 1.06 | 9 |
| Give economical solutions | 3.14 | 1.08 | 3 |
| Financial uplift of farmers | 2.65 | 0.83 | 5 |
| Sustainable agricultural development | 2.14 | 1.11 | 8 |
| Sustainable rural development | 2.39 | 1.07 | 7 |
| Increased per acre yield | 2.76 | 0.88 | 4 |
| Improve working efficiency | 2.53 | 1.01 | 6 |
| Farmers' access to information | 2.53 | 1.16 | 6 |
| Need oriented extension programs | 3.21 | 1.08 | 2 |
| Farmers' appreciations | 3.49 | 1.04 | 1 |

The above table indicates the strengths of extension modalities of the agricultural extension field staff. The data shows that strengthen farmers contact was rated low to medium with average score of 2.01 having standard deviation 1.06 whereas give economical solutions were also rated between medium to high by the respondent with average score of 3.44 having standard score 1.07. However, financial uplift of farmers was rated between low to medium by the respondent with average score of 2.65 having standard score 0.83 while sustainable agricultural development was rated between low to medium with average score of 2.14 with standard score of 1.11. Sustainable rural development was rated between low to medium by the respondent with average score of 2.39 having standard score of 1.08 and increase per acre yield were rated between low to medium by the respondent with average score of 2.76 having standard score of 0.88 whereas improve working efficiency were rated between low to medium with average score of 2.53 with standard score of 1.16. Farmers access to information were rated between low to medium by the respondent with average score of 2.53 having standard score of 1.16 and need oriented extension programs were rated between medium to high by the respondent with average score of 3.21 having standard score of 1.08 and also farmers' appreciation was rated between medium to high with average score of 3.49 with standard score of 1.04.

**Table 4. Weaknesses of the Extension Modalities of Agricultural Extension Field Staff**

| Weaknesses: | Mean | SD | Rank |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Lack of funds | 2.98 | 1.02 | 4 |
| Top-down approach | 2.75 | 0.95 | 8 |
| Strict schedule of visits | 2.81 | 0.85 | 6 |
| Lack of farmers' satisfaction | 2.40 | 1.01 | 10 |
| Extension is expensive | 2.13 | 1.08 | 12 |
| Political interference | 3.54 | 1.18 | 1 |
| Single line command | 3.14 | 1.11 | 2 |
| Lack of skilled experts | 2.95 | 0.94 | 5 |
| Lack of guidance | 2.80 | 0.86 | 7 |
| Lack of training facilities | 3.02 | 0.98 | 3 |
| Lack of resources | 2.40 | 1.24 | 11 |
| Lack of experience | 2.70 | 1.14 | 9 |

The above table indicates the ranking of the weakness of extension modalities of agricultural extension field staff. The data shows that lack of funds was rated low to medium with average score of 2.98 having standard deviation 1.02 whereas top-down approach were also rated between low to medium by the respondent with average score of 2.75 having standard score 0.95. However, strict schedule of visits was rated between low to medium by the respondent with average score of 2.81 having standard score 0.85 while lack of farmers' satisfaction was rated between low to medium with average score of 2.40 with standard score of 1.01. Extension is expensive were rated between low to medium by the respondent with average score of 2.13 having standard score of 1.08 and political interference were rated between medium to high by the respondent with average score of 3.54 having standard score of 1.18 whereas single line command was rated between medium to high with average score of 3.14 with standard score of 1.11. Lack of skilled experts were rated between medium to high by the respondent with average score of 2.95 having standard score of 0.94 and lack of guidance were rated between low to medium by the respondent with average score of 2.87 having standard score of 0.86 and lack of training facilities were rated between medium to high with average score of 3.02 with standard score of 0.98. Lack of resources were rated between low to medium by the respondent with average score of 2.40 having standard score of 1.24 and lack of experience were rated between low to medium with average score of 2.70 with standard score of 1.14.

### 3.1 Regression Analysis

**Role of different demographic factors in the assessment of the in-service training needs of agricultural extension field staff.**

The data of the regression statistics depicted that adjusted R square value was 0.053. This demonstrates that the opinions of professionals who answered the question varied greatly.

**Table 5. ANOVA Table**

| | df | SS | MS | F | Significance F |
|---|---|---|---|---|---|
| Regression | 6.000 | 925.585 | 154.264 | 3.975 | 0.001 |
| Residual | 313.000 | 12148.365 | 38.813 | | |
| Total | 319.000 | 13073.950 | | | |

The above table shows the significant results. The table shows highly significant difference among the study variables (Assessment of the in-service training needs of agricultural extension field staff with age, subject, in-service training, field, gender, designation, education, experience). In comparison to the alpha value of 0.05, the computed Significance F value is 0.001. As the p-value (also known as the F-value) is less than.05, it is clear that there are significant differences between the extension professionals' assessments of the in-service

training requirements for agricultural EFS based on factors like age, subject, in-service training, field, gender, designation, education, and experience

**Table 6. Regression table**

| | Coefficients | Standard Error | t Stat | P-value |
|---|---|---|---|---|
| Intercept | 39.508 | 2.924 | 13.513 | 0.000 |
| Age | -0.148 | 0.093 | -1.595 | 0.112 |
| Education | 0.936 | 0.245 | 3.822 | 0.000 |
| Designation | -0.029 | 0.753 | -0.039 | 0.969 |
| Subject | ,-0.004 | 0.163 | -0.023 | 0.982 |
| Experience | 0.653 | 0.729 | 0.896 | 0.371 |
| Field | -0.003 | 0.198 | -0.014 | 0.989 |

Regression chart above that displays the p-values for the contribution of several demographic components in assessment of the in-service training needs of agricultural extension field staff. It is necessary to compare the computed P-value for the professionals' age of 0.112 with the alpha value of 0.05. As the p-value is greater than.05, it is clear that professional in-service trainings are of little use in determining the in-service training requirements for agricultural extension field employees. Similar to that, the designation P-value, which should be compared to the alpha value of 0.05, is determined to be 0.969. As the p-value is more than .05 which shows that there is no role of designation in the improving the strengths of the extension modalities. Hence no demographic factor has any role in assessment of the in-service training needs of agricultural extension field staff. Figures show significant role of education in assessment of the in-service training needs of agricultural extension field staff.

### 3.2 Regression

**Role of different demographic factors in addressing the weaknesses of the extension modalities of agricultural extension field staff.**

Regression analysis reveals a very high adjusted R square value (0.070). This demonstrates the wide range of opinions expressed by respondents in response to the question.

**Table 7. ANOVA**

| | Df | SS | MS | F | Significance F |
|---|---|---|---|---|---|
| Regression | 6 | 877.217 | 146.203 | 5.028 | 0.000 |
| Residual | 313 | 9101.671 | 29.079 | | |
| Total | 319 | 9978.887 | | | |

The significant outcomes are displayed in the ANOVA table values. The analysis of variance table demonstrates the extremely significant variation between the investigated variables (weaknesses of the extension modalities with age, subject, in-service training, field, gender, designation, education, experience). It is necessary to compare the significance value of F, which is computed to be 0.000, with the alpha value of 0.05. Because the model's p-value was less than 0.05, it was statistically significant.

**Table 8. Regression Table**

| | Coefficients | Standard Error | t Stat | P-value |
|---|---|---|---|---|
| Intercept | 28.030 | 2.531 | 11.076 | 0.000 |

| | | | | |
|---|---|---|---|---|
| Age | -0.025 | 0.080 | -0.316 | 0.752 |
| Education | 1.047 | 0.212 | 4.939 | 0.000 |
| Designation | 1.365 | 0.652 | 2.096 | 0.037 |
| Subject | 0.024 | 0.141 | 0.169 | 0.866 |
| Experience | 0.522 | 0.631 | 0.827 | 0.409 |
| Field | 0.156 | 0.171 | 0.910 | 0.363 |

The p-values for the various demographic variables are displayed in the regression table that is given in addressing the weaknesses of the extension modalities. The P-value for the professionals' ages is determined to be 0.752, which must be contrasted with the alpha value of 0.05. Because the p-value is greater than.05, it is clear that the experts' age has no impact on how professionals in addressing the weakness of extension modalities. Similar to this, the P-value for the field of designation is computed to be 0.037 and must be compared to the alpha value of 0.05. As the p-value is smaller than.05, it is clear that designation plays a substantial role in addressing the weakness of the extension modalities. Hence no demographic factor has any role in addressing the weaknesses of the extension modalities except education and designation. Figures show significant role of education and designation in addressing the weaknesses of the extension modalities.

### 3.3 Findings

The data about the strengths of extension modalities of the agricultural extension field staff shows that farmers' appreciations got the highest score and was ranked 1st with average value of 3.88 closely followed by need oriented extension programs, which got the second highest score and received 2nd highest average value of 3.26 and give economical solutions to farmers was ranked at 3rd position with average value of 3.24. Increased per acre yield, financial uplift of farmers and improve working efficiency were the strengths of extension modalities of the agricultural extension field staff ranked at 4th, 5th and 6th positions with average values of 2.89, 2.69 and 2.62 respectively. The average values in this regard indicate that these strengths fell between low to medium but tending towards medium categories. The data regarding the weaknesses of extension modalities of the agricultural extension field staff shows that political interference got the highest score and was ranked 1st with average value of 3.87 closely followed by single line command, which got the second highest score and was ranked 2nd with average value of 3.49 and lack of experience was ranked at 3rd position with average value of 3.26. Lack of skilled experts, lack of training facilities and strict schedule of visits were the weaknesses of extension modalities of the agricultural extension field staff which ranked at 4th, 5th and 6th positions with average values of 3.17, 3.09 and 3.01 respectively. The average values in this regard indicate that these weaknesses fell between medium to high but tending towards high categories. The data about the in-service training needs of the agricultural extension field staff shows that inter-personal skills got the highest score and was ranked 1st with average value of 3.43 closely followed by crop management, which got the second highest score and was ranked 2nd with average value of 3.24 and farm management was ranked at 3rd position with average value of 3.20. Use of ICTs, water management and risk management were the other in-service training needs of the agricultural extension field staff which ranked at 4th, 5th and 6th positions with average values of 3.18, 3.04 and 3.01 respectively. The average values in this regard indicate that these aspects fell between medium to high but tending towards high categories.

### 3.4 Recommendations

Various management skills must be enhanced through different latest practical approaches. These skills will enhance the technical competencies of the extension field staff and will

remove the weaknesses present in extension modalities and hence will strengthen them. The process of skills development must be executed through latest and updated skills development approaches by using latest instructional technologies. Continuous in-service trainings must be conducted to improve the weaknesses and address the training needs of the extension field staff. Weaknesses in extension modalities must be sorted out and they must be addressed on priority basis to remove hurdles causing difficulties in successful field activities. Quality of in-service trainings must be improved to enhance the working efficiency of the extension field staff in the extension department for sustainable agricultural development.

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