

# THE INFLUENCE OF MASS MEDIA ON THE ACCESS AND UTILIZATION OF AGRICULTURAL INFORMATION

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**Abstract:** A study was carried out among settler farmers in Trithala Block, Palakkad District, Kerala, India who came from Malappuram for cheaper farm land. A combination of purposive, multistage and proportionate random sampling was used to get stratified 250 new and previous settlers for the pre-tested structured interview from the three selected panchayats. Secondary data were collected through related authentic documents and reports. Qualitative data through focus group discussion were used to supplement quantitative data. Data collected were subjected to descriptive analysis using Statistical Package for Social Sciences version 15. The major sources of information for farmers were predominantly mass media, followed by previous settlers and development agents. Farmers continue to rely more on radio, TV and advanced ICTs such as cell phone SMS, internet and email more than printed materials to access agricultural information. Preferred media contributed significantly to the farmer's use of agricultural information. In the absence of responsive extension service that understands and addresses interests of various groups of farmers, the purpose of food security and fallow less land would not be fulfilled. Farmers who had access and use of information realized a significantly higher mean yield of major crops compared to the non-participants.

**Index Terms - Access, Utilization, Agricultural information, Mass media, Settlers.**

## I. INTRODUCTION

In the dynamic and changing agricultural scenario, agricultural information plays a decisive role for the overall development of agriculture as well as improving the livelihoods of farmers. Agriculture information requirements are changing constantly which are primarily due to changing needs of agricultural activities and farmers increasing awareness. Farmers need a wide variety of information on various issues such as availability of new inputs, technology, disease outbreak, weather forecasts, market information and price information of both input and output for crop production and management, availability of agricultural support services or government schemes related to agriculture. Farmers access agriculture information from different sources and as per the needs and demand of farmer.

The previously settled farmers who have been living in the study area having red loam soil type and plain topography for more than 15 years, have enough know-how of their farming system. Malappuram district is known for majority of muslim population; who earn better living by moving at least a member of the family working in the middle east. Consequently, the land value increased enormously and hence people started migrating to the nearby Trithala Block of Palakkad District, Kerala, India in search of cheap farmland. However, the new settlers who came from the "Malappuram type" to "Palakkad plains" agro-ecology require tailored and intense provision of agricultural information compared to the previous settlers or natives. The Malappuram type agro-ecology is with less extensive valleys, hills with tabletops and steep slopes having laterite soils. All extension actors in the study area like public extension services of the Kerala Agricultural University (Krishi Vjnan Kendra, Pattambi), State Department of Agriculture Development and Farmers Welfare (Krishi Bhavan at Panchayat level); NGOs and other development agencies are involved in agricultural development. However, new and previous settlers were provided with similar agricultural information while following the same extension approach. Nevertheless, there exist the need to understand the constraints and factors influencing the level of the access to and utilization of agricultural information and understand the gaps to take remedial action. It is important for policy makers to understand whether the existing agricultural information services, beside the local knowledge flows, assure the desired food security and fallow less land strategies and to make useful policy changes to facilitate meaningful interventions in such areas.

Generally, except from seasonal extension orientation and mass media information access, in all cases the extension service, the support of Development Agents and provision of agricultural information biased towards the previous settler side, so that the new settler farmer's agricultural information access was very limited. Within this limited agricultural information provision, especially the new settlers will not be efficiently familiarized and productive in the new agro ecology. Within this limited agricultural information access and undermining their role, agricultural development will not be successful.

To analyze the extension service and farmers' attachment in depth, the respondent farmers were asked to evaluate the responsiveness and potential of extension service addressing their problems. This survey result indicates that the majority of respondents laid on 'no responsive' and 'I didn't ask support' or 'no opinion' responses. This tells us the current extension system has poor linkage with the farmers and the farmers did not have interest to work with the service provider. If the extension service lacks information to respond timely and solve the farmer's problem, it will be expected to provide from wherever it is available.

Therefore, in the absence of appropriate responsive extension service, it cannot be expected to provide different, relevant and utilizable agricultural information to the farmers and the farmers will not be encouraged to get and utilize agricultural information from extension service.

Regarding the potential of extension service addressing farmers problem, this survey result revealed that the majority of respondents lay on 'not addressing our interest' and 'I did not asked support to evaluate this issue' responses. This tells us that current extension system did not working based on the farmer's problems and the farmers did not build confidence as the extension service is an agricultural solution provider, so that the majority of the farmers did not ask support from the service provider. In the presence of this entire problem, the Kerala Government is still following top down planning approach and the farmers did not involve in the problem identification and planning process. Therefore, in the absence of addressing farmer's interest and demand driven extension service, the farmers may not be interested to search and receive agricultural information from the extension service and consequently utilization of agricultural information cannot be expected. Variation in access to and utilization of agricultural information among the sample households was thus assessed in the present study, in view of various factors theoretically known to influence farmer's access to and utilization of scientific agricultural information.

## II. MATERIALS AND METHODS

The use of sources of communication like television, radio and newspapers have limited effectiveness [1,2] and these are unable to meet the growing information needs of farmers, relating to crop and technology choice, processing, utilization, storage and marketing of their produce. In the last decade with the increasing penetration of mobile phones even in rural area, various mobile phone-based information delivery models for agricultural sector have developed [3]. Several authors [4-8] describe the benefits of ICT transmitted information and knowledge on the lives of the poor, on farmer and fishermen's efficiency, on women's empowerment and on economic growth, but empirical evidence is still missing.

Ogutu et al.'s [9] study finds that participation in the ICT-based market information service has a positive and significant effect on the usage of purchased seed, fertilizer, labour productivity and land productivity, but has a negative and significant impact on the use of hired family and total labour. Kirui's [10] study specifically found that the largest proportion of money received (32%) via mobile was used on agricultural related purposes (purchase of seed, fertilizer for planting and topdressing, farm equipment/implements, leasing of land for farming and paying farm workers). Farmers have another advantage of mobile phones they do not go to market but directly communicate and ask the price of their production to save their money, time and energy [11].

A two stage random sampling technique was employed to identify panchayats and then respondents. In the first stage of sampling, three panchayats were selected (Trithala, Anakkara and Kappur) purposively from seven settlement panchayats of Trithala block of Palakkad district of Kerala, India and the respondents were stratified into new settler and previous settler categories. Equal numbers of sample respondents were allocated for each category (125 each) and Fifteen percent of respondents were ensured female-headed households. In the second stage of sampling, probability proportional to size sampling technique was applied to each stratum and 250 sample households drawn from these strata based on the stratum proportion. Farmers were interviewed using pre-tested and structured interview schedule.

The primary data sources were both new and previous settler farmers, as well as Development Agents and subject matter specialists on various aspects of access and utilization of agricultural information of farmers. Secondary data sources were documents and reports of Development Agents, Krishi Vijnan Kendra, Krishi Bhavan, and other related institutions. The sources of qualitative data were previous and new settler farmers through focus group discussion, key 250 informant interviews and personal observations. The qualitative data have served as a supplementary to quantitative data. Data were analyzed using descriptive statistical tools such as mean, percentage, ranking,  $\chi^2$ -test [12] based on the level of measurement to analyse the influence of several independent variables on access to and utilization of agricultural information through SPSS 15.

## III. RESULTS AND DISCUSSION

### 3.1 Level of agricultural information access

The respondent farmer's overall level of agricultural information access from extension service was identified based on the sum of frequencies of their access to agricultural information. The access to agricultural information were categorized into four groups known as 'no access, low access, medium access and high access'. Those 39 farmers (15.6%) having zero agricultural information access were categorized as 'no access' farmers. The survey result reveals the following different level of agricultural information access and the categorization of different level of agricultural information access values are presented as follows in Table 1.

Table 1. Distribution of respondents based on access to agricultural information categories

Access level	Settlement Category					
	New settlers (N = 125)		Previous settlers (N = 125)		Total (N = 250)	
	No.	%	No.	%	No.	%
No Access	23	18.4	16	12.8	39	15.6
Low Access	102	81.6	85	68	187	74.8
Medium Access	0	0	24	19.2	24	9.6
High Access	0	0	0	0	0	0
Total	125	100	125	100	250	100

From total sample households, 0 (0%) were with high access, 24 (9.6%) were in medium access and 187 (74.8%) were in low access (Table 1). The levels of agricultural production information access of new and previous settlers were also found in different level. Higher proportion of new settlers were found without agricultural information access from extension service. The remaining new settlers were found at low information access level. But, the majority of the previous settlers were found towards the low and medium information access level than no access. However, both of the settler categories did not have 'High accesses' to agricultural information. Generally the agricultural information access of both settlers were limited, and especially the new settler's agricultural information access was extremely limited than the previous settlers.

Social networks play an important role in information transfer. Farmers observe and learn from others in their network about the suitability and profitability of new agricultural production methods. Such participation provides them with greater access to information about agricultural innovations and stimulates information exchange with others [13]. The finding from the present study reveals that, for all farmers particularly for new settlers, the contribution of agricultural extension in information provision and human resource development is not attractive.

### 3.2 Level of agricultural information utilization

The same procedure as adopted for access of information was applied to utilization of agricultural information also. From 250 sample respondents having access to information, 10 farmers (4%) not utilized the agricultural information accessed from all sources and methods. Based on the operational definition of agricultural information utilization, these farmers are excluded from utilization analysis and the remaining 240 farmers are considered throughout this section. The respondent farmer categories were identified based on the sum of frequencies of utilization from their accessible agricultural information. Those farmers having zero utilization of agricultural information were categorized as 'Not utilized' farmers. The respondent households categorized into high utilization, medium utilization and low utilization level. Based on this method, the survey categorizations of different levels of agricultural information utilization values are presented as follows in Table 2.

Table 2. Distribution of respondents based on agricultural information utilization categories

Utilization level	Settlement Category					
	New settlers (N = 125)		Previous settlers (N = 125)		Total (N = 250)	
	No.	%	No.	%	No.	%
No Utilization	6	4.8	4	3.2	10	4
Low Utilization	119	95.2	98	78.4	217	86.8
Medium Utilization	0	0	17	13.6	17	6.8
High Utilization	0	0	6	4.8	6	2.4
Total	125	100	125	100	250	100

In the case of utilization of the obtained information, among the total sample respondents, 6 (2.4%) were in high utilization, 17 (6.8%) were in medium utilization and 217 (86.8%) were in low utilization categories of households. The utilization levels of agricultural production information in new and previous settlers were also found in different level. The new settlers did not achieve both medium and high level of agricultural information utilization. The maximum information utilization score of new and previous settlers were 119 (95.2%) and 121 (96.8%). More proportion of previous settlers are found in low, medium and high level of utilization, but the new settler's proportions were higher in 'no utilization' and the rest recorded under 'low utilization' categories.

Farmers' decision to adopt a new agricultural technology in preference to old technologies depends on factors such as access to institutional services and in-put supply markets [14]. Agricultural extension is considered as a process of bringing desirable change in the behaviour of the farmers to adopt innovations relating to agriculture in such a way that they are clear and convinced of their utility [14]. From the results of the current study, we can understand that both settlement categories, especially most of the new settlers had limited utilization of agricultural information. In the group discussions, participants of new settler farmers clarified that "the provision of credit from formal institution" was biased to the previous settlers and they are resource poor to utilize the different new and native agricultural technologies.

### 3.3 Information access by local information network

New settlers are more or less practicing agricultural activities and producing crops different in several respects from those in the previous agro ecological conditions prevailed in their former habitat. The local information exchange through extension service, farmer's attachment in depth with the experienced previous settlers and mass media information access is analysed in the production process after arriving in the study area. The respondent new settler farmers were asked to evaluate the responsiveness and potential of extension service and major agricultural information access in addressing their problems in respect of three major crops of the area viz., banana, paddy and vegetables and the result presented as follows in Table 3.

Table 3. New settler's major agricultural information sources in major crops

Information sources	Production activities requiring agricultural information							
	Banana		Paddy		Vegetable		Total	
	No.	%	No.	%	No.	%	No.	%
Mass media	48	38.4	48	38.4	48	38.4	144	38.4
Previous settler	42	33.6	43	34.4	41	32.8	126	33.6
Development agents	30	24	29	23.2	30	24	89	23.7
Own experience	5	4	5	4	6	4.8	16	4.3
Total	125	100	125	100	125	100	375	100

As indicated in Table 3, among the new settlers, 38.4%, 33.6% and 23.7% of respondents explained that the mass media, previous settler and the development agents were their agricultural information sources respectively. Regarding the accessible agricultural information, except 4.3% respondents, the majority of the farmers accessed banana, paddy and vegetable agricultural information with different degree of access. The new settlers are highly depending on the mass media and local information exchange system than the information provision of extension service and own experience. The survey result reveals that, all respondents particularly the new settlers have limited agricultural information access from different methods of agricultural extension, own experience and other major information sources. There was no significant difference between the information accesses, in respect of the production of major crops in the study area.

Rogers [15] indicated that the core of technology diffusion consists of interpersonal network of information exchange between those individuals who have already adopted innovation and those who are then influenced to adopt. Together, they assess the worthiness of technologies and suitability to their farming conditions [16]. Sudath [17] noted that agricultural innovation diffusion is largely affected by information available on the innovation. The organisations providing information mostly to cocoa farmers in Nigeria are radio stations, television stations and Non-governmental organisations [18]. The rapid spread of mobile phone coverage in developing countries provides a unique opportunity to facilitate technological adoption via information and communication technology based extension programmes [2]. Simultaneous selection of more than one information sources is common for obtaining information about precision farming in cotton [19]. Farmers use multiple information sources, that may be complementary or substitutes to each other and this implies that any single source does not satisfy all information needs of the farmer [1]. Therefore, the present results suggest that the farmers can access agricultural information, if they are exposed to well-organized agricultural information.

### 3.4 Information sharing by local information network

To examine the participation of individuals in information communication among the community, all respondents were asked to explain their involvement in the dissemination of the obtained information in local information exchange through other farmers, neighbours, friends etc. The result shows that, 87.6% of respondents were participated in local information exchange during different meeting, social gathering time and religious occasions such as in market places, committee meetings, public meetings, festivals, marriage functions etc. (Table 4). There was no significant difference between new settlers and previous settlers with respect to the information sharing by local information network. Therefore, these results assure that, the local information exchange network plays an important role in the dissemination of agricultural information.

Table 4. Participation of all respondents in local information exchange

Participation in local information exchange	New settlers (N = 125)		Previous settlers (N = 125)		Total (N = 250)	
	No.	%	No.	%	No.	%
Yes	108	86.4	111	88.8	219	87.6
No	17	13.6	14	11.2	31	12.4
Total	125	100	125	100	125	100

Katungi *et al.* [20] indicated that social capital is measured by different indicators, each capturing a different aspect of social interaction, such as the size of the social network, the frequency of interaction in social institutions and civic engagement. Neelameghan [21] pointed out that one of the prerequisites for information use is its accessibility, because farmer's mobility may be limited and even basic access to public markets may be limited which constitutes an important place where agricultural information is exchanged [20]. It could be noticed in the present survey that the farmers bound as a group for agricultural information sharing and utilization seem to exchange more information and those having more farming inputs also participate more in local information exchange. Farmers with large farms are likely to be better informed, and more keen in searching for information on improved technologies [22]. Farmer groups make information easily accessible to their members than individual farmers not joined in any farmer groups [23].

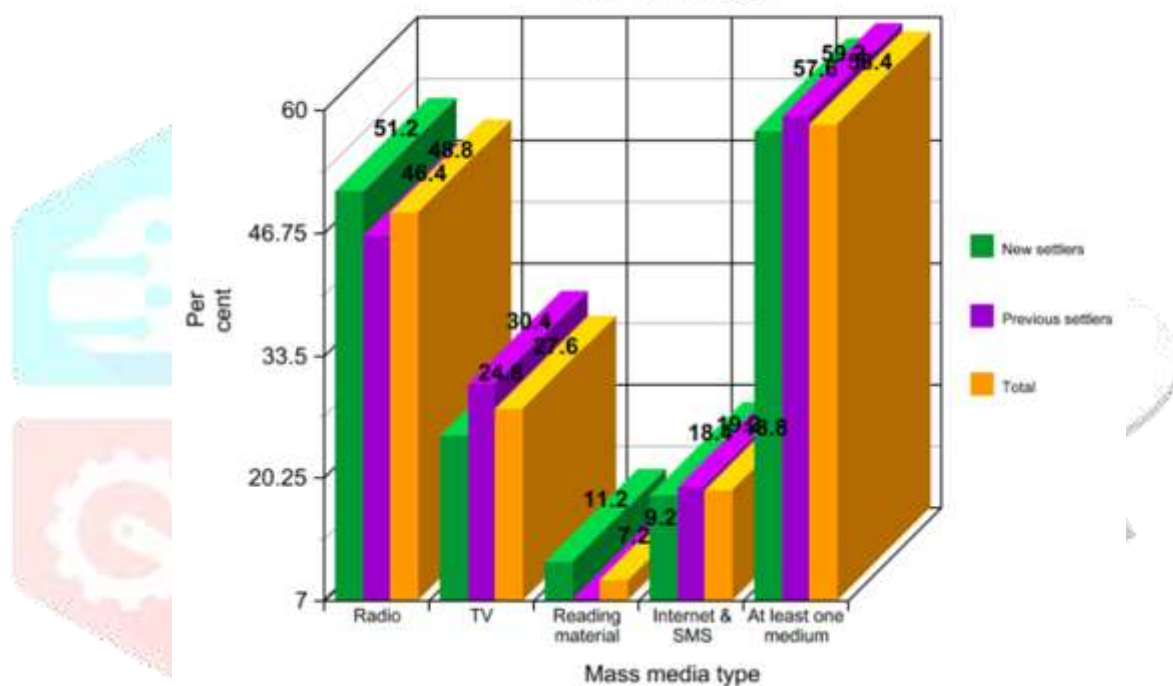
New settler farmers, having interest in internet usage (face book usage and email) and mobile phone SMS were motivated to form coherent groups having 5-6 members in order to improve their access and utilization of agricultural information. The farmers having more farmland were having the maximum interest to join in these groups. These groups served as focus groups also for data

collection in respect of the present study. Relevant and timely information, organized according to local language and format understood by farmers received more attention than the information and messages in simple English.

### 3.5 Agricultural information exposure of settler farmers from mass media

Mass media includes electronic such as radio, television, internet, mobile phone etc. and print like newspapers, magazines, posters, extension brochures etc. Mass media play a great role in provision of information and creating awareness in shortest time possible over large area of coverage. As far as awareness is a prerequisite for behavioural change, its role cannot be underestimated. Furthermore, its influence can be expressed through other effects like enhancing favourable attitude and overall good perception about innovations. In the study area, almost all the respondents produce crops such as banana, paddy and vegetable. Some of the farmers can afford to purchase mass media. Radio and television are more appropriate for one-way communication, reaching many people quickly with simple ideas. Access to extension services is a key determinant in the adoption and use of improved technologies and farming practices. Therefore, the frequency of extension contact has an important role in the access to and utilization of agricultural information. By considering this, amongst different mass media such as radio, television, leaflets and newsletter (reading material), Short Message Service and internet contribute to the dissemination of agricultural information with different degrees. The information access of 125 each new and previous settler farmers from mass media is presented in Fig. 1.

Fig. 1 Agricultural information access from mass media based on settlement category



Out of the total respondents, 48.8%, 27.6%, 9.2% and 18.8% of farmers obtained information from radio, television, reading material, internet and SMS respectively. 58.4% settlers accessed at least one mass medium. The  $\chi^2$  values were not significant and registered 0.41, 0.52, 0.91, 0.69 and 0.26 for radio, television, reading material, internet & SMS and at least one medium respectively. It is worthy to note that the combined use of new media such as mobile phone SMS and internet to access agricultural information exceeded twice the usage of reading material. As the result reveals, most of respondents obtain information from radio, due to the high number of radio ownership. Regarding the information obtained from reading material, internet and SMS were in lower proportion, due to the poor availability level and poor know how of technical usage. Statistically, there was no significant difference in mass media access between settlement categories.

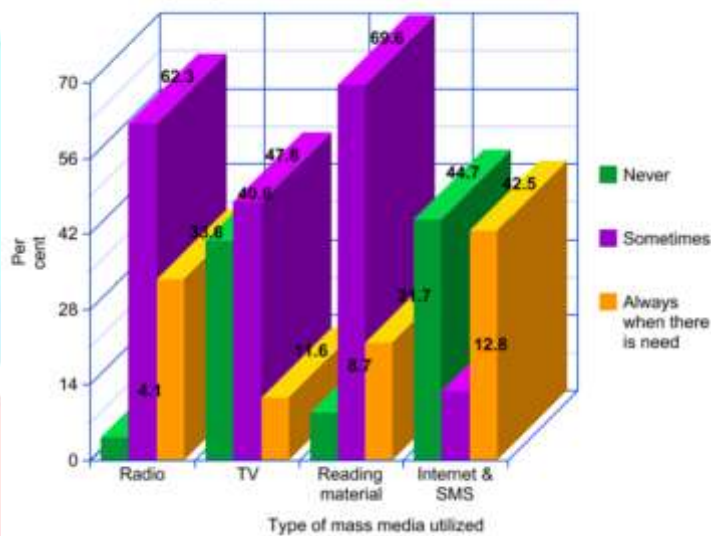
The knowledge and information needs, and information seeking patterns of farmers were location specific and the advancements in the ICTs is an opportunity to harness and utilize information and knowledge to improve productivity in agriculture [24]. Though a high level of ICT access is viewed as a basic human right [25], the level of access or skills varies widely among citizens. ICT generates satisfactory returns for productivity, yet its macro and micro level conditions are important [26]. According to Ribeiro *et al.* [27], socioeconomic level and socio-spatial location are determinant criteria for Internet access. Households with higher amounts of material resources (income) and intangible resources (education) are most likely to access opportunities offered by the Internet [28, 29]. High service costs and a lack of ICT skills are identified as major barriers to increased ICT use [30]. Effective utilization of ICT has potential to make the rural communities prosperous as it enables the dissemination of requisite information in user-friendly form, easy to access, cost-effective ways at the right time [31]. Internet and mobile phone SMS access are seen improved further, as noticed in the present study, when coherent groups of settler farmers are motivated through its technical aspects of usage by better extension approaches.

**3.6 Mass media utilization of agricultural information by settler farmers**

Among radio program information accessed respondents, 62.3% and 33.6% of respondents have utilized information in the frequency of sometimes and always when there is need, respectively (Fig. 2). However, the remaining 4.1% did not utilize the accessible information. Unsuitability of information to the prevailing agro-ecological condition and inability to consider the farmers experience were the major reasons explained by respondents. Regarding the utilization of agricultural information from television program, 47.8% and 11.6% of respondents utilized information in the frequency of sometimes and always when there is need, respectively. The remaining 40.6% did not utilize the accessible information. The major reasons for not utilizing the accessible television program are; it is not timely provided, it is difficult to implement information, unsuitability of information to the prevailing agro ecological condition, unsuitability to the farmer’s economic status and inability to consider the farmer’s experience.

From the accessible reading material information, 8.7% did not utilize the accessible information but the remaining 69.6% and 21.7% of respondents utilized information in the frequency of sometimes and always when there is need, respectively. Reasons for non-utilization are the information is not ideal and unsuitability of information to the prevailing agro-ecological condition. Even though the farmers explained these issues, their reading and understanding level also determine the information utilization. Among internet and mobile phone SMS information accessed respondents, 44.7% did not utilize the accessible information but the remaining 12.8% and 42.5% of respondents utilized information in the frequency of sometimes and always when there is need, respectively. Farmers explained that, information from internet and mobile phone SMS are difficult for implementation.

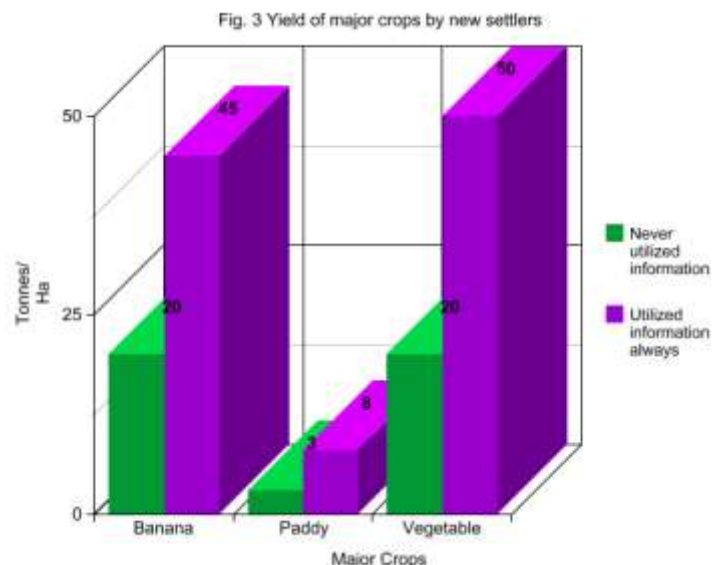
Fig. 2 Agricultural information utility level from mass media



Users of private-sector e-Choupal show significantly better decision-making aptitudes, as compared to non-users, on various agricultural practices across the agricultural supply chain, with prominence in production planning, post-harvest and marketing related decisions [32]. Information that is provided to farmers through the public-sector extension system largely concentrates on on-farm activities. e-Choupal initiative and various small-scale models have tried to provide farmers with information not only regarding on-farm production but also regarding prices and accessing markets. Knowledge sharing should go beyond the formal extension system and utilize the various information sources so that the knowledge and information required by the farmers to innovate can be provided and linkages developed [33]. It is evident that group participation positively influences the adoption of innovations. Group membership provides a social forum where farmers share experience and exchange information in innovation in the farming community. It is easier for extension assistance to reach widely dispersed settler farmers when they organize themselves properly into coherent groups.

**3.7 Agricultural production based on frequency of information utility by settlers**

From Fig. 1, it is evident that 42.4% (53 new settler farmers) respondents never accessed even a single medium for agricultural information with respect to their production of major crops such as banana, paddy and vegetable. Further, from Fig. 2, it is noticed that 11.2% (14 new settler farmers) never utilized agricultural information from mass media. The mean of realized yield of the new settler farmers cultivating the major crops in the study area such as banana (variety: Nendran), paddy (variety: Ponmani) and vegetable (Saubhagya variety of oriental pickling melon) are tabulated in tonnes per hectare as two separate groups based on the frequency of agricultural information utility. The results are compared and presented in Fig. 3.



Farmers who had access to agricultural information always through at least a medium realized a significantly higher mean yield for all the three major crops (125%, 167% and 150% increase for banana, paddy and vegetable respectively) compared to the non-participants who realized a mean yield of 20, 3 and 20 tonnes/ha for the above crops in succession. Thus, there existed an overall 147% higher productivity for the major crops in the study area cultivated by the new settler farmers, who utilized agricultural information from mass media always when there is need. This infers that access to agricultural information contributes to the increase in yields. TRFK [34] noted that utilization of relevant, accurate, timely and up-to-date information ensures increased production and productivity. The findings emphasize that relevant and timely information has to be organized according to language and format understood by farmers. The study emphasized the need for appropriate information to reach new settler farmers to facilitate increased yield.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the study, the following conclusions are made.

1. For all farmers particularly for new settler farmers, the contribution of agricultural extension in information provision and human resource development is not attractive and access is extremely limited.
2. Both new and previous settlement categories, especially most of the new settlers had limited utilization of agricultural information and higher proportions are found in 'no utilization' and the rest recorded under 'low utilization' categories.
3. The new settler farmers are highly depending on the mass media and local information exchange system than the information provision of extension service and own experience.
4. The local information exchange network plays an important role in the dissemination of agricultural information and the farmers bound, as a group for agricultural information sharing and utilization exchange more information like those having more farming inputs.
5. The combined use of new media such as mobile phone SMS, internet and e-mail to access agricultural information exceeded twice the usage of reading material.
6. 42.4% of new settlers never accessed even a single medium for agricultural information with respect to the production of major crops such as banana, paddy and vegetable.
7. 11.2% of new settler farmers never utilized agricultural information from mass media.
8. An overall 147% higher productivity is registered for all the major crops in the study area cultivated by the new settler farmers, who accessed and utilized agricultural information from mass media, always when there is need.
9. A majority (38.4%) of new settler farmers, source information from the mass media, followed by previous settler farmers at 33.6% and extension agents at 23.7%.
10. Out of the 84.4% farmers, accessed agricultural information; 4% of them had not utilized it, and only 9.6% utilized it to medium and high utility level.
11. Having access to agricultural information is an essential ingredient that leads to better crop production through better utilization level.

The following recommendations are made based on the findings of the present study.

1. There is need for change agents to identify and use farmer's preferred media of information delivery as this is likely to facilitate their acceptance and use of information presented to them.
2. Internet, e-mail and mobile phone SMS accesses should be improved further by better extension approaches through motivating the members of the coherent groups of settler farmers.
3. Relevant and timely information has to be organized according to local language and format understood by farmers.
4. The study emphasized the need for appropriate information to reach all farmers to facilitate increased yield.
5. Widely dispersed settler farmers should be organized properly into coherent groups to enable the extension assistance to reach them easily.

Emphasis to improvement of extension support system may be provided through policy and development interventions to achieve the desired food security and fallow less land strategies in Kerala, India.

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