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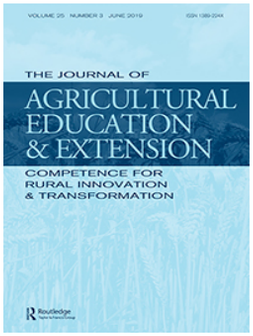

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# Identifying gender-responsive approaches in rural advisory services that contribute to the institutionalisation of gender in Pakistan

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## ABSTRACT

**Purpose:** Unequal reach and access to information is an issue that affects women involved in agricultural activities around the world. Recent initiatives to address gender unequal access to agricultural information have been clumsy, overlooking participatory approaches that focus on transformative change. This study uses Pakistani rural advisory services to compare farmers' and extension workers' perceptions of access to agricultural information, to identify culturally acceptable gender-responsive schemes.

**Design/methodology/approach:** One-hundred and eleven extension workers in Pakistan's public rural advisory services were interviewed and crosstabulated with farmers' answers in previous studies.

**Findings:** Male extension workers are aware that women access less information less often; however they might not be aware of its importance in the gender inequality debate. Lead farmers could offer a potentially transformative knowledge pathway because of its blend of formal and informal interactions – both systems favoured by female smallholders. An exclusively female-led lead farmer approach could be developed and trialled in specific areas of the province.

**Practical implications:** Targeted initiatives focusing on improving awareness and importance of gender inequalities in information access as well as specific extension system development centred on lead female farmers and extension agents are important in institutionalising gender and creating transformative change.

**Theoretical implications:** Linking these activities to in-depth social network and agricultural innovation system analyses would provide further evidence of the importance of focused gender activities and their impact on food security.

**Originality/value:** This paper highlights the importance of analysing individual perceptions to understand the types of initiatives that could be considered for a wider institutionalisation of gender in RAS.

## ARTICLE HISTORY

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## KEYWORDS

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## Introduction

As global populations and food consumption are projected to rise (Cleland and Machiyama 2017), food security challenges become increasingly important (Sustainable Development Goals 2017). Smallholder agriculture is an important sector to prioritise when addressing food security as up to 500 million smallholder farms supply food to over 2 billion people in Africa and Asia (International Fund for Agricultural Development 2013). Yet major issues need resolving. Geographically isolated smallholder farmers are, unlike large-scale commercial enterprises, less embedded in the national knowledge and information infrastructure. This reduces their access to safe, up-to-date and effective agricultural information. Rural Advisory Services (RAS) – a multisectoral network of actors who design and deliver knowledge transfer processes and activities to respond to a rural population's needs (adapted from GFRAS 2011; Leeuwis and van den Ban 2004; Peterman et al. 2011) – can alleviate this knowledge gap. Over a million individuals currently work in public agricultural RAS ministries/departments worldwide (Swanson and Davis 2015). These usually government-led services utilise a combination of innovative and traditional approaches that focus on systematising specific communication pathways in order to deliver high-quality information whilst maximising impact. However, as with many development activities, unequal reach and access is an issue to resolve.

Globally, approximately 43percent of the one and a half billion agricultural workers are women (World Bank, FAO and IFAD 2008). However, the rise of the patriarchal agricultural revolution system has created gender inequalities across a variety of professional and social spheres through national, religious and tribal socio-cultural contexts (Harari 2014). Throughout the ages until the eighteenth Century, gender roles and sexuality were a fluid notion (Laqueur 1990). However, women and men's physical differences have become more important in our society's definition of gender roles after the medical proof of sexual dimorphism between genders in the twentieth Century (Haines, Deaux, and Lofaro 2016). In a society increasingly defined by urbanised, industrialised and growing middle class came the demand for equality of women, challenging the 'domestic ideal' idealised by this middle-class ideology (the suffragettes for example). The activists were typically classed as feminists: liberal feminism seeks equal rights for women via political and civil channels; cultural feminism seeks to recover lost female voices from the past; and separatism seeks to establish female-only spaces and fora where women can determine their own values and beliefs (Laqueur 1990). These gender-based theories have permeated into many professional and popular domains, including agriculture: indeed, women are currently woefully under-represented as scholars, extension agents, researchers and instructors (World Bank and IFPRI 2010). This imbalance is also reflected in smallholder farming, where women farmers struggle to achieve equal representation, access to information and resources as male farmers. This includes land ownership, high quality inputs, access to credit, insurance, education and rural advisory services (Jafry and Sulaiman 2013; Carter and Weigel 2011; Cohen and Lemma 2011; Manfre et al. 2013; Meinzen-Dick et al. 2011; Ragasa et al. 2013; Samee et al. 2015; Johnson et al. 2016; Lamontagne-Godwin et al. 2018). Indeed, certain figures put women's agricultural information access at less than ten percent in certain countries (Lamontagne-Godwin et al. 2017; Lamontagne-Godwin et al. 2018). These figures highlight significant issues, especially given women's complex role in the agricultural value chain (Doss 2001; Meinzen-Dick et al. 2011) and

their importance in increasing agricultural productivity (FAO 2011; World Bank, FAO and IFAD 2008; Beintema and Stads 2010; Pardey et al. 2006).

International development entities and multilateral organisations, many of whom are responsible for RAS initiatives at the national level – such as the Training and Visit (Due 1997), Farmer Field Schools models developed by the FAO (Davis et al. 2012), or CABI's Plantwise approach (Evidence on demand 2015), have attempted to respond to gender inequality in agriculture. However, traditional development efforts often promote mainstreaming approaches that aim to increase numbers of disenfranchised or vulnerable groups involved, with a particular focus on women (Doss 2001; Quisumbing 2003; Rao and Kelleher 2005; Schilling, Froese, and Naujoks 2018). However, these efforts are mostly driven by top-down project management approaches rather than by participatory activities which consider inherent gender issues – the topic they set out to resolve in the first place – in the developmental stages of any initiative (Kristjanson et al. 2017; Mishra and Sinha 2012; Tegbaru et al. 2010), often overlooking transformative empowerment processes that come from in-depth ethnological research responsible for long-term sustainable improvements in gender equality (Agarwal 2000; Gurung and Biggs 2008; Hambly-Odame and Sarapura 2009; Mukhopadhyay 2014). National systems usually compound the issue by operating under similar administrative and monitoring constraints in order to satisfy donor requirements and expectations (Chauhan 2014). According to many, the institutionalisation of gender – the process whereby gendered social practices become sufficiently regular and continuous to be described as institutions (adapted from Turner, Abercrombie, and HIll 2014) – is still beyond reach. This is partly because the issue is complex, necessitating formal institutional and informal individual agendas to feedback positively amongst themselves.

On the one hand, formal institutional processes that frame gender inequality in countries, such as laws and policies governing access to resources, are linked to informal perceptions formed in part by traditional socio-cultural norms and individual beliefs (Rao and Kelleher 2003; Rao and Kelleher 2005). Social customs and the socio-cultural context determine men and women's roles, restrictions and prohibitions in society, and therefore their position in their community. These roles determine how individuals interact formally and informally with one another, such as an interaction between extension workers and farmers of different genders (Figure 1). This top-down view is consistent with many gender-at-work theories.

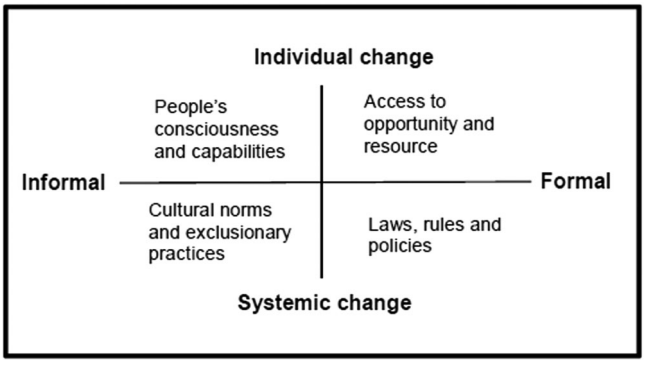


**Figure 1.** Institutionalising gender across individual and systemic processes.

On the other hand, a bottom-up perspective, focusing on the operationalisation of gender transformative approaches can also impact on the institutionalisation of gender as a whole. Agricultural research in the past shows that women currently represent a significantly smaller proportion of scholars, extension agents, researchers, innovators and instructors compared to men (Carter and Weigel 2011; Doss 2001; Jafry and Sulaiman 2013; Lamontagne-Godwin et al. 2017; Ragasa et al. 2013; Puskur 2013). In conjunction with this lack of female representation, many public services still adopt a gender-neutral stance – considering their approaches suitable for and applicable to both male and female genders – when designing and carrying out activities. Consequently, technical information and rural communication efforts follow suit, favouring men over women's needs (Mudege et al. 2016), leading to a positive reinforcement of male farmers consistently reporting better access to extension information (Lamontagne-Godwin et al. 2017; Ragasa et al. 2013; Puskur 2013). Research by Farnworth and Colverson (2015) through the Gender-Transformative Extension and Advisory Facilitation system (GT-EAFS) shows that specific gender transformative approaches, developed through a thorough understanding of male and female perspectives on the ground, can be of benefit to gender equality, systematically identifying, integrating and scaling up proven positive women empowerment approaches. The development and promotion of these activities leads to a gradual socio-cultural change from the ground up. This in turn aims to move beyond individual self-improvement, transforming the power dynamics and structures that serve to reinforce gendered inequalities (Hillenbrand et al. 2015). A review of the effectiveness of new approaches targeting women in extension does much to highlight potential avenues of research and development in knowledge pathways (Mbo'o-Tchouawou and Colverson 2014) and its impact on gender equality in the long term.

Yet many studies focus on individual activities and neglect the social-cultural impact they have that can be so important in determining whether the technology's application will be successful from a gendered perspective. Certain studies do impress the need for considering gender in each step of the planning phase when trialling new technologies (Kabeer 2010), while others have focused almost exclusively on the importance of gender norms exclusively in the household (Mudege et al. 2015). In Pakistan, past research has usually focused on simplistic analyses of gendered activities and did not delve into its gender transformative potential, although urban research on the evolution of gender roles has shown the importance of education and mass media to combat static and enforced structures imbedded in society (Ali et al. 2011) so important for promoting long-term change.

The integration of non-traditional stakeholders is also vital in order to get a well-rounded view. The inclusion of extension workers' perceptions could lead to more powerful conclusions. Indeed, research focused on the extension worker has previously focused on knowledge of sustainable agricultural practices (Tiraieyari et al. 2013), climate change (Obasi et al. 2014), agricultural policies (Kinyanjui et al. 2000), use of ICTs in extension service delivery (Ajayi, Alabi and Akinsola 2013), and the importance of computers in extension activities (Rad, Hashemi, and Chizari 2014), the impact of devolution (Saeed et al. 2006) and staff development opportunities (Masud, Hashmi, and Ali 2011).

This study uses RAS in Pakistan as a case study to focus on individual perceptions of farmers and extension workers, helping to triangulate and identify gender responsive approaches in order to trigger, or at least formalise, institutionalised gender processes.

In Pakistan, women utilise less sources of information than men, focusing mainly on non-formal individual sources, such as female friends/neighbours (Lamontagne-Godwin et al. 2018; Hassan, Ali, and Ahmad 2007; Butt et al. 2010; Sadaf, Asif, and Muhammad 2006; Yaseen et al. 2016). In spite of their many roles and responsibilities in the field, women have minimal roles in decision-making due to existing cultural norms (Samee et al. 2015). This problem is apparent at various official levels. Over 240 of the 259 middle senior and executive level decision makers in the Department of Food, Agriculture and Livestock are men. Only 15 women work in the executive wing of agricultural ministry in Pakistan; none work at the executive level. Finally, 26 of 500 extension workers in the Directorate of Agricultural Extension and Adaptive Research of the Punjab province are women (Chauhan 2014).

A clearer understanding of extension workers' perspectives of male and female farmers' perceptions in agriculture, and how this translates into operational and institutional change, would be of practical value to those attempting to transform extension systems to reach women as well as men. From a theoretical perspective, the approach undertaken to compare both sets of results could provide a perspective for future holistic research to explore the influence of individual perceptions of gender and its institutional impact in a national context. Understanding extension workers as individuals in a large workforce is no guarantee of an effective system (Ragasa et al. 2016), but a comparison between both sets of results could support a more comprehensive understanding of the Pakistani context from institutional and individual perspectives. Most importantly, these findings facilitate the continuation of a discussion about the institutionalisation of gender in RAS's evolving environment.

Having demonstrated the importance of the paper's purpose and its contribution to existing theoretical and practical knowledge, the manuscript will present the methodologies used in the research before listing a logical sequence of results. Subsequently, the paper discusses the results in light of existing knowledge and suggests possible ways to develop further in-depth studies, utilising qualitative research theories.

## Methods

In this study, the target population were extension workers in the Punjab province of Pakistan, specifically in the Jhang and Bahawalpur districts. The study interviewed one hundred and sixteen staff in the field or in their offices. They were from the Provincial Department of Agricultural Extension and Adaptive Research (PDEAR) and performed a variety of field and office roles in the department. Sixty-six participants were from Bahawalpur's four sub-districts (Ahmadpur East, Bahawalpur, Hasilpur and Yazman) and 50 were from Jhang's three sub-districts (Shorkot, Ahmadpur Syial and Jhang).

Of the 116 participants, five were women (three from Bahawalpur and two from Jhang). Ideally, the study would've achieved a 50–50 gender balance. However, data collection efforts could not find enough women extension workers to interview in the area, as they were out of the offices. In addition, women working in low to middle administrative roles in the departments did not interact with farmers professionally so were excluded from this study. Whilst their views would have been interesting to consider, it was outside of the scope of the study. The study subsequently focused on male extension worker findings.

The study interviewed participants through face-to-face administered questionnaires. Questionnaires were designed and tested prior to final data collection activities, conducted in the language of preference of the participant. Each interview took between half an hour and 45 min. The facilitators led interviewees through their background and current role in PDEAR and their perceptions of agricultural information needs and habits in rural households. The list of information sources was chosen according to past studies (Hassan, Ali, and Ahmad 2007; Sadaf, Asif, and Muhammad 2006) and systematically compared to the information sources cited by farmers in Lamontagne-Godwin et al. (2018) farmer study in the same districts.

Whilst data sources on access to information are available, the study's aims are as much to highlight the inequality of information access by end-users as they are to contribute to the wider gender inequality debate. Men and women's views reflect socio-cultural norms they adhere to, and the conscious bias/preferences in accessing specific information sources at convenient locations. This paper is keen to highlight how, based on these perceptions, specific short-term gender-responsive schemes can help the unequal access to information to evolve, as well as how these changes can contribute to the wide institutionalisation of gender equality debate.

Data were collated onto Microsoft excel in Pakistan, and cleaned and analysed in the SPSS$^{tm}$ statistical package in the UK. Due to the categorical nature of the dependent and independent variables, the study used cross-tabulated descriptive statistics and binomial Z tests: the null hypothesis states there are no significant differences in access to information between how extension workers view farmers' access to information, correlated with a five percent margin of error. When sample sizes were too low for Z tests, the study conducted descriptive statistics for qualitative purposes. In order to keep statistical analyses powerful and conclusions relevant, the study focused the majority of its correlations on the top information sources for both farmer genders.

## Results

The first section of results describes male extension workers' perceptions of information access for male and female farmers, considering age and profession. The second section compares extension worker and farmer views. Results form the basis for the article's ensuing discussion, focusing on the importance of gender institutionalisation in agriculture.

### *Population statistics by gender*

Overall, the survey interviewed 116 staff members (Table 1). This included 24 agricultural extension officers and inspectors (18 extension officers, of which 15 were men, and six inspectors, of which four were men). These professionals mainly spend their time in the office. The study also interviewed four male deputy district officers working exclusively in the district head office, and 88 male field assistants who mostly work in the field. The three female extension workers and two agricultural inspectors worked exclusively from the office, carrying out administrative duties and giving agricultural advice to visiting farmers.

Sixty-nine percent of male participants were over 40, while four of the five women interviewed in the survey were between the ages of 20 and 30. All women and 23 of the

**Table 1.** Professional positions of rural advisory service workers in the survey.

| Job holder | Male | Female | Total | % |
|---|---|---|---|---|
| Agricultural extension officer | 15 | 3 | 18 | 16 |
| Agricultural inspector | 4 | 2 | 6 | 5 |
| Deputy district officer agriculture | 4 | 0 | 4 | 3 |
| Field assistant | 88 | 0 | 88 | 76 |
| Total | 111 | 5 | 116 | 100 |

111 men (all extension officers, inspectors and deputy district officers) had completed a postgraduate study. Four field assistants had completed their undergraduate, and the remaining 84 has passed their agricultural diploma.

## *Extension workers' perceptions of male and female farmers' information access*

### *By information source*

Male extension workers view male and female farmers' access to information significantly differently (Table 2). They believe male farmers accessed all 16 information sources listed, while they thought female farmers accessed three sources only ($z = 22.6$; $p<<<0.05$). Indeed, male extension workers' responses around female farmers' use of information sources were very low: the highest-ranking source used by female farmers was their female neighbours/friends. However, only seven of the 111 extension workers (or six percent) believed female farmers used them. Six male extension workers also thought women used public extension services, and only one extension worker stated women used agrodealers. These results highlight male extension workers' perceptions of the lack of access of female farmers' to sources of agricultural information access.

On the other hand, all 111 male extension workers believed male farmers accessed public extension services, followed by agrodealers (89 percent, or 98 of the 111), private extension services (73 percent), male neighbours/friends (43 percent), and lead male farmers (37 percent). Less than a quarter of the extension workers in the survey believed male farmers accessed the remaining 11 sources. These include other public services (PDAR, PDAI, PDPW and plant clinics), mass media communication tools (radio, television, brochures), informal interactions with women (neighbours and lead farmers), NGO workshops and university extension services. The results underline the importance of the top sources as perceived by male extension workers. It is encouraging to see the public, private and informal sectors highlighted in the top five sources.

### *By location*

The study analyses male extension workers' perceptions of location convenience for male and female farmers to access information (Table 3).

Male extension workers believe the majority of locations are appropriate for male farmers. Indeed, over 95 percent of all answers were positive ('good' or 'very good'). The most convenient location is the field, with the highest proportion of 'very good' ratings. The market place, the district and sub-district offices are useful locations, as are also spiritual places and the village office to a lesser extent. The homestead is the only location cited with a significant proportion of 'OK' ratings (but still manages to receive 73 percent of 'good' and 'very good' ratings). For women in agriculture, the situation is

**Table 2.** Male and female farmers' information source access according to male extension workers.

| | Male extension workers $n = 111$ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Where do male farmers get their information | | | | | Where do female farmers get their information | | | | |
| Sources of information | Never | Rarely | Sometimes | Frequently | Very frequently | Never | Rarely | Sometimes | Frequently | Very frequently |
| PDEAR[1] | 0 | 0 | 1 | 98 | 12 | 105 | 5 | 1 | 0 | 0 |
| PDAI[1] | 105 | 2 | 1 | 3 | 0 | 111 | 0 | 0 | 0 | 0 |
| PDAR[1] | 107 | 3 | 1 | 0 | 0 | 111 | 0 | 0 | 0 | 0 |
| PDPW[1] | 106 | 1 | 4 | 0 | 0 | 111 | 0 | 0 | 0 | 0 |
| Plant clinic[2] | 84 | 0 | 5 | 20 | 2 | 111 | 0 | | 0 | 0 |
| Agro dealer | 13 | 0 | 35 | 62 | 1 | 110 | 0 | 1 | 0 | 0 |
| Private extension service[3] | 31 | 5 | 58 | 17 | 0 | 111 | 0 | 0 | 0 | 0 |
| University extension | 108 | 2 | 1 | 0 | 0 | 111 | 0 | 0 | 0 | 0 |
| NGO workshop | 108 | 2 | 1 | 0 | 0 | 111 | 0 | 0 | 0 | 0 |
| Radio programme | 90 | 4 | 17 | 0 | 0 | 111 | 0 | 0 | 0 | 0 |
| Information brochure | 105 | 2 | 3 | 1 | 0 | 111 | 0 | 0 | 0 | 0 |
| Television programme | 87 | 2 | 21 | 1 | 0 | 111 | 0 | 0 | 0 | 0 |
| Male neighbour/friend | 63 | 2 | 26 | 20 | 0 | 111 | 0 | 0 | 0 | 0 |
| Female neighbour/friend | 110 | 1 | 0 | 0 | 0 | 104 | 0 | 4 | 2 | 1 |
| Lead male farmer | 71 | | 28 | 12 | 0 | 111 | 0 | 0 | 0 | 0 |
| Lead female farmer | 110 | 1 | 0 | 0 | 0 | 111 | 0 | 0 | 0 | 0 |
| Total | 1298 | 27 | 202 | 234 | 15 | 1762 | 5 | 6 | 2 | 1 |
| Total % | 73 | 2 | 11 | 13 | 1 | 98 | 1 | 1 | >>1 | >>1 |

[1] PDEAR (Provincial Department of Extension and Adaptive research); PDAI (Provincial Department for Agricultural Information); PDAR (Provincial Department of Agricultural Research); PDPW (Provincial Department for Pest Warning and Quality Control of Pesticides).

[2] Plant clinics are a network of plant health information advice points run by agricultural officers and field assistants of PDEAR and supported in their implementation by CABI's Plantwise programme ('www.plantwise.org').

[3] Private extension services are a service working for a particular agrochemical company that travels to a household, compared to agrodealers who have a shop and await farmers' custom.

**Table 3.** Male extension workers' perceptions of male and female farmers' access to information by location.

| How convenient is location for accessing information | Male extension workers on male farmers ($n = 111$) | | | | Male extension workers on female farmers ($n = 111$) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Very bad/ Bad | OK | Good | Very good | Very bad/ Bad | OK | Good | Very good | *Z* test |
| District office | 0 | 0 | 92 | 19 | 55 | 40 | 16 | 0 | 22.03** |
| Sub-district office | 0 | 0 | 92 | 19 | 55 | 40 | 16 | 0 | |
| Village office | 0 | 2 | 95 | 14 | 44 | 49 | 18 | 0 | |
| Spiritual place | 0 | 0 | 94 | 17 | 0 | 4 | 106 | 1 | 2.08* |
| Market | 0 | 1 | 77 | 33 | 35 | 43 | 33 | 0 | 10.98** |
| Homestead | 0 | 30 | 71 | 10 | 0 | 69 | 42 | 0 | 5.23** |
| Field | 0 | 0 | 75 | 36 | 0 | 63 | 48 | 0 | |
| Total | 0 | 33 | 596 | 148 | 189 | 308 | 279 | 1 | −25.1** |
| Total % | 0 | 4 | 77 | 19 | 24 | 40 | 36 | <1 | |

* Denotes $p < 0.05$; ** Denotes $p = 0<<<0.05$.

very different according to male extension workers. 'Very bad' and 'bad' ratings constitute a quarter of all answers in the survey, and only 36 percent of answers are rated 'good' or 'very good', a significant difference. Extension workers believe the least convenient locations to access information are the district and sub-district offices, followed by the village office and the market place. The most convenient location by quite a distance is in a spiritual setting. They also view the field in which they work and the homestead relatively positively. There are some significant perception differences according to administrative locations (district, sub-district and village offices), domestic locations (field and home) and commercial locations (market). In a spiritual setting there are slight statistical significances found, although by and large all extension workers believe that spiritual settings are good or very good locations for men to get information, and 96 percent believe spiritual settings are good or very good locations for women to access information.

## Extension workers' perceptions of male farmers' information access

The following analysis investigates the top five male farmer information sources according to extension workers in order to provide a statistically useful sample size (Table 4). The large majority of field and office-based extension workers believe PDEAR services are accessed frequently or very frequently by male farmers. They also have similar perceptions regarding male farmers' access to informal information services, such as lead male farmers or their neighbours. Regarding private services, although both groups believe they utilise

**Table 4.** Top five male information sources according to extension workers' different professions.

| Top 5 Male information sources according to extension workers' perceptions | Field based extension workers ($n = 88$) | | | | Office based extension workers ($n = 23$) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Never | Sometimes | Frequently | Very frequently | Never | Sometimes | Frequently | Very frequently | *Z*-test |
| PDEAR | 0 | 1 | 79 | 8 | 0 | 0 | 19 | 4 | 0.24 |
| Agrodealers | 13 | 25 | 50 | 0 | 0 | 10 | 12 | 1 | 1.42 |
| Private extension services | 29 | 48 | 11 | 0 | 2 | 15 | 6 | 0 | 0.28 |
| Male neighbours/ friends | 53 | 21 | 14 | 0 | 10 | 7 | 6 | 0 | 0.56 |
| Lead male farmers | 60 | 21 | 7 | 0 | 11 | 7 | 5 | 0 | 0.25 |

private extension services similarly, there is a slight difference in their perception of the use of agrodealers: whereas 15 percent of field-based extension workers believe that male farmers never access information from agrodealers, none of the 23 male extension workers who work in the office believe this. Instead, 43 percent of office-based extension workers believe male farmers' access these services 'sometimes', compared to 28 percent of field-based extension workers (the difference is not statistically different however). Overall, there were no statistically significant differences between opinions from extension workers primarily based in the field and extension workers based in the office and the field.

## Comparison with male and female farmers' perceptions of information access

This section compares survey results of extension worker perceptions with past farmer-based studies (Lamontagne-Godwin et al. 2018) regarding information source access.

Overall, male extension workers believe male farmers access information sources significantly more often than they actually do ($z = 4.4$; $P<<0.05$). Male extension worker responses are consistent with farmer responses in believing that PDEAR and agrodealers are most commonly accessed information resources by male farmers. However, male farmers also value other public services significantly more in the case of PDPW ($z = 3.2$; $p<<0.05$) and PDAI ($z = 2.32$; $p = 0.02 < 0.05$) than extension workers do. Inversely, male extension workers value plant clinics significantly more ($z = 3.09$; $p<<0.05$) as a source of information than male farmers do (Table 5). We can therefore identify a clear bias in extension workers' perceptions of their own value for the dissemination of agricultural information.

However, extension workers also understand the importance of informal methods for accessing information for male farmers. Male neighbours and friends are considered the fourth most important source of information, closely aligned to male farmers' views as the third most popular source.

There are similarities and differences regarding male farmers' use of mass media communication. While there is little difference in male extension workers' perceptions of radio and television use by male farmers and farmers' actual use, male farmers value information brochures significantly more ($z = 2.67$; $p<<0.05$) than male extension workers think they do.

Moreover, some vastly differences in perception of information sources are apparent. Over a third of male extension workers believe lead male farmers are an important source of information, compared to 14 percent of male farmers ($z = -4.54$; $p<<0$). Male farmers also value NGO workshops ($z = 5.31$; $p<<<0.05$) and private extension services ($z = 12.31$; $p<<<0.05$) significantly more than male extension workers think they do (Table 5).

When comparing perceptions of female farmer access (Table 6), three clear messages are understood. Firstly, male extension workers believe female farmers access information sources significantly less often than they actually do ($z = 7.38$; $P<<0.05$). Male extension workers have listed three sources (female fiends/neighbours, PDEAR and agrodealers), compared to female farmers listing twelve (although ten of these have a response rate of less than ten percent of female farmers).

**Table 5.** Information source access according to perceptions of male farmers and male extension workers.

| | Male extension workers % ($n = 111$) | | | | | Male farmers % ($n = 200$)[1] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Where do male farmers get information? | Never | Rarely | Sometimes | Frequently | Very frequently | Never | Rarely | Sometimes | Frequently | Very frequently | *Z*-test |
| PDEAR[2] | 0 | 0 | 1 | 88 | 11 | 36 | 8 | 30 | 23 | 3 | 0.75 |
| PDAI[2] | 94 | 2 | 1 | 3 | 0 | 86 | 0 | 12 | 2 | 0 | 2.32** |
| PDAR[2] | 96 | 3 | 1 | 0 | 0 | 89 | 0 | 8 | 3 | 0 | 1.15 |
| PDPW[2] | 95 | 1 | 4 | 0 | 0 | 81 | 1 | 15 | 3 | 0 | 3.2** |
| Plant clinic[3] | 75 | 0 | 5 | 18 | 2 | 89 | 1 | 7 | 3 | 0 | 3.09** |
| Agrodealer | 11 | 0 | 32 | 56 | 1 | 44 | 3 | 34 | 15 | 4 | 1.13 |
| Private extension service[4] | 28 | 5 | 52 | 15 | 0 | 95 | 0 | 5 | 0 | 0 | 12.31** |
| University extension | 97 | 2 | 1 | 0 | 0 | 96 | 0 | 4 | 0 | 0 | 0.23 |
| NGO workshop | 97 | 2 | 1 | 0 | 0 | 73 | 2 | 20 | 5 | 0 | 5.31** |
| Radio programme | 81 | 4 | 15 | 0 | 0 | 77 | 4 | 12 | 7 | 0 | 0.66 |
| Information brochure | 94 | 2 | 3 | 1 | 0 | 88 | 1 | 11 | 0 | 0 | 2.67** |
| Television programme | 78 | 2 | 19 | 1 | 0 | 80 | 4 | 12 | 4 | 0 | 0.43 |
| Male neighbour/friend | 57 | 2 | 23 | 18 | 0 | 53 | 1 | 26 | 20 | 0 | 0.15 |
| Female neighbour/friend | 99 | 1 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.03 |
| Lead male farmer | 64 | 0 | 25 | 11 | 0 | 86 | 0 | 12 | 2 | 0 | −4.54** |
| Lead female farmer | 99 | 1 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.03 |
| TOTAL | 1165 | 27 | 183 | 211 | 14 | 1273 | 25 | 208 | 87 | 7 | 4.4** |
| TOTAL % | 73 | 2 | 11 | 13 | 1 | 79 | 2 | 13 | 5 | 1 | |

[1] Male farmers' responses taken from Lamontagne-Godwin et al. 2018.
[2] PDEAR (Provincial Department of Extension and Adaptive research); PDAI (Provincial Department for Agricultural Information); PDAR (Provincial Department of Agricultural Research); PDPW (Provincial Department for Pest Warning and Quality Control of Pesticides).
[3] Plant clinics are a network of plant health information advice points run by agricultural officers and field assistants of PDEAR and supported in their implementation by CABI's Plantwise programme ('www.plantwise.org').
[4] Private extension services are a service working for a particular agrochemical company that travels to a household, compared to agrodealers who have a shop and await farmers' custom.

**Table 6.** Information source access according to perceptions of female farmers and male extension workers.

| | Male extension workers % ($n = 111$) | | | | | Female farmers % ($n = 201$)[1] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Where do female farmers get information? | Never | Rarely | Sometimes | Frequently | Very frequently | Never | Rarely | Sometimes | Frequently | Very frequently | *Z*-test |
| PDEAR[2] | 94 | 5 | 1 | 0 | 0 | 88 | 3 | 8 | 1 | 0 | 1.41 |
| PDAI[2] | 100 | 0 | 0 | 0 | 0 | 99 | 0 | 1 | 0 | 0 | 0.03 |
| PDAR[2] | 100 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.00 |
| PDPW[2] | 100 | 0 | 0 | 0 | 0 | 99 | 0 | 1 | 0 | 0 | 0.03 |
| Plant clinic[3] | 100 | 0 | 0 | 0 | 0 | 99 | 0 | 1 | 0 | 0 | 0.03 |
| Agro dealer | 99 | 0 | 1 | 0 | 0 | 91 | 2 | 6 | 1 | 0 | |
| Private extension service[4] | 100 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.00 |
| University extension | 100 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.00 |
| NGO workshop | 100 | 0 | 0 | 0 | 0 | 97 | 0 | 3 | 0 | 0 | 0.05 |
| Radio programme | 100 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.00 |
| Information brochure | 100 | 0 | 0 | 0 | 0 | 99 | 0 | 1 | 0 | 0 | 0.00 |
| Television programme | 100 | 0 | 0 | 0 | 0 | 95 | 1 | 4 | 1 | 0 | 0.16 |
| Male neighbour/friend | 100 | 0 | 0 | 0 | 0 | 96 | 0 | 3 | 1 | 0 | 0.12 |
| Female neighbour/friend | 93 | 0 | 4 | 2 | 1 | 67 | 0 | 21 | 11 | 1 | 5.11** |
| Lead male farmer | 100 | 0 | 0 | 0 | 0 | 92 | 1 | 6 | 1 | 0 | 0.24 |
| Lead female farmer | 100 | 0 | 0 | 0 | 0 | 91 | 0 | 7 | 2 | 0 | 0.27 |
| Total | 1586 | 5 | 6 | 2 | 1 | 1513 | 7 | 62 | 18 | 1 | 7.38** |
| Total % | 99 | <1 | <1 | <1 | <1 | 95 | <1 | 4 | 1 | <1 | |

[1] Female farmers' responses taken from Lamontagne-Godwin et al. 2018.
[2] PDEAR (Provincial Department of Extension and Adaptive research); PDAI (Provincial Department for Agricultural Information); PDAR (Provincial Department of Agricultural Research); PDPW (Provincial Department for Pest Warning and Quality Control of Pesticides).
[3] Plant clinics are a network of plant health information advice points run by agricultural officers and field assistants of PDEAR and supported in their implementation by CABI's Plantwise programme ('www.plantwise.org').
[4] Private extension services are a service working for a particular agrochemical company that travels to a household, compared to agrodealers who have a shop and await farmers' custom.

Secondly, the three sources listed by male extension workers correspond to the three most utilised sources listed by female farmers: male extension workers still recognise the importance of certain sources for female farmers, such as PDEAR and agrodealers. However, analysis of the most utilised source (female neighbours/friends) as listed by both groups shows a significant difference in perceptions ($z = 5.11$; $p<<<0.05$ – Table 6): whereas seven percent of male extension workers believe female farmers use female neighbours/friends, a third of female farmers state they use this resource 'sometimes', 'frequently' and 'very frequently'. Finally, whilst lead female farmers are perceived to be a non-existent resource for female farmers according to male extension workers' perceptions, female farmers actually list lead female farmers at joint third most important source of information. This is an important final message that could point towards new knowledge pathway development.

The study now analyses male extension workers' perception of location convenience and compares it with male farmers' views (Table 7). Overall, male extension workers believed listed locations were more convenient to farmers than male farmers thought themselves. Indeed, an average of 96 percent of extension workers believed the seven locations listed were 'good' or 'very good', compared to 68 percent of male farmers, a significant difference. Individually as well, extension workers believe administrative, spiritual, market and domestic locations are much more convenient than male farmers perceived. According to extension workers, the most convenient location for male farmers to access information is in the field, closely followed by the marketplace. Male farmers stated the market was the most convenient place, followed by the sub-district office. These differences are important to note, as they could have a huge bearing on the efficiency and methods of knowledge transfer between public RAS and the farming community.

Overall, the majority of male extension workers believe women do not feel at ease accessing information from the listed locations (Table 7). Sixty-four percent of extension workers' responses stated the locations are 'very bad/bad' or 'OK', compared to 52 percent of female farmers' responses (a significant difference). In specific cases, extension workers are more accurate: for example, they accurately perceive female farmers do not find administrative locations convenient. Indeed, less than 16percent of total responses by female farmers state they feel administrative locations (particularly district and sub-

**Table 7.** Male extension workers' and male farmers' perceptions to access to information by location.

| | Extension workers on male farmers ($n = 111$) | | | | Male farmers ($n = 200$) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| How convenient is location for getting information | Very bad/ Bad | OK | Good | Very good | Very bad/ Bad | OK | Good | Very good | *Z*-test |
| District office | 0 | 0 | 92 | 19 | 0 | 62 | 80 | 58 | 5.82** |
| Sub-district office | 0 | 0 | 92 | 19 | 0 | 46 | 98 | 56 | |
| Village office | 0 | 2 | 95 | 14 | 18 | 44 | 112 | 26 | |
| Spiritual place | 0 | 0 | 94 | 17 | 26 | 52 | 122 | 0 | 7.6** |
| Market | 0 | 1 | 77 | 33 | 2 | 30 | 144 | 24 | 4.12** |
| Homestead | 0 | 30 | 71 | 10 | 22 | 82 | 92 | 4 | 5.39** |
| Field | 0 | 0 | 75 | 36 | 0 | 70 | 106 | 24 | |
| Total | 0 | 33 | 596 | 148 | 68 | 386 | 754 | 192 | 15.12** |
| Total % | 0 | 4 | 77 | 19 | 5 | 27 | 54 | 14 | |

** Denotes $p = 0 <<< 0.05$.

**Table 8.** Male extension workers' and female farmers' perceptions to access to information by location.

| How convenient is location for getting information | Extension workers on female farmers ($n = 111$) | | | | Female farmers ($n = 201$) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Very bad/ Bad | OK | Good | Very good | Very bad/ Bad | OK | Good | Very good | *Z* test |
| District office | 55 | 40 | 16 | 0 | 87 | 82 | 30 | 2 | 0.25 |
| Sub-district office | 55 | 40 | 16 | 0 | 76 | 89 | 34 | 2 | |
| Village office | 44 | 49 | 18 | 0 | 34 | 137 | 28 | 2 | |
| Spiritual place | 0 | 4 | 106 | 1 | 0 | 4 | 161 | 36 | 0.83 |
| Market | 35 | 43 | 33 | 0 | 2 | 78 | 109 | 12 | −5.15** |
| Homestead | 0 | 69 | 42 | 0 | 0 | 92 | 105 | 4 | −3.85** |
| Field | 0 | 63 | 48 | 0 | 2 | 54 | 121 | 24 | |
| Total | 189 | 308 | 279 | 1 | 201 | 536 | 588 | 82 | 5.23** |
| Total % | 24 | 40 | 36 | <<1 | 14 | 38 | 42 | 6 | |

*Denotes $p = 0 < 0.05$; **Denotes $p = 0 << 0.05$.

district offices) are a convenient location. Male extension workers also accurately perceive the importance and value placed upon spiritual locations by female farmers. Indeed, over 96 percent of male extension workers state spiritual locations are good or very good locations for female farmers to access information. Their perceptions mirror proportions of female farmers (98 percent) who state that spiritual locations are either 'good' or 'very good' locations to access information. Spiritual locations could be a good solution for agricultural information access for women (Table 8).

Finally, female farmers feel that the market and domestic locations are more convenient compared to male extension workers' perceptions. Indeed, 60 and 61 percent of women feel the market and domestic locations (the homestead and their field) are 'good' or 'very good' locations to access information, compared to 30 and 40 percent of male extension workers. There is a distinct lack of understanding from public services of women's perceptions of information access in locations traditionally renowned to give men information. These results clearly point to possible solutions, discussed in the following section.

## Discussion

The discussion focuses on three specific aspects. Firstly, it attempts to understand extension workers' overall perceptions of gendered information access. Secondly, it analyses the role of individual perceptions between extension workers and farmers' perceptions to triangulate and develop specific and targeted gender-responsive initiatives that have the potential to contribute to transformative change, leading to an evolution of institutional gender policies in Pakistan. Finally, the discussion seeks to frame the findings according to the current gender inequality situation in Pakistan. This section goes on to list study limitations.

### *Extension workers' knowledge of gendered situations in RAS*

Past research suggests that extension workers' view on gender-specific issues is limited: no extension workers interviewed in either Farooq et al.'s (2010) or Hussain, Khan, and Asif's (2010) studies cited access to women farmers or the lack of female extension agents as a major issue for extension departments to deal with. Indeed, compared to issues such as

reduced professional development, increased workloads and fiscal constraints at the administrative and operational level that seriously affect staff morale and productivity (Rivera and Alex 2004; Rivera 2011; Okereke and Onu 2007; Davidson and Ahmad 2002; Saeed et al. 2006), a concern for women's access to extension services does not become a priority for a predominantly male extension workforce (Rivera 2011; Umali and Schwartz 1994; Pray and Umali-Deininger 1998; Pardey et al. 2006; Gowda and Saravanan 2001).

In this study, extension workers are aware of certain situations confronted by both male and female farmers. They are aware of men's access to greater variety of information sources, and more often, than female farmers do, corroborating previous Pakistan (Lamontagne-Godwin et al. 2018; Hassan, Ali, and Ahmad 2007) and worldwide studies (Lamontagne-Godwin et al. 2017; Ragasa et al. 2013). They also accurately perceive that female farmers access information significantly less often and understand where women access their information, mentioning the same top three information sources as female farmers (female neighbours, PDEAR and agrodealers). They are also aware that men use formal services more than women do, and discern women smallholders' preference for spiritual rather than administrative locations for accessing information. However, certain gendered information access issues are ignored: for example, male extension workers believe male farmers access information sources significantly more often than they actually do and female farmers access information sources significantly less often than they actually do; and of women's perceptions of information access in locations traditionally renowned to give men information.

Further qualitative studies focusing exclusively on the differences between farmer and extension worker perceptions would be of great benefit in order to gain a significantly better understanding of the socio-cultural norms influencing their perceptions. This could also enable a targeted gender-responsive extension worker training programme, aimed to improve knowledge and awareness for the individual. As this study discusses later, this could have positive implications for the institutionalisation of gender.

### *Operationalising gender-responsive approaches in RAS: the importance of individual perceptions*

Whilst the gender-responsive improvement of national RAS systems is a lofty aim, would it perhaps be more appropriate to consider RAS as a service that can help support the attainment of a more gender equal society instead? The development, promotion and scale up of gender responsive approaches might be a more effective and pragmatic manner to achieve practical change, rather than attempting to drive an entire systems evolution through ambiguous gender topic driven discussions (Farnworth and Colverson 2015). A practical approach could therefore result in transformative change for women's agricultural information access, clearly and measurably improving gender equality in agriculture. This study manages to identify an interesting example. A large proportion of male extension workers ignore the importance of lead female farmers, even though women smallholders perceive it to be the joint third most important resource they use to access information. Moreover, extension workers vastly overestimate the importance of lead male farmers in transmitting information to male farmers. These two findings suggest

lead farmers could be an interesting gender-specific knowledge transfer pathway to explore. Positive perceptions of lead farmers by extension workers in Pakistan could be due to the long-standing Training and Visit approach disseminated in the late twentieth Century (Ashraf et al. 2009). Even though the Training and Visit system suffered from inherent and ultimately fatal administrative, implementation and quality control issues (Dejene 1989), extension workers in the field actually gained time with contact farmers and research stakeholders, and reduced their non-extension duties (Hussain, Byerlee, and Heisey 1994).

Lead female farmers could therefore offer a potentially innovative knowledge pathway, blending formal extension worker knowledge with farmer to farmer interactions, and incentivising informal arrangements favoured by female smallholders in this study. A network of trained and knowledge-rich female lead 'contact' farmers could be developed and trialled to understand its potential role in improving the dissemination of agricultural information to women in farm households. By initiating change with women in the household, this could lead to changing beliefs in the household, and instigating transformative change in the process. In this instance, the involvement of national and local RAS institutions to develop, implement and raise awareness of this novel approach would be vital.

### *Gender responsive schemes and the institutionalisation of gender in the national context*

Although three legal documents (Muslim Personal Law of Shariat, 1948; Charter of Women's Rights, 1954; Constitution, 1956) give women representation in legislative assemblies, the right to own property and vote in Pakistan, the gender debate and the gender situation in Pakistan is woefully inadequate, and examples of gender-specific approaches' socio-economic effectiveness are sorely needed (Chauhan 2014). Indeed, institutional activities designed to change the situation, such as Gender Reform Action Plan's in 2005, or the Punjab Women Empowerment Package launched in 2014, have been unsuccessful to date, largely because they have never been backed up by comprehensive policies, or those that do pass the vote are generally ignored (Chauhan 2014) or would only target privileged and educated women, forgetting the poorer women in society (The Express Tribune 2014). Information access and representation of women in the public sector remains extremely low, or only concentrated in culturally acceptable domains, such as human health and education.

The development of gender-responsive approaches and targeted gender trainings could challenge the individual and institutional status quo of gender-specific socio-cultural norms in Pakistan by providing opportunities to gather evidence of successful implementation and its implications on improved knowledge, yields and incomes in rural areas. As discussed by Rao and Kelleher (2005), this evidence could improve gender neutral views, promote transformative policies (or at least not block them), and dictate legal change in the long term. In turn, this would allow informal norms at the individual and systemic level to evolve, as targeted gender-responsive policies with specific resources for gender-specific activities enable these policies to come into practice in a positive feedback mechanism.

A data-focused dialogue with a comprehensive set of stakeholders at all levels of the agricultural innovation system would be an important step forward to understand and

analyse the impact of gender responsive approached on transformative change in gender equality in RAS.

### *Limitations and further research*

These results are important to consider when planning gender transformative activities in the short-term. Informal perceptions gathered from end-users and extension workers are crucial to help devise specific and tailored systems that not only promote formal gender-specific activities, but also an evolution of gender in informal systems. However, there is a need for a more qualitative perspective in the future, utilising theories such as reasoned action theories or other contemporary social definition methods. While the study suggests trialling an adapted system that incorporates individual perceptions and could potentially drive the development of gender-based approaches, women stakeholders, including extension workers, would still need to be consulted and their perceptions analysed in a qualitative and quantitative fashion. It was in the original objectives of this study to conduct similar perception-based research with female extension professionals in extension. However, the small cadre of female extension professionals in Pakistan meant it was not possible to obtain a clear picture of their views. Whilst this study solely focused on information access, future studies should analyse other factors according to gender, such as the quality of the advice provided, and their trust in sources. A more detailed household background, focusing on crops grown, economic situation and social status, should also be utilised to contextualise the situation of the men and women smallholder farmers interviewed.

## Conclusions

This article investigates multiple stakeholders' individual perceptions in order to highlight potential gender inclusive initiatives, with an aim to institutionalise gender in the long-term in RAS in Pakistan. This study draws attention to male extension workers' lack of awareness of specific gender-based realities of agricultural information access, and discusses the importance of implementing targeted initiatives focusing on improving awareness. The article also considers the potential gender-specific success of developing and trialling a specific extension system is development, centred on lead female farmers and extension agents. This is of course dependant on further qualitative and quantitative studies involving female stakeholders, particularly female extension workers.

The findings contribute to understanding of individual and institutional processes of gendered agricultural information access, taking a country's socio-cultural context into consideration, with implications for the development of national and international rural advisory service initiatives: indeed, by focusing on key findings that arise from perception analyses, future RAS initiatives can suggest concrete approaches to integrate gender-specific requirements, improving gender awareness in public sector activities, and leading to overall women's empowerment.

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