



Research Article

Content Analysis of Websites of Agricultural Universities in North-Western Part of India for Agromet-advisory Component

RENU PANWAR¹, A.S. NAIN^{*2}, SUNIL GORIA³ AND UMESH SHARMA⁴

¹*Institute of Library & Information Science, NIMS University, Shobhanagar, Jaipur-303121*

²*Department of Agrometeorology, G.B. Pant University of Agriculture and Technology, Pantnagar-263145, US Nagar, Uttarakhand*

³*University Library, G.B. Pant University of Agriculture and Technology, Pantnagar-263145, US Nagar, Uttarakhand*

⁴*Department of Agronomy, RVSKVV, Gwalior, Madhya Pradesh*

ABSTRACT

Keeping in view the importance of agriculture in Indian economy and its strong dependence on weather, a mega network project was launched by Government of India in 1991 through IMD (then NCMRWF) to provide the advices to farmers of the country through more than 127 Agrometeorological Fields Units (AMFU) located across the country especially in the Agricultural Universities. The information is disseminated through the various means and ways such as print media, electronic media, fax, phone, SMS, and hard copy bulletins. IMD has also advised the AMFUs to keep all the information related to Agromet-advisory on the websites of the Institutions so that farmers / users can access the information as and when required. The present investigation was carried out to evaluate the contents / features related to Agromet-advisory on the websites of Agricultural Universities / institutions of North-western India. The websites were evaluated for the 15 different parameters and results showed that only few websites kept the good amount of contents / features related to Agromet-advisory. Websites of about 50% institutions were not even keeping 50% of parameters on websites. However, most of the universities / institutes keep the link for agromet related information on front page. It was also learnt during the investigation that the average amount of contents / features on websites are related to the age of officer in-charge of the Agromet-advisory project especially for the timeliness components (statistically significant at 0.038 probability level); however no statistically significant difference was found for parameters related to value additions.

Key words: Website contents / features analysis, Agomet-advisory, Agricultural University

Introduction

Agricultural production in India depends mainly upon the monsoon rainfall. Its timely onset, spread over the country, and distribution

along with dry spell and wet spell are important factors that contribute to the production of agricultural crops in general and *khariif* (rainy season) crops in particular (Varshneya *et al.*, 2010). Agriculture plays an important role in Indian economy. The annual agricultural production decides the gross domestic product (GDP) of the country, directly as well as

*Corresponding author,
Email: nain_ajeet@hotmail.com

indirectly (Varshneya, 2007). Share of agriculture in GDP is 15.7%, industries 28%, and services sector 56.4% (Agricultural Statistics at a Glance, 2010). However, both industries and services sector are influenced by agricultural sector. More than 90% of food consumed in India is produced locally; the efficiency of production has to be improved for the wellbeing of the poor, through the use of appropriate technologies (Varshneya, 2007). The total irrigated area in India is around 33.8% (Agricultural Statistics at a Glance, 2010) and it is not expected to exceed more than 50% even after interlinking all rivers in the country (Varshneya, 2007). Therefore, major thrust for increasing agricultural production should be on the weather forecast at all times and spatial scales and advising farmers according to the ensuing weather conditions.

Weather forecasts in all temporal ranges are desirable for effective planning and management of agricultural practices. The development of response strategy (Stewart, 1988) helps farmers realize the potential benefits of using weather-based agrometeorological information in minimizing the losses due to adverse weather conditions. In fact, short and medium-range weather forecasts play a significant role in making short term adjustments in daily agricultural operations. The National Centre for Medium Range Weather Forecasting (NCMRWF) under the Ministry of Earth Sciences (MoES), Government of India in collaboration with India Meteorological Department (IMD), Indian Council of Agricultural Research and State Agricultural Universities had been providing Agrometeorological Advisory Services (AAS) at the scale of agroclimatic zone to the farming community based on location-specific medium-range weather forecast (MRWF) (NCMRWF, 1999). Since 2007, the entire framework of AAS, developed and successfully demonstrated by NCMRWF, has been relocated at IMD under MoES for extending the service (in operational mode) to districts under these agro-climatic zones. It is now called the Integrated Agrometeorological Advisory Service. Thus, the AAS setup exhibits a multi-institutional, multidisciplinary synergy to render an operational service for use of the farming community.

For issuing the weather based agro-advisories, a forecasting system for generating (Das Gupta and Rizvi, 2001) objective medium-range location-specific forecast of surface weather elements has been evolved at NCMRWF (Kumar *et al.*, 2000; Maini *et al.*, 2004; Maini, 2006). Location-specific weather forecasts for six parameters, viz. rainfall, cloud cover, wind direction and speed, and minimum and maximum temperature are obtained twice a week from T-80 General Circulation Model with a resolution of 150 km × 150 km. These forecasts are further subjected to statistical (Maini *et al.*, 2002; Wilks, 1995) and synoptic interpretation by experts and 5-days forecasts in quantitative terms are issued to the AAS units twice a week. These forecasts are converted into farm-level advisories by AAS units and disseminated to the farmers in vernacular language through mass media (NCMRWF, 1999) like print, electronic, cable and personal contact. Public awareness programmes in 'kisan melas' are regularly held by agricultural universities to educate farmers on the usage of farm advisories. The AAS programme is an innovative interdepartmental extension service, with a goal to deliver weather-wise management of agriculture. It is encouraging the adoption and use of modern agricultural production technologies and practices, in promoting weather-based irrigation management, pest/disease management, etc. along with greater use of post-harvest technologies and commercial marketing of commodities. A study conducted by (Maini and Rathore, 2011) showed that AAS farmers accrued a net benefit of 10–15% in the overall yield and a reduction by 2–5% in the cost of cultivation over the non-AAS farmers. The initial evaluation of AAS has been quite favourable, they have been quantitative in nature and are based on descriptive analyses of results of structured surveys (Maini and Rathore, 2011). However, more work needs to be carried out in bringing out substantial awareness among farmers about adoption of weather-based advisories, their timely availability and quality of service. With increasing use of internet and accessibility of modern technology in terms of mobile, data card etc, the dissemination of advisory through internet could prove to be vital (Rathore, 2007; Kumar 2007).

A website is a virtual location of the associated organization with an unique Uniform Resource Locator (URL) and is the information resource in the World Wide Web. It attempts to cater the needs of all the intended users through a wide variety of contents such as text, image, audio, and video incorporated in connected web pages of the site. The contents on websites are very important in order to increase the interest of the user. Users' participation in the web is dictated by their cognition, skill, literacy, and disabling features, (Shneiderman, 2000; Zahedi, *et al.*, 2001) and only satisfied users are likely to revisit the site and recommend it to others (Zhang and von Dran, 2000). One such study carried out by Mateos *et al.* (2001) analyzed the type of information available on Spanish university websites. They created a Web Assessment Index with four categories contributing to the assessment of a website. Middleton *et al.*, (1999) proposed a more comprehensive set of normative guideline for types of information for university website. Chadha (2008) analyzed the contents of the websites of Indian Universities and concluded that websites of Indian universities are having on an average 11.69 contents / features (out of 20 coded) and more frequently cater to the needs of external users.

Despite organizational commitments to motivate and engage users to its website, as with any information system, if a website is not capable of being used advantageously and with ease (Davis, 2001), users tend to remain indifferent towards it and, as a consequence, its stickiness may decline (Sterne, 2002). Fox (2006) explained the web content analysis as the process of assessing the nature of the content on a given website and included anything that can be structured or described such as words, images, video, tools or applications, features, services, physical items and signage as part of web content.

Therefore, keeping in view the importance of Agromet-advisory for the farming community in the country and usefulness of the websites for dissemination of the weather based advisories, the present study has been carried out with following objectives:

- 1) To evaluate the contents of websites of Agricultural Universities of North-Western India for Agromet-advisory component.
- 2) To examine the linkage between the age of the Officer In-Charge of Agromet-advisory and content on institutional website.

Material and Methods

Study Material

The websites of all Agricultural Universities located in North-Western India have been considered for the present study. The deemed to be Universities like Indian Agricultural Research Institute (IARI), Pusa, New Delhi and National Dairy Research Institute (NDRI), Karnal and Veterinary Universities have also been considered. The complete list on Indian Agricultural Universities has been given on ICAR website (ICAR, 2012). The list of the North-Western Agricultural Universities has been given in Table 2. A survey of websites of all Agricultural Universities was carried out in order to get the status of Agromet-advisory in the University / institutions. The survey revealed that Agromet-advisory project (Integrated Agro-Advisory) sponsored by NCMRWF, New Delhi (now IMD) is being run only in State Agricultural Universities and State Horticultural Universities. The project has not been yet implemented in the State Veterinary Universities and Dairy Research Institutions. Additionally, project has also not been implemented in deemed-to-be University at Allahabad, Uttar Pradesh.

Methodology

Following methodology has been adopted in conduct of the present study.

i) Selection of Parameters: The survey of the websites of the major Agricultural universities for the content of Agromet-advisory was carried out and the different parameters have been selected for evaluation of the websites. A total number of 15 different parameters were selected and were grouped in two categories 1) parameters related to "timeliness", and 2) parameters related to the "value addition". The complete list of parameters is given in Table 1.

ii) Coding: A coding scheme was developed using the analytical framework proposed by Middleton *et al.* (1999) and Meteos *et al.* (2001). Grounded theory methodology (Glaser & Strass, 1967) was also used to generate additional coding categories. The code “1” was assigned in the case of presence of parameter and “0” code has been assigned in absence of parameter on the website. In addition, separate codes were assigned to the language of the Agromet-advisories i.e., 1= English, 2= Hindi, 3 = Regional, and 4= both

English and Regional. The coding scheme is given in the Table 1.

iii) Content Analysis: The websites of all agricultural universities / institutions were thoroughly checked for the content analysis. In most of cases the information related to Agromet-advisory was found at the single place and the link was provided on the front page, however there were certain instances when information was found scattered. Therefore, all the pages were

Table 1. The Parameters considered for evaluating the websites of Agricultural Universities / institutions for Agromet-advisory with their category and coding.

Sr. No.	Parameters	Specification of Parameter	Category	Coding
1	Parameter 1	Agromet Link on front Web page	Value Addition	0 = Absent 1 = Present
2	Parameter 2	Agromet Link on sub Web pages	Value Addition	0 = Absent 1 = Present
3	Parameter 3	Agro-advisory Bulletin	Timeliness	0 = Absent 1 = Present
4	Parameter 4	Agro-advisory Bulletin Available for all Agroclimatic zones	Timeliness	0 = Absent 1 = Present
5	Parameter 5	Whether current Agro-advisory Bulletin available, if not mentioned the date of bulletin	Timeliness	0 = Absent 1 = Present
6	Parameter 6	Language of Agro-advisory Bulletins	Value Addition	1=English, 2=Hindi, 3=Regional, 4=both Eng & Regional
7	Parameter 7	Current Weather information	Timeliness	0 = Absent 1 = Present
8	Parameter 8	Current weather information of all districts under University jurisdiction	Timeliness	0 = Absent 1 = Present
9	Parameter 9	Historical Weather Data of station	Value Addition	0 = Absent 1 = Present
10	Parameter 10	Historical Weather data of all stations under University jurisdiction	Value Addition	0 = Absent 1 = Present
11	Parameter 11	Weather Forecast of the station	Timeliness	0 = Absent 1 = Present
12	Parameter 12	Weather forecast of Jurisdiction area	Timeliness	0 = Absent 1 = Present
13	Parameter 13	Feedback form for Advisory	Value Addition	0 = Absent 1 = Present
14	Parameter 14	Mobile Alert Facility	Value Addition	0 = Absent 1 = Present
15	Parameter 15	Crop-weather calendar	Value Addition	0 = Absent 1 = Present

checked to draw the information on different parameters (mentioned in Table 1) related to Agromet-advisory. The average of contents available on websites was computed by summing up all the code values and dividing by total number of parameters considered in the present study using equation below given. The language parameter has been analyzed separately.

$$\text{Contents (\%)} = \frac{\text{Sum of Present Contents}}{\text{Total Number of Contents}} \times 100 \quad (1)$$

iv) Analysis of Age dependency on Contents of Agromet-advisory: The websites of Agricultural Universities were categorized into three categories based on the approximate age of the Nodal Officer of Agromet Advisory project to analyze if there is any influence of age on contents of Agromet-advisory on websites. Three categories: 1) age less than 45 year, 2) age between 46 and 55 years and 3) age more than 56 years, were formed. The approximate age of the Nodal Officer with the Universities belonging to these categories is mentioned in the Table 2.

v) Statistical Analysis: The statistical analysis employing ANOVA technique has been carried out to test the hypothesis $H_0: \mu_1 = \mu_2 = \mu_3$. In the analysis, the age groups have been considered as treatments and the member Universities have been considered as replications.

Results and Discussion

i) The average contents / features of Agromet-advisory on Websites

The appearance of the parameters listed in Table 1 were checked on the websites of Agricultural Universities / institutions located in north-western India. The average score of the individual university / institution are exhibited in the Figure 1, which clearly shows that no agricultural university / institution in North-Western region of India is having all the components related to Agromet-advisory on their respective websites. However, IARI topped the list with maximum percent of features (78.57%) available on website, followed by CCSU, Hisar, CSA, Kanpur and PAU, Ludhiana. Surprisingly, the websites of GB Pant University of Agriculture

Table 2. The approximate age of officer in-charge of Agromet-advisory and category of the university / institution

Sr. No.	University	Approximate Age of Incharge Agromet	Category
1	Chandra Shekar Azad University of Agriculture & Technology, Kanpur	36	I
2	Chaudhary Charan Singh Haryana Agricultural University, Hisar	50	II
3	CSK Himachal Pradesh Krishi Vishwavidyalaya, Palampur	45	I
4	Dr Yashwant Singh Parmar University of Horticulture & Forestry, Solan	55	II
5	Govind Ballabh Pant University of Agriculture & Technology, Pantnagar	58	III
6	Maharana Pratap University of Agriculture & Technology, Udaipur	52	II
7	Narendra Dev University of Agriculture & Technology, Faizabad	59	III
8	Punjab Agricultural University, Ludhiana	45	I
9	Rajasthan Agricultural University, Bikaner	38	I
10	Sardar Vallabh Bhai Patel University of Agriculture and Technology., Meerut	56	III
11	Sher-E-Kashmir University of Agricultural Sciences & Technology, Jammu	56	III
12	Sher-E-Kashmir University of Agricultural Sciences & Technology, Kashmir	45	I
13	Indian Agricultural Research Institute, Pusa, New Delhi	39	I

Note: The age mentioned in table is very approximate based on survey. No documentary proof has been considered.

& Technology, Pantnagar and Rajasthan Agriculture University, Bikaner are not holding any content / feature related to Agromet-advisory despite the fact that these two Universities are running Agromet-advisory for long time. GBPUAT, Pantnagar was among first 5 Agricultural Universities, which initiated this project. The In-Charge officers of Agromet-advisory are perhaps mostly relying on other ways of information dissemination like print media, electronic media, telephone, fax and printed advisory through distribution system (Maini, and Rathore, 2011). The low amount of contents / features on institutional website does not represent the performance of the Agromet-advisory services at any particular place, however it indicate that the presence of Agromet-advisory can be further improved among farmers / users for their ready and easy reference. With the advancement of mobile telephony and availability of internet on mobile, the availability of timely information / advice on internet will not only increase the number of user but also could prove to be very beneficial for those farmers, who keep on moving for their farm related operations (Kumar, 2007).

ii) Analysis of most appeared Content / Feature on website

The websites of Agricultural Universities / institutions located in North-Western India were also evaluated for the occurrence of different contents / features. The results have been depicted in the Figure 2, which clearly shows that the parameter 1 (link on front page) found the place on the websites of the most of agricultural universities / institutions. Out of 13 websites of universities, the parameter-1 was available on 11 (84.62 %) websites of agricultural universities / institutions. The second most featured content was parameter-3 (Availability of Agro-advisory Bulletin), which appeared on 9 (76.92%) websites, followed by parameter-4 (Availability of Agro-advisory Bulletin for all Agroclimatic zones /Districts), parameter 11 (Weather Forecast of the station), parameter-5 (Availability of current agromet-advisory) and parameter 12 (weather forecast of jurisdiction area), which appeared on an average 69.23%, 61.54%, 53.85%, and 53.85% instances on the websites of agricultural universities / institutions. Other parameters like parameters 15, 14, 13, 10, 9, 8, and 7 appeared rarely on websites of agricultural universities / institutions ranging from 7.69 -

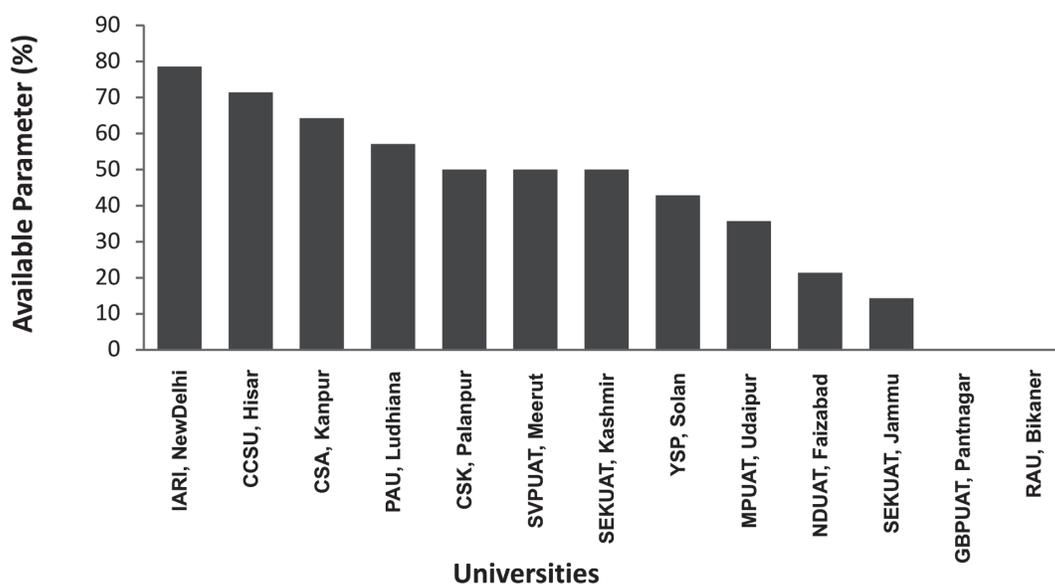


Fig. 1. The Average content / features related to Agromet-Advisory on the websites of Agricultural Universities/ institutions of North-Western India

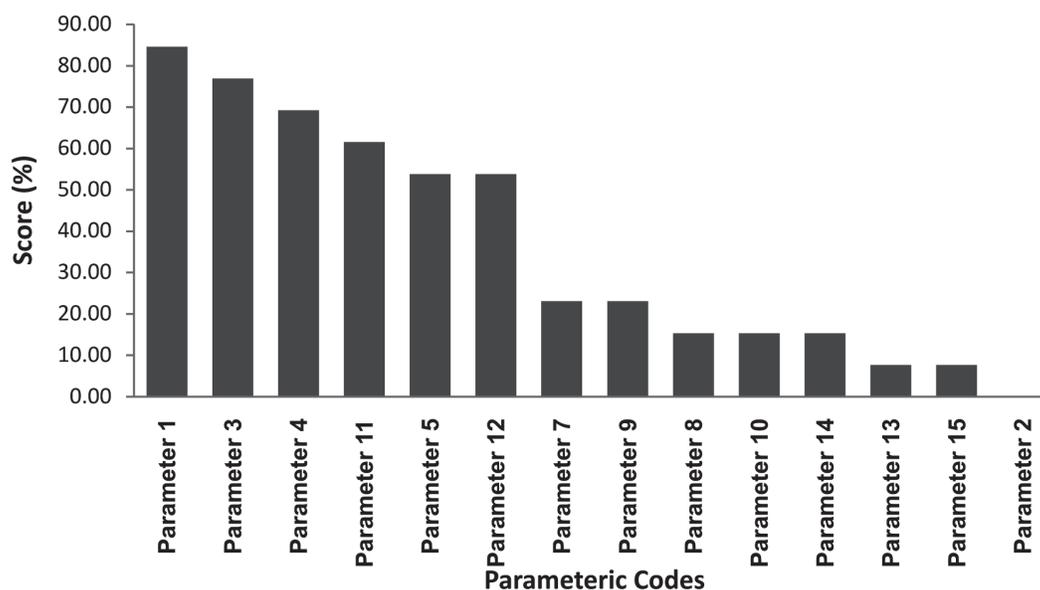


Fig. 2. The appearance of different contents / features on the websites of Agricultural University of North-Western India

23.08 % cases. The parameter 2 did not appear on any website of agricultural university / institution of North-western India. The link at sub-pages can allow the quick access of Agromet-advisory while navigating through the different web pages. According to Tan and Wei (2006), the graphical design and internal links support users to browse through the subject, and navigation helps them to determine the page on which they are and where they can go.

iii) Analysis of Age dependency on Contents of Agromet-advisory

An analysis has been carried out to establish the relationship between the number of features related to Agromet-advisory on websites and age of the officer in-charge, Agromet-advisory services. As stated in section 2.4 (Table 2) the universities / institution considered in the present study have been categorized in three different groups on the basis of the approximate age of the officer in-charge of Agromet-advisory. The difference in the contents / features available on the websites of Agricultural universities / institutions has been analyzed considering two groups of the parameters i.e. 1) timeliness and, 2) value addition.

a) Timeliness

The average score (%) of the websites of the Agricultural Universities / institutions has been depicted in Table 3 for timeliness. The average scores of the three treatments have also been shown, which suggest large variation among the various age groups. The hypothesis that the average of the contents / features appeared on the websites of the Agricultural Universities / institutions is same, irrespective to the age of the officer in-charge of Agromet-advisory, has been tested on the first group of parameters. The statistical analysis was carried out in SPSS software using ANOVA technique. The analysis shows that there is significant difference among the different age groups suggesting that the contents / features appearing on the websites related to Agromet-advisory depends on the age of the officer in-charge. The results are statistically significant ($F = 4.628$, $P=0.038$). The critical difference analysis further explains that the contents / features on the website belonging to first group (80%) are significantly higher than the third group (25%). While significance test between second group (42.86%) and third (25%) fails, suggesting that the average difference is not more than the difference due to standard errors.

Table 3. The average score of the universities for two groups “Timeliness” and “Value Addition” with treatments average

University	Treatment	Timeliness (%)	Treatment Average (Timeliness)	Value Addition (%)	Treatment Average (Val. Add.)
CSA, Kanpur	1	100.00	80.00	28.57	42.86
IARI, New Delhi	1	100.00		57.14	
PAU, Ludhiana	1	57.14		71.43	
CSK, Palanpur	1	71.43		28.57	
SEKUAT, Kashmir	1	71.43		28.57	
YSP, Solan	2	57.14	42.86	28.57	32.14
MPUAT, Udaipur	2	42.86		28.57	
CCSU, Hisar	2	71.43		71.43	
RAU, Bikaner	2	0.00		0.00	
GBPUAT, Pantnagar	3	0.00	25.00	0.00	17.86
SVBPUAT, Meerut	3	71.43		28.57	
SEKUAT, Jammu	3	0.00		28.57	
NDUAT, Faizabad	3	28.57		14.29	

Michael and Viswanath (2006) established that compared to older workers, younger workers' technology usage decisions were more strongly influenced by attitude toward using the technology. In contrast, older workers were more strongly influenced by subjective norm and perceived behavioral control, although the effect of subjective norm diminished over time.

b) Value Addition

The content of the websites of Agricultural Universities were also evaluated for value addition related to Agromet-advisory. The parameters under this head were mostly those, which are not the integral part of Agromet-advisory, however, their presence can improve the understanding and interest of users. The average score of the individual universities for value additions parameters with their treatment (group based on age) average are shown in Table 3. The treatment average is varying from one group to other; however the ANOVA analysis shows that the difference in treatment averages is not very significant ($F = 1.448$, $P=0.280$). Therefore, critical difference analysis was also carried out which also failed to explain significant difference between different combinations of treatments.

Though, the difference among different age group is not statistically significant, the average of young group (comparatively) is quite higher justifying the study carried out by Michael and Viswanath (2006) that younger adopt the technological advancement quickly in comparison to aged persons; especially the persons in older age group are more resistant to adopt advance internet based technology (Kirk, 2006).

Conclusions

It can be concluded on the basis of the results obtained during the present study that the performance of the websites of the Agricultural Universities located in the North-Western part of India are not good in their contents / features related to the Agromet-advisory, which is one of the most important activity of agricultural university. Only websites of few Universities / institutions like IARI, Pusa, New Delhi, CCSU, Hisar, CSA, Kanpur and to the certain extent PAU, Ludhiana have provided relatively better contents on their websites. There is a good scope for improvement in the websites of other universities, and the responsibilities lies on the shoulders of the website administrator and Officer in-charge of Agromet-advisory so that the efforts

being made towards the betterment of farm operations could be properly disseminated.

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