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ASSESSING THE ROLE OF PLANT CLINIC ADVISORY SERVICES IN PLANT HEALTH IMPROVEMENT IN CHAKWAL DISTRICT PUNJAB

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A B S T R A C T

Plant clinic (plant-wise) is a global catalog that Punjab Agriculture Extension is currently implementing to reduce crop losses in order to improve food security and rural incomes. Plant clinics provide farmers with information that obligates them to lose less of their produce due to pest and disease outbreaks. Plant clinics are held once a week in a village where farmers come to get advice on crops under the protection of a shade. The goal of the desk monitoring was to assess the overall execution and the assistance provided by this initiative. The study was covered the district Chakwal, and 225 total participants randomly was selected for data collection in the research area. The data was collected by a well-structured interview schedule consisting of closed-ended and open-ended questions to maintain the quality regarding farmers' perceptions of plant clinics. After data collection, the data was analyzing by using SPSS. Descriptive statistical analysis, including frequencies, averages and percentages was undertaken. The result shows that 55.6% of farmers belong of middle age. 60.0% working as private jobs, 44.0% achieved matric and 60/0% of them are living in a nuclear family. According to 100.0% of farmers, the plant clinic is providing services about disease management, providing pest control resources, and integrated pest management. A plant clinic (100.0%) teaches them methods of weed control, pest identification, and fungal and bacteria identification in form of a plant clinic. 66.7% of farmers learned the manure application from the plant clinic activities. According to 100.0% of farmers, disease identification and control of the disease are very important. 100.0% of them never visit to plant clinic on daily bases. 100.0% of them communicated with office calls. 90.2% connect with the plant clinic through the farm visit. 82.2% of farmers' crop production increased up to 25% with the adoption of the plant clinic services. 82.2% of plant clinics are working with value addition. 100.0% of farmers had awareness about the diseases services, pest identification & control, seed verities recommendation, and spraying technique services. 98.2% of them also stated that they had achieved awareness about the fertilizers application services from the plant clinic. 82.7% of farmers achieved good awareness about the diseases services, pest identification & control, seed verities recommendation, and spraying technique services.

Keywords: Disease clinic; Extension; Farmers; Plant health

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INTRODUCTION

Effective plant health management is becoming ever more important in agriculture, not only for food security but also for increasing farm income. Various factors, such as climate change, are expected to increase the frequency and magnitude of pest and disease outbreaks, leading in production losses if they are not properly managed. Rural advisory or extension services play an important role in assisting farmers to interact with current and upcoming challenges through exchange of information and collective capability (Bourne et al., 2017). Plant health management, in particular, is a persistent issue for small farmers, who are confronted with unpredictability in pest and disease patterns and pressures as a result of climate change and increasing global mobility of people and goods (Bebber et al., 2014). However, rapid and reliable plant health information and advisory services are frequently lacking or non-existent in low-income areas (Smith et al., 2008).

The Center for Agricuture and Biosicence International (CABI) leads a worldwide project “plant clinic” that takes a horizontal (many crops and pests) strategy rather than a vertical approach. Plant clinics have proven to be a useful access point for improving plant health, It is same as healthcare system for human has proven to be a successful platform for improvement in several countries (Kruk et al., 2010; Pallas et al., 2012). It promotes plant health networks in order to increase plant health services for farmers. A plant clinic is a simple public service that is available to the public and is provided by 'plant physicians' (local extension workers) which are experts in the field of diagnosis and plant healthcare. In a plant clinic, simple examination tools are typically available (scissor, knife, magnifier), materials of reference, and visual aids, such as photos and fact sheets. Plant physician (plant doctors) typically combine plant clinic work with their regular extension activities. Plant clinics can be stationary or mobile and typically operate weekly or quarterly from public locations like local markets, local premises, or cooperatives (Danielsen and Kelly, 2010). In order to address specific crop health issues, farmers consult at plant clinic. They take samples of the diseased crops to the plant doctor, who can diagnose the issue and recommend a treatment plan. According to the principles of integrated pest management (IPM), the proposed treatment includes agronomic strategies as well as pesticide application (Danielsen et al., 2013; Ochilo et al., 2018).

Effective plant health management is critical for food security, as well as meeting the demands of domestic and international markets. However, in the majority of developing nations, plant health advising services are either limited in the scope and substance or inaccessible to small-scale farmers (Miller et al., 2009; Ochilo et al., 2018; Smith et al., 2008).

While small-scale farmers rely on many crops for food, medicine, fodder, and revenue, traditional pest management approaches are restricted to a small number of crops, illnesses, and technology. Increased reactivity to plant health concerns becomes even more necessary and urgent in a global setting of new exotic diseases and unanticipated disease patterns driven by climate change and increased mobility of people and commerce. Plant clinics have been created in Asian countries as well as in America, since 2003 to address some of the short comings of traditional plant health management methods (Boa, 2009). These clinics can benefit smallholder farmers since they provide a novel method to plant health improvement. A plant clinic is a free public service given by extension workers which are experts in crop diseases and diagnosis, at public locations such as farmers cooperatives, local markets, and bus stops (Boa, 2009). Plant doctors usually combine their work in the plant clinic with their regular extension responsibilities. Plant doctors are inspired mostly by community health professionals in a number of underdeveloped countries who have made substantial contributions to human and animal health (Catley et al., 2004).

Plant clinics represent a shift from a single crop to a multi-crop strategy. Plant clinics have been deemed a viable platform for developing health systems in many nations, just as primary care in human health has proven to be an effective platform for strengthening health systems in a number of countries (Kruk et al., 2010; Pallas et al., 2012).

As progressive farmers have different options for managing disease and insect attack, some of them have partnered with agronomists or any private company to address the issues or hire any staff. Smallholders, on the other hand, just seek aid from a neighbour or a chemical provider. However, the plant clinic will specifically assist small-scale growers. since these farmers rely on any progressive farmer, neighbour Even some farmers attempted to rid themselves of disease based on personal experience, and the media provided more relevant information than pesticide merchants and neighbours (Van Mele et al., 2002).

The development of plant diseases later in the treatment of a wide range of cases such as the effects of disease threats and food security, with a focus on diagnosis. Plant treatments are important in the management of plant health for this purpose (Boa, 2009).

As small scale farmers have limited access to extension advisory services, so they have well knowledge regarding plant health and use of pesticide applications (Atreya, 2005), which have severe effect on human, livestock and the environment (Shrestha and Neupane, 2002). As a result, it is critical to provide ideal plant health services, such as sound advice on plant health issues as well as preventive and curative measures, to farmers. Furthermore, farmers should be able to access these services whenever they need them. Since 2003, the concept of a 'plant health clinic,' also known as a 'plant clinic,' has evolved as a unique method to deliver farmers with consistent, low-cost plant health services in order to fill some of the gaps in plant health extension (Bentley et al., 2009; Boa, 2009). Plant clinics, like human and animal clinics, provide primary health care for plants and are run by local extension workers in any location that is convenient for local farmers. They have very basic tools and facilities for examining sick plants brought in by farmers (Danielsen and Kelly, 2010).

Studies have shown that pesticide abuse and overuse is a

concern. Chemical pesticide use has increased significantly in Ethiopia during the previous decade. According to Negatu et al. (2016) increasing agricultural output while conserving the environment, biodiversity, and product quality is a key global concern. Primary plant healthcare is offered through plant clinics located in farmer-friendly venues For example, stack markets, village hub and cooperative centres, and farmer training facilities (Bentley et al., 2009; Ghiasi et al., 2017).

Plant clinics are held weekly or biweekly in Ethiopia; these can be held more regularly by incorporating them. Farmers experiencing crop problems bring samples to qualified extension officials referred to as plant physicians. Plant doctors evaluate plant samples, diagnose the problem, and then counsel farmers, accompanied by a written prescription, on how to resolve the problem. Plant physicians keep records on farmers, crops, and crop health issues, in addition to the recommendations they make during each consultation. Thus, plant clinic records are crucial for determining farmers' key concerns regarding plant health, as well as the importance and changing status of agricultural pests (Finegold et al., 2014).

The plant clinic is very important for the increased knowledge of the farmers. The majority of farmers did not take part in the activities of the plant clinic which reduced the interest of the farmers and also decreased the confidence of the plant clinic officers to increase the awareness of farmers. For the purpose to find out the awareness level of the respondents about the plant clinic in the area. To identify the extension delivery method used by extension advisory services of plant clinic. To analyze the farmers' perception regarding the effectiveness of extension advisory services of plant clinics. To examine the obstacle in the adoption of extension advisory services of plant clinic. To explore the association between dependent and independent variables.

MATERIALS AND METHODS

Research methodology is step by step process for any researcher to collect, analyze and interpret data. The study was covered the district Chakwal, and 225 total participants randomly was selected for data collection in the research area. The data was collected by a well-structured interview schedule consisting of closed-ended and open-ended questions to maintain the quality regarding farmers' perceptions of plant clinics. After data collection, the data was analyzing by using SPSS. Descriptive statistical analysis, including frequencies, averages and percentages was undertaken.

RESULTS AND DISCUSSION

The raw data were collected from the crop farmer through a designed questionnaire and after the collection, it transfers on an excel sheet in coding form, afterward, it was analyzed through SPSS.

Data regarding age are reported in Table 1 which describes that the majority (55.6%) of the respondents belong to middle age. The second category (24.4%) was recorded for young age in the study area. The frequency percentage of old age was recorded at (40.0%). The results showed that the majority of middle age farmers were involved in plant clinic activities and services. The extent of involvement of farmers was middle age farmers > young age farmers > old age farmers. These farmers must involve their young farmers and also take knowledge from their old-age farmers. Because of their experience they had better knowledge regarding the plant clinic and their relation with crops. The result of Zubair and Garforth (2006) also found that the similarity index was high in middle age. The results of the study show that the majority of farmers belong to middle age. The plant clinic extension services must be provided to young age farmers for the energetic learning and adoption.

The data collected from respondents about education level are reported in table 2. The data show that 44.0% of the farmers achieved matric (10 years of schooling) from the formal educational institution. The 2nd highest frequency (19.1%) of education was recorded at 12 years of schooling (Inter). The middle class of education was followed by (9.8%). The higher education (7.1%) percentage was recorded with very few numbers of farmers and the illiterate (1116%) farmers were also recorded from the research area. According to Kassie et al. (2011), the majority of respondents had a matric of education level.

The majority (82.7%) of farmers are taking information from the plant clinic with up to 5 years of experience. It is shown (Table 3) that a high rate of farmers did not connect with the plant clinic for a long period. The innovation of mass media increased the direct linkage between the farmers and plant clinic officers. 17.3% of farmers stated that they are achieving the service of the plant clinic with 10 years. The farmers further stated that the services of the plant clinic were limited in the initial decades. The plant clinic was wide's its information resources and connected a lot of farmers with their services.

The majority (82.7%) of farmers are taking information from the plant clinic with up to 5 years of experience. It is shown (Table 4) that a high rate of farmers did not connect with the

plant clinic for a long period. The innovation of mass media increased the direct linkage between the farmers and plant clinic officers. 17.3% of farmers stated that they are achieving the service of the plant clinic from 6 years to 10 years.

Table 1. Age of the farmer's selected for the study.

Age	Frequency	Percentage
Young age (up to 35 years)	55	24.4
Middle age (36 to 50 years)	125	55.6
Old age (More than 50 years)	45	40.0

Table 2: Education of the farmer's selected for the study.

Education	Frequency	Percentage
Illiterate	25	11.1
Middle	22	9.8
Matric	99	44.0
FA/FSc	43	19.1
Bachelor	20	8.9
Above Bachelor	16	7.1

Table 3: Farmer connected with plant clinic.

Farmer connected with plant clinic	Frequency	Percentage
2 to 5 years	186	82.7
6 to 10 years	39	17.3
Total	225	100.0

Table 4: Farmer connected with plant clinic.

Farmer connected with plant clinic	Frequency	Percentage
2 to 5 years	186	82.7
6 to 10 years	39	17.3
Total	225	100.0

All (100.0%) of farmers stated that the plant clinic was providing services about disease management, providing pest control resources, and integrated pest management (Table 5). The plant clinic officer is providing the crops seeds, 92.9% of farmers stated that they achieved knowledge from the plant clinic about it. 60.0% of farmers stated that they learned from the plant clinic about the soil test. It increased their soil quality. The fertilizers are the basic part of disease spreading and controlling. 98.2% of plant clinic beneficiaries stated that they adopted fertilizers services from the plant clinic.

Table 6 shows that 100.0% of farmers stated that the disease identification and control of this disease are very important. 78.7% of farmers mentioned the sowing methods and recommendation of improved seed varieties are very important for plant growth. 82.7% of them also stated that agricultural marketing is very important for farmers' knowledge. The majority of farmers couldn't find out a profitable agricultural market for their crop production. 76.7% of plant clinic beneficiaries mentioned pest control; they stated states that it is very important for crop protection. 75.6% of plant clinic beneficiaries said that the reduced input costs are very important to increase the outcome of the production. 72.9% of the respondents stated that the information related to fertilizers use and their application is very important for the crop production.

Table 7 is reporting the plant clinic farmer's frequency distribution response regarding hurdles/problems faced by the plant clinic. 100.0% of farmers stated that they observed hurdles with a very low attitude of EFS of plant clinic and ability of EFS of plant clinic. 88.9% of farmers stated that observed very low hurdles among cultural differences. 86.7% of them stated that they reported low language problems. 68.9% of the farmer also mentioned the low hurdles with the environment and lack of information.

77.8% of beneficiaries reported a low lack of interest on the part of the farmer. 80.0% mentioned a low lack of modern technology. 100.0% also mention a low lack of experience. 48.9% faced low challenges with agricultural policies.

Table 5: Farmer's frequency distribution response regarding plant clinics extension services.

Extension services plant clinics	Yes	No
Crops seeds	92.9	7.1
Soil test	60.0	40.0
Fertilizers	98.2	1.8
Financial support	17.8	82.2
Diseases management	100.0	0.0
Providing pest control resources	100.0	0.0
Climate information	60.0	40.0
Agriculture practices	82.7	17.3
Integrated pest management	100.0	0.0
Water management	45.8	54.2

Table 6: Farmer's frequency distribution response regarding plant clinic importance.

Variable	1	2	3	4	5
Plant clinics are important	0.0	0	0	66	33
Sowing methods	0.0	0	0	78.	21
Recommendation of improved seed varieties	0.0	0	0	78.	21
Pest control	0.0	0	0	76.	23
Reduce input costs	0.0	0	0	75	24
Information related to fertilizers use and application	0.0	0	0	72.	27
Disease identification and control	0.0	0	0	0.0	10
Agricultural marketing	17.	0	0	82.	0

Scale 1= Less important, 2= Much Important, 3= Not important, 4= Very important, 5=Highly important

Table 7: Plant clinic farmer's frequency distribution response regarding hurdles/problems faced with plant clinic.

Hurdles faced with plant clinic	1	2	3	4	5
Cultural differences	88.9	0.0	0.0	11.	0.0
Language problem	86.7	0.0	0.0	13.	0.0
Environment	0.0	68.9	0.0	31.	0.0
Lack of information	0.0	68.9	0.0	31.	0.0
Lack of interest on the part of farmer	0.0	77.8	0.0	22.	0.0
Attitude of EFS of Plant clinic	100.	0.0	0.0	0.0	0.0
Ability of EFS of Plant clinic	100.	0.0	0.0	0.0	0.0
Favoritism on the part of EFS	0.0	20.0	0.0	80.	0.0
Lack of modern technology	0.0	80.0	0.0	20.	0.0
Lack of Finance	0.0	28.9	0.0	71.	0.0
Lack of skills	0.0	0.0	11.1	88.	0.0
Lack of training	0.0	40.0	0.0	60.	0.0
Lack of experience	0.0	100.	0.0	0.0	0.0
Lack of facilities	0.0	26.7	0.0	73.	0.0
Agricultural policies	37.8	48.9	13.3	0.0	0.0

Scale 1= Very Low, 2= Low, 3= Medium, 4= High, 5= Very High

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crop losses in order to improve food security and rural incomes. Plant clinics provide farmers with information that obligates them to lose less of their produce due to pest and disease outbreaks. Plant clinics are held once a week in a village where farmers come to get advice on crops under the protection of a shade. The goal of the desk monitoring was to assess the overall execution and the assistance provided by this initiative. The study was covered the district Chakwal, and 225 total participants randomly was selected for data collection in the research area. The data was collected by a well-structured interview schedule consisting of closed-ended and open-ended questions to maintain the quality regarding farmers' perceptions of plant clinics. After data collection, the data was analyzing by using SPSS. Descriptive statistical analysis, including frequencies, averages and percentages was undertaken.

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CONFLICTS OF INTEREST

The authors declared no conflict of interest. The funders had no part in the design, collection analyses and interpretation and writing of short communication.

AUTHOR'S CONTRIBUTION

All authors contributed and supported towards writing of this manuscript.

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