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Understanding the Information Network among Farmers through Content Analysis of Farmers' Facebook Groups

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ABSTRACT

Facebook groups have emerged as a powerful tool for connecting individuals with shared interests, and the agriculture sector is no exception. Examining the significance of Facebook's involvement in agricultural extension within India is essential because of the nation's significant agricultural industry, growing digital presence, and the necessity for prompt and precise information distribution. This research aims to investigate the origins of the Bengali Facebook groups, the profiles of members and administrators, and the manner in which information is shared through posts within these groups. The study also seeks to delve into the broad themes of these posts and their specific focus on agricultural topics, including general agriculture, identification of plant diseases, crop varieties, recommended practices, and more. Furthermore, this study analyses the content of posts concerning agricultural operations, implements, agricultural products, and livestock. Out of 995 Facebook groups, 84 core agricultural groups and 24 Bengali groups were purposively sampled. Among the 1442 posts, 206 were screened randomly for the study. Results revealed that 50 percent of these groups emerged during the lockdown period and the most discussed agricultural operation in these groups was 'plant protection measures' . The study suggests that Facebook groups should be mainstreamed by public and private extension agencies to reach even those farmers with low levels of formal education.

Keywords: *Content Analysis; Facebook Groups; Farmer to farmer extension; Mainstreaming; Bengali.*

INTRODUCTION

In recent years, the proliferation of social media platforms has revolutionized the way information is disseminated and shared across various communities. Facebook, being one of the most popular and widely used social networking sites, has not only connected individuals on a personal level but has also become a powerful tool for information exchange within specific interest groups. One area where Facebook groups have made a significant impact is in the domain of agriculture information dissemination.

Agriculture, as a vital sector of the global economy, faces numerous challenges ranging from technology adoption to market access and sustainable practices. To address these challenges, farmers, agronomists, researchers, and agricultural enthusiasts have increasingly turned to online platforms to share their knowledge, experiences, and expertise. Facebook

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groups have emerged as a virtual meeting place for these stakeholders, creating vibrant communities dedicated to agriculture-related discussions.

The impact of Facebook groups on agriculture information dissemination has been profound. These online communities provide a platform for individuals with diverse backgrounds and expertise to come together, exchange ideas, and learn from each other. Farmers from different regions and countries can connect, overcome geographical barriers, and share their experiences and best practices. Researchers and agronomists can disseminate the latest scientific findings, cutting-edge technologies, and innovative farming methods directly to the farming community, facilitating the adoption of new techniques.

Moreover, Facebook groups offer a space for mentorship and peer-to-peer learning, where seasoned farmers can guide and support those new to the field. Through discussions, Question and answer sessions, and shared resources, members can access valuable information, troubleshoot problems, and stay updated on the latest trends in the agricultural industry. This democratization of knowledge empowers farmers of all scales, enabling them to make informed decisions and improve their farming practices. Furthermore, Facebook groups serve as a platform for collaboration and networking. Farmers can connect with suppliers, buyers, and agricultural service providers, fostering business relationships and enhancing market access. Entrepreneurs in the agricultural sector can find potential partners, investors, and customers, leading to increased opportunities for growth and innovation. The power of these online communities lies in their ability to bring together individuals with complementary skills and interests, catalyzing collaboration and creating a collective force for positive change in the agriculture sector.

Studying Facebook's role in agricultural extension in India is vital due to the country's substantial agricultural sector, increasing digital penetration, and the need for timely and accurate information dissemination. The platform can bridge information gaps, customize advice for diverse agroecological zones, extend extension services to remote areas, enable peer-to-peer learning, and connect farmers with markets. The use of social media as a tool for technology dissemination can enhance farming practices, engage youth, encourage climate resilience, facilitate policy communication, and offer insights into effectiveness, benefiting Indian agriculture and rural livelihoods.

This study is an attempt to focus on the genesis of these chosen Facebook groups, the background of both their members and the administrators (admins), and the pattern of information dispersed through the posts in these groups. This work also tries to implore on the broad subjects these posts cover as a whole and the various agricultural information in particular, like, information related to general agriculture, plant disease diagnosis, crop variety, the package of practices, etc. This research finally analyses the pattern of information shared among the members and admins of the groups that will pave the future of extension strategy in the country.

METHODOLOGY

The Facebook groups related to agriculture were searched through the Facebook Group search-bar. Nearly 995 groups with Indian admins (as on January 2023) were found but most of them were either inactive or related to agricultural jobs. After screening, 84 groups dealing with core

agricultural technology dissemination among farmers and other stakeholders were found. After rigorous search and studies, 24 Facebook groups on Agriculture operating predominately in Bengali were purposively sampled by the end of February 2023. A total of 1442 posts were found in a span of a year (April 1, 2022, to March 31st, 2023), out of which every 7th post was chosen by systematic random sampling method. A checklist for conducting content analysis was prepared with experts' opinions and the content analysis (Berelson, 1952) of the posts of each group was performed. The posts were subsequently categorized and quantified based on the appearance/disappearance of the predetermined codes.

To pre-test the coding technique, the first author underwent training and practiced with non-sample posts (Wimmer *et al*., 2005). The intra-coder reliability (Bower, 1972) was calculated to ensure the consistency of the coder in respect of generating data.

FINDINGS AND DISCUSSION

The data generated through Content Analysis under each category are objectively presented in tabular format. The groups were first categorized based on number of members, their nationality, the background of the group admins, and the genesis year of the group. The content of the posts was analyzed based on agricultural information shared, agricultural operations mentioned, agricultural implements concerned, agricultural products dealt with, and the livestock associated with farming.

Table 1: Categorization of Bengali Facebook Groups Based on the Number of Members Members (n=24).

Sl. No.	Category	Frequency	Percentage
1.	Small (less than 5000 members)	10	41.67
2.	Medium (5000 to 10000 members)	4	16.67
3.	Large (greater than 10000 members)	10	41.67

Table 1 represents the categories of Bengali Facebook groups based on the number of members into small (less than 5000 members), medium (5000 to 10000 members) and large (greater than 10000 members). The categorization was done following the mean split method.

Table 2: Categorization of Bengali Facebook Groups based on the Nationality of Majority of the Members (n=24).

Sl. No.	Category	Frequency	Percentage
1.	Indian	16	66.67
2.	Bangladeshi	8	33.33

Table 2 depicts the categorization of the Bengali Facebook groups based on the nationality of the majority of the members. It can be observed that majority of the groups (66.67 percent) had Indian nationals constituting the majority, whereas 33.33 percent belonged to Bangladesh. Since the Facebook groups selected for the study dealt with Bengali language, the Bengalis of West Bengal and Bangladesh were major stakeholders.

Table 3: Categorization of Bengali Facebook Groups based on the Background of Admins.

Sl. No.	Category	Frequency	Percentage
1.	Agricultural and allied sciences	14	58.33
2.	Non Agricultural	6	25.00
3.	Undecided	4	16.67

Table 3 represents the categorization of the Bengali Facebook groups based on the educational background of admins. It can be observed that most of the groups had admin belonging to an agricultural background (58.33 percent) in contrast to admins belonging to non-agricultural background (25 percent). The background of admins of two groups (16.67 percent) could not be found out since their profiles did not have any information about their education or profession.

Table 4: Categorization of Bengali Facebook Groups based on the Year of Creation of the Groups

Sl. No.	Category	Frequency	Percentage
1.	Before Lockdown	8	33.33
2.	During Lockdown	12	50.00
3.	After Lockdown	4	16.67

Table 4 portrays the categories of Bengali facebook groups based on the year in which they were created. Three categories were made based on the Covid 19 lockdown. The years before 2020 was termed as before lockdown, the year 2020 and 2021 was termed as lockdown and the years after 2021 were categorized as after lockdown. It was observed that half of these twelve groups were created during lockdown, followed by before lockdown (33.33 percent) and after lockdown (16.67 percent). It is interesting to note that when Covid 19 pandemic resulted in shutting down of every outdoor chores, the use of internet and the influence of social media on the lives of people spiked during this very time. (Effenberger et al., 2020)

Table 5: Categorization of Bengali Facebook Groups based on the Broad Subject they deal.

Sl. No.	Broad subject	Frequency	Percentage
1.	Solely Agriculture	4	16.67
2.	Agriculture + Horticulture	14	58.33
3.	Agriculture + Animal Husbandary	6	25

Table depicts the categorization of the Bengali Facebook groups based on the broad subject area they deal with. It can be observed that all these groups had agriculture as the primary subject, whereas 58.33 percent of these groups also had horticulture and 25 percent of the groups dealt with information related to animal husbandry. Since, the sample was purposively drawn; it was quite obvious that Agriculture was the primary subject of these selected groups.

Table 5.1: Categorization of Bengali Facebook Groups based on the Agricultural Information they provide.

Sl. No.	Category	Frequency	Percentage
1.	General information on agriculture	24	21.81
2.	Disease diagnosis related information	18	16.36
3.	Variety of crop related information	22	20.00
4.	Pesticide related information	16	14.54
5.	Fertilizer related information	10	9.10
6.	Marketing related information	12	10.91
7.	Value addition related information	8	7.27

**sample size (n) cannot be determined because of overlapping themes*

Table 5.1 represents the categorization of the Bengali Facebook groups based on the agricultural information they provide. It can be observed that majority of the posts 21.81 per cent provided general information on agriculture. 20 percent of the groups provided information on the variety of crop, followed by disease diagnosis related information at 16.36 percent. Pesticide based, Marketing related and value addition related information stands at 14.54 percent, 10.91 percent and 7.27 percent respectively.

Table 5.1.1: Categorization of Bengali Facebook Groups based on the Agricultural Operations they mention

Sl. No.	Operations	Frequency	Percentage
1	Land preparation	10	10.20
2	Sowing	12	12.24
3	Manuring	4	4.08
4	Irrigation	6	6.12
5	Trans plantation	4	4.08
6	Intercultural operation	8	8.16
7	Plant protection	22	22.45
8	Harvesting	18	18.37
9	Dehusking	4	4.08
10	Winnowing	2	2.04
12	Storing	4	4.08
13	Transporting	4	4.08

**sample size (n) could not be determined because of overlapping themes*

Table 5.1.1 portrays the categorization of the Bengali Facebook groups based on the agricultural operations they mention. It can be observed that all these groups covered nearly all the operations of crop production but plant protection received maximum attention (22.45 percent), followed by harvesting (18.37 percent), sowing (12.24 percent) and others. Asking for plant protection related advices is easier than the rest because mere uploading of pictures of the diseased sample ensures solution from the other members.

Table 5.1.2: Categorization of Bengali Facebook Groups based on the Agricultural Implements they Mention

Sl. No.	Implements	Frequency	Percentage
1	Plough	6	13.63
2	Spade	4	9.10
3	Ladder	2	4.55
4	Sickle	4	9.10
5	Scissors	18	40.91
6	Husking pedal	4	9.10
7	Winnowing fan	6	13.63

**sample size (n) cannot be determined because of overlapping themes*

Table 5.1.2 represents the categorization of the Bengali Facebook groups based on the agricultural implements they mention. It can be observed that all these groups covered nearly all the essential implements of crop production, where scissors recurred in most (40.91 percent) of the groups, followed by plough and winnowing fan (13.63 percent).

Table 5.1.3: Categorization of Bengali Facebook Groups based on the Agricultural Products they Mention

Sl. No.	Products	Frequency	Percentage
1	Rice	18	42.86
2	Aromatic rice	4	9.52
3	Puffed rice	2	4.76
4	Ghee	12	28.57
5	Honey	6	14.29

**sample size (n) cannot be determined because of overlapping themes*

Table 5.1.3 portrays the categorization of the Bengali Facebook groups based on the agricultural products they mention. Rice invariably tops the list by being mentioned in 42.86 percent of the groups, followed by ghee (28.57 percent) and honey (14.29 percent). Since these are groups with Bengali members, it is evident that rice being the staple food of this area, will always find a mention in most of the groups.

Table 5.3: Categorization of Bengali Facebook Groups according to the Livestock they Mention

Sl. No.	Livestock	Frequency	Percentage
1	Cow	14	24.14
2	Goat	8	13.79
3	Fish	16	27.59
4	Fowl	18	31.03
5	Buffalo	2	3.45

**sample size (n) cannot be determined because of overlapping themes*

Table 5.3 represents the livestock information disseminated through these Facebook groups. It can be observed that there is maximum mention of fowl (31.03 percent) followed by fish (27.59 percent) and cow (24.14 percent). Goat and Buffalo get limited discussions at 13.79 percent and 27.59 percent respectively.

Taking these findings in to account, the extension organizations / departments who are in entrusted with the responsibility of disseminating relevant and timely information through Facebook, should formulate their social media strategies for effectiveness in reaching the farmers.

CONCLUSION

The scarcity of manpower in formal agricultural extension compels the farmers to more peer-to-peer extension. Social networking platforms like Facebook emerged as one of the most widely accessed social networking sites even by farmers and other stakeholders like Research Institutes, Agricultural Universities, Krishi Vigyan Kendras, Government Departments, NGOs, etc., and can reach a large audience in a very limited time. From the study, it was observed that half of the sampled Facebook groups came into existence during the Covid-19 lockdown. Interestingly, when COVID- 19 pandemic resulted in the shutting down of every outdoor responsibility, the use of the internet and the influence of social media on the lives of people spiked during this very time. Seeking plant protection advice in these groups was observed the most because uploading picture of the diseased part itself induced suggestions and recommendations from the members. The collective wisdom of the members not only helped in solving the problems but also opened avenues for the exchange of essential products, services, and innovations like planting materials, manures, methods, etc. The Facebook groups should be mainstreamed by extension agencies to outreach farmers even with low levels of formal education and reach the unreached. In the present scenario, nearly every organization associated with agricultural technology generation and dissemination has a dedicated Facebook account or page. This study will benefit agricultural organizations such as Research Institutes, Agricultural Universities, Krishi Vigyan Kendras, Government Departments, NGOs, Agricultural Professional organizations, and Agripreneurs. Apart from these, Farmer's producer organizations. Farmer's Cooperatives, Farmer Clubs, Agri trader organizations, etc. also have their Facebook accounts/pages. This study will not only benefit the members/friends/admins directly but also help the extension organizations / departments indirectly for disseminating relevant and timely information.

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