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Gender differences in use and preferences of agricultural information sources in Pakistan

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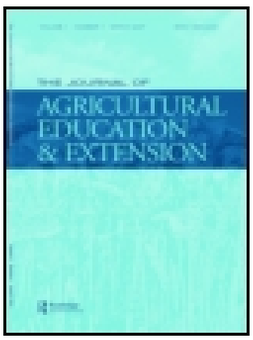

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Gender differences in use and preferences of agricultural information sources in Pakistan

J. Lamontagne-Godwin [a], F. E. Williams [b], N. Aslam[c], S. Cardey[d], P. Dorward[d] and M. Almas[c]

[a]School of Agricultural Policy and Development, University of Reading, CABI Egham, UK; [b]CABI Africa, Nairobi, Kenya; [c]CABI CWA, Rawalpindi, Pakistan; [d]School of Agricultural Policy and Development, University of Reading, Reading, UK

ABSTRACT

Purpose: Rural advisory services ensure agricultural information is disseminated to rural populations, yet they are less accessible to women. This research provides insight on gender differences in information access by investigating frequency of use and preference of agricultural information sources by gender in a rural setting, differentiated according to literacy and age.
Design/Methodology/approach: This study interviewed 401 male/female individuals in farm households in Jhang and Bahawalpur district of Punjab, Pakistan in 2016.
Findings: Men and women farmers' use and preferences in accessing information sources are extremely different. Women hardly use sources for agricultural information, and value interpersonal communication from informal sources. In contrast, men use and value official agencies more. Radio, surprisingly, was very rarely used, contradicting previous findings of research elsewhere. Age and literacy affect differences between women more than it does between men, particularly for convenient locations to access information. Practical implications The study identified and refined major gender differences regarding use and preference for agricultural information in relation to age and literacy, and helps to articulate options to improve gender equality of access to agricultural information in Pakistan.
Theoretical implications: The focus and outcomes regarding gender intersecting with age and literacy in agricultural information access imply the need for more refined socio-economic models, discerning and interrelating gender and other social dimensions beyond the standard of male-headed households.
Originality/value: This paper adds to the growing body of evidence on information access according to gender, highlighting the need to investigate deeper socio-cultural issues around age and literacy.

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KEYWORDS
Age; literacy; socio-cultural norms; agricultural information access; gender; rural advisory services; Pakistan

Introduction

Across broad geographic and cultural contexts, women working in agriculture in rural settings tend to have less access to, and make less use of, land, quality seed, fertilisers,

CONTACT J. Lamontagne-Godwin j.godwin@cabi.org

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pesticides, credit, insurance, education and rural advisory services (Cohen and Lemma 2011; Manfre et al. 2013; Meinzen-Dick et al. 2011; Ragasa et al. 2013), despite their significant and culturally specialised input in agricultural activities (Doss 2002; FAO 2011; World Bank, FAO and IFAD 2008) and their potential to improve agricultural productivity (Doss 2011; FAO 2011; Pardey et al. 2006). The warnings about the lack of equal opportunity for women are constantly heard in international settings (Commission for Africa 2005; Moon 2014), yet significant progress will only be achieved at a local scale when underlying effects causing an inequality between men and women in access to agricultural knowledge are understood (Olajide 2011; Tandi Lwoga, Stilwell, and Ngulube 2011; Yaseen et al. 2016).

There are many aspects to consider when focusing on the inequality of access to agricultural knowledge. A number of studies (Lawal, Alabi, and Oladele 2017; Mtega, Ngoepe, and Dube 2016; Rehman et al. 2013) suggest that age has a significant influence on access to agricultural information. They found that adult male farmers (over 35 years of age, as defined by UNESCO (2017)) access more information than younger male farmers (under 35) do. There is also a common perception that low literacy rates also reduce access to information (Odini 2014; Rehman et al. 2013). However, socio-cultural norms, such as age and literacy have rarely been related to information access from a gender perspective. Therefore, in this study, we shall attempt to answer the following research question: how do are male and female farmers differ and resemble in their frequency of use and preference of various sources for gaining agricultural information, and how is this differentiated by age and literacy. This study investigates this in effect of age and literacy on perceptions of information access according to gender in a rural settings in two districts (Jhang and Bahawalpur) of the Punjab province in Pakistan. Due to a lack of sufficient data on households run by women, it will solely focus on male headed households.

In patriarchal countries, gender inequalities in agricultural information access are readily reinforced in their socio-cultural contexts (FAO 2015). Pakistani women farmers have limited access to adequate resources, including agricultural knowledge. Increasing access to information for women in rural settings is very challenging: according to previous research, women farmers face not only a shortage of information sources to consult (Hassan, Ali, and Ahmad 2007; Sadaf, Asif, and Muhammad 2006), but the sources they do consult are generally perceived as poor in quality (Sadaf, Asif, and Muhammad 2006). For example, over 80% of women interviewed stated they never accessed 8 of the 9 sources of information investigated in Hassan, Ali, and Ahmad (2007) dual-gender study. Indeed, both studies (Hassan, Ali, and Ahmad 2007; Sadaf, Asif, and Muhammad 2006) found the main information source for women to be through face-to-face contact in the community (either with the male head of household, female relatives or female neighbours), suggesting that women primarily have mediated, rather than direct, contact with expert sources.

Access to information requires further elaboration. A farmer first needs the important capacity to identify and understand what can be of good use. Clearly, a farmer therefore needs to be able to obtain the information in a useable (e.g. print media or through hearing it e.g. radio) and understandable format (e.g. in local language, pictorially for farmers who have lower levels of education). The farmer also needs to be able to obtain the information from an easily accessible location (e.g. village hall, place of worship, radio). Not only is this situation complicated by different genders' access, explained above, but also the evolution

of knowledge transfer in the twenty-first century. Age and literacy will be at stake. The introduction of extra information communication technologies (ICT) in the dissemination of information for example, is creating a new dynamic that is worthwhile exploring. Adult farmers (over 35) access radio more than younger (under 35) farmers (Mburu 2013) but younger farmers preferred to access television, mobile phones and computers. Despite increased mobile phone ownership, only farmers under 40 years used mobile phones to access agricultural information (Mburu 2013). Moreover, information disseminated through text print media will not be accessible to those who are unable to read. This will also apply to information in text formats provided through mobile phones or computers. For those farmers who are not able to read, information is only accessible in visual formats, such as graphics in print media, or through audio formats such as radio or TV. However access to radio, TV and even print media is influenced by the sources of information that are available in the home. Men tended to access information from TV, internet, print media and extension agents during their leisure hours when they are outside the home (Mtega 2012). However women have no such free time, as it is taken up by household activities. Therefore their access to such information sources is very limited.

Rural advisory services – defined as services seeking to deliver a wide range of processes and activities through institutional arrangements that respond in a sustained and inclusive manner to the communication needs of rural populations (adapted from GFRAS 2011; Leeuwis and van den Ban 2004; Peterman et al. 2011) – are extremely important for the communication of information (Leeuwis and van den Ban 2004). In Pakistan, they are a dynamic sector based on an interaction between public, private and civil society bodies (Riaz 2010). This study enables rural advisory services to understand how to make a more effective and inclusive impact on farmers of both genders involved in agriculture. Indeed, by understanding end-user perceptions of access, this article also hopes to be an important addition in the development of gender responsive services in a major agricultural production country. This study is sorely needed, seeing as no (Sadaf, Asif, and Muhammad 2006) or 11% (Hassan, Ali, and Ahmad 2007) of women had actually accessed public rural advisory services in previous studies. Women face decision-making constraints due to cultural, traditional and sociological factors, and their work in the agricultural sector is largely ignored by federal and provincial development efforts even though they make up three quarters of its workforce (Davidson, Ahmad, and Ali 2001; FAO 2015; Hassan, Ali, and Ahmad 2007; Jamali 2009; Sadaf, Asif, and Muhammad 2006). One of the ways to contribute to challenging many of these socio-political challenges is through an improved access to knowledge (FAO 2015).

The article will first briefly introduce the study's methodology before analysing and listing the results according to gender, age and literacy. Secondly, the authors will discuss the results found in the Pakistan study. Finally, conclusions and possible follow up studies will be mentioned.

Methods

The population studied in this study were male and female smallholder (defined here as cultivating land less than one hectare) farmers in Bahawalpur district's 24-BC union council, and Jhang district's Kotla Zareef Khan union council in the Punjab province of

Pakistan. Overall, 201 farmers in 24-BC (101 women and 100 men), and 200 in Kotla Muhammad Zareef Khan (100 men and 100 women) were interviewed.

The research used a random sampling questionnaire strategy: interviewers used household district agriculture office lists available in each union council to sample households. The sampling aimed for a 50:50 male and female ratio. For female interviews, the first household on the rural population list was picked, and every third household thereafter (1, 4, 7, 10 …). For male interviews, the second household on the rural population list was picked, and every third household thereafter (2, 5, 8, 11, 14 …). Depending on the numbered household, the interviewer would ask to speak to a woman, or a man. If farmers of either gender did not want to be interviewed in selected households, the interviewer moved on to the following household on the list. A female interviewer was used to interview female participants, and a male interviewer was used to interview male participants to minimise bias and possible participant discomfort. No two farmers of different genders from the same household could be interviewed for the survey. Respondents were not interviewed if they did not participate in the household's agricultural activities. Interviewers were left to make this decision at their discretion. Various aspects of rural life were investigated: participants were asked about household dynamics and decision making, the information needed for the different crops they grew, and their perceptions of access, trust and quality of various information sources. Data were collected through the use of paper based questionnaires, and took between half an hour and forty five minutes to complete. The activity took place in the participant's home, or in a public place if preferred. Data were collated onto Microsoft excel, and then into SPSS ^{tm} statistical package for cleaning and descriptive tests. Data were then analysed according to male and female headed households, age and literacy. Due to the categorical nature of the dependent and independent variables, cross tabulated descriptive statistics and binomial Z tests were used. In this case the article's null hypothesis states there are no significant differences in access to information between men and women of a certain age and literacy level correlated with a 5% margin of error. When sample sizes were too low for Z tests, descriptive statistics were still conducted for qualitative perspectives. In order to keep statistical analyses powerful and conclusions relevant, the study focused the majority of its age and literacy correlations on the top three/four information sources. The categories 'very bad' and 'bad', and 'very good' and 'good' were grouped for statistical reasons when discussing information access and convenience of locations. Age sub-categories were grouped according to participants under 30 and over 30, to be as similar to UNESCO's 2017 definition of youth.

Results

Study population

From the 401 interviewees (200 men and 200 women) of both genders in smallholder households in 2 districts, 72% of women and 69% of men were over 30 years old. Women between the age of 30 and 40 (29%), and men between 20 and 30 (25%) were best represented in their respective gender groups. The smallest age group was under 20 years old both for men and women. Three quarters of women, but only 38% of men, were illiterate, a significant difference ($z = 7.39$; $p << 0.05$). 384 participants (200

men and 184 women (92%)) identified themselves as living in a male headed household. 16 women (eight per cent) were in female-headed households.

Information access according to gender

Overall, participants' access to information was low: 883 of 6817 answers over 401 interviews on 17 different sources, (or 13%) gave a positive account of information access. Of these, less than a third of answers (29%) were listed as 'frequently' or 'mostly' accessed. For male participants, 699 of 3400 answers (or 20%) were positive. Of these, 27% were classed as 'frequently' or 'mostly' accessed. Six of the 17 sources were accessed by more than 20% of participants. For women, the figures are even lower: 184 of 3417 (or five per cent) were positive. Of these, 21% were listed as 'frequently' or 'mostly' accessed. Only one of the 17 sources was accessed by more than 20% of women (female friends/neighbours).

Frequency of use of information sources by men/women of male headed households

Frequency of use and preference for information sources for men

Table 1 Seventy nine per cent of men interviewed had 'never' accessed information through the sources listed. 128 men (or 64%) had used the Provincial Department of Extension and Adaptive research (PDEAR) as an information source (82 participants using it 'frequently' or 'mostly'). This is the most popular source of information, followed by agrodealers (55%), male neighbours/friends (53%), NGO workshops (27%) and radio programmes (23%). 20% of men had used television, radio programmes and village leaders, whilst less than one in five men had used PDAI, PDAR, PDPW, plant clinics,

Table 1. Perceptions of information access for men in male headed households.

	Male $n = 200$				
Where do you get your information	Never	Rarely	Sometimes	Frequently	Mostly
PDEAR[a]	72	16	60	47	5
PDAI[a]	173	0	24	3	0
PDAR[a]	178	0	16	6	0
PDPW[a]	162	1	30	7	0
Plant clinic[b]	179	1	14	6	0
Agrodealers	89	6	68	29	8
Private extension service	190	0	9	1	0
University extension	192	0	8	0	0
NGO workshop	146	3	40	11	0
Radio programme	155	7	24	14	0
Information brochure	176	1	23	0	0
Television programme	156	9	26	9	0
Male neighbour/friend	107	1	53	39	0
Female neighbour/friend	200	0	0	0	0
Village leader	154	1	29	16	0
Lead male farmer	172	0	23	5	0
Lead female farmer	200	0	0	0	0

[a]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);

[b]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)

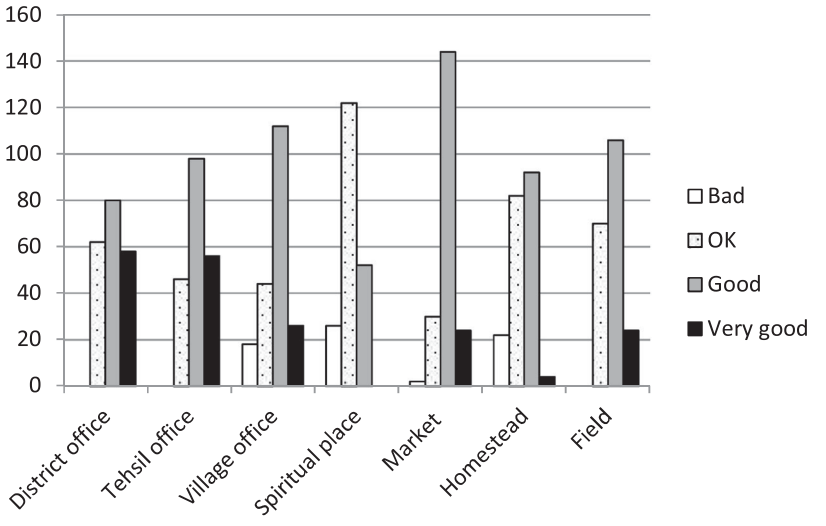

Figure 1. Male participants' perceptions of location convenience in male headed households.

university extension, village leaders or male lead farmers. Female neighbours and lead farmers were never consulted.

Over two thirds of male participants view official public sector locations (district, sub-district (the tehsil), or village offices) to be good or very good locations. The market and the field are also attractive locations for male farmers to source information. Indeed, significantly more male participants classified the district ($z = 8.6$; $p << 0.05$), tehsil ($z = 10.8$; $p << 0.05$), and village offices ($z = 7.6$; $p << 0.05$), markets ($z = 13.6$; $p << 0.05$) and fields ($z = 6$; $p << 0.05$) as 'good' or 'very good' location to access information compared to 'bad' or 'OK'.

Significantly more men stated spiritual places were 'bad' or 'OK' compared to 'good' or 'very good' to access information ($z = 9.6$; $p << 0.05$). However, the homestead is a location that splits opinion in the survey. 52% of men stated it was 'bad' or 'OK', and 48% marked it as a 'good' or 'very good' location (Figure 1).

Frequency of use and preference for information sources for women

There is an extremely significant difference in agricultural information access between men and women in a male headed household ($z = 16.2$; $p << 0.05$). Indeed, 167 answers out of 3162 (five percent) stated they had accessed information, of which only a quarter were listed as 'frequently' or 'mostly' accessed. The most popular sources of information were female neighbours/friends (30%), PDEAR (ten per cent) and lead female farmers (eight per cent). The remaining 14 sources were accessed by less than six per cent of all women in male-headed households. Four sources – PDAR, private extension services, university extension and radio programmes – were never consulted (Table 2).

Spiritual places are by far the most favoured location for women to access information. Over 98% of women view this location to be 'good' or 'very good', a very significant proportion ($z = 19.1$; $p << 0.05$). The field (72%; $z = 9.2$; $p << 0.05$), the market (61%; $z = 4.14$; $p << 0.05$) were attractive to a significant proportion of female participants. Much like for men, the homestead is a location that splits women's opinion in the survey. 54% of men

Table 2. Perceptions of information access for women in male headed households.

	Female $n = 186$				
Where do you get your information	Never	Rarely	Sometimes	Frequently	Mostly
PDEAR	166	6	13	1	0
PDAI	185	0	1	0	0
PDAR	186	0	0	0	0
PDPW	186	0	0	0	0
Plant clinic	185	0	1	0	0
Agrodealers	174	3	8	1	0
Private extension service	186	0	0	0	0
University extension	186	0	0	0	0
NGO workshop	180	0	6	0	0
Radio programme	186	0	0	0	0
Information brochure	184	0	2	0	0
Television programme	177	1	7	1	0
Male neighbour/friend	178	0	7	1	0
Female neighbour/friend	125	0	37	33	2
Village leader	178	0	8	0	0
Lead male farmer	173	1	11	1	0
Lead female farmer	171	0	14	1	0

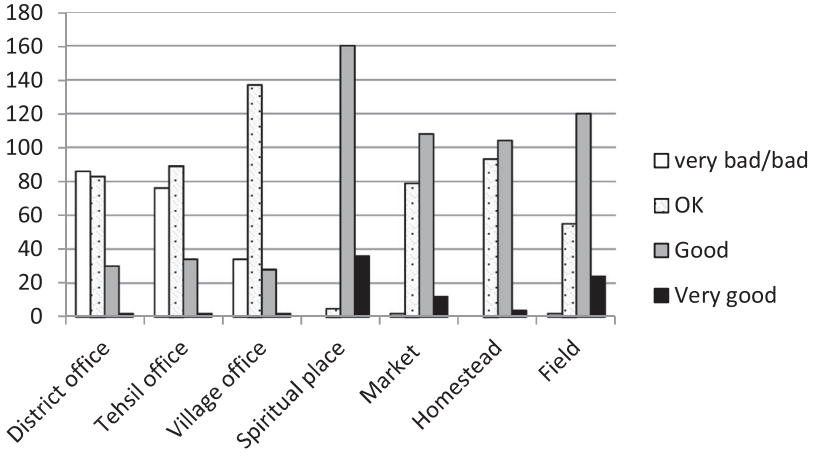

Figure 2. Female participants' perceptions of location convenience in male headed households.

stated it was 'good' or 'very good' location, whereas the remaining 46% stating it was 'bad' or 'OK'. Of the women, 43% and 38% state the district and tehsil offices are a 'very bad' or 'bad place' to receive information. The village office was rated 'OK' by 68% of women to access information (Figure 2).

Male information access according to age

Being over or under 30 does not affect men's perceptions of information access overall. There are no specific relationships between age and access to PDEAR, agrodealers and male neighbours in this survey. Age also does not affect perceptions of information access at official locations like district and tehsil offices, and spiritual locations. However, men over the age of thirty are more likely to feel comfortable accessing information at village offices ($z = -2.78$; $p << 0.05$), in the market place ($z = 2.6$; $p << 0.05$) and in the field ($z = 2.55$; $p = 0.01 < 0.05$).

Female information access according to age

Women over the age of 30 feel they access more information ($z = 5.6$; $p << 0.05$) compared to women under 30 in a male headed household. No women under the age of 20 access information at all. Age affected perceptions of information access from PDEAR and female neighbours and friends: women over 30 years of age were statistically more likely to utilise a female neighbour or friend ($z = 2.44$; $p = 001 < 0.05$) and PDEAR ($z = 3.06$; $p = 0.002 << 0.05$) than women under the age of 30. Age was not a factor in accessing information from female lead farmers however.

Age does not affect assessments of information access at spiritual places and district offices. Older female participants (over 30 years of age) are more likely to find the market place ($z = 2$; $p = 0.04 < 0.05$), the homestead ($z = 2.91$; $p << 0.05$), the field ($z = 3.2$; $p << 0.05$), the tehsil office ($z = 2.09$; $p << 0.05$) and the village office ($z = 4.01$; $p << 0.05$) convenient compared to younger female participants (under the age of 30). Age did not affect district offices.

Male information access according to literacy

Overall, literacy does not affect male participant's access to all information sources in male headed households, and specifically in their access to PDEAR, agrodealers and male neighbours in this survey. The study also suggests literacy does not alter perceptions of access to information in district and tehsil offices, the market place, spiritual places and the homestead. However, illiterate men consider village office less convenient than literate men ($z = 2.16$; $p = 0.03 < 0.05$).

Female information access according to literacy

Literate women feel they have greater access to official services like PDEAR ($z = 3.1$; $p = 0.002 << 0.05$) and agrodealers ($z = 1.9$; $p = 0.0.4 > 0.05$) compared to illiterate women. However, literacy does not affect women's perceptions of information access from female neighbours/friends ($z = 0.98$; $p = 0.3 > 0.05$) or female lead farmers ($z = 1.1$; $p = 0.2 > 0.05$).

Literacy does not affect views of information access in official locations such as district and village offices, spiritual locations, the market place, the homestead and the field, apart from a slightly significant difference in the tehsil ($z = 1.98$; $p = 0.047 < 0.05$), which illiterate women are more negative about.

Discussion

The discussion firstly identifies the limitations of the research based on the study group. The section then proceeds to discuss aspects of information access, focusing on gender, age and literacy. Finally, the article seeks to suggest focused messages for Pakistan's rural advisory services as well as guidelines for rural advisory services' future research.

Study limitations

The study acknowledges age and literacy differences between study populations and national averages that could influence findings and conclusions. The national age average in Pakistan is 23.3 for men, and 23.4 for women in Pakistan (Index Mundi

2016), whilst the study's median and average age is between 30 and 40 for both genders. Moreover, three quarters of farm women and 38% of farm men in this study are unable to read and write compared to 44% of women and 31% of men in Pakistan (World Bank 2014). However, household head proportions are closer to reality (eight per cent of women in the study compared to the national average of 11%; World Bank 2016), which helps to justify many assumptions in the study. Unfortunately, whilst this study's results and discussion would have been improved by quantitative comparison of male and female headed households, the sample size for female headed households (15) was too low to offer significant statistical results. Therefore, the discussion will be focused on male-headed households, and offer loose qualitative comparisons with female-headed household results later on in the discussion.

Information access according to gender, age and literacy

Overall, results show a low level of information access, and significant differences between male and female access, consistent with past findings (Hassan, Ali, and Ahmad 2007; Sadaf, Asif, and Muhammad 2006). Indeed, women access much less variety and frequency of information than their male counterparts. Whilst men value the use of official (public or commercial) services, women clearly feel more at ease with informal means of communication. These perceptions can be linked to convenience of locations. For example, men feel official locations (the district, tehsil and village offices) and the field are the most suitable locations, which relates well to PDEAR being the most popular service to access information, seeing as those locations are where extension agents traditionally discuss agricultural matters with farmers. Agrodealers, also interacting with farmers in the marketplace (near the town centre) and in the field – locations perceived as convenient for male farmers – were also popular. Male participants also accessed a considerable portion of their information through informal discussions with male neighbours and friends. This could also explain their preference for the marketplace and the field where the majority of male interactions are said to occur, and their disinterest in the homestead (confirming past research (Mtega 2012)). Although age and literacy were not a defining factor for male participants' use of information sources, it did affect their perceptions of location convenience. Men over the age of 30 feel more comfortable accessing information in the market, the field and the village office. Perhaps these are the more traditional locations to receive information, although more research would be needed to further investigate the underlying nature of these perceptions.

Women use informal services, like their female neighbours/friends or lead farmers (of both gender) proportionally more often than formal public and private services. This could explain their preference for accessing information in informal places, conducive to informal discussions with neighbours, such as spiritual locations, the field or the marketplace. It could also explain their discomfort in more official locations like the district, tehsil or village offices. Age is an important factor to consider not only for use of the information, but also their access: women over 30 were significantly more comfortable accessing information from the two most popular sources, female neighbours/friends and PDEAR. This is perhaps due to their social standing and increased freedom in the household (Acharya et al. 2010). The fact that older women feel more comfortable accessing information in variety of locations suggests this may be the case. None of the 55

women under 30 utilised PDEAR as a source, and no women under 20 had any contact with any information sources. Considering all men under 20 accessed information from PDEAR either 'sometimes' or 'frequently' in this study confirming past research (Rehman et al. 2013), this study shows that age remains a barrier for women, again confirming previous results (Okwu and Umoru 2009).

Literacy does not affect women's perception of use and access to informal services, such as face–to-face interactions with female neighbours and friends, or lead farmers. Illiterate women feel as confident interacting orally with neighbours and other female farmers as literate women. However, illiterate women do not feel as confident using formal services, such as PDEAR and agrodealers. Interestingly, this dichotomy is not found in women's perceptions of access: a literate woman will feel as uncomfortable or comfortable in an official location as an illiterate woman. This is a potentially important finding as it demonstrates the complexities of equal access to information. Whilst improving literacy rates around the world is a worthwhile and valuable, it should not be viewed as a goal in itself. Instead, improving one aspect of a gender's capacity, such as literacy, should be seen through the context of a country's individual socio-cultural norms. In this example, even though increased literacy might improve women's interaction with formal services, it will not improve their willingness or capacity to visit official locations in order to get this information. Individual and institutional gender perceptions need to be explored, understood and raised before any worthwhile changes occur. That is not to say that change is not happening. The 'Punjab Women Empowerment Package 2014' was launched on International Women's Day as a concrete example. The package is aimed to advance the status of women in the province through safeguards, legislative action and increased representation in government institutions (The News 2014), although critics stated it would only target privileged and educated women (The Tribune 2014).

Ideas to improve access in Pakistani RAS

Based on the study's findings, various options could be considered. Firstly, a simple solution, often discussed and rationalised in past studies (Abbas et al. 2009; Butt et al. 2010; FAO 2015; Nosheen et al. 2008), is reiterated in this paper: increasing the presence of women agricultural extension workers or field assistants in the field or in offices. Clearly, this option represents a major challenge in an extremely populous country. Currently, 763 agricultural officers and 3264 field assistants work in the Punjab province, tending to a rural population of 69 million (PARC 2011). Moreover, institutional interactions with and between women are made harder to implement due to patriarchal norms. Indeed, traditional belief systems in favour of male dominance are major constraints for women farmers in the field. These are portrayed by the challenges of mobility of women in a traditionally male-run environment that largely discourages female travel without male family members (Butt et al. 2010). This can produce an adverse institutional atmosphere for women to progress socially or professionally (Chauhan 2014).

Secondly, informal interactions are extremely important based on these findings. Indeed, interactions with male and female neighbours are in both genders' top three sources of information. Discussions with lead farmers of both genders are also important for women. Encouraging information dissemination through informal means could be an

interesting route for improving women's access to information. The Training and Visit (T&V) extension system was popular in the 1990s in Pakistan, but failed for a variety of reasons, not least the systems inflexibility, but also due to financial complications once the international funding had expired (Hussain, Byerlee, and Heisey 1993). This paper is not advocating a return to such a network. However the clear indication that informal interactions not only with neighbours and friends, but also lead farmers – the mainstay of the T&V system – suggests that an integrated and simplified scheme based on similar principles could be proposed exclusively for women. Indeed, whilst past training and visit schemes' gender bias have been exposed (Due, Magayane, and Temu 1997; Hussain, Byerlee, and Heisey 1993), some recent studies show that if women's role in household agricultural activities were provided with specific agricultural training, rural areas of Pakistan could be significantly better off (Khurshid et al. 2013; Malik et al. 2016). It is also important to note that proposing a system that enables and reinforces current knowledge pathways does not always guarantee sustainable and transformative change, as it focuses on existing prejudices rather than forces stakeholders to investigate new avenues for knowledge transfer. Other initiatives, such as Plantwise (www.plantwise.org) have also engaged with the lack of equal access to information according to gender (Mur et al. 2015). Information on women's preferences for use and access, such as spiritual locations, could be especially interesting to the programme developing plant clinic system.

Finally, certain findings in this study can be extremely important for the future of RAS: radio, largely advocated as a useful tool for gender equal rural advisory services (GFRAS 2013), and previously found to be popular amongst women in Pakistan (Hassan, Ali, and Ahmad 2007), is surprisingly absent from women participants' results (even though 10 women had accessed information through television). Whilst these results do not directly contradict research stating that rural households' access to radio is often good (Meinzen-Dick et al. 2011), it does imply women farmers in Pakistan do not perceive radio to be an effective information tool even though information and communication technologies (ICTs), such as radio and mobile phones, are changing the landscape (Karubanga et al. 2016). Results could also suggest that radio content and timetables for agricultural programmes do not suit women's lifestyle and schedules in the day-to-day rural life.

This does suggest ICTs in Pakistan deserve more focus. In this study, as well as answering questions on the 17 information sources listed, two further rows were left blank. Participants were free to list any extra information source they used. Indeed, enumerators conducting the interview were instructed to specifically notify participants of this. No extra information sources were added by any participant. This could be due to a prohibitive atmosphere during the study that did not allow women the comfort to list personal information. However, the study methodology specifically tried to put women at ease, through women-to-women interviews in a setting of their choice. Therefore, this shows that participants either do not use other sources than the ones listed, or socio-cultural norms dictate they are not allowed/capable of accessing or mentioning them. This might be particularly interesting in regards to digital access technologies.

There is a growing trend rural advisory services' use of ICTs to increase ubiquity of service, efficiency and gender equality (Foster et al. 2012; GFRAS 2016). However, much still needs to be achieved to attain significant impacts (Mbo'o-Tchouawou and Colverson 2014). Indeed, as ICT-based rural advisory services are booming in Pakistan,

largely due to the incredible rise in access to mobile technologies and coverage (Siraj 2011), understanding underlying socio-economic factors such as age and literacy is crucial. As mentioned in the introduction, not only does age affect perceptions and access to ICTs, but literacy severely affect their use. This suggests further participatory research must be conducted to not only reach households, but reach the right household members according to the information they provide. Findings from Farm Radio International across Africa and the GSMA mAGRI programmes state that farmers who are engaged in the radio programme design are more likely to adopt new practices and technologies than passive listeners (African Farm Radio Research Initiative 2011). The mAGRI programme in Africa is focusing on connecting women to knowledge and credit systems, using data driven processes to understand the gender gap in mobile and media access. Methods such as theirs may need to be piloted in Pakistan to increase the effectiveness of radio as an extension delivery method.

Conclusions

This study has reiterated the fact that men and women use and access information differently. Men more frequently use and prefer official sources of information and value formal communication means, while women favour informal sources of information. Official sources of information, such as PDEAR and agrodealers, should not be discounted however. More could be done to facilitate official sources in the context of the country's patriarchal socio-cultural norms. One solution, voiced by many past studies would be to recruit a higher proportion of women professionals in the public sector as field workers. Extension workers, agrodealers and lead farmers of both sexes are well trusted and their advice is considered of high quality. Hence the issue with promoting women as professionals is not the perceived lack of trust in their abilities, simply the physical barriers imposed by socio-cultural norms that make it harder for women to work in the field. These are made all the more complex by particular aspects such as age and literacy, which need to be carefully considered when developing initiatives.

Rural advisory services at a national and international level are evolving, but need to ensure they reach the right audience, taking into account conflicting results in different studies. This study has shown the importance that men and women farmers attach to face-to-face interactions. Nevertheless, it is important to consider the ever-increasing digital world of ICTs. The international development community is keen to explore new mass communication approaches through radio, text and voice messaging in order to reach high numbers of farmers. However, it must be careful with pre-conceived ideas about the effectiveness of these tools, as the results around the use of radio in this study suggest. It is also important to distinguish between reach and impact. These are two separate issues that need to be investigated thoroughly in a country context in order to reach a delicate balance of approaches suitable to all needs, more specifically tailored to either male or female, and young and adult recipients in order to make it relevant to their situations or address the constraints. This can only help to increase the efficiency of various information services.

This analysis affords us a glimpse of the actual practices and values attached to various sources of information men and women have access to in the community. The value of the results found in this article would be increased in two ways: firstly, a similar comparison

should be made directly between women in male and female headed households. Unfortunately, it was not possible to complete this activity in this article. Secondly, it is important to remember that the transfer of knowledge is a dual activity, relying on information beneficiaries being permitted to receive the knowledge provided equally, but also on information providers to provide information equally between genders. Whilst this article has chosen to focus on the importance of end-user accessibility, in this case male and female farmers, the authors realise the necessity to analyse upstream advisory services' gender responsiveness. Even though certain stakeholders in the network are increasingly committing to reduce the gender imbalance, the majority of members in a RAS network are gender blind (i.e. do no differentiate their products between male and female needs), and do not understand the significance of developing targeted and integrated messaging for the appropriate member of the household fulfilling the agricultural activity. A detailed analysis of this aspect would be incredibly powerful in shaping the future of Pakistani RAS.

One must not forget to ask whether the practices and preferences shown are borne of choice or lack thereof; whether the country's cultural norms have shaped the information pathways, and forced women to access information through this manner based on their age and literacy, or whether women's preference for informal information access has shaped the country's rural advisory services. These issues cut to the heart of gender equality research and development, and one that agencies and institutions should constantly keep in mind during rural advisory services' development if we are to improve agricultural information access, and agricultural productivity, to half the world's rural population.

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Notes on contributors

Julien Lamontagne-Godwin is a scientific officer at CABI, and programme manager for the Action on Invasives programme. Julien is currently finalising his PhD on rural advisory services and gender in Pakistan.

Dr Frances Williams is the global coordinator for Monitoring and Evaluation at CABI, reinforcing the quality control processes in both the Plantwise and Action on Invasives programmes.

Naeem Aslam is Plantwise coordinator for Pakistan, in-charge of the Punjab region.

Dr Sarah Cardey is Associate professor, teaching gender and development at the University of Reading.

Dr Peter Dorward is professor at the University of Reading, focusing on smallholder agriculture and innovations.

Muntazir Almas is an associate advocate and specialist interviewer working in Pakistan.

ORCID

J. Lamontagne-Godwin http://orcid.org/0000-0002-0849-5373
F. E. Williams http://orcid.org/0000-0002-6772-0753

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