RESEARCH NOTES
AND STATISTICS

Demand for Agricultural Information among Women Farmers: A Survey from Karnataka, India

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Introduction

A large number of women in rural India are engaged in agriculture. Addressing the challenges faced by women farmers can lead to improvements in women's income, health, agency, and the welfare of their households, and, in the long run, reduce inter-generational inequity. Women's engagement in agricultural activities increases family incomes (Mencher and Saradamoni 1982), and women's control over household decision-making and resources can lead to improvements in the health, nutrition, and welfare of households (Kadiyala *et al.* 2012; Kadiyala *et al.* 2014; Herforth and Ahmed 2015). Thus, a deeper understanding of women farmers' needs is critical for furthering equity and women's agency.

Yet the role of Indian women in agricultural activities and their contribution to agriculture are underestimated in national statistics because of enumeration methods that under-count their participation in the work force (Hirway and Jose 2011; Agarwal 1985; Agarwal 1994; Swaminathan and Usami 2016). Women producers tend to encounter more constraints than men, due to a combination of factors such as poor literacy and mobility, limitations of time, and problems caused by restrictions on interaction between men and women (Johnston *et al.* 2015; Swaminathan *et al.* 2012; Babu *et al.* 2012; Kaur 2010). Women typically engage in the production of crops and farm activities that are different compared to men, with greater focus on livestock rearing, cultivating crops for household consumption, weeding, and harvesting, etc. Such differences make their needs for productive resources and technical information quite distinct, though not homogenous. We argue that it is important that women have greater access to information on agricultural topics such as improved production techniques and the marketing of produce, through sources which they prefer. This has been shown not only to

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improve yields, reduce input costs, and increase incomes, but also enable women's participation in decision-making and enhance women's empowerment (DANIDA 2004; Agarwal 2011a).

The needs of women farmers have largely been ignored in the design of extension programmes (Pingali 2012; Agarwal 2011a; Sharma 2002; Birner *et al.* 2006). This is because, among other factors, of a lack of understanding of women as participants in extension programmes (Glendenning *et al.* 2010; Raabe 2008; Birner and Anderson 2007). The neglect of women farmers' roles and needs is also reflected in research: while there are several studies examining the impact of various agricultural extension programmes, there are very few that examine women farmers' need for information on agricultural activities (Ansari and Sunetha 2014; Magnan *et al.* 2015).

We conducted a study of women farmers to understand, directly from women themselves, the kind of agricultural information they seek and their preferred sources of such information. Of particular interest to us was an exploration of intra-household exchange of agricultural information among men and women, and understanding the deviations from traditional assumptions about the kinds of information sought by women. A deeper understanding of women farmers' information needs is essential in order to understand the differences between their needs and those of men, and, ultimately in order to clarify issues of equity, women's agency, and women's role in agricultural production.

Survey Design

In order to study the information-seeking behaviour of women farmers, we conducted a survey of 1,434 women farmers, followed by focus group discussions with selected women and men. In this paper we use the term "women farmers" to refer to women who either cultivate crops on owned or leased-in land or rear livestock. The survey was conducted in two semi-arid and largely rainfed districts of Karnataka, Raichur and Chamarajanagar. The study covered a large number of women engaged in cultivation and livestock-rearing.

Every sub-district (taluka) in both districts was covered by the survey. Within each taluka, villages were selected using a random number generator. Villages with fewer than 210 households were excluded for logistical reasons. Each selected village was mapped, and houses within it were assigned sequential numbers using a consistent method. Then, every "N"th house in the village was visited, with the number "N" being calculated based on the total number of houses in the village and the desired sample size.

In each household, the survey enumerators identified the youngest married woman under the age of 60 who was engaged in agricultural activities for more than two months in a year. The agricultural activities identified were cultivation on

family-owned or leased-in land, or livestock-rearing. Slightly different surveys were administered for cultivation and livestock-rearing; women who engaged in both were asked to identify the activity they considered more important, and then the relevant survey was administered. Households with no women fitting the survey profile were omitted.

The survey questionnaire was pre-tested in a different district prior to conducting the study. The survey was conducted in April–June 2013 with a target of 1,200 to 1,400 respondents. The sample plan and actual respondents from each category of respondents are presented in Table 1.

Particular care was taken to reduce biases in data collection pointed out by previous researchers (Agarwal 1985; Hirway and Jose 2011). First, it was ensured that all the enumerators in both districts were female. This allowed them to interact directly and candidly with the women farmers. Secondly, all the enumerators were from the same region, so they could communicate in the local language. Thirdly, the enumerators were trained to enter data directly into electronic tablets in Kannada instead of paper forms, to avoid data conversion errors.

In addition, several measures were taken to overcome conceptual biases in responses. For example, instead of asking the women respondents to identify themselves as "farmers," the survey question asked whether they "grow crops," carry out "weeding, harvesting, etc.," or "keep animals such as chicken, cattle, etc." This approach was crucial to identify women farmers, and the advantage of this approach became evident during the survey. In several instances the women claimed that they were not farmers, but when probed about their daily activities, it became apparent that they spent a substantial amount of time on activities related to cultivation or livestock-rearing. Similar behaviour on the part of respondents has been observed in other studies too (Swaminathan and Usami 2016). As an added precaution, enumerators were trained to check the surroundings for any evidence of agricultural activities, such as the presence of animals in the courtyard.

Table 1 *Targeted and actual sample size from each study district*

	Target sample			Actual sample		
	Raichur	Chamarajanagar	Total	Raichur	Chamarajanagar	Total
Sub-divisions	5	4	9	5	4	9
Villages	15	20	35	12	17	29
Survey respondents:						
Cultivators	>100	>100	>200	544	400	944
Livestock keepers	>100	>100	>200	75	415	490
Total	600—700	600—700	1200—1400	619	815	1434

After the completion of the primary survey, focus group discussions were conducted with five groups. The first three groups consisted of five survey respondents each, selected for having reported greater time spent on agriculture or having a greater say in decision-making. The remaining two were male groups: one comprising husbands of women livestock keepers and the other, local male cultivators. The purpose of the focus group discussions was to develop a nuanced understanding of the survey responses and to explore the male point of view.

The study has some limitations. First, since the survey did not cover male farmers, the study does not allow a comparison of the agricultural information needs of men and women. This limitation was slightly mitigated through discussions with the focus groups of males. Secondly, since the data were collected over a period of two months, the responses may have a seasonal bias, despite the questions being worded in such a way as to elicit responses about activities in general and not specifically during the previous week or month. Lastly, the survey did not include women who were engaged only in daily-wage agricultural labour and not in any activities related to own family farm or livestock-rearing. Nevertheless, several of the observations about women farmers in the study may also apply to landless female agricultural labourers.

Profile of Respondents

As mentioned earlier, the survey covered 944 women cultivators and 490 women livestock keepers across two districts of Karnataka. A significant proportion of the surveyed women reported not being able to read or write in any language, and only some of them lived in *pucca* houses (Table 2).

Among cultivators, 91 per cent of the respondents reported having small or marginal landholdings (5 acres or less); 33 per cent of the livestock keepers were landless, and of the remaining, almost all had small or marginal landholdings. This is consistent with national-level data, which suggest that households where women are engaged in agricultural activities tend to be poorer than households where they are not (Srivastava and Srivastava 2010).

Most of the women respondents reported spending more than four hours a day on agricultural activities such as weeding, fertilizer application, harvesting, and sowing. Cultivators reported growing millets (57 per cent), rice (51 per cent), pulses and beans (24 per cent), and vegetables (13 per cent). Among livestock keepers, cattle were the most common animals, followed by goats and chicken.

Almost all the respondents worked at the production of some food items – rice, millets, beans, milk, etc. – for household consumption, a feature of the data that highlights the link between agriculture and household nutrition. In the focus group discussions, livestock keepers reported holding back about half a litre of milk every day for household needs and selling the surplus in the market. In the male focus group

Table 2 *Self-reported characteristics of survey respondents (women farmers)* in numbers and per cent

Variable	Cultivators	Livestock keepers
Total number of respondents	944	490
Percentage with *kutcha* or semi-*pucca* houses*	74	68
Median family landholding	2 acres	1 acre
Proportion of landless	0	33
Proportion that cannot read or write in any language	81	73
Market orientation, or extent of crop sale (in per cent)		
All output marketed	6.7	0.4
All output kept for consumption	14	11
Both market sales and own consumption	79	88
Role of respondent in specified activity (in per cent)		
Weeding	100	
Fertilizer application	96	
Harvesting	82	
Milking cattle	99	
Feeding animals	79	
Percentage that spends >4 hours per day on production activities	85	49
Buys inputs/livestock from markets**	15	24
Decides when to sow/what breeds to raise**	30	47
Controls cash in buying and selling transactions**	22	33

Notes: * *Pucca* house is defined as a house with at least one complete room with walls of fired brick, stone (packed with lime or cement), cement, concrete, timber, and a roof of corrugated iron/asbestos sheets, tiles, timber, etc. A *kutcha* house is defined as a house with walls or roof of unfired brick, bamboo, mud, grass, thatch, loosely packed stones, etc. A semi-*pucca* house is defined as a house with walls of *pucca* material but a roof of *kutcha* material.
** Either the woman farmer on her own, or together with her husband or son.
Source: Survey data.

discussions, men reported holding back 20 to 40 kilograms of pulses for household consumption. In fact, 13 per cent of the respondents were engaged in production exclusively for household consumption.

Severity of Information Gap

The survey asked women farmers about their access to information on seed varieties, fertilizer application, livestock feeding, credit, crop diseases and treatment, place of sale for their produce, etc. The respondents reported very low access to such agricultural information. In Raichur district, only 1.5 per cent of women received any such information. In Chamarajanagar district, a local non-governmental organisation (NGO) had recently initiated women's self-help groups (SHGs) specifically for the purpose of disseminating information on agricultural practices,

Table 3 *Women farmers' current access to agricultural information* in numbers and per cent

	Chamarajanagar		Raichur		Combined	
Total number of respondents	815		619		1434	
	in numbers	in per cent	in numbers	in per cent	in numbers	in per cent
Receives information	344	42	9	1.5	353	25
Receives information from sources other than self-help groups (SHGs)	62	7.6	5	0.8	67	4.7
Wants information in the future	666	82	573	93	1239	86

Source: Survey data

such as agricultural practices involved in vegetable cultivation. As a result, 42 per cent of women in Chamarajanagar reported receiving some information. If SHGs are excluded as a source, only 7.6 per cent of women in Chamarajanagar and 4.7 per cent in both districts combined reported receiving agricultural information from any source (Table 3). This combined 4.7 per cent compares very poorly with the 86 per cent of women who stated, during the survey, that they would like to receive information related to agricultural activities.

Nationally, on average, 35 to 41 per cent of farming households in India receive agricultural information (NSSO 2014a). Women's lower rate of access, in comparison, is because women farmers are, *inter alia*, worse off than men with respect to literacy and mobility, the free time they have, and the restrictions that are placed on their interactions with men (Johnston *et al.* 2015; Swaminathan *et al.* 2012; Babu *et al.* 2012; Kaur 2010).

This information gap among women farmers is exacerbated by the focus of most mainstream extension programmes on large farmers and male producers. Not surprisingly, access to information about agricultural activities in India decreases with landholding size: small and marginal farmers have access to only 50–70 per cent of the sources that large and medium farmers have (Adhiguru *et al.* 2009; Agarwal 2011b; Sajesh and Suresh 2016). Since most women farmers belong to small and marginal farm households, their access is even more restricted than males in the family (Srivastava and Srivastava 2010). Such "elite capture" leads to a disproportionate share of benefits accruing to those with economic, social or political power (Raabe 2008; Feder *et al.* 2010), a phenomenon observed in several agricultural extension programmes. Hence, progressive frameworks of agricultural extension and information advisory services emphasise the need to reach small farmers and women, and meet their specific requirements (Birner *et al.* 2006).

Table 4 *Demand for agricultural information among women farmers by market-orientation* in numbers and per cent

	Cultivators	Livestock keepers	Total
Number of respondents			
Output only for market sale	63	2	65
Output only for consumption	135	56	191
Both market and consumption	746	432	1178
All	944	490	1434
Percentage that wants agricultural information, by category			
Output only for market	86	*	86
Output only for consumption	74	75	74
Both market and consumption	91	83	88
All categories	89	82	86

Note: * Data not meaningful; only 2 women were in this category.

Another important issue, discussed later in this paper, is the lack of intra-household dissemination of agricultural information.

Interestingly, women farmers who produced *only* for household consumption also indicated a strong need for agricultural information. In fact, their demand for information was only slightly lower than those who produced only for the market (Table 4). Since almost all women were found to produce food items for household consumption, this strengthens the case for expanding the variety of home consumption crops included in agricultural advisory services.

Kinds of Information Sought

Women respondents were asked about their interest in different types of agricultural information, ranging from information on day-to-day activities, such as the correct use of fertilizers, to information about better seed varieties. The list was not intended to be exhaustive but indicative of information needs relevant to different kinds of agricultural production and marketing activities.

As expected, there was a clear demarcation between the agricultural activities undertaken by men and women in a household. A high proportion of women reported involvement in activities like weeding, fertilizer application, and milking, and very low engagement in activities such as land preparation (Table 2).

Most respondents were interested in gaining access to information related to their daily agricultural activities. For instance, 58 per cent of cultivators stated that they would like information on the correct use of fertilizers (Table 5) – not surprising, given that 96 per cent of women cultivators reported fertilizer application as one of

Table 5 *Nature of agricultural information sought by women cultivators* in per cent

Nature of information	Percentage of all respondents
Better seed varieties	84
Crop diseases and treatment	69
Correct use of fertilizers and pesticides	58
Access to farmer credit	44
Irrigation methods and equipment	33
Tools and machines to reduce drudgery	13
Where to sell the produce	11
Other cultivation practices	6
Post-harvest processing and storage	1

Note: Multiple responses were allowed; women were asked to select from among a list of possible categories of information.
Source: Survey data

their activities. Similarly, livestock rearers stated a desire for more information about day-to-day activities such as feeding livestock.

However, the survey also indicated that women farmers want to be better informed about decisions in which they were currently not involved. For example, 69 per cent of women stated that they would like information on animal breeds. This was greater than the percentage of women (47 per cent) who were involved in taking decisions on what livestock to rear. In fact, 66 per cent of women who reported themselves as not being involved in decisions about the choice of livestock said that they wished to receive information about which breeds to rear; this was only slightly lower than the demand for the same information from women who were involved in decision-making (Table 6). The focus group discussions also confirmed this: women sought information on a wide range of topics, such as better seed varieties for improved yields, the correct use of fertilizers and pesticides, market rates, and better tools for sowing. Furthermore, even women engaged in subsistence

Table 6 *Information needs and decision-making among women livestock keepers* in numbers and per cent

Involvement in decision on which animal to rear (self-reported)	Number of respondents	Number that wants information on livestock breeds	Percentage that wants information on livestock breeds
Decides by herself	118	91	77
Decides together with husband/son	114	79	69
Not involved in decision	258	169	66
Total	490	339	69

Source: Survey data

agriculture expressed interest in a wide range of information, some of which was not directly relevant to their work.

Our study demonstrates that women farmers seek information related to a wide range of agricultural activities, including activities that are traditionally considered to be within the male domain or activities in which they do not directly participate. Thus, a purely utilitarian view of women's information needs, as commonly practised in livelihood interventions may not meet women's needs adequately, and more importantly, may inhibit the potential to contribute towards the long term objectives of women's empowerment and agency.

Sources of Agricultural Information

As already discussed, women farmers are subject to greater constraints in gaining access to agricultural information than men. Moreover, social information networks among men and women generally did not overlap, which further limited women's access to information (Magnan *et al.* 2015). Therefore, it is important to specifically investigate women's current and preferred sources for accessing information.

The survey asked women farmers to select their preferred sources of information from a list of possible sources. The list did not include any written sources because of known issues of low literacy levels (Table 2). Their responses have been summarised in Table 7. A large proportion of respondents (55 per cent) said that television was the most favoured source of information, which is not surprising given the

Table 7 *Preference for different sources of agricultural information* in per cent

	Preferred sources of agricultural information		
	Cultivators	Livestock keepers	Total
Television	52	63	55
Self-help group (SHGs)	37	61	45
Veterinarian	n.a.	23	23
Farmer/producer group	27	13	23
Government worker/agent	23	12	19
Husband or other family members	22	8	17
Cooperative society	15	16	15
Mobile phone*	14	11	13
Other farmers	17	n.a.	17
Kisan mela (farmers' fair/exhibition)	9	3	7
Inputs shop and markets	7	n.a.	7
NGOs (non-governmental organisations)	4	8	5

Note: * Only 1,136 respondents were asked this question since it was added after the survey began.
n.a. = not applicable.
Multiple responses were allowed; women were asked to select their preferred sources from a list of possible sources of agricultural information.
Source: Survey data

widespread access to television. National data show that television ownership has surpassed radio ownership even in rural areas (NSSO 2014b). In our survey, too, it was found that a majority of the households owned a television. Typically, households that did not own a television did not own a radio either.

Television also overcomes the constraints of literacy and mobility faced by women farmers. Some recent interventions have used this preference to advantage by screening short videos to disseminate information on agricultural activities among women farmers. Interestingly, 66 per cent of women respondents in our survey stated that they preferred receiving information through television at particular times of day. This is similar to other studies of extension programmes where women requested a modification in the timing of such programmes on television (Babu *et al.* 2012).

Television was closely followed by self-help groups as preferred sources of information, perhaps because of convenience and access. Farmers' groups were also relatively popular sources of information possibly due to the same factors. For livestock keepers, veterinarians were the obvious source of reliable information about animal diseases and their treatment.

Not surprisingly, government agents were not preferred sources of information, partly because of their alleged bias in reaching out to women farmers and partly because of their lack of adequate knowledge about women farmers' information needs. In focus group discussions, women stated that government agents who attended mixed gender farmers' groups talked only to the men. This finding is similar to that of a Tamil Nadu study that found that male extension agents did not interact with women (Babu *et al.* 2012).

The survey respondents presented an interesting departure from expected norms in one respect, namely, their lack of a strong preference for female extension agents: 63 per cent of the respondents stated no preference regarding the gender of extension agents. This leads to the intriguing conclusion that the need for female extension agents may not be driven by women farmers' own gendered preferences but rather the reticence of male agents to reach and interact with female farmers. Further research is required to understand the factors driving these preferences.

Intra-Household Dissemination

Most extension interventions treat households as unitary entities, in the belief that reaching one member (usually a male member) is adequate for providing relevant information about agricultural activities. However, our study demonstrates evidence to the contrary.

Hardly any survey respondent (1.2 per cent) reported receiving agricultural information from her husband or other members of the family (Table 8), even

Table 8 *Intra-household dissemination of agricultural information* in numbers and per cent

	Currently receives information from husband or other family members		In the future, wants information from husband or other family members		In the future, wants information from husband or other family members *only*		Total number of respondents
	Number	Per cent	Number	Per cent	Number	Per cent	
Cultivators	16	1.7	184	20	45	4.8	944
Livestock keepers	1	0.2	31	6.3	4	0.8	490
All	17	1.2	215	15	49	3.4	1434

Source: Survey data

though 10 per cent of the women claimed that their family members (mostly husbands) received such information from various sources. The actual dissemination gap may be even larger than reported if we factor in the possibility that women's awareness of their husbands' access to information may be limited.

Only a few women (15 per cent) indicated that, in future, they wanted agricultural information to be provided by family members. This proportion is much smaller than that of women who wanted information from sources such as television, SHGs, and even farmers' groups. An analysis of the responses also revealed that hardly any women (less than 5 per cent) wished to receive information *only* from their family members (Table 8).

The focus group discussions revealed a gender division in crop choice, and household activities of men and women. For example, women farmers reported a preference for growing local varieties of rice such as Mililong, Jaya, and Mangala, because of higher resistance to diseases and lower input requirements. In contrast, male farmers (in separate focus group discussions) reported a preference for cultivating IR50 for the market because of better yields and profits, and IR56 for home consumption. Male cultivators reported that they undertook ploughing, watering, and fertilizer and pesticide application work, while women cultivators reported sowing, weeding, and harvesting work. Such differences in male and female crop choices and activities could be one reason why women do not seek information from family members. This inference is also supported by the fact that even fewer livestock keepers are reported seeking information from family members.

Another reason for the lack of interest among women in receiving agricultural information from family members is likely to be the intra-household norms and power dynamics prevalent in households. This is corroborated by comments made by male farmers in focus group discussions. Statements such as "only male members

of the family – father, brother, myself – are major contributors to agriculture" illustrate the failure of men to acknowledge women's contribution to agriculture.

These findings demonstrate that relying on intra-household transfer of agricultural information is inadequate and undesirable; extension interventions must strive to reach women farmers directly by understanding and tapping into information networks accessible to them.

Self-Help Groups (SHGs)

As mentioned earlier (Table 3), self-help groups (SHGs) were the biggest existing source of agricultural information for women farmers in Chamarajanagar district, because of an SHG-based extension programme run by a local NGO. In the focus group discussions, livestock keepers mentioned receiving both credit and information on care of animals through the SHGs. Further, the discussions revealed an interest in interacting with experts at SHG meetings, and expressed disappointment with the current extension agents who were providing information only to male SHG members.

The near ubiquity and increasing social acceptance of SHGs in most parts of the country makes it convenient for women to gain access to them. It was not surprising that women farmers selected SHGs as the second most desirable source of information on agricultural activities, after television (Table 7). Despite this, SHGs are infrequently used for agricultural extension work, especially for sharing cultivation-related information.

Mobile Phones

There has been considerable interest in using mobile phones to provide agricultural extension services to farmers in India (Mittal and Tripathi 2009; Cole and Fernando 2012). The latest Socio-Economic and Caste Census indicates that 82 per cent of rural households own a mobile phone (SECC 2011). In our survey, 81 per cent of the women respondents reported that they had access to a phone, 13 per cent owned a phone, and another 68 per cent had access to their husband's or some other family member's phone.

However, even among those who owned a mobile phone, only one-fifth wished to access agricultural information by means of the telephone. One reason for this could be a lack of knowledge of how to use the phone: while 97 per cent owners of mobile phones knew how to receive calls, only 46 per cent knew how to make calls and only 8 per cent used text messages. Knowledge of how to use a phone was even lower among those who had access to a family member's phone rather than owning a phone themselves.

Secondly, women who relied on the phone of a family member (usually the husband or other male members) had access to it only when the men were at home. It is possible that this limited duration of access was further compounded by patriarchal family interactions.

Interestingly, even male farmers, despite having greater access to mobile phones, reported in the focus group discussions that they had less interest in receiving information through phones than from their current sources, namely, television and newspapers.

Therefore, despite the potential of mobile-based advisory services, it is important for intervention designers to exercise caution in depending too much on mobile phones as a means to reach women farmers directly. Intervention designers must validate the suitability of their approach by investigating women's access to phones, their literacy levels, language preferences, and preferences related to voice versus text messages, and the best times to reach women directly. In many cases an alternative model may be more suitable, such as one in which a local community resource person is trained in the use of mobile phones and sharing information with other women.

Summary and Discussion

This paper, based on a survey of over 1,400 women farmers in two semi-arid and rainfed districts of Karnataka, establishes the existence of a severe information gap among women farmers.

The paper points out the importance of reaching women farmers directly through methods that address gender-specific constraints of mobility and time. One effective strategy could be to use women's SHGs for collective engagement; this has the added benefit of strengthening women's information networks and contributing to women's agency in the long run. The study also highlights the limitations of relying on mobile phones to reach women farmers directly due to ownership and phone-literacy constraints. The study establishes that men do not share agricultural information with women in the household, nor do women want intra-household information-sharing to be the main means of receiving agricultural information.

The study demonstrates that women farmers wish to be well-informed about a wide range of topics related to agricultural livelihoods, including many issues that are generally considered to be in the male domain, and even in situations where women are producing exclusively for household consumption. Since almost all women farmers produce some items for household consumption, supporting their information needs can have a direct impact on the nutrition security of women and children.

Efforts to support women's role in agriculture are hampered by the absence of sufficient research on women farmers in India and the lack of availability of gender-disaggregated data. Further research is required in order to deepen our understanding of women's agricultural information needs. Multi-disciplinary research is required to further investigate the roles of women in agriculture and study the pathways from womens' livelihoods to agency.

Greater emphasis on understanding the nature of women's work and livelihoods across different regions and social contexts in India can have wide-ranging consequences in terms of advancing women's agency and equity, and addressing issues of poverty, health, and welfare.

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