

## **Social media: Shaping the future of agricultural extension and advisory services**



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# Social media: Shaping the future of agricultural extension and advisory services

## Abstract

Since the introduction of social media, communication is becoming more and more dynamic every day. Platforms like Facebook and Twitter have 1.18 billion and 316 million active monthly users as of 2015. Communication has become more virtual than physical. More and more people – young and old alike – are fascinated by the social media and it is a trend that is not going down very soon. For a long period in the future, social media is going to shape the way people interact, share information, form opinions and also lead individual and collective actions. In a world where social media etiquettes are probably more important than table manners, ignoring it is not something that the development sector can afford to do. Especially for agricultural extension and advisory services (AEAS), whose primary element is communication, social media can be a potential goldmine. Engaging with clients online, helping rural community gain a voice, making development bottom-up, more fruitful innovation brokering, engaging with all the actors in agricultural innovation systems on the same platform – social media has more than one use for AEAS. But in spite of all the advantages, its actual use in rural areas of developing countries is still low due to infrastructural difficulties and psychological barriers. Also, skill and competence in using social media is also lacking. Though national and international organizations are opening up to the prospects of social media, at local level this digital media

still faces scepticism. Training programs, awareness campaigns, and workshops can help actors in agricultural extension understand and use social media better. Extension is not just about communicating but bringing behavioural change and social media can prove to be a powerful aide if utilized up to its potential. GFRAS Global survey on use of social media in agricultural extension and advisory services conducted online across 60 countries and 226 respondents provided interesting results. Face book was found to be the most popular social media platform used by AEAS actors. The major activity on social media was searching for news and events and sharing information. A major impeding factor for social media use was the lack of authenticity of information shared online. Social construction of information (development and publication of information socially by the users) was considered as the most important feature of social media (95 %). Ninety five percent of the respondents believed social media can play an important role in bridging the gap between stakeholders in Agricultural Innovation Systems (AIS). Overall, the survey found that social media is a very useful tool in agricultural extension and rural advisory services. To quote one respondent, “SM is not only a tool for reaching large audiences; it is also an opportunity to develop relationships.”

**Key words:** Social media, ICTs, agriculture, extension, advisory services, information and communication technology, face book, twitter



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## List of acronyms / abbreviations

AEAS	Agricultural Extension and Advisory Services
AESA	Agricultural Extension in South Asia
AIS	Agricultural Innovation Systems
ARD	Agricultural and Rural Development
B2B	Business to Business
B2C	Business to Customer
BoP	Bottom of Pyramid
CEO	Chief Executive Officer
CGIAR	Consortium of International Agricultural Research centres
CTA	Technical Centre for Agricultural and Rural Cooperation
e-WOM	Electronic Word of Mouth
FAO	Food and Agriculture Organization of the United Nations
GFRAS	Global Forum for Rural Advisory Services
ICT	Information and Communication Technology
IFPRI	International Food Policy Research Institute
ILO	International Labour Organization
INGENAES	Integrating Gender and Nutrition within Agricultural Extension Services
IoTAgri	Internet of Things in Agriculture
ITU	International Telecommunication Union
LDC	Least Developed Country
MS	Microsoft
PC	Personal Computer
PDF	Portable Document Format
POTUS	President of The United States
PPT	Power Point Presentation
UN	United Nations
USDA	United States Department of Agriculture
YoBloCo	Youth Blog Competition

## Glossary

**Agvocacy:** Agvocacy is the combination of two words agriculture and advocacy and means talking for and about agriculture. It is about the representatives of agriculture proactively telling their story. The term was coined by Mike Haley, a grain farmer and cattle rancher from Ohio.

**BoP farmers:** Bottom of the pyramid or base of the pyramid farmers are those who live on US\$5 or less per day.

**Crowdfunding:** It is the practice of funding a project or venture by raising many small amounts of money from a large number of people, typically via the internet.

**Felfies:** Felfies are farming selfies taken by farmers or individuals engaged in farming activities.

**Millennials:** Millennials or Generation Y are the demographic cohort with birth years ranging from early 1980s to early 2000. Authors William Strauss and Neil Howe coined the term and identified the generation born between 1982 and 2004 as millennial. This generation is identified as confident, tolerant, civic-minded with strong sense of community (both local and global), detached from institution and networked with friends, and digital natives.

**Social media readiness:** It is the access to social media and the capacity to create opportunities using social media by an individual. Social media readiness signifies the intent of a user to use social media for multiple purposes to create value.

**Social Media:** Social media are web based tools of electronic communication that allows users to personally and informally interact, create, share, retrieve, and exchange information and ideas in any form (text, pictures, video, etc.) that can be discussed upon, archived, and used by anyone in virtual communities and networks.

**Web 2.0:** Web 2.0 refers to the cumulative changes in World Wide Web with increased interactivity, usability, and user-generated content. The term was first introduced by Darcy DiNucci in 1999. The concept of Web 2.0 mostly considers web as a platform characterized by increased participation with value added by users.

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## Executive summary

In any field of development, information is power and information and communication technologies in recent times have brought this power to the fingertips of the people through its recent addition – social media. To say it has revolutionised communication is to say the least. Social media has completely changed the topography of personal communication and taking on the world of professional communication as well. Aided by mobile phones, social media is spreading fast across the world. While urban areas are already having large number of active social media users, rural areas are soon following suit. At present, there are 2.078 billion social media users in the world. If Facebook was a country, it would have been second most populated. Around 500 million tweets are sent every day. YouTube is the 2<sup>nd</sup> largest search engine and 3<sup>rd</sup> most visited site on the web. More and more people are joining LinkedIn to create professional networks. And in such a world where online communication is becoming synonymous to social media, its importance in development sector to empower the people is like never before.

In agriculture sector too, social media is gaining popularity. Professionals are using them to form networks and farmers are taking to social media to talk to peers and consumers. All big things in agriculture – new technology or innovations, seminars and meetings, workshops and trainings, reports, publications – get tweeted or hashtagged. Facebook, Twitter, YouTube, and blogs are the major platforms for agricultural information dissemination. The uses of socially integrated messaging apps are also increasing in the rural areas. But still, there is a difference in the intensity of use in developed and developing countries – basically due to economic conditions and infrastructure availability. In spite of the differences, use of social media is picking up in rural areas of developing and least developed countries as well.

GFRAS Global survey on use of social media in agricultural extension and rural advisory services conducted online during 11th February to 31st May, 2015 across 62 countries and 229 respondents provided interesting results. Facebook was found to be the most popular social media platform used by AEAS actors. The major activity on social media was searching for news and events and sharing information. A major impeding factor for social media use was the lack of authenticity of information shared online. Social construction of information (development and publication of information socially by the users) was considered as the most important feature of social media (95.1 %). Ninety five percent of the respondents believed social media can play an important role in bridging the gap between stakeholders in AIS. Reaching clients (77.4 %) was a major use of social media in AEAS. Training in social media use was uncommon, and 71 % of the respondents said they need training on social media use. If and when there was training con-

ducted by the respondents' organizations, it mainly focused on the specifics of different social media platforms, and awareness creation on the use of social media in agricultural extension. But on an organizational level, social media is still not given much importance by higher authority and social media policy restricts rather than encourages its use. Also, weak or non-existent connectivity in rural areas, high cost of data charges, illiteracy of the clients and low participation and lack of interest of clients are reported to be major problems. Overall, the survey found that social media is a very useful tool in agricultural extension and rural advisory services. To quote one respondent, "social media is not only a tool for reaching large audiences; it is also an opportunity to develop relationships."

Major issues that were identified from an extensive literature review and the global survey are:

*i. Lack of skill and competency among extension personnel:* It is a major reason behind minimal use of social media by field level extensionists and proper awareness and training programs need to be conducted to address the needs.

*ii. Organizational guidelines:* Organizational guidelines need to be encouraging towards employees' use of social media to communicate with clients maintaining professionalism.

*iii. Infrastructure:* Physical infrastructure is a must for translation of information into practical use.

*iv. Training needs:* Training needs of agricultural stakeholders needs immediate attention for utilizing the potential of social media

*v. Knowledge management:* Social media can be very helpful in knowledge management for rural users.

*vi. Attitude towards social media:* A positive attitude towards social media is important for using it and this needs increased awareness and training programs.

*vii. Engaging rural community:* Social media is all about user engagement and as long as rural users are not engaged in conversations, it will not be of much help to anyone.

To overcome the hurdles that are hindering the use of social media in agriculture, there needs to be a multipronged approach at individual, institutional, infrastructural, and policy levels. While individual use needs to be increased, organizations need a more positive attitude towards social media. Infrastructure needs to be provided in rural areas to put information into use and with policy support at political level. Social media has high potential to change the face of rural areas for good but the actual benefits accrued depends on the potential tapped into by agricultural stakeholders.



# Social media: Shaping the future of agricultural extension and advisory services

## 1. Introduction

### 1.1. Social media – the means to revolutionized communication

Social media is the most recent form of digital communication and on a global scale, we can love it, we can hate it but it can't be ignored anymore. The millennials have made social media an inseparable part of their lives which connects them with the rest of the world. Accessing news through social media by using mobile devices is also gaining popularity (Italie, 2015). The power of social media has expanded beyond revolutionizing personal communication to a socio-political level bringing social revolutions and toppling governments. Arab spring in 2009–2010 in Middle East and few African countries which made headlines for Twitter uprisings and Facebook revolutions have made political history with Facebook, Twitter, YouTube and Google Docs helping people, as Daniel Nadler puts it, 'share revolution'. Barack Obama joined Twitter with the White House handle @POTUS and created world record of a million followers within 4.5 hours (Thorne, 2015). General elections of 2014 in India have created another history with massive social media campaigns increasing awareness and forming public opinion (Wolf, 2015). Not just on political level, social media activism has actually yielded results in social causes like HeforShe campaign of UN Women which generated millions of tweets and raised awareness on gender equality, the Ice Bucket challenge raised awareness on Amyotrophic Lateral Sclerosis (ALS) and funds worth millions for further research on the disease, Facebook's 'Safety Check' app during Nepal earthquake of 2015 helped people locate their friends and family in the disaster zones. Corporate recruiters are hiring their prospective employees referring their social media profiles and digital footprints rather than their resume (Schawbel, 2012). And these are just few examples of the way social media is affecting the life of millions around the globe for a positive change. Be it the 2008 Mumbai attacks, 2009 Green revolution in Iran, 2010 earthquake in Haiti, Egyptian revolution of 2011, or 2015 Nepal earthquake, social media has alerted the world, helped people unite during a crisis, and most importantly, motivated people to act. A major cause of concern and scepticism for social media use is the limited span of attention to events and popularity of sen-

sational ones only but in those cases too, they have served the purpose well for the period they were intended to. This sea-change in communication has the power to affect the way people create change. "Group action gives human society its particular character, and anything that changes the way groups get things done will affect society as a whole" (Shirkey, 2009) and this holds true for development sector as well.

### 1.2. What is social media?

Social media refers to the internet-based digital tools for sharing and discussing information among people. It refers to the user generated information, opinion, video, audio, and multimedia that is shared and discussed over digital networks (Andres and Woodard, 2013). Merriam-Webster (2015) defines social media as forms of electronic communication through which users can create online communities to share information, ideas, personal messages and other content. The definition of Ahlqvist *et al.* (2008) is focussed on three basic components – content, communities and Web 2.0 and operationalises social media as the interaction of people and also to creating, exchanging and commenting contents in virtual communities and networks. According to Michelle Chmielewski (2011), social media is not about what each one of us does or says, but about what we do or say together, worldwide, to communicate in all directions at any time by any possible digital means. Social media are basically digital technologies facilitating communication of user generated content through constant interaction (Terry, 2009; Kaplan and Haenlein, 2010). In a nut shell, social media are web based tools of electronic communication that allows users to interact, create, share, retrieve, and exchange information and ideas in any form (text, pictures, video, *etc.*) that can be discussed upon, archived, and used by anyone in virtual communities and networks. Aspects of social media that makes them an important and accessible tool in development communication are their easy access through mobile phones, mass-personal communication and mass-self communication, a larger set of weak ties to ensure receipt of novel ideas, high degree of connectedness, and linkability and content sharing across multiple platforms (Hemsley and Mason, 2013). A brief classification of different types of social media platforms is given in Table 1.

**Table 1 Types of social media platforms and their brief description**

Type of platform	Examples	Description
Social networking sites	Orkut, Facebook, Friendstar, MySpace, Google+	These platforms are mostly used for creating personal profiles and networks with friends, colleagues, and peers. They are the most popular form of social media platform and have the highest reach, mainly because of the personal reach.

**Table 1 Continued**

Type of platform	Examples	Description
Blogs and vlogs	Blogger, Wordpress	These are the earliest form of social media. They are mostly personal web pages but are increasingly being used by corporate houses to reach their clients. Media richness is high in blogs but not so much in vlogs.
Micro-blogs	Twitter, Instagram	They are similar to blogs with restriction of characters (140 for Twitter) and allow users to create and share content. Media richness is also high as in blogs.
Collaborative projects	Wikis	Joint and simultaneous content creation by users. Media richness is generally low but they can become the main source of information for users due to mere diversity and broad base coverage.
Social bookmarking	Delicious, Blinklist	Group based collection, rating, and sharing of internet links and media content. Low media richness.
Virtual social worlds	Second life	Users are generally in their 3D avatars and interact in a virtual environment. These platforms give users the unlimited scope for self-presentation strategies. Users can also create content online and give opportunities to corporate houses for virtual advertisement, v-commerce and marketing research.
Social gaming	World of Warcraft, Farmbook	These platforms are similar to virtual social worlds with high social presence and media richness. The users can interact with each other though the scope of self-presentation and self-disclosure is somewhat limited. They can also be leveraged by corporate houses for communication campaigns and reach millions of users
Content communities	Video (YouTube, Vimeo, Vine)	They are mostly formed to share specific type of content easily amongst many users. Media richness is high for specific content. They are easy means to reach a global user base in an interesting way.
	Photo (Instagram, Flickr, Tumbler)	
	Audio (Soundcloud, Podcasts)	
	MS Office docs, PDF, PPT (Slideshare)	
Forums, discussion boards and groups	Google hangout, Blackboard, Discussion groups (Dgroups)	Content creation and sharing among users with specific interests or activities is easier. Media richness is medium as all platforms do not support various formats of content.
Socially integrated messaging platforms	Whatsapp, Facebook messenger, Snapchat	These platforms have recently gained high popularity due to group messaging options and high media richness. Users can create and share any form of content in groups or to individuals.
Professional networking	ResearchGate, Academia.edu, LinkedIn	Specifically for professional networking, these platforms increase the scope for scientific discussions among peers and experts in specific fields. Increased networking among professionals increase the scope of researches to be disseminated amongst wider audience.
Social news	Reddit, Propeller, Digg	These are news item sharing platforms where users can comment on the posts. The news items and comments can be ranked based on popularity. Media richness is high and can be very useful for keeping up with recent happenings and web trends.

[Modified from the classification of Kaplan and Hainlein (2010)].

The types described above are a broad categorization of the existing social media platforms but many a times, it becomes difficult to clearly classify them in a strict category as evolution of social media platforms depending on user's preference is very common and integration of new features makes them fit in more than one category at times.

Social media is more about sociology and psychology of communication than about technology (Saravanan and Bhattacharjee, 2014). Major characteristics of social media that distinguishes this form of online communication from others are participation, openness, conversation, community, and connectedness (Mayfield, 2008). The phenomenal growth of social media can mostly be attributed to the common platform it gives to people to share their ideas and create their own content – be it texts, images, sound clips or videos and also the affordability of these platforms as they can be accessed without incurring extra charges, Convergence of technologies and evolution of multi-functional portable gadgets are other reasons for expanding social media reach. The popularity of these social media platforms to a global audience is like never before owing to the increased reach of internet enabled mobile phones and increased number of social media platforms across the globe. Social media sites gained their popularity not only because they connected friends and family but the huge potential of communication was soon realised and it started finding its use in professional communication. The preferences of social media platforms are still different based on the purpose. While Facebook has the highest reach among all social media platforms, LinkedIn is still the number one choice for professional communication as it is more likely to have a professional, well informed discussion in LinkedIn which is not possible in Facebook or Twitter. It is not a personal social media platform and that is a reason why 26 per cent of Fortune 500's Chief Executive Officers (CEOs) are in LinkedIn compared to only 7.6 per cent in Facebook (Simonson, 2013). Platforms for researchers and academicians like ResearchGate and Academia.edu allow users to post public questions to the community, both networks group users by institution, allowing users to see colleagues and create sub-domains, scores members based on content interaction and score of members interacting with the content, thus quantifying the impact of the researcher in his peer community (Ovadia, 2014). In addition, the hashtag revolution has made content search specific and content reach wider on social media.

## 1.2. How popular is social media?

While social media has spread the concept of virality, social media itself has been viral in the world of communication. As of January 2015, 29 per cent of the world population was active on social media, a 12 per cent increase from January, 2014, and 23 per cent of these accounts are accessed from internet enabled mobile phones. Facebook dominates the global social media landscape with 1.415 billion active users and 47 per cent of all

internet users as of March, 2015. Micro blogging site Twitter has 284 million active users and on an average there are 500 million tweets per day. Instagram, with 53 per cent of the internet users aged 18–29, grew 50 per cent between March and December, 2014 and exceeded Twitter. Tumblr's user base grew 120 per cent in 2014. LinkedIn dominated the professional social networks with 347 million registered members and 39 million students. Non-English speaking networks like Qzone in China have exceeded Twitter, Instagram and Google+ with 639 million users. Instant messaging and chat apps account for 3 of the top 5 global social platforms. Whatsapp has 600 million users, Facebook messenger has 500 million users, WeChat has 468 million users, Viber has over 200 million users, and Snapchat grew 56 per cent in 2014 (Brynley-Jones, 2014; Kemp, 2015; Bullas, 2015).

A major boost to social media use comes from increased mobile phone subscriptions. Unique mobile subscribers are 51 per cent of the global population, whereas, global mobile penetration is 97 per cent. Globally, active mobile social media accounts penetration is 23 per cent. Nigeria and India has the highest share of web traffic through mobile in the world. 1.69 billion people across the globe are accessing social media via mobile where total number of active social media accounts are 2.08 billion (ITU, 2015; Kemp, 2015). In growing markets like India, of the 118 million active social media accounts, 100 million are mobile users. With falling mobile broadband prices, it has now become affordable in 111 countries, giving another push to internet access in developing countries. According to a report released by Juniper networks, 97 per cent of people in developing countries say that mobile internet has transformed their lives. Poorer mobile phone users focused more on communicating to improve their lives in some way or the other (Banks, 2015). Even though the uses are many, social media is not always used positively. While unproductive activities in relation to development works dominate its use, a deeper analysis into the facilities provided by applications like Facebook, Twitter, or LinkedIn indicates the fallacies which limits user interaction. Also, issues of content security and privacy of users dominated the debate regarding the actual use social media in development as opposed to its perceived use. But then again, with mobile being the major source of internet access across the world, it is going to change the landscape of social media use in a very near future. What needs to be emphasised is how best mobile and social media can be combined and used strategically to bring changes in the life of the people and lead to their development.

All the statistics above is not only about what is but what could be. Within two decades of its introduction, social media has taken the communication industry by storm. It is very clear that this trend can only go up and the question now is about how best can agricultural extension and advisory services (AEAS) move with changing trends and utilize these technologies for growth. Agriculture being one of the major sectors to be con-

centrated on for global development, the need to utilize social media for better communication needs is not a choice but a necessity.

### 1.3. AEAS and social media – a review

Agriculture is world's largest job providing sector (ILO, 2014) and while for developed countries its highly commercialized form has become remunerative, in developing countries the situation is reverse. Limited success of Green Revolution in Asia and its complete failure in Africa, conflicts, political unrest and government missteps added with increased pressure on agricultural lands, abandonment of agricultural activities, highly subsidised agricultural activities, unstable global food prices, and climate change are pushing people more and more people into poverty and food insecurity (Nelson *et al.*, 2009; Rosenberg, 2014; FAOa, 2015). The most important step to prepare the rural people against these challenges is to create informed communities. Though due to its strategic position within the rural communities, agricultural extension and advisory services have the potential to reach the rural people effectively, its weak or ineffective conditions limits the ability to reach smallholders in Africa, Asia, Middle East, Eastern Europe and Central America with agricultural innovation and market opportunities (MEAS, 2015). Success in agriculture and rural development is determined by action of millions of rural families on an individual basis whose decisions are shaped by the information, knowledge and technologies available to them (FAOb, 2015) and Information and Communication Technologies (ICTs) can provide new opportunities in fostering innovation, facilitating communication, and innovation brokering by AEAS organizations. ICTs have long been used in AEAS for facilitating communication among stakeholders, especially farmers and extensionists, and of its various applications, social media is the most recent addition. Within a few years, it has completely changed communication globally, forcing enterprises and development agencies to take notice. Social media has already impacted the wind of global development making people more informed and aware. Its introduction for agvocacy is still very recent but the promises it is showing are huge.

Agvocacy is the combination of two words agriculture and advocacy and means talking for and about agriculture. It is about the representatives of agriculture proactively telling their story. The term was coined by Mike Haley, a grain farmer and cattle rancher from Ohio (AgChat Foundation, 2014). Social media gives an opportunity to connect and interact with one's audience in agriculture, educate them and helps to know more about the industry. It makes promotion of extension programs easier, allows real time interaction with clients, helps extend outreach to new audiences, and promotes development of relationship among actors in Agricultural Innovation Systems (AIS) (Cornelisse *et al.*, 2011). Digital technologies can give a special edge to both extension (Woods and Langcuster, 2014) and social

media can be very helpful tool for both farmers and extensionists in this regard. The extensionists or extension organizations can start by making an effective social media page, getting followers to collaborate for practical actions on the information shared through the social media pages, and keep the followers involved by continuous engagement through conversations to form a mutually created knowledge pool (Typhina *et al.*, 2015). Social media is a platform of engagement where agriculture is the content and for agricultural producers, the major reason for using these platforms is mass influence (Varner, 2012). It gives farmers a voice and an opportunity to directly connect with their customers, which can help in direct marketing and increased profits alongside facilitating mass-personal communication (Carr and Hayes, 2015). Also, they don't need to depend on a single source for information anymore and with increased contact with peers, tried and tested information at the right time can prove to be a very important input. To agriculture as an industry, the key values of communication that social media provides are peer to peer networking, farmer – industry networking, consumer engagement, and crisis communication (Stanley, 2013). Social media provides agribusinesses and agripreneurs a never before opportunity to connect with consumers and build relationships. For extension organizations, communication has become much easier and hassle free as the personal contact becomes uncomplicated with social media and platforms like Facebook, Twitter and Whatsapp which encourage high interaction among users benefiting everyone involved. Social media presence also increases the online visibility of extension websites (Arnold *et al.*, 2012) which is another big advantage for quicker information dissemination. For researchers and academicians, creating peer networks are an important part of career advancement as well as dissemination of important findings that can be translated on farms and social media provides a very good platform for academic and professional networking. In a nut shell, social media has huge opportunities and incentives for all the stakeholders in agricultural sector but more importantly, in the age of pluralistic extension, it is an excellent platform for making all the actors a part of the greater agricultural community.

Facebook, YouTube, blogs, wikis and podcasts provide large potential for use to extensionists but the content and outreach needs to be determined based on users and content (Kinsley, 2010; Gharis *et al.*, 2014). A YouTube search with the keyword 'farming' yields about 300,000 hits and 'agriculture' yields about 889,000 hits while 'agricultural extension' gives 10,400 hits.



Classification of blogs (Valsamidis et al., 2013)  
Depending on their topics agricultural blogs are classified into following eight criteria – 1.General agriculture blogs, 2. Blogs categorized by agricultural speciality, 3. Blogs categorized by agricultural events, 4. Blogs categorized by farming scope, 5. Blogs categorized by author/publisher, 6. Blogs categorized by number of contributors, 7. Miscellaneous blogs categorized by topic, 8.Collection of agriculture blogs.

Twitter has numerous accounts related to agriculture by global organizations, agriculture ministries of different countries, development organizations (profit and non-profit based), agribusinesses and farmers. These large numbers of likes for pages, members of groups, followers of accounts, and subscribers of channels indicate the growing space of agriculture in social media and increased popularity of farming among the non-farming community as well. This provides an unique opportunity for extension to reach an increased number of audience in lesser time and with reduced resources. A further probe about the followers/members of these groups shows the increasing number of users from developing countries too. Blogs are efficient platforms in agriculture for personally connecting with clients and peers and sharing stories, opinions, and experiences aided by interactivity with audience at an individual and organizational level. For research and extension organizations, they also provide the opportunity of opinion mining to understand farmers' concerns, their problems and opinions, and evaluation of their attitudes towards agricultural aspects (Valsamidis et al., 2013). LinkedIn, Academia.edu and ResearchGate have more users from researchers, academicians and other professionals to create a peer network. Whatsapp groups of farmers in India are actively sharing information and seeking advice from experts when needed and are requesting the government to use Google Earth and Whatsapp for accurate and efficient information delivery (Chaba, 2015; Kaggere, 2015). e-WOM (electronic Word of Mouth) through social media can play an important role to form network of consumers online and in value

creation process in agrifood sector (Sturiale and Scuderi, 2013). An interesting example of how social media can be used to bring farming and entertainment together to create awareness about agriculture is the Peterson Farm Bros. – three brothers from Kansas, USA who shot to stardom after creating viral parody video of the pop song “I am sexy and I know it” by LMFAO called “I am Farming and I grow It” (9.4 million views) and then “Farmer Style” (16 million views) to the tune of “Gangnam Style” on YouTube. They started it to educate general public about the everyday life of USA farm families and their recent initiative “Life of a Farmer” video series promote positive discussions about modern agricultural practices, consumer concerns and engaging youth in farming lifestyle (Stanley, 2013). Their Facebook page (<https://www.facebook.com/PetersonFarmBros>) has 240,129 likes and YouTube channel (<https://www.youtube.com/user/ThePetersonFarmBros>) has 98,333 subscribers along with individual tweeter handles of the brothers, WordPress blog and Instagram accounts through which they communicate with people across the globe. Some other prominent examples of use of major social media platforms in agriculture are given in Table 2. A recent study shows there has been 100 per cent increase in the past year in rural social media users in India and many reported going online only to join social media (Bhargava, 2015). Farmers are becoming more and more innovative in using social media and felfies or farming selfies trending across social media platforms are a good example. Farmingselfie.com, (<http://farmingselfie.com/>) a blog by an Essex farmer @will-wilson100 (<https://twitter.com/willwilson100>) collects all the recent felfies from around the world to showcase rural farm lives across the globe (Gray, 2014). These shows the increasing interest and number of users of social media platforms in agriculture from the grassroots but more important than that, it shows the increasing audience for agricultural information throughout the globe. The use of platforms is dependent on the users, region, and economic status as internet enabled devices and data usage are still costly affairs for many, but with increased reach of internet and increased use of social media platforms, the opportunities for agvocy are huge too.

**Table 2 Examples of use of social media in agriculture**

Name of Group / Community / Pages	Description	Target users	Region
<b>Facebook</b>			
<b>By farmers</b>			
Livestock Information and Marketing Centre ( <a href="https://www.facebook.com/groups/Livestock.TN/">https://www.facebook.com/groups/Livestock.TN/</a> )	Members (farmers, extension personnel, scientists, market functionaries, consumers, local leaders, etc.) of this group share information related to livestock production, management, marketing, etc. A separate page is also on Facebook related only to marketing of livestock. ( <a href="https://www.facebook.com/Livestock.Market">https://www.facebook.com/Livestock.Market</a> )	Agricultural stakeholders related to livestock	India

**Table 2 Continued**

Name of Group / Community / Pages	Description	Target users	Region
Mkulima Young (Young Farmer) ( <a href="https://www.facebook.com/mkulima.young">https://www.facebook.com/mkulima.young</a> )	This page is an information sharing platform for young farmers started Joseph Macharia, a young farmer himself. Mostly agro-advisory and market information are shared.	Young farmers	Kenya
Turmeric Farmers' Association of India ( <a href="https://www.facebook.com/turmeric.farmers">https://www.facebook.com/turmeric.farmers</a> )	This page was created by turmeric farmers to stabilize price of turmeric in the market. Till date, the farmers connect through the page and share information to keep turmeric price stable and increase marketing opportunities of turmeric.	Turmeric farmers	India
National Ecological Producers Association (APNE) ( <a href="https://www.facebook.com/anpe.peru">https://www.facebook.com/anpe.peru</a> )	Information related to ecological farming is shared through the page.	Farmers	Peru
<b>By extension centres</b>			
Krishi Vigyan Kendra, Namakkal ( <a href="https://www.facebook.com/krishi.namakkal">https://www.facebook.com/krishi.namakkal</a> )	Krishi Vigyan Kendra, Namakkal communicates information related to farmers' training programmes, availability of inputs etc. through this account	Subject Matter Specialists of KVK, farmers, agricultural stakeholders	India
<b>By extension professional networks</b>			
Agricultural Extension in South Asia (AESAs) ( <a href="https://www.facebook.com/groups/428431183848161/">https://www.facebook.com/groups/428431183848161/</a> )	Members post links to relevant publications on extension and advisory services, announcements of workshops and conferences, major policy decisions on extension, reports of meetings/workshops and blogs relevant to the broader theme of extension	Agricultural Extension stakeholders	South Asia
Global Forum for Rural Advisory Services (GFRAS) ( <a href="https://www.facebook.com/groups/gfras/">https://www.facebook.com/groups/gfras/</a> )	This page provides information related to advocacy and leadership on pluralistic, demand-driven rural advisory services.	AEAS Professionals and others	Global
<b>By extension personnel</b>			
Vivasayam Karkkalam (Let us Learn Agriculture) ( <a href="https://www.facebook.com/groups/madhualan">https://www.facebook.com/groups/madhualan</a> )	Mr. Madhu Balan, a public extension officer started Facebook group to cater the information needs of farmers in 2012. This group, exchange information on improved farm technologies, initiates discussion with other farmers and extension personnel, share information and photos on best practices by other farmers, government schemes, etc. Question and answers, information on Terrace garden, hydroponics are most discussed topics in this group.	Farmers and others those who are interested in agriculture	India

**Table 2 Continued**

Name of Group / Community / Pages	Description	Target users	Region
<b>Twitter</b>			
<b>Farmers</b>			
AgChat ( <a href="https://twitter.com/agchat">https://twitter.com/agchat</a> )	The AgChat (Twitter online discussion group by the AgChat Foundation) started in 2009 by a group of American farmers is widely used in USA, UK, Australia, New Zealand and Ireland for facilitating discussions of industry issues between farmers and agribusinesses	Farmers, entrepreneur, farm product consumers	USA, UK, Australia, New Zealand, Ireland
Agriculture Proud ( <a href="https://twitter.com/AgProud">https://twitter.com/AgProud</a> )	Twitter handle of Ryan Goodman, a young farmer and rancher from Montana, US. Through his Twitter account he shares his experiences of farm life and answers questions of fellow farmers, agriculture enthusiasts, and consumers.	Agriculture enthusiasts, consumers, and fellow farmers	USA
Young Farmers ( <a href="https://twitter.com/F4YFKenya">https://twitter.com/F4YFKenya</a> )	Information shared through this Twitter handle of the Foundation for Young Farmers shares information for better agriculture with the objective to attract more youth to farming.	Young farmers	Kenya
<b>Extension centres</b>			
USDA ( <a href="https://twitter.com/USDA">https://twitter.com/USDA</a> )	The Twitter handle of U.S. Department of Agriculture shares latest news, events, and information in agriculture	Farmers, extensionists, development practitioners	USA
INGENAES ( <a href="https://twitter.com/INGENAES">https://twitter.com/INGENAES</a> )	This Twitter handle of Feed the Future initiative Integrating Gender and Nutrition within Agricultural Extension Services shares information and gender-appropriate, nutrition-enhancing technologies to improve life and livelihood of women farmers	Researchers, extensionists, farmers	Global
eXtension4U ( <a href="https://twitter.com/eXtension4U">https://twitter.com/eXtension4U</a> )	Twitter handle of eXtension.org, a research based learning network of cooperative extension of USA. Sound research based information is shared through the handle.	Farmers, researchers, policy makers of USA related to ARD	USA
<b>Professional networks</b>			
MEAS ( <a href="https://twitter.com/MEAS_extension">https://twitter.com/MEAS_extension</a> )	Twitter handle of the project Modernizing Extension and Advisory Services shares good practice strategies and related information to ultimately raise farm income and enhance livelihood of rural poor of 12 selected countries of Asia and Africa.	Development practitioners	Global
GFRAS ( <a href="https://twitter.com/infogfras">https://twitter.com/infogfras</a> )	This page provides information related to advocacy and leadership on pluralistic, demand-driven rural advisory services.	Extensionists, development practitioners, researchers, policy makers	Global



**Table 2 Continued**

Name of Group / Community / Pages	Description	Target users	Region
e-Agriculture ( <a href="https://twitter.com/e_agriculture">https://twitter.com/e_agriculture</a> )	Twitter handle of e-Agriculture, a global initiative to enhance sustainable agricultural development and food security by improving the use of ICTs. Information shared are related to recent developments, effort, publications and stories of ICT use in agriculture.	Farmers, researchers, development practitioners	Global
<b>Blogs</b>			
<b>Individual blog</b>			
Gate to Plate Blog (Michele Payn-Knoper) ( <a href="http://www.causematters.com/blog/">http://www.causematters.com/blog/</a> )	Through this blog, agriculturist, entrepreneur and founder of Cause Matters Corp. shares her views about food and agriculture.	Farm product consumers, agriculture enthusiasts, farmers	USA
Ecoagriculturist (Oluwabunmi Ajilore) ( <a href="https://ecoagriculturist.wordpress.com/">https://ecoagriculturist.wordpress.com/</a> )	The blogposts are related to sustainable agriculture, environment, youth involvement in agriculture, ICT4Ag, and other related topics. Th blog was also a winner of the YoBloCO Awards of CTA in 2014.	Farmers,	Nigeria
The Unconventional Farmer (Gil Carandang and Patrick Gentry) ( <a href="http://theunconventionalfarmer.com/flog/">http://theunconventionalfarmer.com/flog/</a> )	Featured in top 50 farm blogs by <a href="http://www.seametrics.com">www.seametrics.com</a> , this blog covers natural farming techniques from Japanese and Korean natural farmers. Topics range from farming techniques to animal care for urban and rural farmers.	Farmers, agriculture enthusiasts	Global
<b>Institutional blog</b>			
AGRF Blog (African Green Revolution Forum) ( <a href="http://www.agrforum.com/blog/">http://www.agrforum.com/blog/</a> )	The AGRF was established in 2010 to initiate discussions and develop concrete plans for achieving Green Revolution in Africa. The blog is a part of the initiative where issues related to African agriculture and ways to develop are discussed by various authors working in different capacities in the agriculture sector. The posts are by invitation only to maintain professionalism.	Policy makers, private actors, civil society actors, researchers, farmers, agribusinesses	Africa
Agricultural entrepreneurship (Penn State Extension) ( <a href="http://farmbusiness.blogspot.in/">http://farmbusiness.blogspot.in/</a> )	This blog is especially helpful for agripreneurs for getting information on marketing, economics, and other recent news in agricultural industry. Since 2008, 348 blog posts have been made by the eight contributors.	Agripreneurs	USA

**Table 2 Continued**

Name of Group / Community / Pages	Description	Target users	Region
TNAU Agritech Portal blog (Tamil Nadu Agricultural University) ( <a href="http://tnauagritechportal.blogspot.in/">http://tnauagritechportal.blogspot.in/</a> )	The blogs of TNAU Agritech Portal deals with everything agriculture – from sowing to harvesting, crop protection to crop management, weather, recent happenings in the agriculture industry, schemes and programs for farmers, ICTs, and many more. A total of 940 blog posts have been made since 2012, 541 of which are made in 2015 itself, by 43 members consisting of extensionists, researchers, academicians, and farmers.	Farmers, agripreneurs, extensionists	India
<b>YouTube</b>			
Farming First ( <a href="https://www.youtube.com/user/FarmingFirst/">https://www.youtube.com/user/FarmingFirst/</a> )	This channel highlights the mission of the agricultural development coalition of the same name, founded in 2009. Made up of 131 organizations worldwide, Farming First prioritizes the protection of natural resources, knowledge sharing, local infrastructure, harvests, market access, and innovative research ( <a href="http://www.foodtank.com">www.foodtank.com</a> ).	Policy makers, researchers, agricultural enthusiasts and practitioners	Global
CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) ( <a href="https://www.youtube.com/user/CCAFS">https://www.youtube.com/user/CCAFS</a> )	The videos shared by the channel features stories of smallholder farmers, interviews with leading agricultural experts across the globe, and innovative information on climate-smart agriculture ( <a href="http://www.foodtank.com">www.foodtank.com</a> ).	Researchers, farmers, policy makers	Global
IFADTV ( <a href="https://www.youtube.com/user/IFADTV/">https://www.youtube.com/user/IFADTV/</a> )	It is a well produced and highly engaging channel from the International Fund for Agricultural Development (IFAD). Videos feature news stories about smallholder farmers in addition to interviews with agriculture experts ( <a href="http://www.foodtank.com">www.foodtank.com</a> ).	Policy makers, farmers, extensionists	Global
Farmers Weekly Video ( <a href="https://www.youtube.com/user/FarmersWeeklyVideo/">https://www.youtube.com/user/FarmersWeeklyVideo/</a> )	It is produced by U.K.-based Farmers Weekly, a multimedia independent information service for farmers and agricultural businesses. Videos contain information on how to make agri-businesses sustainable, advice on farming careers, and information on different crop inputs ( <a href="http://www.foodtank.com">www.foodtank.com</a> ).	Farmers, extensionists, agribusinesses	U.K.

Other than the common features, each social media platform provides the users some unique features that can be of much help to the extensionists. For example, Facebook offers features like creating events, individual and group chats, sharing memories, insights of user engagements, publishing and sharing documents, etc. Twitter has recently introduced poll features that anyone can use and its earlier tools like Twitter analytics are also very useful in analysing one's activity on the social networking site. These features help increase productiv-

ity on the social media sites, help manage the activity of the users, and make them more effective when used judiciously.

In spite of the opportunities, the use of social media is still just beginning in AEAS. More and more farmers are using social media around the world and find it effective on farm (LeBoeuf *et al.*, 2012; Fahy, 2013). While personal use is very common, professional use of social media for information dissemination by extensionists at personal or organizational level is still

low mostly because of lack of awareness (Rhoades and Aue, 2010). Social media use has more to do with mindset than with age. While many farmers across the globe are taking to social media to connect with experts and their peers, extensionists and extension organizations are much laid back by stereotyping farmers and believing they are not technologically savvy (Diem *et al.*, 2011; Payn-Knoper, 2013). Also, there is the question of social media etiquette. Maintaining professionalism on social media is very important, especially when affiliated to professional organizations as online behaviour of individuals may reflect upon one's organization. There are both advantages and disadvantages of "friending one's clientele" (Hill, 2014) and extensionists and other professionals need to remember the do's and don'ts of social media behaviour to successfully communicate with target audiences (Harder *et al.*, 2011). To change the mindset and promote thoughtful use of social media among AEAS community, mass awareness and interaction with one's clients needs to be emphasised.

Few other important applications of social media like – polls, events, group discussions, forums, documents, webinars, chats (individual, groups, memories, advertisements etc). These applications are very useful for extension professionals for planning, organising, and evaluating extension programmes. The facebook also gives insights of the user engagement and offer several publishing tools

## 2. Global survey on social media for agricultural extension and rural advisory services

### 2.1. Why the survey?

The basic philosophy of social media is the democratization of information, communication and knowledge management (Saravanan *et al.*, 2015). It is becoming an important part of the rural community with or without outside help and this digital revolution can provide a much needed boost to AEAS in their development efforts. Social media has revolutionised communication and worldwide, the question has shifted from if it is a fad to how best it can be utilized for development. And being at the forefront of rural development, it is very important to understand the perception agricultural extension stakeholders have towards use of social media in AEAS and how they are using it to communicate with clients. From there, strategies and guidelines need to be developed to make social media an integral part of AEAS and with this objective, this global survey was conducted.

### 2.2. Methodology

The structured survey questionnaire was specifically developed for this study using Google Forms and circulated through social media platforms like Facebook and Twitter, emails, and web portals of GFRAS, e-Agriculture, AESA and other agriculture communities with an appeal for extension professionals to fill the survey. A total of 229 respondents from 62 countries responded to the survey with 78.5 per cent of them belonging to developing countries. Based on the findings of the study, some future steps are suggested to successfully integrate social media in AEAS. Data were analysed through descriptive statistics using Microsoft Excel software.

### 2.3. Findings

#### 2.3.1. Personal details of the respondents

The diverse set of respondents of the study includes researchers (25.9%), extensionists (21.5%), academicians (20.6%), entrepreneurs (5.7%), policy makers (4.4%), farmers (0.4%) and others (21.5%) from a variety of national and international institutions. (Figure 1). One fourth of the respondents were female. 48.2 per cent of belong to 26 to 45 years age group, followed by 46–65 years (42.1%). While a large majority of respondents indicated that they are from developing countries, the rest were from developed (13.90%) and underdeveloped (7.60%) countries.

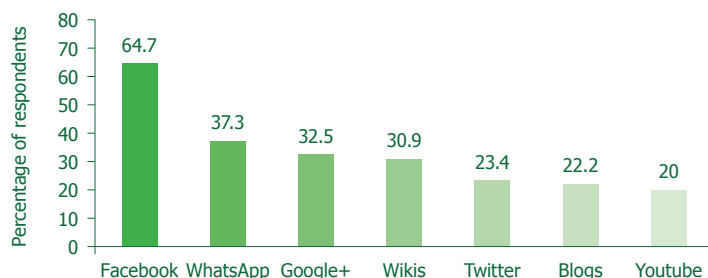
**Fig. 1 Type of organization of the respondents**



#### 2.3.2. Social media participation

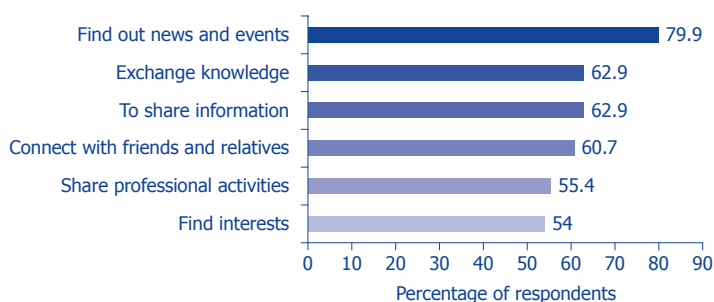
Inspite of the high number of respondents using social media platforms (99%), only 51.10 per cent of them were member in/follower of any AEAS pages/accounts/handles. In consistent with the global trend, the study identified Facebook as a most preferred social media platform by a large majority of the respondents (64.7%) (Fig. 2) followed by Whatsapp (37.3%), Google+ (32.5%), Wikis (30.9%), Twitter (23.4%), blogs (22.2%) and YouTube (20.00%).

**Fig. 2 Social media preferences**



Sharing news items and events, and exchanging knowledge in the form of discussions are becoming major activities on social media sites, especially for agricultural professionals and practitioners as was evident from the responses in the survey. Other major activities on social media sites (Fig. 3) were connecting with friends and family, share professional activities, and find accounts of interests. The findings are in congruence with that of Chowdhury and Hambly Odame (2013).

**Fig. 3 Reasons to use social media**

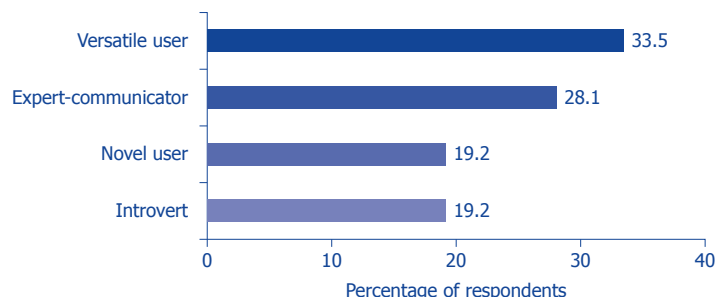


Personal mobile phones were the most used device by the respondents to access social media (68.2%) followed by personal laptop (60.1%), personal computer (49.8%), office computer (41.7%) and office laptop (26%). Though mobile phones are getting increasingly popular, globally laptops and PCs are still the most used devices to access social media according to the research results of Global Web Index ([www.incite-group.com](http://www.incite-group.com), 2015).

The respondents were familiar with social media, majority (52.7%) having been using it for more than past five years, followed by those who have been using it for last three to five years (38.8%). Only few have been using it for last one to two years (6.3%) or less than one year (2.2%). Depending on how active an individual is on social media platforms in sharing information and communicating with others on a regular basis, four types of social media users were identified (Alarcon-del-amo *et al.*, 2011) – introverts (only update profile and mostly communicate through private messaging), novel users (updates profile, actively seek out information, spend time tagging photos, logs in between 1–5 hours a week), versatile users (updates profile, sends public and private messages, shares links, comment on discussion threads, mostly in social media for professional activities) and expert communicators (logs in several times a

day, actively engaged in all social media/networking activities, stay updated and interact very frequently both professionally and personally) A sizable portion of the respondents identified themselves as versatile users (33.5%) followed by expert communicators (28.1%), and novel users and introverts tied at 19.2% (Fig. 4).

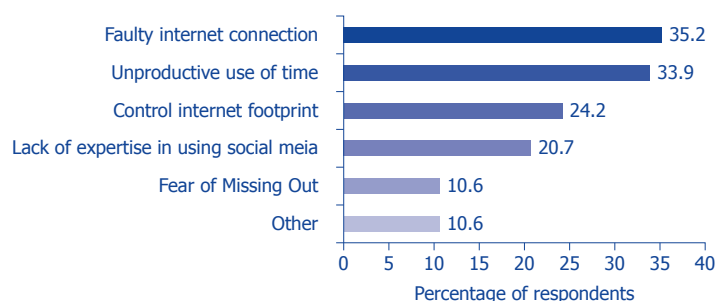
**Fig. 4 Types of user**



Globally, an individual spends about 2.4 hours a day on social media (Kemp, 2015) but in the present study, many of the respondents (21.70%) reported using social media for 1–2 hours per day followed by those who use it for 31–60 minutes (19.5%), those using for 15–30 minutes (19.5%) and 2–3 hours each day (11.10%). But some reported not to use social media every day (11.10%) and of them, 66% logged in to their social media accounts 3–5 times a week.

Faulty internet connection (35.20%) and unproductive use of time (33.90%) were considered as the major drawback in using social media (Fig. 5). Lack of expertise was also reported by about 20 per cent of the respondents. Concerns about privacy, wastage of time, and lack of expertise in using social media is in line with the findings of Newbury *et al.* (2014). While internet connections are infrastructural issues and needs to be looked into by the service providers and governments, personal constraints and privacy concerns can be easily taken care of with awareness creation and learning to better use social media through trainings and workshops, if needed.

**Fig. 5 Drawbacks in using social media**

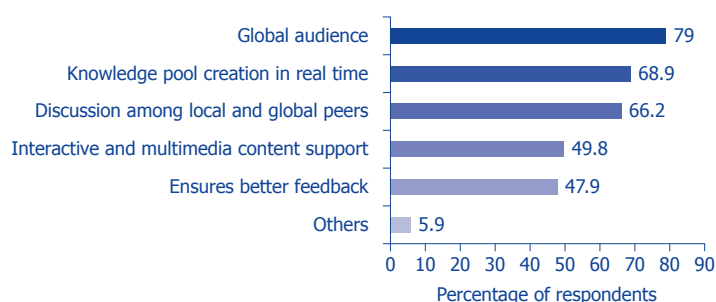


### 2.3.3. Attitude towards social media in AEAS

There is growing unanimity across the globe about the importance of social media in development and the same trend has also been reflected by the respondents of the study where 94

per cent deemed social media to be useful in AEAS, while 1.8 per cent disagreed and 3.5 per cent said they were not sure about the importance of social media in AEAS.

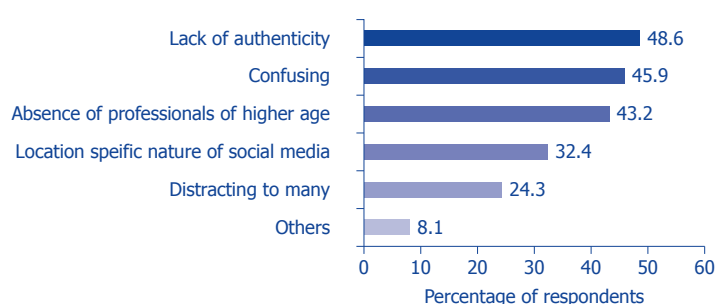
**Fig. 6 Advantages of social media**



Global reach is considered one of the most important features in any development sector and it is same for social media use in AEAS as has been reflected by the respondents (Fig. 6). Global audience for the information shared is considered the greatest advantage of social media (79%) followed by knowledge pool creation in real time and discussion among local and global peers.

But along with the advantages, social media has some perceived disadvantages too (Fig. 7). Information being one of the most important inputs in agriculture, lack of authentic information can do more harm than good to the farmers. Since the knowledge pool in social media are mostly anonymous, without proper citation, most of the time source of information is difficult to trace. Added with diverse information on the same topic, it becomes confusing to users. Also, many extensionists and experts have not started using social media either because they are sceptic about its usefulness, concerned about privacy issues, or for lack of technical skills which keeps an important part of AEAS outside social media. There are also arguments about utility of global knowledge in agriculture when it is a location specific activity. Numerous conversations at the same time were also distracting for some users.

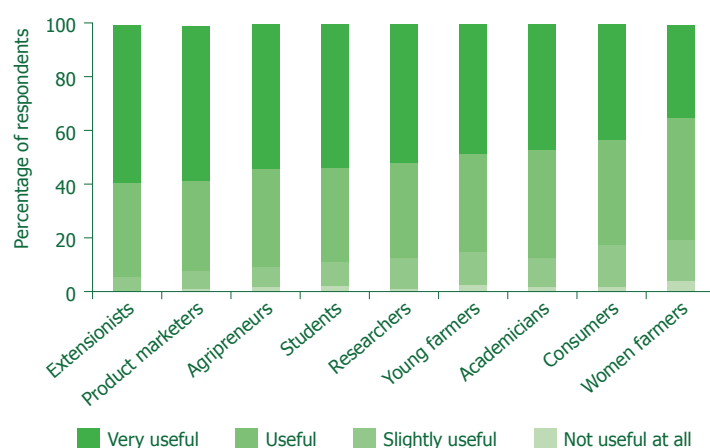
**Fig. 7 Disadvantages of social media**



Irrespective of its disadvantages, social media is agreed to be an important platform for pluralistic extension, bringing together all the actors in AIS and making them shareholders in development. But the perception about its usefulness varies

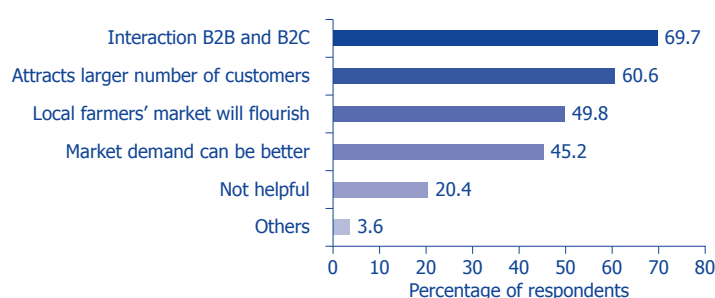
with the stakeholders using it, their environment of operation and their roles and actions in AIS (Fig. 8). Social media is perceived to be of no importance to the women farmers by some respondents (3.9%) and currently, that is the scenario in rural areas but being the disadvantaged group in rural communities, they have much to gain from social media in terms of farming, livelihood, health and nutrition, and childcare.

**Fig. 8 Perceived usefulness of social media to agricultural stakeholder**



Linking farmers to market and helping them get maximum returns out of their enterprise is one of the basic objectives of AEAS and diverse set of location specific technologies are put into use. In market led extension, the process of advisory also become pluralistic and inclusion of consumers become more important to help local farmers get high returns. Interaction between agribusinesses and with their customers was considered the biggest advantage of social media in market led extension (69.7%) (Fig.9). Attracting large number of customers through social media platforms (60.6%) and flourishing of local farmers' markets (49.8%) were also considered as important benefits.

**Fig. 9 Social media for market-led extension**



In spite of the huge potential that social media has to offer to the agricultural sector, it is the personal incentives that will encourage the individuals to join in the conversation. For the respondents of the survey, getting information about news and events (82.5%), getting to know about conferences, seminars, workshops, etc. (77.6%), information about new publications

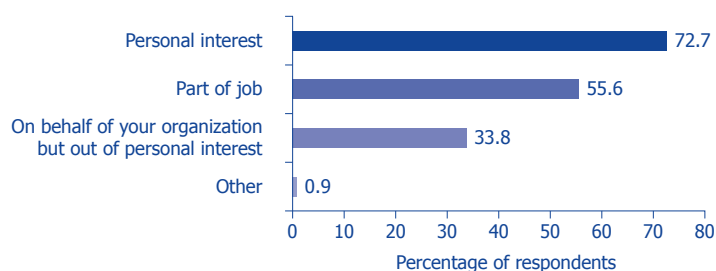


(75.8%), job alerts (43%), getting product review/information from peers (36.8%), and learning about new business opportunities (28.7%) have been the important personal benefits received from using social media.

**Fig. 10 Personal benefit using SM**

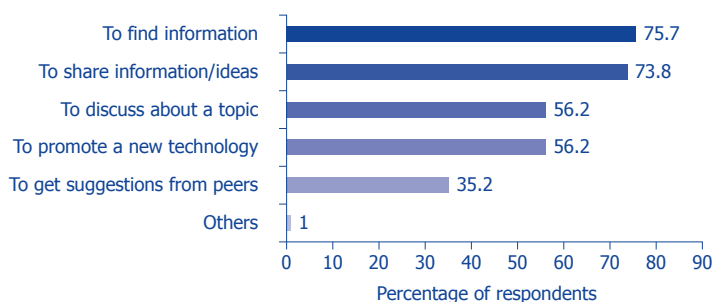


**Fig. 11 Reason for using SM for agricultural information**

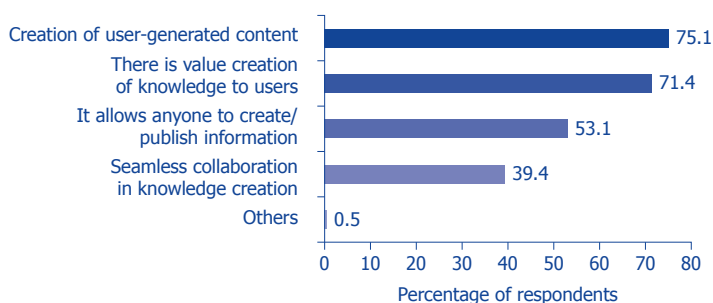


Specifically for agricultural information, 93.4 per cent of the respondents used social media. Because of the peer presence in social media, it makes a great platform to discuss idea and problems and get professional views. The major uses of social media, according to the respondents, were to find information (75.7%), to share information/ideas (73.8%), to discuss topics with peers (56.2%), to promote new technology/information/ideas (56.2%), and to get suggestion from peers on academic/professional matters (35.2%). Personal interest was the major reason for using social media by the respondents (72.7%) (Fig.10). Even though use of social media for agricultural information was fairly high among the respondents, there were some major concerns for not using it intensively for the purpose. Contextual to AEAS, the linkage between research-extension-farmer-market is not yet cohesive on social media and so, benefits can be reaped by a very few. Also, sparse use of the platforms for professional use, lack of authentic information, lack of awareness about its use among extensionists, lack of competence in using the social media platforms properly, unavailable or erratic internet connections, and biased information and advertisements were found to be acting as deterrents among the respondents in using social media for professional purposes.

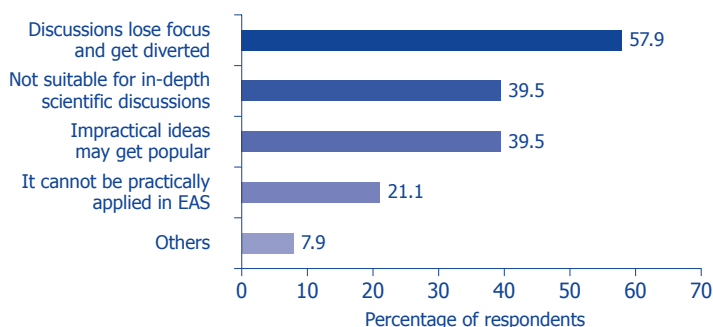
**Fig. 12 Uses of SM for agricultura information**



**Fig. 13 Advantages of social construction of information**



**Fig. 14 Drawbacks of social construction of information**



Social construction of information is one of the most important characteristics of social media. While it can be a very important tool for opinion forming and social development, applied to AEAS, it has both advantages and disadvantages (Fig. 11 and Fig. 12). Majority of the respondents (95.2%) believed social construction of information was important in social media while 4.8 per cent of the respondents disagreed. Creation of user generated content (75.1%) and value creation of knowledge to users (71.4%) were considered as useful features of social construction of information but lack of focus and diversion from central topic (57.9%), unsuitability of the medium to carry out in-depth scientific discussions (39.5%), and popularity of impractical ideas (39.5%) were the major disadvantages identified that diluted its importance in AEAS.

Archiving of information is important in AEAS to enable users retrieve information as and when needed. 68.2% agreed that archiving information is easy in social media while 7.9 per cent disagreed and 23.8 per cent were undecided.

While communication has become much easier with social media and global and local communication has become hassle free, 55.9 per cent of the respondents believed social media saves time and money in communication compared to traditional media but 2.6 per cent of the respondents believed. But as social media is found to be distracting at times depending on platform used or activities online, 41.4 per cent of the respondents opined it to be resource saving only at times.

A larger communication network and connection with peers is generally believed to make individuals more informed. Also, access to diverse sources of information helps in acquiring knowledge contributing to personal development. Contextual to agricultural information and AEAS, majority of the respondents (64.3%) believed social media helps in personal development of individuals only to some extent while 32.6 per cent believed it to be highly contributing towards personal development, though 3.1 per cent respondents didn't agree to it.

Information in social media evolves very fast and news becomes old within matter of hours. Information acquired by an individual needs processing and the huge amount of information that is being generated on social media every second on single topics can have both beneficial and detrimental impact depending on the context. While 18.5 per cent of the respondents strongly agreed and 36.1 per cent of the respondents agreed that information explosion is a major disadvantage of social media, 6.6 per cent respondents strongly disagreed and 21.6 per cent disagreed to the notion while rest of the respondents (17.2%) are undecided.

Because of selective need of information of individuals, the huge amount of information in social media can generate noise and redundancy, thus reducing its utility to users. For customization of information and news feeds received by users according to their own preference, all the major social media platforms have introduced features like hastags, selective following, forming of interest groups, etc. Majority of the respondents of the survey agreed (18.5% strongly agreed and 50.7% agreed) that interest groups eliminate the problem of redundancy of information in social media while 11 per cent disagreed.

Information is the most important component of AEAS and one of the basic principles of AEAS is providing open and equal access to information to everyone. Social media makes it possible to a great extent as 95.2 per cent of the respondents agree (47.6% strongly agrees and 47.6% agrees) while only 1.8 per cent disagrees.

Innovation brokers are the systemic intermediaries in AIS whose main purpose is to build appropriate linkages and facilitate multi stakeholder interaction in innovation (Klerkx *et al.*, 2009). Innovation brokers are organizations that generally focus on enabling others to innovate rather than on the organization

or implementation of innovation (Winch and Courtney, 2007) and social media can help AEAS, which mostly acts as facilitator in rural settings, to better initiate the linkages between different stakeholders and increase innovation capacity as agreed by 95.2 per cent of the respondents (49.8% strongly agreed and 45.4% agreed) while 1.3 per cent disagreed.

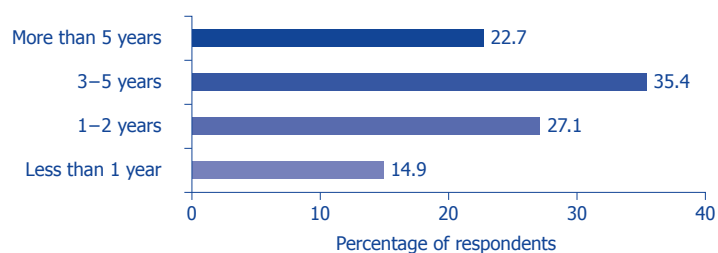
### 2.3.4 Organizational use of social media in AEAS

Innovation has been reconceptualised as a successful combination of 'hardware' (new technical devices and practices), 'software' (new knowledge and modes of thinking), and 'orgware' (new social institutions and form of organizations) (Smits, 2002). To facilitate innovation, communication and interaction among stakeholder organizations and institutions is important and social media have the potential to provide the platform in agricultural sector.

Inter-organizational and intra-organizational communication can result in increased interaction within the employees and with customers (Langer, 2014), thus giving a favourable work environment. Increased numbers of organizations are now taking to social media to connect with their clients and 77.5 per cent of the respondents said their organizations are using social media to do so. Facebook is the most popular platform (80.9%) followed by Twitter (40.4%), Blogs (35.1%), LinkedIn (34.6%), Google+ (34.6%), and various other platforms (18.9%). Faster information dissemination (75.5%), better reach than traditional media (48.9%), higher reach among young farmers (39.9%), and interactivity (36.7%) were the major reasons identified for taking up social media.

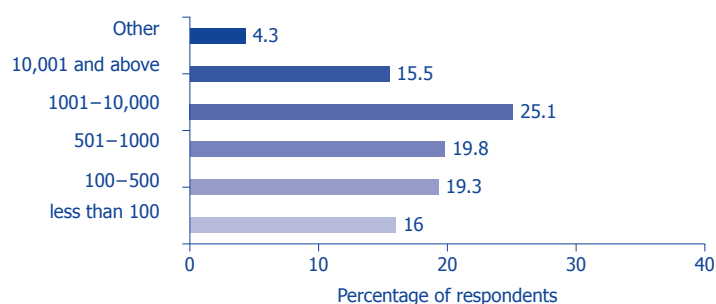
Social media has increased the number of clients of AEAS organizations and agribusinesses manifolds over the past few years. Only 14.9 per cent of the respondents said their organization has been using social media for less than one year while the rest have been using it for longer period (Fig. 13). The number of clients reached directly through social media is still not considerably high (Fig. 14) but hopefully the situation will be better with increasing number of rural people taking to social media. While 62 per cent of the respondents said their organization have social media manager or communication officer to maintain the social media handles and accounts of the organization, 37.2 per cent said their organizations had no such positions.

**Fig. 15 Number of years using SM**





**Fig. 16 Number of clients directly reached through SM**



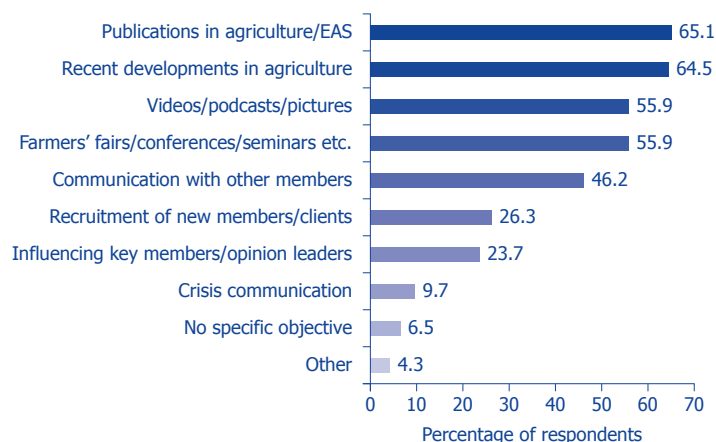
Social media policies and guidelines are some broad outlines about how to behave online and maintaining decorum when representing the organization online. It also clarifies the objectives of the organization and gives a clear idea to the employees about what information to share online and should be built on the principles such as keeping content up to date, commenting and providing feedback in a timely manner, encouraging audiences, providing accurate information, and avoiding arguments and comments on legal matters (Saravanan *et al.*, 2015). 31 per cent of the respondents reported that their organization have a social media policy while 49 per cent said their organization did not have any and 16.8 per cent of the respondents said they didn't know if a social media policy guideline existed in their organization.

Social media is relatively new medium of communication and though basic use is fairly simple to learn, mastering this new technology can be difficult because of the continuous evolution it is going through (Andres and Woodard, 2013). To effectively use the platforms for sharing information, some basic technical knowledge is enough but for developing tools and apps, advanced knowledge is required. For extensionists, farmers and other professionals to use social media for communication, some preliminary knowledge is enough to help them utilize it. Also, with the rise of social media use and its increasing importance in agricultural communication, organizations in AEAS have started organizing training programs and workshops for their employees and clients to increase awareness and impart basic skills to use social media. 32.6 per cent of the respondents said their organization have conducted training programs on social media use and 61.7 per cent of respondents said those trainings have been for the employees, 37 per cent said they have been for all the actors in AEAS, 22.2 per cent for the clientele and 8.6 per cent for others. Major focus of the trainings organized were creating awareness about Web 2.0 technologies and social media, use of Facebook, Twitter, YouTube, blogs, cloud computing, social media and transfer of farm technology, reaching out to the audience through social media, and so on.

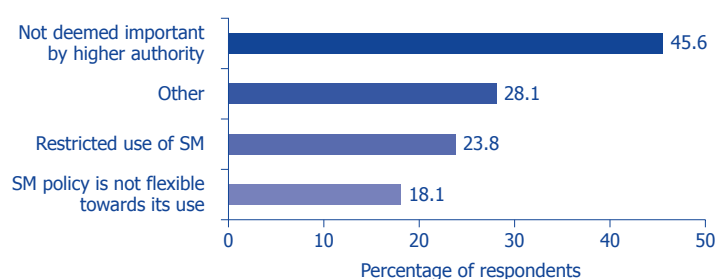
Among the respondents, 71 per cent said they require some training on social media to better understand its functioning. The major areas of training identified were integration of different types of social media platform for information sharing

across different social media (77.6%), technicalities of social media use (66%), creating content on social media (60.3%), and 43.6 per cent said they require in general training on use of social media.

**Fig. 17 Type of information shared**



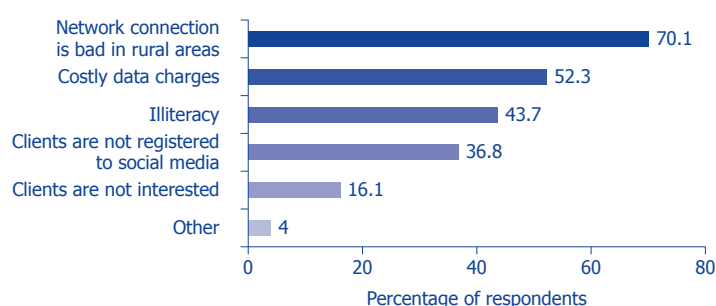
**Fig. 18 Institutional difficulties**



Major category of information that respondents' organizations share through their social media handles and accounts are publications in agriculture and AEAS, recent development in agriculture, videos, podcasts, etc. (Fig. 15)

Social media is about user engagement and to keep the social media accounts of the organizations active and to keep the target audience interested, posts and updates at regular intervals are necessary. While 47.3 per cent of the respondents said posts are not made every day in the social media account of their organization, for the rest it varied from one post a day (5.5%) to more than 20 (6.6%), though mostly it is 5–10 posts a day (15.4%).

**Fig. 19 Infrastructural difficulties**



Though social media has many uses and utilities, but like any other technology, there are problems at different levels which prevents these from fully utilizing it. For social media, while problems at institutional level (Fig. 16) creates problem in utilizing it, infrastructural problems (Fig. 17) blocks its access altogether from many. Access to technology in rural areas is not necessarily a problem of developing country either as studies conducted in Canada (Chowdhury and Hambly Odame, 2013) and U.S (Newbury *et al.*, 2014) suggests. Along with these, the generic problems of rural areas of developing countries like erratic power supply, lack of price and market commercialization, costly internet connectivity severely handicap the potential of social media in these areas.

## 3. Discussion

### 3.1. Social media and AEAS – strengths, weaknesses, opportunities, and challenges

Social media has no doubt opened a completely new vista in mass-personal communication that has altogether revolutionised the communication industry. And this has opened up new ways for development. As it is clear from the review and findings of the global survey, social media has varied degree of applicability based on situation and users. In spite of all the advantages that one experiences and also research findings suggest, practical use of social media in agriculture is still in nascent stage and the challenges are at more than one level. While in developed countries farmers are mostly resource rich and reach of internet is not a problem, its use is wider compared to developing and underdeveloped countries which are still struggling to get the entire infrastructure in place. But irrespective of those issues, like every other technology, social media also has its own strengths and weaknesses, opportunities and challenges many of which are generic in nature. The major issues are discussed below:

#### Strengths

*i. Democratization of information:* The greatest strength of social media is the democratized information that is created and also accessible to all without any bars or conditions. All the stakeholders are included in discussions on critical issues like GMOs (Genetically Modified Organisms) which provides a wider view point and help understand issues better. Knowledge is one of the most important resources for rural communities and getting it whenever they want is a big step towards their empowerment which can be made possible through social media.

*ii. Voice of the community:* Social media gives voice to the people and makes them active stakeholders of development efforts. For example, in the discussions that take place in Twitter with #agchat are decided by farmers and they are the major participants. This makes bottom up approach of devel-

opment much easier and brings all pro-development forces on the same platform.

*iii. User generated content:* Web 2.0 and social media has given power to the users to generate as well as share content. The biggest advantage of this feature is that it makes content reach wider to a large user base and the possibility of everyone getting access increases manifold. Facebook groups like Mkulima Young have brought young farmers of Kenya closer to their consumers not only locally but internationally and give the farmers opportunity to learn from the experiences of their counterparts worldwide.

*iv. Easy access:* Mobile phones being the major device to access social media, especially for rural population, the reduction in the cost of mobile phones (smart phones), ever increasing mobile phone subscription and reduction in the cost of data exchange among the rural communities of developing countries can prove to be a boon for social media reach too, thus making it easier for AEAS to reach the farmers.

*v. Extended reach:* AEAS has long been struggling to reach the bottom-of-the-pyramid (BoP) farmers and connecting the last mile but with increased users of social media, especially with the young farmers, AEAS can hopefully bring every individual within its reach. While traditional extension methods like projection system could cater to only 30–40 farmers at one time, a video uploaded in YouTube or shared through Facebook or Twitter can have millions of views within a day. But before taking to social media, extensionists need to start their outreach efforts by identifying the responsiveness of the clients to the particular media (Typhina *et al.*, 2015) and then build on from there.

*vi. Social capital:* Social capital can be defined as trust, engagement, and community involvement (World Bank, 2011). Social media can help in building sustainable communities involving extensionists, farmers, managers, researchers, and policymakers using their highly interactive platform, to build and utilise social capital to derive larger benefits for the society. Facebook groups like AESA, GFRAS, ICT4D, blogs of individuals and institutions are giving an unique platform of collaboration and discussion to professionals and development practitioners.

#### Opportunities

*i. Possibility of translating ideas/information into action:* Social media, through engagement online, can actually motivate users to practically act on issues, take stands, and bring develop-

ment. Awareness created through social media had been translated into practical actions in many instances in developments sector, agro-tourism, etc. Mobilising the people to do something with the information they are exposed to online be the biggest opportunity of social media.

*ii. Forming special interest groups:* Groups and pages in Facebook, tweet lists in Twitter, subscription to channels in YouTube, and following specific hashtags across most of the platforms are some of the ways users can filter the information or feeds they receive on their walls according to their interests to avoid overcrowding of news feeds and information explosion. Groups like AESA have attracted thousands of professionals online which have resulted into increased actions offline.

*iii. Collaboration:* In an age of pluralistic extension, social media provides a rich opportunity in collaboration among various stakeholders in AIS seamlessly and include the farmers actively in those discussions. The benefits are already been utilized through professional networking as expressed by Pamela Mappala, an extensionist from Philippines who opines "Through social media we got to network with other international organizations like GFRAS, USDA's eXtension program, e-Agriculture, and the like" (Mappala, 2015).

*iv. Internationalization and localization:* Social media bring the unique opportunity to AEAS to translate global content into local context with necessary modifications and thus make agriculture adaptive to changing context and technology transfer faster. Also, strategic modifications in platforms to make them easy to use by the local farmers in developing countries is also needed to popularize them at the grassroots as expressed by P.N. Ananth, a researcher from India and Nandana Jayasinghe, an extensionists from Sri Lanka (Ananth, 2015; Jayasinghe, 2015),.

*v. Information brokering and fostering innovation:* With social media, content availability becomes easier and this gives the opportunity to AEAS to act as information and innovation brokers. Open access information in social media and conversations with peers and experts can help progressive farmers develop innovative capacity.

*vi. Sharing stories:* Stories of success and failures in Agriculture and Rural Development (ARD) helps to learn from others' experience but more importantly, they create an emotional bonding with readers and help in forming better connections personally, an advantage available only through social media.

*vii. Crisis communication:* Not just in natural disasters or social and political emergencies, social media can be effective in agricultural crisis like pest or disease outbreaks as well facilitating faster communication among experts, farmers, and other actors helping in containing situations quickly.

*viii. Developing innovation competencies:* Social media intensifies communication by amplifying messages from traditional media and enabling new ways of collaboration and content co-creation with target audience (Schein *et al.*, 2010), thus giving users an opportunity to contribute their views and ideas making it an interactive environment where no one is just an audience. Exposure to different views and trying them out in their own situations can help the smallholders develop innovation competencies.

## **Weaknesses**

*i. Duplication of information:* Due to sharing and re-sharing of content and weak copyright laws due to open access of information, duplication of information is very high which might make finding authentic content harder in social media. Moreover, absence of authenticated source and reduced credibility with lack of proper archival facilities except for blogs and few other tools, finding the desired content might get harder with time.

*ii. Lack of social media readiness:* At an individual level, social media readiness is still low among researchers, extensionists, development actors, and farmers especially in developing countries. Many a time, lack of proper knowledge and skill 11,815 members in using social media or its potential in extension hinder its use which are big obstacles that needs to be overcome to make social media an integral part of development communication.

*iii. Information explosion:* Amount of content generated on single topics is very high and lack of monitoring makes the scientifically incorrect at times. This huge amount of information may confuse inexperienced users and can be more harmful than beneficial.

*iv. Limited audience:* A critical look into the social media accounts of Facebook, Twitter, YouTube, blogs, and other platforms clearly shows the disparity of number of users from developed countries and developing countries. While farmers, extension organizations, extensionists, and development practitioners from North and South American and European countries dominate the platforms, only recently, development practitioners, policy makers, researchers, and academicians from developing countries are joining these platforms while participation from the grassroots is still negligible. This seriously limits the most important audience and target users in development sectors and becomes an impediment in using social media for ARD.

*v. Stereotyped thinking:* The stereotypical thinking of extension system that farmers are not technologically smart or interested enough to use social media for communication. But, sometimes it is also the other way round when extension personnel are laggards in such matters and find difficulty in grasping the idea of virtual program delivery (Diem *et al.*, 2011). The same has also been reported by Tom Phillips, an academic from Australia

"Farmer uptake and use (of social media) is advanced (create content, discussions and conversations), and use of hashtags and weekly online meetings (#agchatNZ) compared to extensionists, academics, researchers which tends to be one way messaging" (Phillips, 2015).

## Challenges

*i. Cost effectiveness:* Even though mobile phone subscriptions have increased, getting decent network is still a struggle in many rural areas of Asia and African countries. Topped with high data charges, internet is inaccessible to many rural communities. While fixed broadband data charges in developing countries are thrice as high as developed countries, mobile broadband charges are twice as higher (ITU, 2015). And in such situations, there is very little use for social media. Also, in some areas internet connection is provided through tele-centres. Also high internet cost restricts the use of multimedia like images and videos as they consume much more data than text (Andres and Woodard, 2013).

*ii. Lack of infrastructure:* Erratic power supplies in rural areas, lack of internet connectivity for using social media, etc. restricts reach and benefit (www.mckinsey.com, 2014). Internet penetration in least developed countries (LDCs) is only 9.6 per cent (ITU, 2015) and a major reason of this is the lack of fibre optic lines, cell towers, wireless spectrum, and reliable electricity.

*iii. Literacy:* At the grassroots level, illiteracy is still one of the biggest challenges holding back the development efforts. Social media use requires both educational and technical literacy which are both lacking among majority of the population, especially women in many developing countries.

*iv. Quality control:* Quality control and monitoring of posts made is very important, especially for organizations, to maintain reputation and so, content filtering needs to be taken very seriously on social media. One way for doing that have been suggested by Isabella Rodriguez y Baena, a researcher from Italy opined that, "In order to keep the organization's reputation high, there is a real need of a full time moderator who makes sure that information shared are reliable, up to date, and in focus with organization's aim" (Baena, 2015).

*v. Ensuring participation and continuous engagement:* A review of the activities in most of the groups/communities/pages on Facebook and YouTube indicated in Table 2 shows that most of the users are very passive and only very few are pro-active. While many visit the group pages, only few posts, share and discuss ideas, and issues. This limits the scope of the information shared to reach a global audience as well as the potential of the platforms.

*vi. Institutionalizing social media:* At an institutional level, social media still hasn't gained much popularity and many have restricted its use for the employees. Changes needs to come from the top and for that creating proper awareness is very important. "The potential of social media in AEAS is yet to be fully tapped. I believe that extension services will be more effective and even delivered more efficiently if the use of social media can be mainstreamed to the operations of regular extension agents" opined Oladapo John Olakulen, an extensionist from Nigeria) (Olakulen, 2015) and this can best be done by special initiatives at institutional and organizational level.

*vii. Measuring impact:* Lack of capacity for tools and analytics that help monitoring and assessing the value of information shared through social media is still scarce. Success of social media use can be measured to some extent by tracking number of visitors, friends, followers, mentions, Facebook "likes," conversation index, and number of shares for which basic knowledge of social media use can be enough.

*viii. Privacy concerns:* Privacy concerns, irrelevant posts, conflicting perceptions among stakeholders about the use, risk, and credibility of social media, and lack of capacity in using social media also act as deterrents in using social media for extension program delivery (Fuess, 2011).

*ix. Inclusion of women:* One of the most disadvantaged groups in the rural areas is the women and their restricted use of mobile phones and other communication technology adds to the cause of their exclusion from development. Formulating special strategies for their inclusion in social media use is a big challenge in development efforts of AEAS.

But sometimes, the line between challenge and opportunity becomes blurry for social media. While content generation by users is one of the opportunities of social media, content generated by users far exceeds those generated by experts and with very limited opportunity of gate-keeping and authentication, it can do more harm than good. The concern has precisely been raised by G.A.K. Kumar, a researcher from India expressed that "Scientific authenticity of message is desirable when posting agricultural extension and advisory related messages. How to control misleading statements which may incur loss to farmers and who will be responsible for it?" (Kumar, 2015). Also, while wider audience and fast dissemination of information globally gives social media its popularity, its viral nature and potential exponential spread of information makes scope of quality check very lean. Being a very new medium and the dynamics still not clearly understood, awareness creation about the pros and cons of social media is very important to get the best out of it, more so in agriculture where wrong information can prove to be devastating to farmers at times.

### 3.2. Social media platforms and their use in agvocracy

With increasing number of social media platforms, the choice is getting diverse for AEAS providers. Each type of platform has more or less utility to individuals depending on type of user, purpose of use, content shared, technical literacy level, etc. And for that reason, choosing a specific platform needs much deliberation on part of AEAS organizations. As Filma C. Calalo, an academic from Philippines points out, “The use of social media has its own advantages and disadvantages. I believe, the challenge to agricultural extension is how to exploit the potential and the opportunities that social media can offer the intended beneficiaries of information and technology so that its benefits will be generated to the fullest” (Calalo, 2015).

**Table 3 Social media applications in AEAS – the pros and cons**

Type of platform	Target users	Functions	Advantages	Limitations
Social networking sites	Literate farmers, extensionists, agripreneurs, development practitioners, consumers	<ul style="list-style-type: none"> <li>• Enabling farmers and others to “gain a voice”</li> <li>• Enabling collaboration, sharing and partnerships for innovation among extension actors</li> <li>• Offering localized and customized information, advisory and other services</li> <li>• Helping to create, document, store, retrieve, share and manage the information</li> <li>• Facilitating capacity development of farmers, extension professionals and other AIS actors</li> </ul>	<ul style="list-style-type: none"> <li>• High media richness</li> <li>• Scope of peer to peer communication is very high</li> <li>• Easy content creation and sharing</li> <li>• Capacity development</li> </ul>	<ul style="list-style-type: none"> <li>• Illiteracy</li> </ul>
Blogs and vlogs	Literate farmers, extensionists, agripreneurs, development practitioners, consumers	<ul style="list-style-type: none"> <li>• Enabling farmers and others to “gain a voice”</li> <li>• Offering localized information, advisory and other services</li> <li>• Helping to create, document, store, retrieve, share and manage the information</li> <li>• Facilitating capacity development of farmers</li> </ul>	<ul style="list-style-type: none"> <li>• Users can share experiences, stories and their views in details and discuss them with audiences</li> <li>• Capacity development</li> </ul>	<ul style="list-style-type: none"> <li>• Technical and educational Illiteracy</li> <li>• Unavailability of high speed internet connection and recording equipments</li> </ul>



**Table 3 Continued**

Type of platform	Target users	Functions	Advantages	Limitations
Micro-blogs	Literate farmers, extensionists, agripreneurs, development practitioners, consumers	<ul style="list-style-type: none"> <li>• Enabling farmers and others to “gain a voice”</li> <li>• Offering localized and customized information, advisory and other services</li> <li>• Facilitating capacity development of farmers, extension professionals and other AIS actors</li> </ul>	<ul style="list-style-type: none"> <li>• Short messages can have higher impact</li> <li>• Capacity development to some extent</li> </ul>	<ul style="list-style-type: none"> <li>• Illiteracy</li> <li>• Word limit can hinder discussions</li> </ul>
Collaborative projects	Literate farmers, extensionists, agripreneurs, development practitioners, consumers, researcher, academicians, policy makers	<ul style="list-style-type: none"> <li>• Enabling collaboration, sharing and partnerships for innovation among extension actors</li> <li>• Helping to create, document, store, retrieve, share and manage the information</li> </ul>	<ul style="list-style-type: none"> <li>• Broad based content due to involvement of many users</li> </ul>	<ul style="list-style-type: none"> <li>• Illiteracy</li> <li>• Unauthentic information</li> </ul>
Social bookmarking	Literate farmers, extensionists, agripreneurs, development practitioners, consumers, researcher, academicians, policy makers	<ul style="list-style-type: none"> <li>• Helping to create, document, store, retrieve, share and manage information</li> </ul>	<ul style="list-style-type: none"> <li>• Rich source of information on specific topic</li> </ul>	<ul style="list-style-type: none"> <li>• Illiteracy</li> </ul>
Virtual social worlds	Use in AEAS is very much limited			
Social gaming	Use in AEAS is very much limited			
Content communities	Farmers, extensionists, agripreneurs, development practitioners	<ul style="list-style-type: none"> <li>• Facilitating capacity development of farmers, extension professionals and other AIS actors</li> <li>• Enabling collaboration, sharing and partnerships for innovation among extension actors</li> <li>• Offering localized and customized information, advisory and other services</li> <li>• Helping to create, document, store, retrieve, share and manage the information</li> </ul>	<ul style="list-style-type: none"> <li>• Technology transfer</li> <li>• Capacity development of AIS actors</li> <li>• Training of farmers and extensionists through videos</li> </ul>	<ul style="list-style-type: none"> <li>• Data charges and accessing device can be a limitation</li> </ul>

**Table 3 Continued**

Type of platform	Target users	Functions	Advantages	Limitations
Forums, discussion boards and groups	Literate farmers, extensionists, agripreneurs, development practitioners, consumers, researcher, academicians, policy makers	<ul style="list-style-type: none"> <li>Helping to create, document, store, retrieve, share and manage the information</li> </ul>	<ul style="list-style-type: none"> <li>Highly useful for discussion and content sharing</li> <li>Capacity development</li> </ul>	<ul style="list-style-type: none"> <li>Illiteracy</li> </ul>
Socially integrated messaging platforms	Literate farmers, extensionists, agripreneurs, development practitioners, consumers, researchers, academicians, policy makers	<ul style="list-style-type: none"> <li>Offering localized and customized information, advisory and other services</li> <li>Helping to create, document, store, retrieve, share and manage the information</li> <li>Enabling farmers and others to “gain a voice”</li> </ul>	<ul style="list-style-type: none"> <li>Interest and peer groups can be formed</li> <li>Media richness is high</li> </ul>	<ul style="list-style-type: none"> <li>Illiteracy</li> <li>Limited scope of adding diverse actors</li> </ul>
Professional networking	Researchers, academicians, policy makers	<ul style="list-style-type: none"> <li>Helping to create, document, store, retrieve, share and manage the information</li> <li>Facilitating capacity development of researchers and academicians</li> </ul>	<ul style="list-style-type: none"> <li>Important for faster dissemination of research findings</li> <li>Professionalism can be maintained</li> </ul>	<ul style="list-style-type: none"> <li>Not all stakeholders can be included in the discussions</li> </ul>
Social news	Researchers, academicians, policy makers, extensionists, farmers	<ul style="list-style-type: none"> <li>Offering information</li> </ul>	<ul style="list-style-type: none"> <li>Discussion on information can be carried out</li> </ul>	<ul style="list-style-type: none"> <li>Illiteracy</li> <li>Limited scope in AEAS</li> </ul>

### 3.3. Social media in AEAS – major issues

*i. Lack of skills and competency among extension personnel:* Social media are comparatively new medium of communication and even though more and more young people are using them, the online presence of the older generation is still low, especially in rural areas of developing countries. In India, women and older men constitute 27 per cent of the social media users in urban India and in rural areas, the trend is lower (Bhargava, 2015). Field level extension personnel of these areas also fall in this group and because of their low levels of skill and competency in using social media, they altogether prefer to avoid using them.

In the global survey too, lack of skill and competency in using social media to effectively communicate with clients is an issue that came up again and again in the comments of the respondents. Basic skills in using social media are particularly easy to acquire for anyone with regular use of these tools. Expertise

is difficult due to constant evolution of the platforms and integration of new features (Andres and Woodard, 2013), but it is neither very much necessary nor important for day to day communication purposes.

*ii. Organizational guidelines:* Social media use by individuals and organizations are completely different. While for individual users posting opinions and views have the luxury to be random and ‘personal’, for organizations, following some norms is important to maintain the quality of information shared. To utilize the potential of social media platforms, building a following is the first step for organizations to ensure successfully reaching the intended audience by building trust and reputation in a community of users. Especially for organizations in AEAS, content shared is considered as opinions of the organization and so being credible, professional and respectful to the target audience is very much important. Also, politically correct con-



tent sharing to avoid unwanted controversy is another important aspect and all these intensify the need of social media policies and guidelines at organizational level. This gives a clear norm for the organization as a whole and persons representing the organizations on how to conduct online so that the organization's reputation will not be harmed. Social media is constantly evolving and so is the interaction pattern online and this necessitates an adaptable policy guideline to accommodate new changes and keep pace with the continuing evolutions. Kevin Gamble, an academic from USA opined that "Social media is not necessarily a tool for reaching large audiences. It is an opportunity to develop relationships. In this regard, organizations need a much more coordinated strategy to reach scale" (Gamble, 2015).

*iii. Infrastructure:* Proper physical infrastructure needs to be in place for getting access to social media and utilization of information in farm life, if access is possible. Lack of mobile networks or poor connectivity, faulty internet connections, high data charges, low bandwidth limits the access of social media to a large extent. Joseph Sekiku, a member of civil society organization from Tanzania, expressed the same problems "We still have a lot to do to better use social media in least developed country like Tanzania, where problems of poor and costly internet connection are big problems along with lack of awareness and expertise" and these are not just the problems of Least Developed Countries (LDCs) but developing countries as well (Sekiku, 2015).

The problem is more than that though. Even if access to information is possible, generic infrastructural issues in developing countries leave very little scope for rural community to practically implement them. Access to markets, road and transportation, storage facility, access to credits, input availability are still major issues that needs to be addressed before putting much hype into social media use.

*iv. Training needs:* Training extensionists, farmers, and other actors in using social media is important to impart required skills to efficiently use them. At present, an important force that is stopping more people at rural level from using social media are psychological barriers and concerns that arise due to lack of knowledge about how social media works. In the global survey, 26 per cent of the respondents have specifically mentioned the need for trainings, awareness programs, and workshops to properly understand social media and use it professionally. Proper trainings, workshops, and awareness programs can take care of these concerns helping them understand and use social media better.

Training is also needed at top level of hierarchy in AEAS organizations to make social media policy guidelines more encouraging to its use. When organizations use social media profusely to communicate with their clients, the trickle-down effect on rural people will encourage them to take it up to stay updated. And to encourage this positive attitude and behaviour towards social

media at individual and institutional level, training need of users needs to be addressed immediately.

*v. Knowledge management:* The term knowledge management was for the first time introduced at a European Management Conference by International Labour Organization (ILO) in 1986. It refers to acquisition, recording, organizing, storage, dissemination, and retrieval of information. The process requires collection of information from one or more sources and its distribution to many so that it can be acquired at the right time in the right format by any user (Mondal, 2013). Social media helps in all the functions with varying degrees of efficiency. While features like hashtags and tweetlists make collecting, organizing, and storing information easier, dissemination of information is the special advantage of social media. Due to the huge amount of content generated every minute in any given platform, retrieving the right content may become time consuming though. Other than that, information shared in interest groups also gets automatically archived. Facebook provides special features of saving content by users on their profile for easy locating and retrieval after a considerable time lapse. Using the features that all the social media platforms have to offer in varying degree of effectiveness, knowledge management can be made much easier on social media for users.

*vi. Attitude towards social media:* "Social media is still a novel idea to many so people hesitate, feel shy, avoid going public, and don't take it seriously. But slowly many are realising it is worth investing time in social media to remain updated and socially and professionally relevant" (Chander, 2015). Due to lack of understanding on working of social media, privacy concerns, and control of digital footprint, many researchers, extensionists and academics host a feeling of negativity towards social media. Along with that, many a times, individuals use social media personally but avoid using it professionally either due to lack of interest or awareness. And age is a factor that sometime affects the attitude towards social media and sometimes don't.

Popularizing social media needs awareness and training for each stakeholder. Understanding the incentives of communicating through social media first hand can play a critical role in increasing its use. Also, as Nallusamy Anandaraja, a researcher from India, points out "social media needs more research on usage, hands on exposure of extension personnel, and studies on potential impact of various tools as too many tools may be confusing" (Anandaraja, 2015) to understand and promote the use of social media to bring a positive attitude about its use among the stakeholders of AIS.

*vii. Engaging rural community:* The most important part of using social media in AEAS is engaging the rural community continuously. Social media is all about user engagement and involving the rural community in the platforms needs strategic planning. While using multiple social media platform can be confusing to

rural clients, it may also result in redundancy of efforts in communicating single information, (Madan, 2015). Choice of social media platforms needs to consider client preference as well as content. As social media platforms are evolving, content support is becoming a minor problem, making user preference the most important consideration. Also, target users need to be selected beforehand depending on prior exposure to social media, frequency of use, and comfort level on the platforms so that their engagement will be high.

## 4. The way forward

From reviews and findings of the survey, it is clear that social media is fast becoming an integral part of agricultural communication and it is being readily accepted as the next big thing in AEAS. Though agricultural organizations are slowly adapting to the changing scenario, faster actions are required to better utilize social media. To overcome the challenges, a multipronged approach is needed at different levels:

### A. Individual level

- Extensionists need to take personal initiative to use social media as part of their job within the norms of institutional guidelines. Continuous engagement at individual level is needed for mass influence and to carry out fruitful discussions and encourage rural communities to get involved.
- Encouraging farmers, agripreneurs, and agribusinesses to directly connect with consumers through social media can raise awareness about agriculture in the general public and increase income.
- Faster translation of research findings into practical application can be ensured by sharing results through social media among communities of extensionists and professionals. This can also reduce the gap between research and practice.

### B. Organizational level:

- Formulation of favourable social media policy and guidelines and coordinated strategies are required. A clear understanding of the audience should be the foremost step to plan a social media strategy.
- Encouraging use of social media to promote organizational goals, actions, and success.
- Training employees not just at the bottom level but also at higher level of hierarchy to help them understand and use social media appropriately.
- Organizing workshops and hands-on-training for clients to create awareness about utility of social media and also developing skill to use it.
- Employing social media officer or communication officers to manage social media accounts, create content with experts, and gatekeeping.

- Private institutions and development agencies can try crowd-funding development projects through social media to raise awareness and financially sustain the projects.
- Organizations need to find innovative ways (like felfies) to promote social media use in agriculture among farming community especially among rural youth and women to make farming attractive.

### C. Infrastructural level:

- Basic infrastructure like power supply and access to network services are necessary to access social media.
- Markets, road, and transportation need to be created in rural areas for translation of information into practical use.
- Free Wi-Fi in public places in rural areas by the government can be helpful in accessing social media.

### D. Policy level

- Regulation of data tariffs in the rural areas and introduction of zero rating services (Bleiberg and West, 2015), by the government can help in making it accessible to the rural people.
- Promoting use of social media at the government level can encourage faster adoption.
- Major social media awareness campaigns and other such initiatives for increasing social media technical literacy of rural people.

## 5. Conclusions

While traditional ICTs were the weak ties for diffusion of innovation, modern day ICTs are bringing vast amount of information to rural communities. But among these, social media are unique because of the potential they provide for forming both strong and weak ties in communication. The society – the rural people, the field level extensionists, farmers – do not read journals; they read blogs, watch YouTube and use Facebook and Twitter and these are the mediums that reach them effectively. These platforms provide incentives to every actor to communicate online forming networks and initiating development. Empowered by mobile technology, social media has a huge potential to revolutionise communication but its success depends, to a large extent, on the innovativeness of AEAS and grassroot level organizations. Mobilising actors in AIS to use social media needs to be addressed first and raising awareness is a big challenge. Moreover, without infrastructure, only information can do very little. Further research into actual impact of social media on rural development and then scaling up are needed at local and global level. Extension is not just about communicating but bringing behavioural change thus mere sharing posts and social media activism is not going to change much without practical actions. A multi level approach and initiatives at institutional and individual level together is needed to make social media a reality in every sphere of agricultural extension and advisory services.

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## Training material / courses

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Innovative Collaboration for Development. A course on social media jointly developed by UNITAR and the Food and Agriculture Organization of the United Nations (FAO), with the support of the Technical Centre for Agricultural and Rural Cooperation (CTA), <https://www.unitar.org/ksi/innovative-collaboration-development>.

## Useful Tools for Monitoring and Social Media Analytics

DATASIFT. A social media management tool, <http://datasift.com/>

Hootsuite, A social media management tool, <https://hootsuite.com/>

TWEETREACH. A tool for analyzing Twitter data, <https://tweetreach.com/>

TrueSocialMetrics- A tool for analyzing different social media data,<https://www.truesocialmetrics.com/>

TouchGraph. Visualization of social media (e.g. Facebook) network data, <http://www.touchgraph.com/navigator>

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