

Agroforestry and Forestry in Sulawesi series:
**Information channels for disseminating
innovative agroforestry practices to
villages in Southern Sulawesi, Indonesia**

Endri Martini, Enggar Paramita, James M. Roshetko



**World
Agroforestry
Centre**

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Abstract

This study was conducted to identify potential information channels for disseminating agroforestry innovations at village level in South and Southeast Sulawesi provinces, Indonesia. An information channel is a method of transmitting information in a specific, one-way flow. In this study, an investigation of information channels from sources to users was conducted to understand the dissemination of innovative agroforestry practices. A better understanding of how farmers obtain information will enhance the impacts of any agricultural extension program. The study was conducted through semi-structured interviews with 144 farmers (40% female) from 12 villages in two districts in South Sulawesi Province and two districts in Southeast Sulawesi Province. In each village, 12 respondents from various ethnicities were interviewed. Data collected during the study covered sources of information, type of information channel in disseminating agricultural/agroforestry information, and important disseminators. Results from the study identified four types of information channels, that is, 1) mass media; 2) personal contacts (interpersonal communication) through opinion leaders, extension agents and other reliable contacts, such as family and friends; 3) formal extension services or government programs; and 4) social gatherings, such as weddings and village meetings. Personal contacts (interpersonal communication) were considered the most accessible for farmers. We also found that opinion leaders (who were also expert farmers) and government extension agents were the two major actors for disseminating agroforestry innovations. Interpersonal discussion with the agroforestry disseminators was the most preferred information channel. Formal extension services were considered as the most reliable channel for disseminating agroforestry innovations, however, the services were limited and mostly occurred only in areas with better infrastructure. Providing agroforestry extension services in villages will also enhance women's access to agricultural information. In areas where language is a barrier, involving farmers as extension agents is recommended.

Keywords

Opinion leaders, extension agents, South Sulawesi, Southeast Sulawesi, mass media, interpersonal.

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1. Introduction

An information channel is a method of transmitting information in a specific, one-way flow, for example from sources to users or from users to sources. Village information channels can be used by extension agents when planning cost-effective activities to disseminate an agricultural innovation. Utilizing preferred information channels for implementing an activity or sharing information about a new technology enhances community participation and adoption. For disseminating information about an innovation, identifying channels from sources to users is recommended; while for facilitating the generation of an innovation it is necessary to identify both channels from sources to users and from users to sources. This study analyzes the information channel from sources to users that are used to disseminate agricultural and agroforestry innovations.

In many parts of Indonesia, the process of disseminating agricultural innovation is dominated by a ‘top–down’ approach, with government extension agents as the main disseminators of innovations. However, in the past 10 years, the government has promoted a more ‘bottom–up’ approach in which extension agents have to identify a community’s extension needs and report those needs to the head of the district extension office at their annual planning meeting. Because there are a limited number of extension agents, and an even smaller number of those who conduct baseline studies to identify information channels before they plan agricultural extension activities, the adoption of the bottom–up approach and participation by villages remains low. Thus, information about which channels are preferred by farmers is also limited.

Identifying information channels is not only useful for government extension agencies but also for projects that want to improve agricultural production and enhance farmers’ livelihoods, such as the Agroforestry and Forestry in Sulawesi: Linking Knowledge with Action (AgFor) project implemented by the World Agroforestry Centre with funding from the Department of Foreign Affairs, Trade and Development, Canada. The AgFor project has the goal of empowering motivated farmers of both genders to enhance and diversify the productivity and profitability of their tree-based systems in a sustainable manner. A series of baseline studies was conducted to document the positive impact of the project (Martini et al 2012; Janudianto et al 2012; Khususiyah et al 2012; Mulyoutami et al 2012). The study reported in this working paper is part of this series. The objective of the study was to analyze the options of information channels in villages for disseminating agroforestry innovations.

2. Methods

2.1 Study sites

The study was conducted from October to November 2012 in Bantaeng and Bulukumba districts of South Sulawesi Province and Konawe and East Kolaka districts of Southeast Sulawesi Province (Figure 1), which were AgFor project sites.

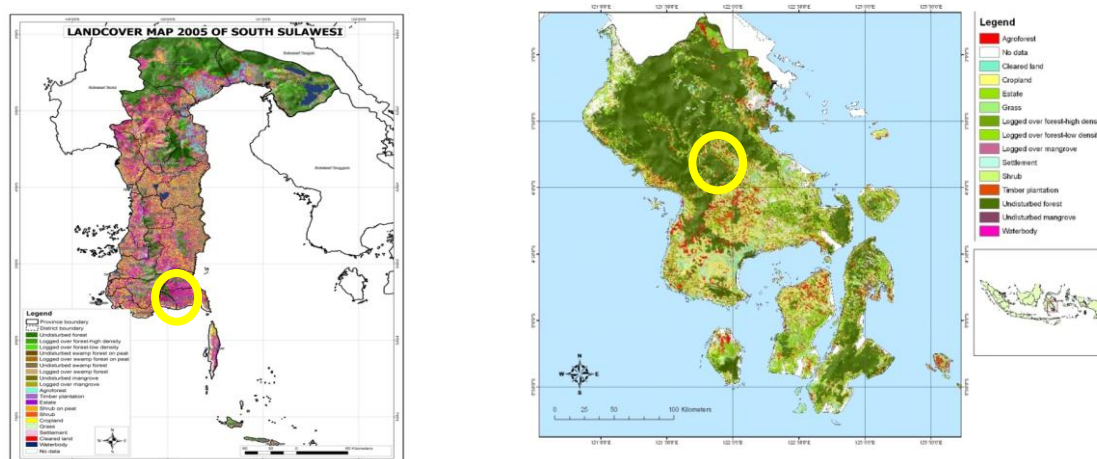


Figure 1. Map of study locations in South and Southeast Sulawesi provinces of Indonesia (marked with yellow circles).

Source: World Agroforestry Centre Indonesia, Spatial Analysis Unit, 2012

Sources of farmers' livelihoods in those districts were dominated by agroforestry systems of cacao, coffee, clove, durian, other tropical fruits and pepper as the main commodities (Janudianto et al 2012; Khususiyah et al 2012) (Table 1). Ethnic composition varied in the districts, from multi-ethnicity as was commonly found in Southeast Sulawesi through to double or single ethnicity as was the case in South Sulawesi. Indonesian was commonly used to communicate between ethnicities and had become the common language of the younger generations, with the exception of Bantaeng district. In Bantaeng, the common language spoken in villages was Makassarese. Infrastructure (electricity, telephone and road) and education levels varied between districts.

Table 1. Characteristics of study districts in South and Southeast Sulawesi provinces, Indonesia

District, province	Sources of local livelihoods	Dominant ethnicity	Common language spoken by farmers
Bantaeng, South Sulawesi	Agriculture (irrigated rice, vegetables, coffee, cacao, clove, maize, coconut)	Makassarese	Makassarese, Konjo
Bulukumba, South Sulawesi	Agriculture (irrigated rice, vegetables, coffee, cacao, clove, maize, coconut)	Makassarese, Bugis	Indonesian, Makassarese, Konjo
Konawe, Southeast Sulawesi	Agriculture (cacao, pepper, coconut)	Tolaki, Bugis, Javanese, Balinese	Indonesian
East Kolaka, Southeast Sulawesi	Agriculture (cacao, pepper, coconut)	Tolaki, Bugis, Toraja, Balinese	Indonesian

2.2 Data collection and analysis

Data was collected through semi-structured interviews in 12 villages in four districts. In each district, three villages were selected based on their distance from the district capital, representing the local centre of agricultural information (Table 2). Interviews were conducted with 12 respondents per village, consisting of 10 farmers (five men and five women) and two opinion leaders. Total number of respondents was 144 farmers (72 in South Sulawesi and 72 in Southeast Sulawesi, of whom 40% were female).

The socioeconomic background of each respondent, such as age, education level, main occupation and ethnicity, was recorded during the interview. Other information that was collected were sources of information, social activities used as a medium for exchanging new information, mass media commonly used in obtaining agricultural information, actors or disseminators in the village, types of information channels typically used to disseminate agricultural innovations, and preferred information channels for disseminating agricultural innovations. The data was analyzed qualitatively as well as quantitatively via descriptive statistics.

Table 2. Characteristics of study villages in South and Southeast Sulawesi provinces

District, province	Study village	Distance to district centre	Migration in and out	Electricity	Phone signal	Road accessibility
Bantaeng, South Sulawesi	Pattaneteang	Far	Medium	Yes	Strong	Good
	Kayu Loe	Intermediate	Low	No	Weak	Good
	Bonto Bulaeng	Near	Medium	No	Weak	Good
Bulukumba, South Sulawesi	Tana Toa	Far	Medium	No	Weak	Medium
	Ara	Intermediate	High	Yes	Strong	Good
	Tugondeng	Near	Medium	Yes	Strong	Good
Konawe, Southeast Sulawesi	Ambondiaa	Far	Low	No	No	Poor
	Lawonua	Intermediate	Medium	Yes	Weak	Medium
	Wonua Hoa	Near	Medium	No	Weak	Medium
East Kolaka, Southeast Sulawesi	Tinondo	Far	Low	No	No	Medium
	Taosu	Intermediate	Medium	Yes	Weak	Good
	Tasahea	Near	Medium	Yes	Yes	Good

3. Findings

3.1 Profile of respondents

Respondents in this study were smallholding farmers. Male respondents had an average age of 43 years and women 36 years. Twenty-seven percent (27%) of the respondents were village leaders/opinion leaders. Most of the respondents owned agricultural land; only 10% of respondents did not (Figure 2).

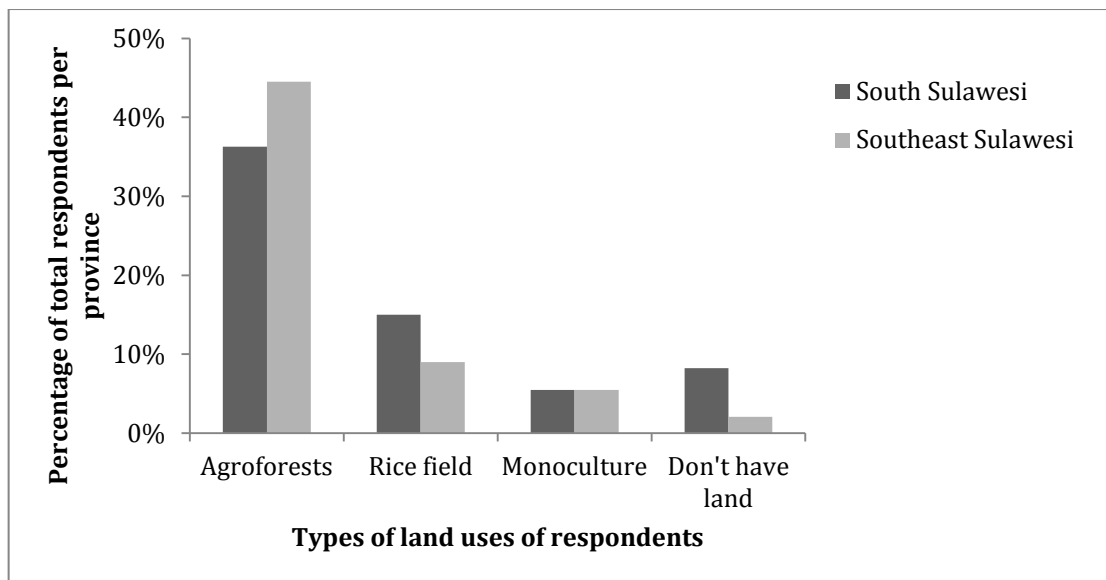


Figure 2. Types of land uses of respondents in South and Southeast Sulawesi provinces, Indonesia

Respondents' membership in farmers' groups was higher in Southeast Sulawesi (33.5%) compared to South Sulawesi (22.0%). This was mostly because in Southeast Sulawesi there were many projects related to enhancement of cacao production, which required farmers to be in groups to receive agricultural aid.

On average, the education level of the respondents in both provinces was elementary school. Respondents in South Sulawesi had lower levels of education compared to Southeast Sulawesi. Distance from the village to the district's capital had no strong correlation with respondents' level of education, although villagers near the district capital tended to have higher education levels (Figure 3.).

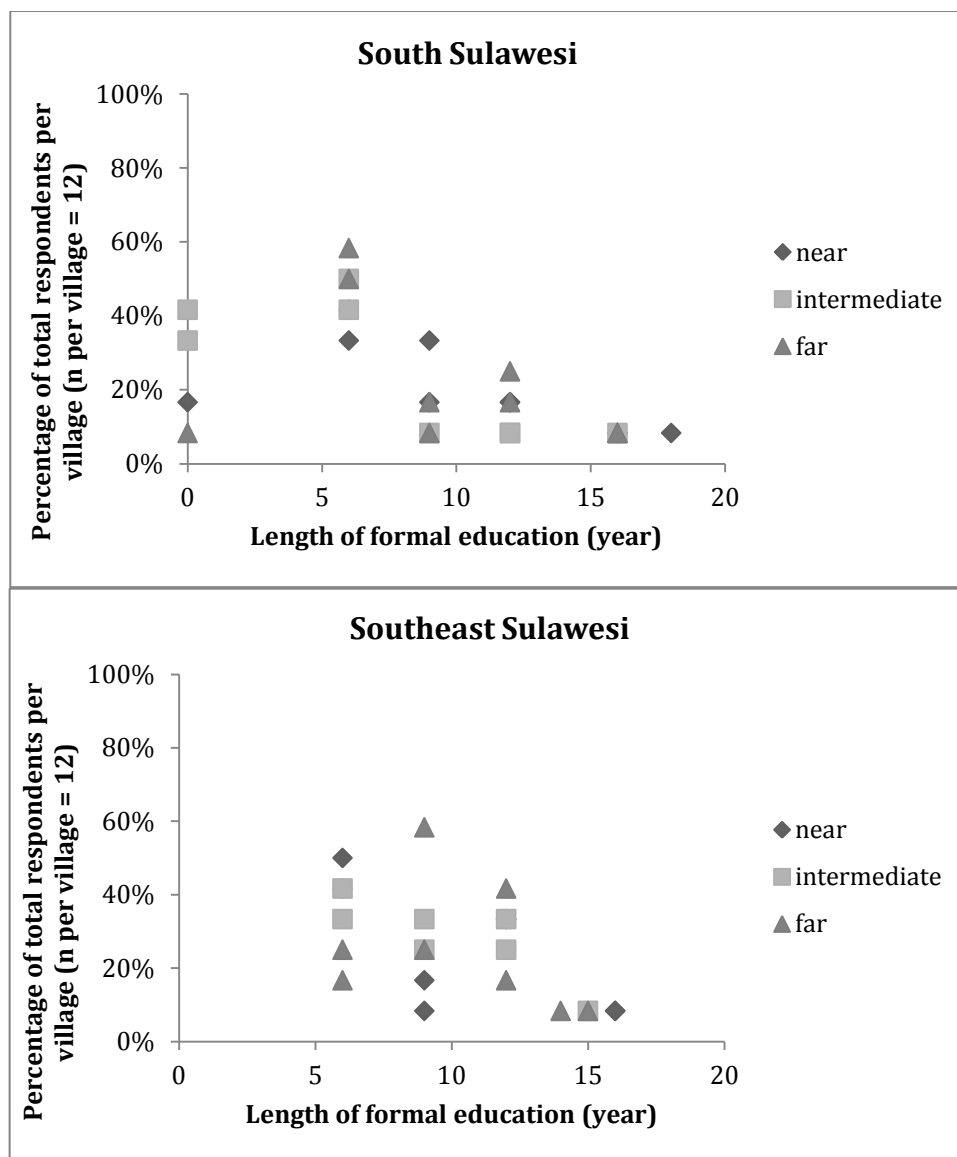


Figure 3. Length of formal education of the respondents per village in South and Southeast Sulawesi provinces

In South Sulawesi, the dominant ethnicities were Makassarrese, Bugis and Konjo, while in Southeast Sulawesi they were Tolaki and Bugis. Javanese, Balinese and Sundanese were also present (Figure 4.). There were no significant differences in ethnicity proportion between village classes (near, intermediate and far) in either province.

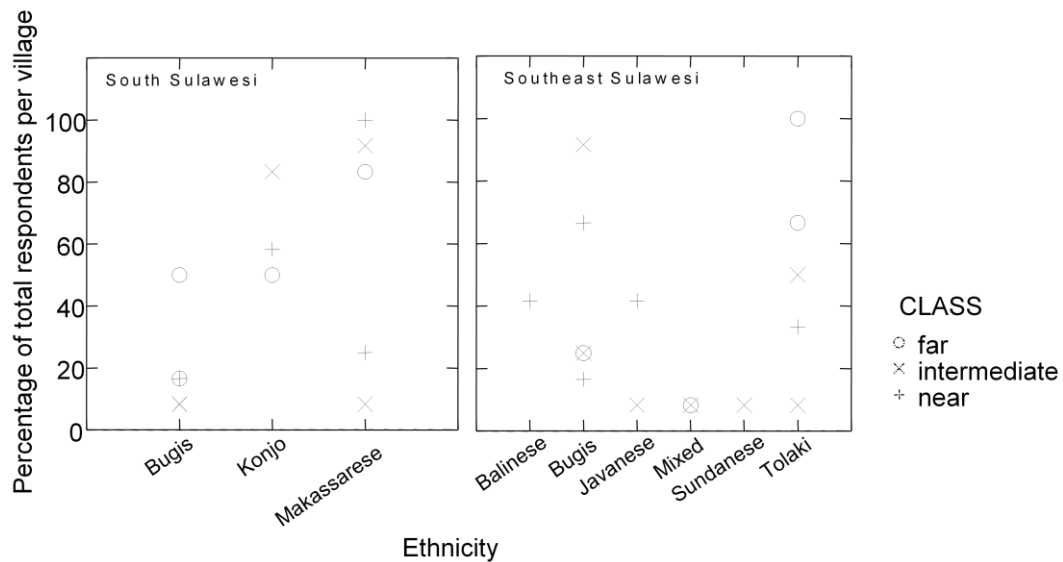


Figure 4. Dominant ethnicity per village by distance to district capital (near, intermediate, far)

At the study sites, 48.6% of respondents were migrants who had arrived in their current location 11-to-18 years ago. The number of male migrants was higher (29.9% of total respondents) than female (18.8%). In total, the number of migrants was higher in Southeast Sulawesi (37.5%) than South Sulawesi (11.1%). The reason for migration was mainly marriage in South Sulawesi and livelihoods' opportunities in Southeast Sulawesi (Figure 5).

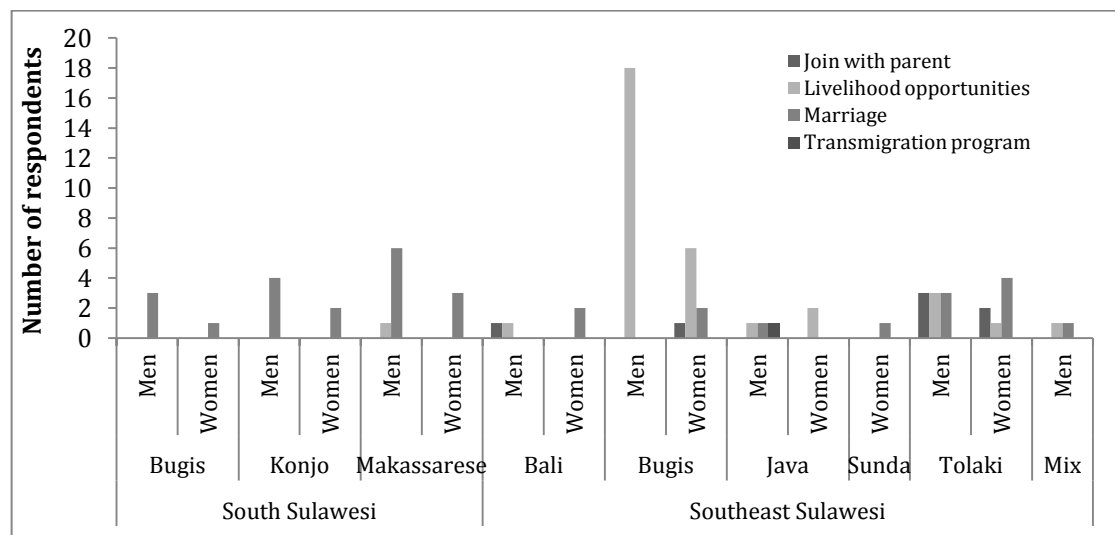


Figure 5. Reasons for migration in South and Southeast Sulawesi provinces

In our study areas, generally, opinion leaders in each village were people of the dominant ethnicity. The education level of opinion leaders was on average above elementary school with the ability to speak fluent Indonesian (the national language). On average, the age of opinion leaders was above 40 years-old. Some opinion leaders were migrants who had lived

in the area for more than 20 years. All of the opinion leaders were members of farmers' groups.

3.2 Sources of information

3.2.1 General sources of information

General information about agriculture, health, education, marketing, public administration and other topics was obtained by respondents both from inside and outside the village with a higher proportion obtaining information from outside the village (external), that is, 52% of total respondents. Inside the village, sources of information (internal) were opinion leaders, friends, farmers, farmers' groups, family, community meetings, religious groups and village traders. External sources of information were mass media, government, traders, friends from other villages, farmers from other villages, traders from other villages, private companies, projects, libraries, markets, migration activity and opinion leaders from other villages. Between provinces, there was no significant difference in sources of information. Distance of the village from the district capital was not clearly correlated with respondents' intensity in obtaining information (Table 3).

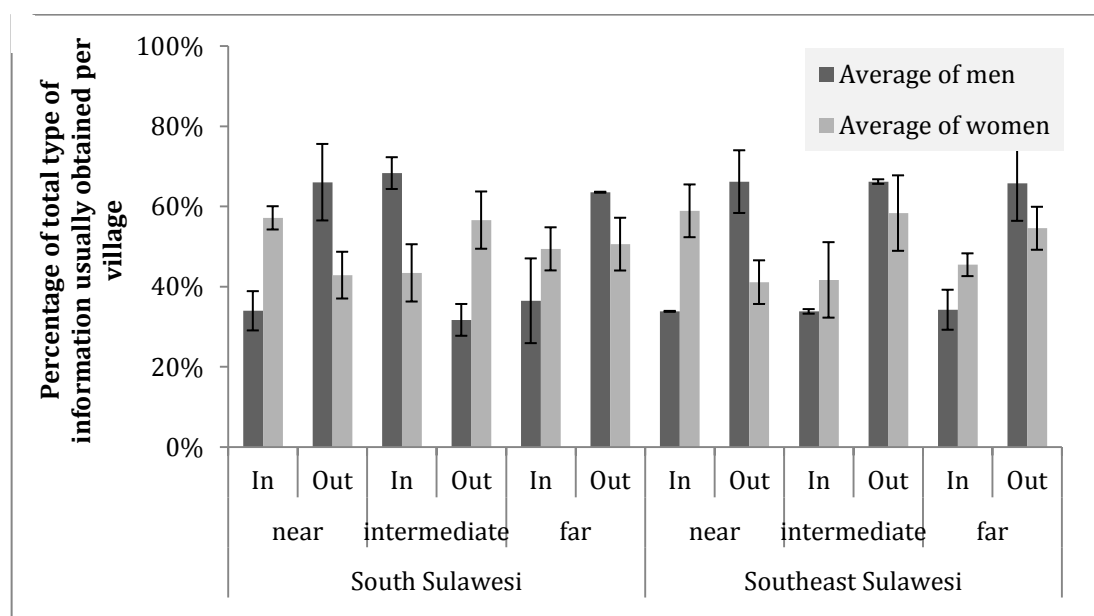
Table 3. Sources of general information in South and Southeast Sulawesi provinces, percentage of total respondents per village class per province

Sources of general information	South Sulawesi (%)			Southeast Sulawesi (%)		
	Near (n=24)	Inter-mediate (n=24)	Far (n=24)	Near (n=24)	Inter-mediate (n=24)	Far (n=24)
Internal						
Community meetings	1.1	6.3	4.1	N.A.	1.1	N.A.
Family	5.5	5	2	7.5	3.4	8.5
Farmers' groups	2.2	6.3	1	5	5.7	3.2
Farmers	2.2	6.3	4.1	7.5	5.7	4.3
Friends	8.8	12.5	12.2	7.5	9.1	11.7
Opinion leaders	19.8	17.5	14.3	15	10.2	11.7
Religious groups	1.1	N.A.	N.A.	N.A.	1.1	N.A.
Traders	1.1	2.5	3.1	N.A.	N.A.	N.A.
Total percentage	41.8	56.4	40.8	42.5	36.3	39.4
External						
Family from other villages	N.A.	N.A.	1	2.5	2.3	1.1
Farmers from other villages	3.3	N.A.	N.A.	N.A.	N.A.	N.A.
Friends from other villages	N.A.	N.A.	1	N.A.	N.A.	1.1
Government	20.9	18.8	19.4	18.8	23.9	20.2
Libraries	1.1	1.3	2	2.5	1.1	1.1
Markets	2.2	2.5	1	N.A.	N.A.	N.A.
Mass media	25.3	18.8	28.6	23.8	27.3	36.2

Sources of general information	South Sulawesi (%)			Southeast Sulawesi (%)		
	Near (n=24)	Inter-mediate (n=24)	Far (n=24)	Near (n=24)	Inter-mediate (n=24)	Far (n=24)
Migration activity	N.A.	N.A.	3.1	N.A.	N.A.	N.A.
Opinion leaders from other villages	N.A.	N.A.	N.A.	1.3	N.A.	N.A.
Private companies	2.2	N.A.	N.A.	N.A.	2.3	N.A.
Projects	2.2	N.A.	2	8.8	5.7	1.1
Traders from other villages	1.1	2.5	1	N.A.	1.1	N.A.
Total percentage	58.3	43.9	59.1	57.7	63.7	60.8

Respondents frequently accessed information from family, farmers' groups, farmers, friends, government, libraries, markets, mass media, opinion leaders and traders. Sources of information that were not frequently accessed were colleagues from other villages, private companies and projects.

From a gender perspective, at most of the sites men tended to more frequently obtain information externally (Figure 6). An exception was for village class 'intermediate' in South Sulawesi Province, where women tended to have greater access to external information because they were workers (share labour or off-farm jobs) in areas outside their own village.

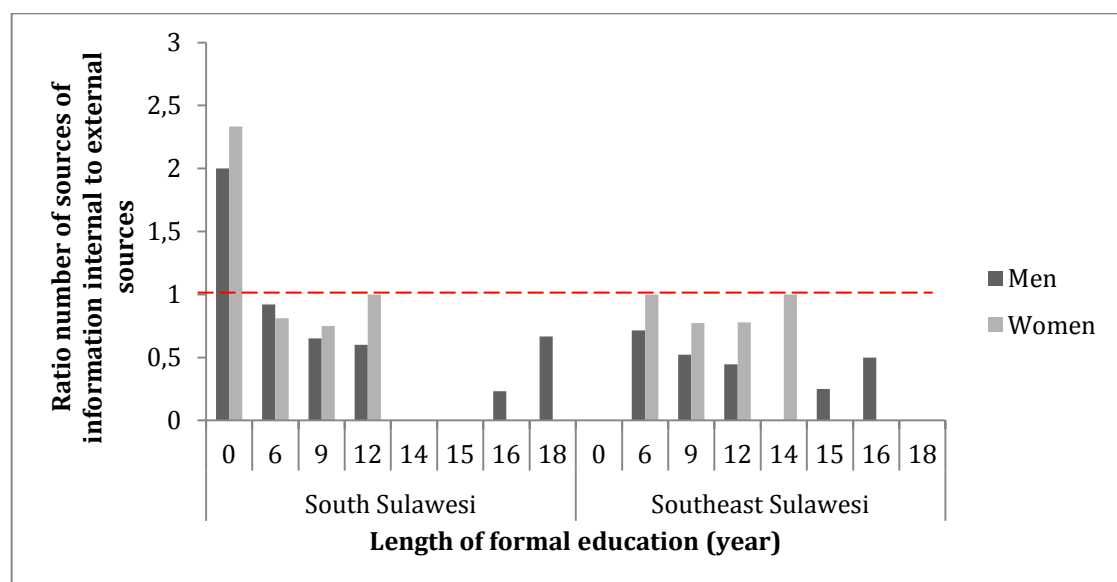


Note: In = internal; Out = external; the error bars is for the standard errors of mean .

Figure 6. Gendered percentage of total types of information usually obtained per village classes in South and Southeast Sulawesi provinces

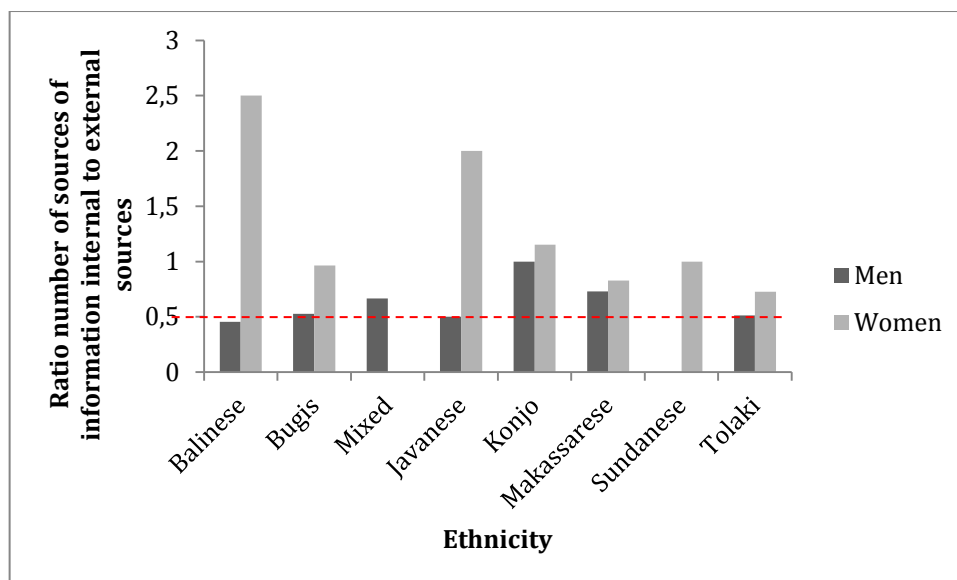
In both provinces, the level of formal education was not correlated to how villagers obtained information (Figure 7). At all study sites, the ratio number of sources of internal information to external was higher for women than men, meaning that compared to men, women obtained information more from internal sources than externally. Specifically for South Sulawesi, respondents who never attended school tended to search for information from sources internally. These people tended to stay in the village and had limited ability in speaking Indonesian.

For all ethnicities, men tended to access more information externally (Figure 8). When comparing gender by ethnicity, only Balinese, Javanese and Konjo women depended solely on sources of internal information, particularly, from their family (husband, father and brothers).



Note: Ratio value higher than 1 means that internal sources of information were used more frequently than external sources.

Figure 7. Ratio number of sources of information by internal to external sources based on respondents' length of education.



Note: Ratio value higher than 1 means that internal sources of information were used more frequent than external sources.

Figure 8. Ratio number of sources of information by internal to external sources across different ethnicities

3.2.2 Sources of agricultural information

Agricultural information was mostly obtained from the same sources as general information, that is, farmers inside the village, extension agents, family, farmers from outside the village, opinion leaders, mass media, projects and NGOs or students. Additionally, own experiments also become source of agricultural information. Respondents reported that they most frequently searched for information on 1) cultivation and domestication of important crops; 2) prices of marketable agricultural products; 3) types of new agricultural commodities; 4) good agricultural management practices to increase production; 5) new technology for garden maintenance (including fertilizing); 6) technologies for pest and diseases management; and 7) cacao side-grafting technique.

Based on the discussion with respondents in South Sulawesi, reliable and accessible sources of agricultural information were extension agents, farmers from the same village, opinion leaders, family, mass media, farmers from other villages, own experiments, NGOs/students, and projects, in descending order of magnitude (Figure 9). In Southeast Sulawesi, which had limited visits by extension agents, farmers from the same village were considered the most reliable and accessible sources of agricultural information. Poor road conditions and inaccessibility of villages limited visits by extension agents in Southeast Sulawesi.

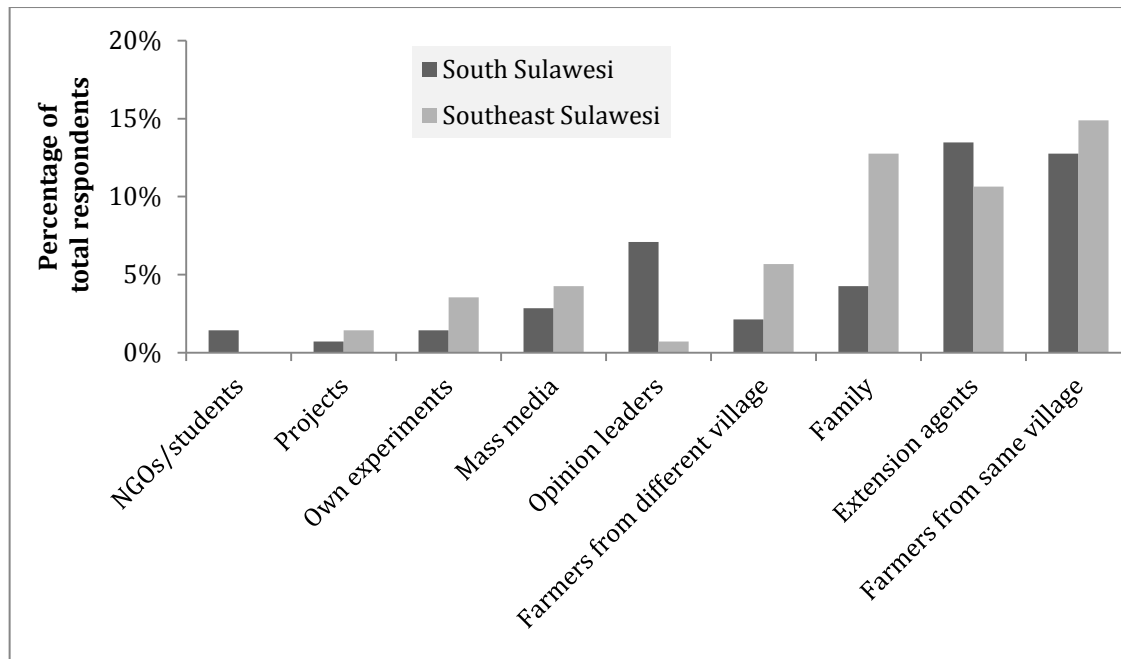


Figure 9. Respondents' perspectives on the most reliable and accessible sources of agricultural information in South and Southeast Sulawesi provinces

3.2.3 Barriers to acquiring new information

Based on the respondents' perspectives, barriers to acquiring new information were 1) location of the village (level of isolation); 2) limited media for communication between villagers; 3) limited support from local governments in providing or improving community access to information; 4) never invited to extension services' events; 5) rarely met extension agents; and 6) illiterate or not able to speak Indonesian (Figure 10). In Southeast Sulawesi, villages located far from the district capital rarely received visits from extension agents owing to poor road accessibility. Frequency of extension agents' visits tended to decrease with distance of the village from the district capital, meaning that villages far from the capital received less visits compared to those nearer.

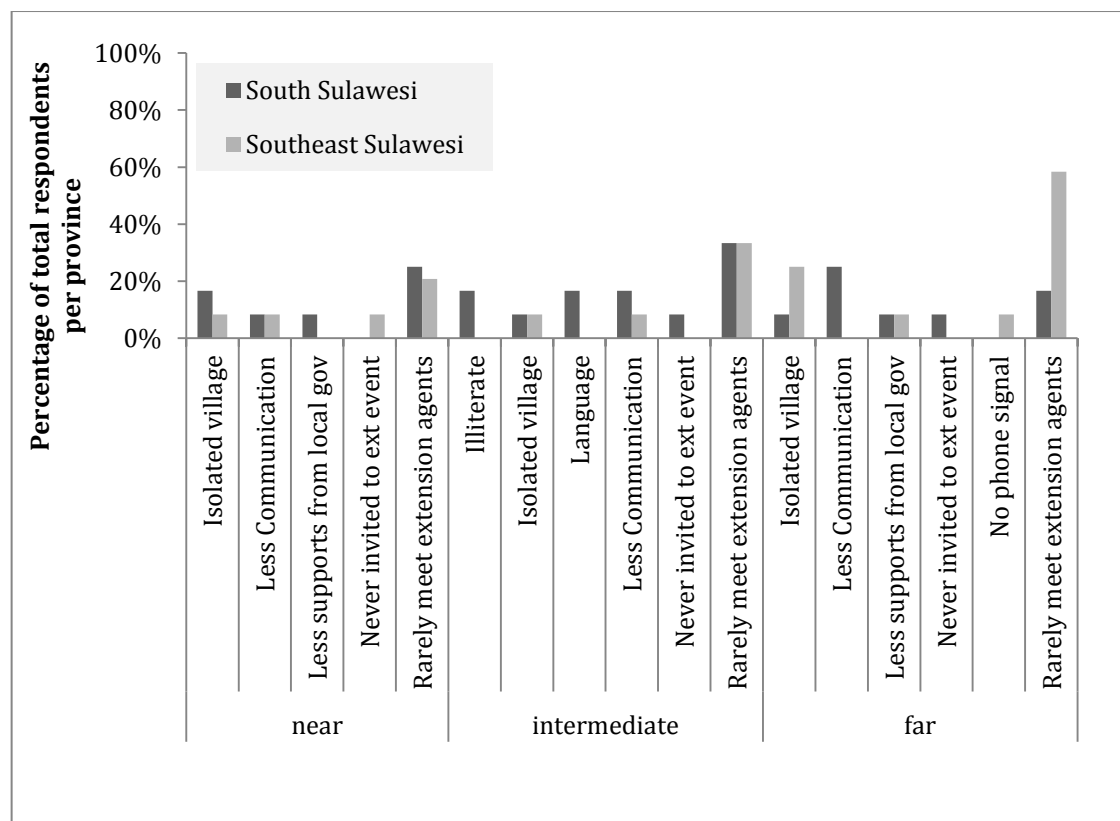
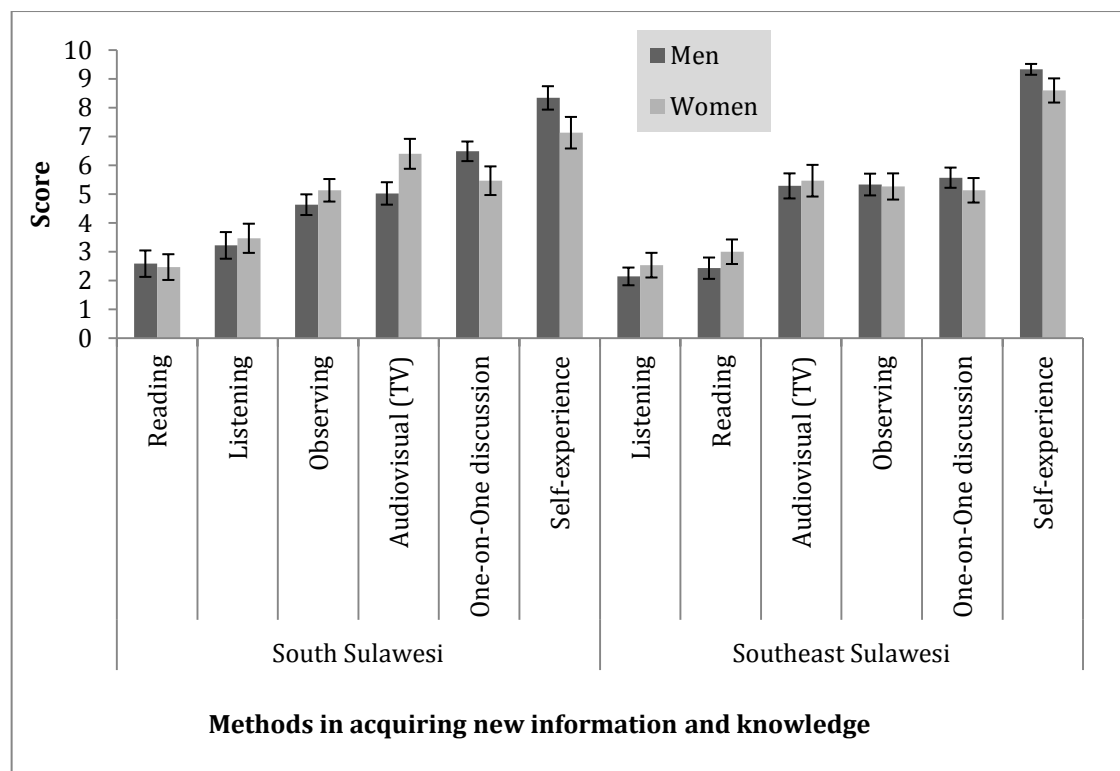


Figure 10. Barriers to acquiring new information by village category based on distance to district capital (near, intermediate, far) in South and Southeast Sulawesi provinces

3.2.4 Preferred communication methods for acquiring new information

During the survey, we set out to identify respondents' preferences for the methods of acquiring new information by asking a pair-wise comparison of six possible methods, that is, reading, listening, observing, audiovisual (for example, television), one-on-one discussion and practice. We gave a score of 1 to the preferred method. Subsequently, the scores of each method were summed and compared by averaging the results and calculating standard errors.

The results showed no significant difference between provinces (Figure 11), however, in South Sulawesi reading was least preferred owing to a higher number of illiterate respondents. Reading was only preferred by respondents with a level of formal education above high school, while listening was more preferred by respondents with levels of education at elementary school and below. In both provinces, when comparing genders, women tended to prefer listening, observing and watching television while men tended to prefer one-on-one discussions and self-experience for acquiring new information.



Note: the error bars are for the standard errors of mean.

Figure 11. Communication methods used in acquiring new knowledge, by gender, in South and Southeast Sulawesi provinces

3.3 Mass media

3.3.1 Most accessible communications media

In both provinces, mobile phones were the most accessible communications media, owned by more than 80% of total respondents. Television, radio and DVD players were the next three most accessible, respectively. Between genders, there was no significant difference in their preferences for most communications media (Figure 12). Landline telephones and computers were the least accessible communications media; only a limited number of respondents owned these devices. There was no significant difference of the ranking of most accessible communications media between village categories, genders and provinces. Only magazines and newspapers were accessed more often by men than women because usually these media were available in the village or sub-district offices, which were attended by men for meetings.

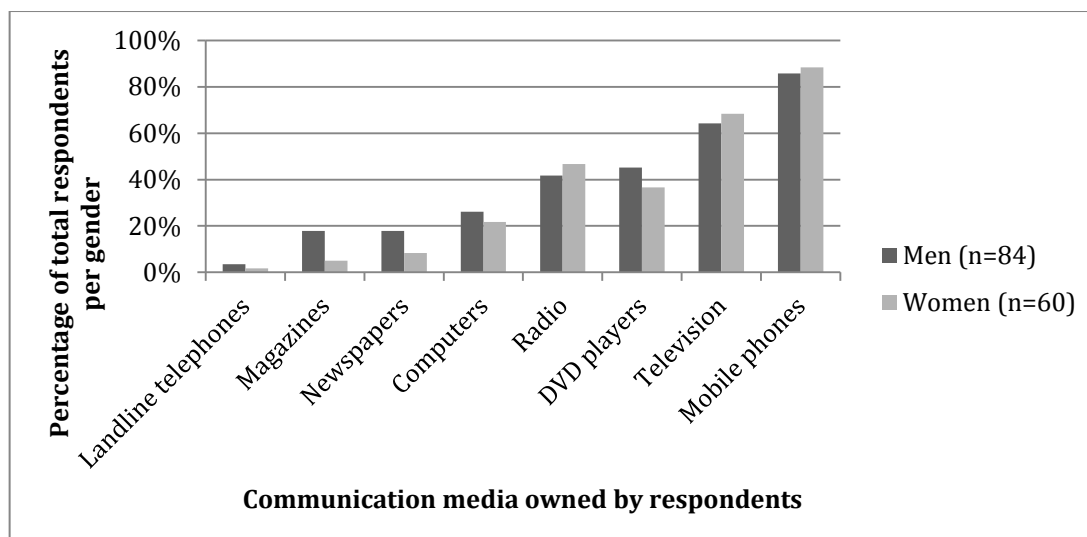


Figure 12. Communications media owned by respondents in South and Southeast Sulawesi provinces

3.3.2 Television and radio

Based on discussions with respondents in both provinces, television and radio were the two media that had the highest potential as channels for disseminating information about innovations. Thus, we explored further details of respondents' preferences for television and radio; the responses varied between provinces (Figure 13). Respondents identified Indosiar as their most-watched television station in South Sulawesi and tvOne in Southeast Sulawesi. For radio, Campaga Asri and Pantai Selatan were the preferred local radio stations in South Sulawesi while in Southeast Sulawesi respondents chose Radio Republik Indonesia (RRI), the national station. Generally, respondents watched television or listened to radio more often at night (Figure 14.)

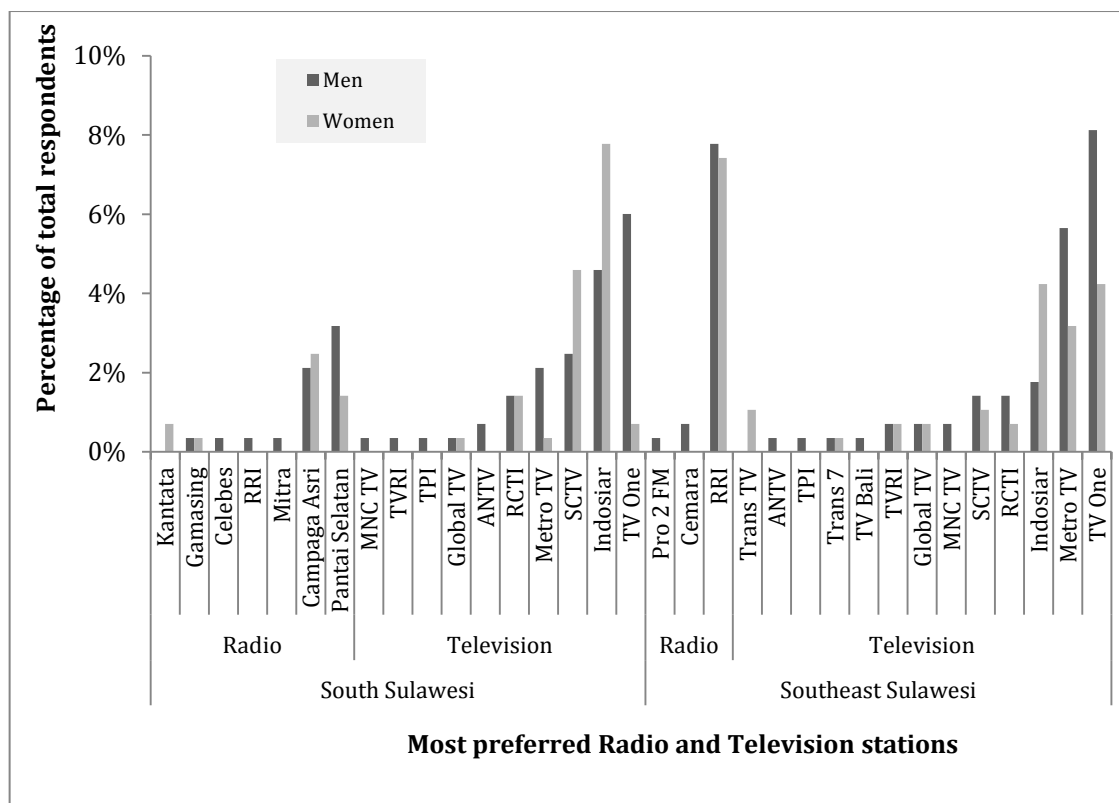


Figure 13. Preferred radio and television stations in South and Southeast Sulawesi provinces

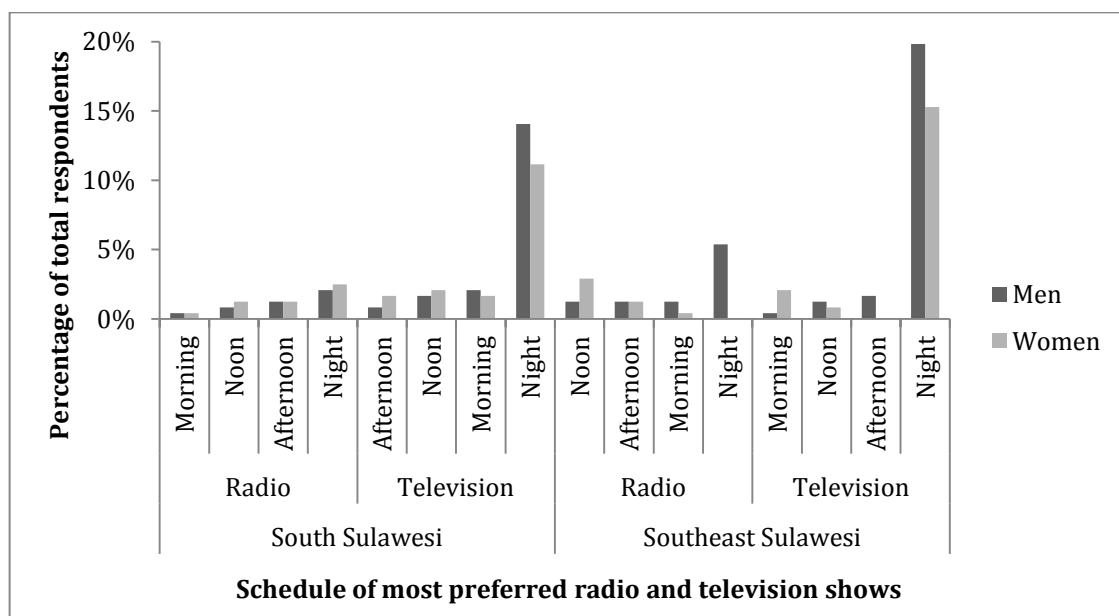


Figure 14. Schedule of preferred radio and television shows in South and Southeast Sulawesi provinces

3.4 Personal contacts

At the study sites, new agroforestry technologies that were adopted by farmers over the past 10 years were those related to 1) cultivating tree species (28.2%); 2) producing tree seedlings (12.4%); 3) vegetative propagation (10.9%); 4) effectively applying fertilizer (5.0%); 5) using innovative agricultural equipment to support better production (2.6%).

Those new agroforestry technologies were introduced through various channels. Personal contacts or face-to-face communication was one of the channels used by farmers for obtaining new information. The people who played a role in disseminating innovations via personal contacts varied between areas. In South Sulawesi, the disseminators were opinion leaders (22%) followed by government officers (21%), farmers (18%), the private sector (12%), extension agents (10%), traders (9%), farmers' groups (4%), staff of agroforestry projects (2%) and family (2%). In Southeast Sulawesi, staff of agroforestry projects (37%) played the major role in the dissemination of agroforestry innovations, followed by farmers (27%), family (12%), government officers (12%), opinion leaders (8%), and the private sector (4%). Thus, leading farmers and opinion leaders' roles in disseminating agroforestry innovations was more important in South Sulawesi than in Southeast Sulawesi while staff of agroforestry projects were more important disseminators in Southeast Sulawesi than in South Sulawesi.

In both provinces, farmers and other community members frequently consulted local opinion leaders or successful farmers for solutions to agricultural issues. Common types of information sought by farmers from opinion leaders included agronomy in general (30%), pests and diseases handling (28%), availability of agricultural aids (aids for planting material or fertilizers) (9%), new varieties/species/commodities (9%), assistance for farmers' groups and agricultural production aids (7%), vegetative propagation (5%), market information (4%), times for planting (4%), fertilizing and nurseries (2%), and agricultural extension services (2%) (Figure 15). To answer the questions, opinion leaders updated their agricultural knowledge by visiting government offices or engaging in self-learning at least once a week. Self-learning included one-on-one discussions with experts or other knowledgeable people, watching specific TV shows, and reading newspapers.

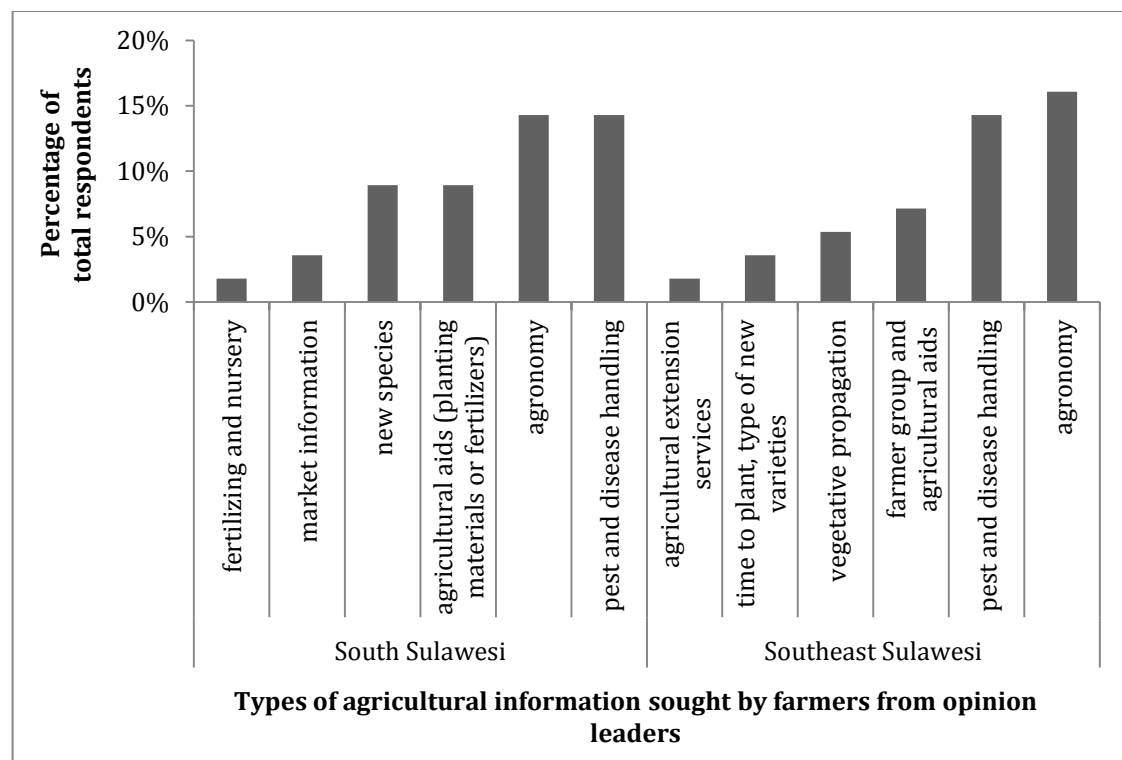


Figure 15. Types of agricultural information sought by farmers from opinion leaders

3.5 Formal extension services

3.5.1 General extension services

In the past 5 years, 75% of respondents received extension services on general topics, with men (46%) receiving more than women (29%) (Figure 16). In both provinces, agriculture and health were the two main topics for extension. Respondents felt that by attending extension events they received new knowledge, which was their main motivation to attend. Afterwards, respondents exchanged their knowledge with other people.

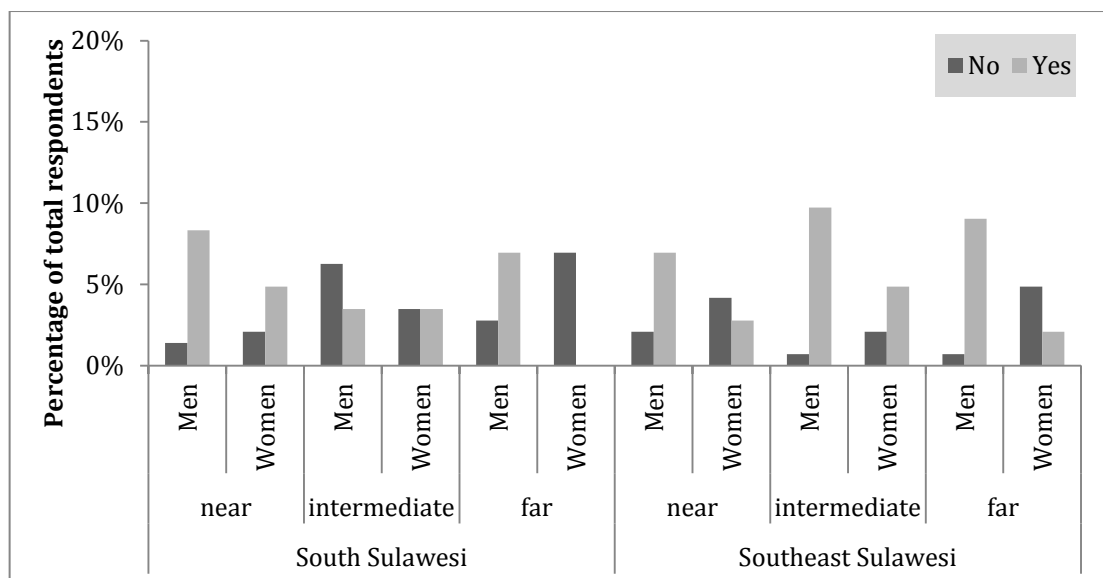


Figure 16. Respondents who received extension services in the past 5 years in South and Southeast Sulawesi

Sixty-three percent (63%) of total respondents attended agricultural extension events conducted both by government and other extension agents: 27% in South Sulawesi and 36% in Southeast Sulawesi. In general, respondents who attended agricultural extension events were 45% men and 18% women. Low female attendance was due to the distance of villages from the district capital where events were held. In South Sulawesi, where the villages were located far from the district capital, the attendance of women at agricultural extension events was almost zero.

3.5.2 Preferences for agricultural extension methods

The study identified two types of common agricultural extension methods in both provinces: 1) discussion; and 2) practice. We asked respondents to select the most effective and preferred. In South Sulawesi, farmers mostly preferred discussions whereas in Southeast Sulawesi farmers tended to prefer practice (Figure 17).

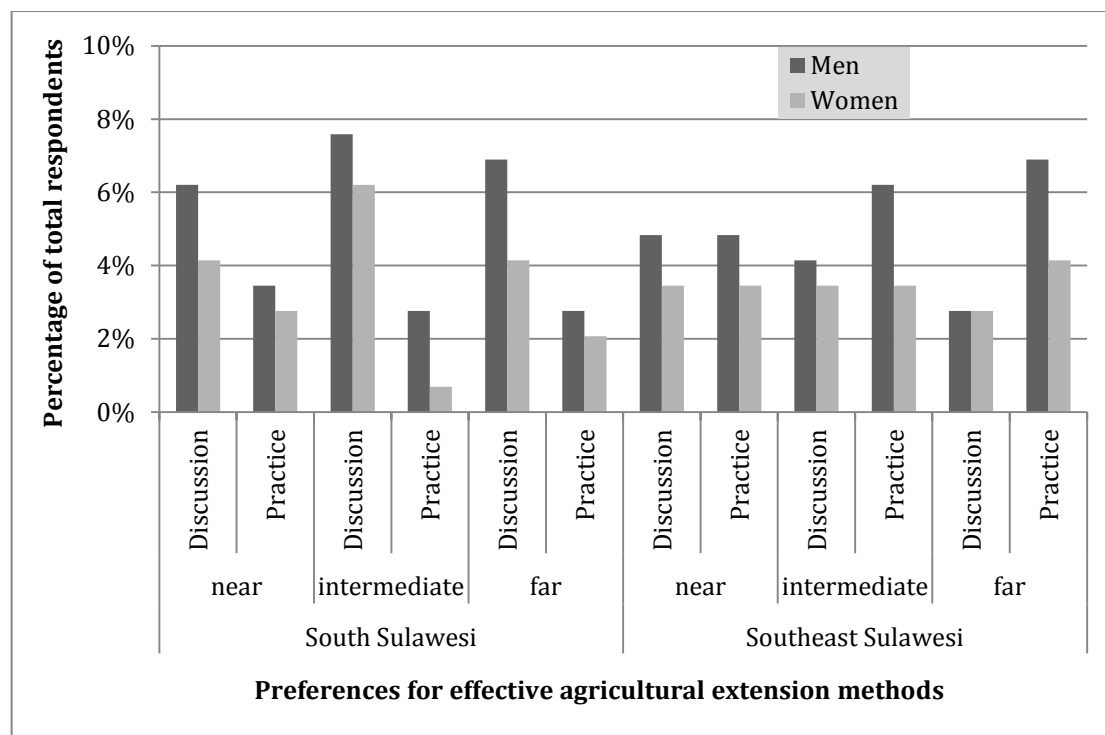


Figure 17. Preferences for effective agricultural extension methods based on respondents' perceptions by gender (men, women) and category of village (near, intermediate, far) in South and Southeast Sulawesi provinces

Preferences were not significant between gender and village classes in each province. Between ethnicities in both South and Southeast Sulawesi there was no significant difference in respondents' preferences (Figure 18).

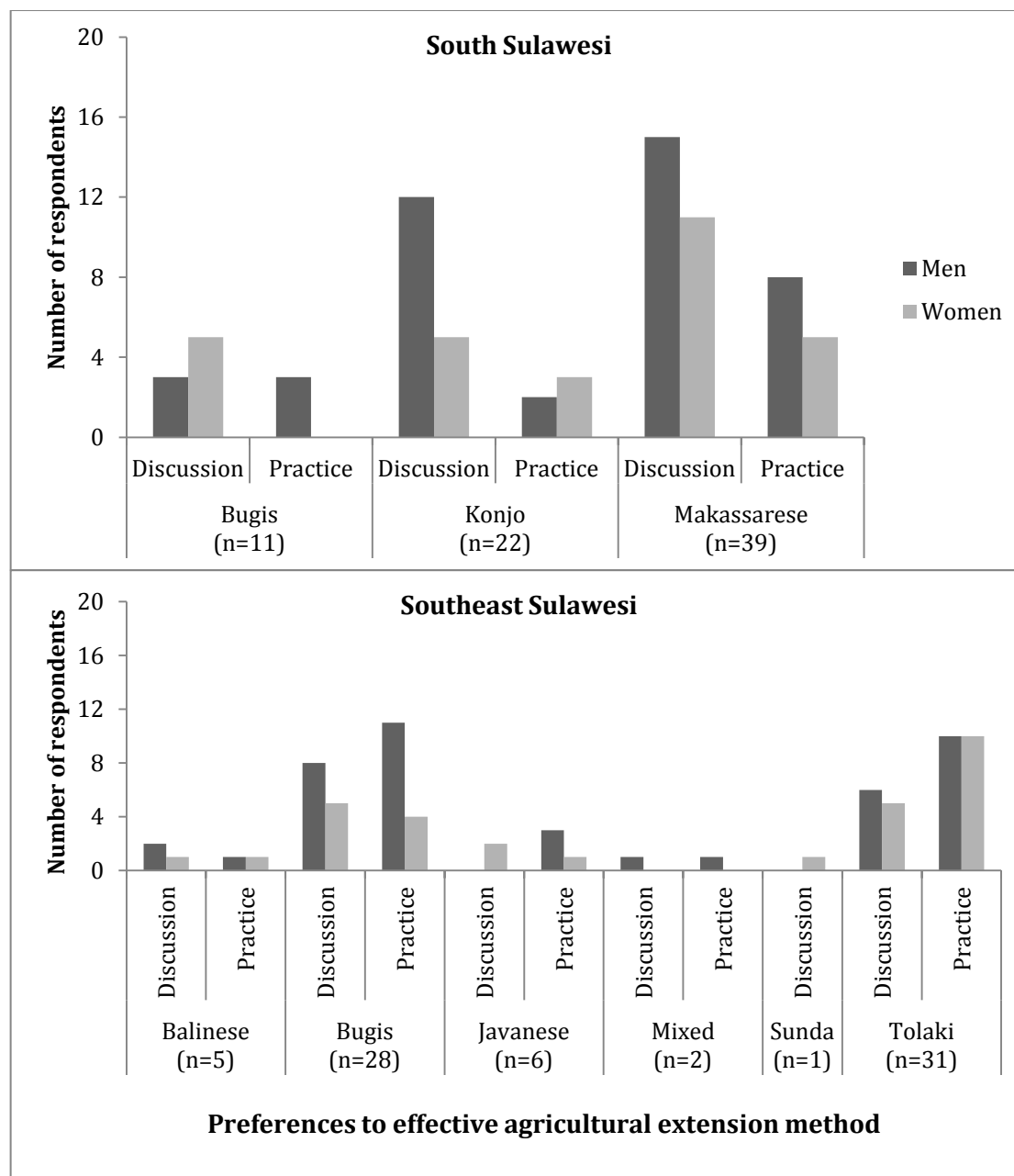


Figure 18. Preferences for effective agricultural extension methods based on respondents' perception by gender and by ethnicities in South and Southeast Sulawesi provinces

Based on respondents' perceptions, effective agricultural extension methods need to be supported by good disseminators or extension agents with the following characteristics: 1) able to provide information that is reliable, trustworthy, new, proven and easy to understand and apply; 2) open for discussion; 3) can meet on a daily basis or regularly; 4) have plenty of knowledge and experience; and 5) able to demonstrate examples.

3.5.3 Gender in agricultural extension services

Of the total of 60 female respondents, 37 attended agricultural extension events, with 62% in Southeast Sulawesi and 38% in South Sulawesi. There was no clear correlation between distances to the district capital with female participation in agricultural extension services in

South Sulawesi (Figure 19). In Southeast Sulawesi, distance of the village to the district capital affected women's attendance at extension events: the closer the village to the district capital, the more women participated. Villages located near the district capital have better access to extension events. In villages located far from the district capital, men had more opportunities for attending extension events than women. This was because it usually required driving by motorcycle to reach events in the capital.

The lower level of female participation in agricultural extension events in South Sulawesi was due to: 1) perceptions in the community that agriculture or agroforestry was a male domain; 2) organizers inviting only men to attend events; and 3) women's household responsibilities that limited their availability. Higher participation of women at extension events in Southeast Sulawesi was partially due to organizers requiring participants to be both men and women, that is, the organizers were formally inviting women.

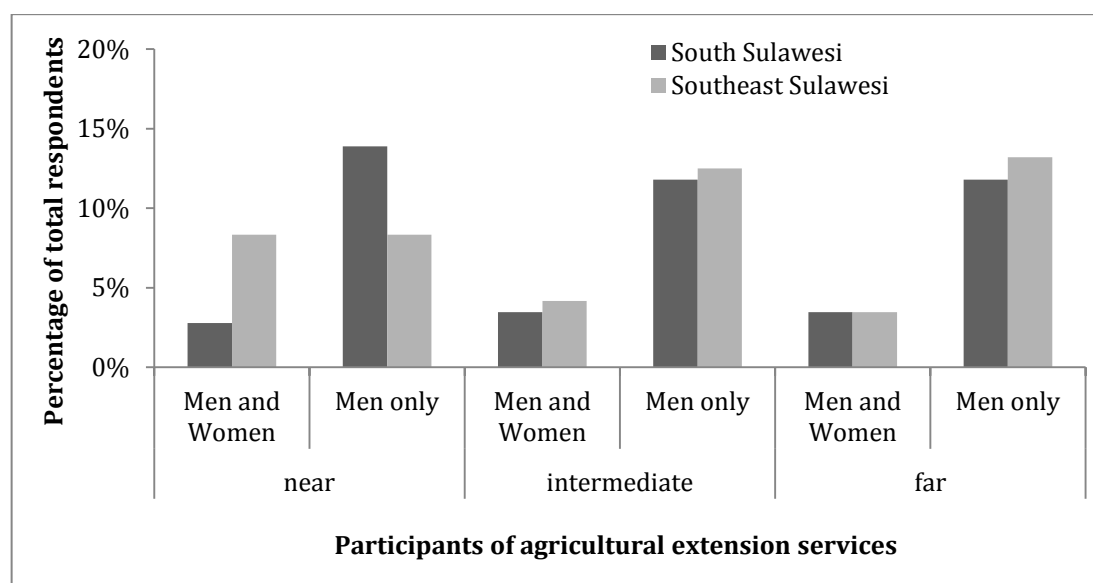


Figure 19. Participation by gender in agricultural extension events in South and Southeast Sulawesi

3.5.4 Agricultural extension communication media

Only 44.4% of the total respondents received extension material during extension activities they attended. Respondents in South Sulawesi received more extension media (23.6%) than those in Southeast Sulawesi (20.8%). In both provinces, men (32.6%) received more extension media than women (11.8%). This was related to more male participants attending agricultural extension events. Books or booklets were the most common extension materials given to farmers. The next most commonly received materials were leaflets, posters and DVDs, respectively.

Respondents appreciated the distribution of extension media, particularly, because it helped them gain new knowledge, could be re-read (or reviewed) if they forgot the details, and helped the extension process. However, only respondents with formal education longer than 9 years tended to maintain an organized collection of the material they received.

3.5 Social events

Besides receiving new information via mass media, opinion leaders or extension services, new information was also disseminated via community gatherings, such as ‘*arisan*’ (informal lottery), ‘*gotong royong*’ (mutual aid activities), religious events and community meetings. On a weekly basis, communities met through *arisan*, *gotong royong* and religious meetings. Monthly, they met in larger groups through community meetings, such as farmers’, youth and women’s groups. Occasionally, they also met at weddings or customary occasions where they could exchange information. Weddings were a key opportunity to meet people from other villages.

4. Conclusions

The study provided baseline data on how village communities obtain new information, particularly, information on agricultural and agroforestry innovations. In general, distance from the district capital did not significantly affect communities’ access to new information. The main factors limiting farmers’ access to information was poor infrastructure, which is a common occurrence in Southeast Sulawesi. Poor infrastructure limited extension agents’ ability to visit communities, which led to farmers playing a major role as agroforestry innovation disseminators. In locations where access to formal extension services was limited, personal contacts was the preferred information channel for disseminating agroforestry innovations. Between ethnicities, there was no clear difference regarding farmers’ preferences for information channels.

From a gender perspective, men tended to have better access to extension services than women. Women’s low access to extension services was different for specific reasons in each province. In Southeast Sulawesi, women had less access to extension services mainly because the activities were often conducted far from most villages. In South Sulawesi, the main reason limiting women’s access was the cultural perception that considered tree-garden management as a male domain.

For obtaining new information, women preferred to ask family members and, sometimes, opinion leaders while men tended to access more diverse information channels, that is, personal contacts, government extension services, mass media and social gatherings. Women tended to depend on sources of information from sources inside the village whereas men more frequently obtained information from outside the village.

In South Sulawesi, language was a barrier in disseminating agroforestry innovations, particularly, for farmers with elementary school education and below. Farmers who could not speak fluent Indonesian tended to obtain new information from their peers and family. Thus, expert farmers, opinion leaders or extension officers who could speak the local language were more effective disseminators for farmers who only spoke the local language.

There are several implications from this study’s findings in disseminating agroforestry innovations developed through the AgFor project in South and Southeast Sulawesi provinces.

- 1) Farmer's access to information in both provinces needs to be improved by, first, identifying the information needs of each village through focus-group discussions. Needs should be identified before project activities are implemented with farmers. The role of existing information channels (personal contacts, mass media, extension services) for disseminating agroforestry can be enhanced by improving the capacity, and access to information, of important information disseminators in each village. In South Sulawesi, opinion leaders and expert farmers were important for disseminating agroforestry innovation while in Southeast Sulawesi staff of agroforestry projects were the more important agroforestry disseminators.
- 2) Extension methods used by AgFor to disseminate innovations in both provinces should be a combination of discussion and practice, with a greater emphasis on practice in Southeast Sulawesi and greater emphasis on discussion in South Sulawesi. Farmers' field schools are a type of extension method that can facilitate the application of both discussion and practice for disseminating agroforestry innovations. Besides farmers' field schools, biweekly visits by project staff should be conducted via either formal or informal events, such as during gotong royong or arisan. In areas where language is a barrier, such as in South Sulawesi, involving farmers as extension agents is recommended.
- 3) Communication media that have the potential to be used by AgFor are printed and radio. Radio and television are potential mass media for spreading information in both provinces, however, radio is more cost effective and feasible owing to the high cost of engaging in television programming. Any kind of print media is important to develop because there are still limited amounts and types of information about agricultural innovations given to farmers. When developing print media for farmers, we advise using more illustrations because reading was less preferred by farmers when learning new technologies. Reading was only preferred by respondents with education levels of high school and above. At AgFor sites, most villagers have education levels limited to elementary school or below.
- 4) Low attendance by women at agricultural extension events can be countered by formally inviting more women to attend. Holding events in villages will enhance women's opportunity to participate. In both provinces, women preferred audiovisual for learning new things, thus, AgFor should produce more audiovisual products to enhance women's access to agroforestry innovations. Equal distribution to women and men needs to be considered when distributing media.

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