

Original Research Article

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Use of ICT for Dissemination of Weather Forecast and Agromet Advisory to Farmers of Palghar District Under GKMS–Damu Project

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ABSTRACT

India Meteorological Department (IMD) and Indian Council of Agricultural Research (ICAR), New Delhi collectively started District Agromet Unit (DAMU) under Gramin Krishi Mausam Seva (GKMS) project at Krishi Vigyan Kendras (KVKs) to minimize the farm losses due to extreme weather events. District & block wise Agromet Advisory Bulletin (AAB) were prepared & disseminated through different Information Communication Tools (ICT). The impact of agromet advisory services of DAMU was analyzed in end of the *kharif* season 2022 by conducting a feedback survey through google form shared in block level what's app groups created by DAMU. 300 farmers have given response through google form. It results that majority of the farmers responded belongs to age group of 21-40 years (43%) followed by 41-60 years (38.60), 61-80 years (16.2%). About 63% of the farmers said that these weather-based agro advisories were useful in all practices of crop cultivation, followed by 14.7% of the farmers said that the advisories were play major role while taking decision at harvesting stage of crop, 11.3% of the farmers used forecast and advisory during sowing and transplanting stage. 51% of the farmers said that they were highly satisfied with AAS, followed by 36.7% of farmers satisfied with the AAS. MEGHDOOT and DAMINI application also became an effective tool for farmer's and 59 % of farmers using these applications in their mobile. It is concluded from the study that weather forecast, agromet advisories & extreme event alerts were disseminated through these simple communications tools play major role in effective crop management and enhanced yield of crops and farmers income too.

Keywords

Weather forecast, Agromet Advisory Services, Farmers Feedback, ICT

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Introduction

In India the success and failure of crop production mostly dependent on weather parameters like temperature, rainfall, wind speed, relative humidity and hail. If accurate weather forecast is available in real time through effective communication tools, the farmer could plan in advance on crop cultivars, time

of fertilizer application, weed management, pest and disease management and make necessary arrangements to reduce the risk of failure (Rathore and Maini, 2008; Chaubey, *et al.*, 2018). Okereke (1981) said that, in India, where literacy levels are low, television and radio are significant as they transfer modern agricultural technology to literate and illiterate farmers alike even in interior areas

within a short time. Weather services to the farmers was started by India Meteorological Department (IMD) in 1945 and later Agromet Advisory Services (AAS) started in 1976 (Khobragade, *et al.*, 2014; Manjusha *et al.*, 2019), to avoid crop failure due to aberrant weather condition. Central and State government is concentrating more on weather based agro-advisory schemes to enhance the farmers livelihood. Agrometeorological information viz., weather forecast, soil status information along with agro- advisory (Prasad *et al.*, 2020) is real input for efficient farm management. Therefore, India Meteorological Department (IMD) initially implements the Gramin Krishi Mausam Sewa (GKMS) program at 130 centers at all states at the district level, those are Agro-met Field Units (AMFUs). AMFU established by the State Agricultural/Animal Husbandry Universities, Krishi Vigyan Kendra (KVKs), Colleges or Research stations (Venkatasubramanian *et al.*, 2014). Each AMFU is led by the university scientist as technical officer to prepare weather based agro advisory at district level. To provide block level advisory to farmers, India Meteorological Department (IMD) and Indian Council of Agricultural Research (ICAR) jointly started District Agromet Unit (DAMU) under Gramin Krishi Mausam Seva (GKMS) project at Krishi Vigyan Kendras (KVKs). Every Tuesday and Friday advisory bulletins are being prepared by Krishi Vigyan Kendra for block level in DSS software by Subject Matter Specialist (SMS) with the help of KVK scientists for major crops of the district. The bulletins are in English and Regional language and disseminated through various Information Communication Tools (ICT) like What's app, Facebook, Twitter, Newspapers, AIR Channel, Television, and District Agril. Office, Different NGO's. The farmers utilize the services to take decision while crop cultivation practices which in turn facilitated to obtain increase in crop yield as well as reduced losses due to bad weather. In this study it is proposed to analyses the use of ICT tools which are used for dissemination of Agromet Advisory Services (AAS) among farmers in Palghar district.

Materials and Methods

Study area

Palghar lies between 72° 45' & 73° 48' East Longitude and 18° 42' and 20° 20' North Latitude. The Eastern part of the district has Sahyadri ranges, which comprises of mainly forest area. Arabian sea toward west while, Gujarat State towards north. Thane & Mumbai district are towards South side of the district. The total geographical area of the district is 517634 ha. Palghar districts comprises of eight blocks namely Vasai, Jawhar, Vikramgad, Wada, Talasari, Palghar, Mokhada and Dahanu, six blocks of the district are tribal. Topographically it has much diverse condition. i.e. hilly, saline, plateau zone and characterized by high iritic rainfall. The district is characterized by warm & humid climate. The district receives assured rainfall of about 2305.4-millimeter from south west Monsoon during the month of June to September. Generally, the highest rainfall is recorded in the month of July and later on there is gradual decline in the rainfall. On an average temperature range from 16°C to 32.30°C. The humidity of district ranges from 61 to 86 percent throughout the year.

Characteristics of Study Area

Paddy is major crop grown in the district. While, Nagali & Warai are the other cereals grown in the district. The Major pulses grown are Udid, Tur, Red Gram & Bengal Gram. Area under Oil seeds very low in compare to other districts. The climate of Palghar district is suitable for fruit & Vegetable crops too. The Mango, Sapota, Banana etc. Fruits Chilly, Turmeric etc. spices, coconut, cashew nut etc. Plantation crops are grown in the district.

Land fragmentation, traditional farming, poor knowledge level about agri business and marketing are weakness of agriculture. May be rainfed farming & low productivity, are the hurdles in the progress of farmers of this district. District AgroMet Units (DAMU) has been established at KVK, Kosbad Hill, in Dahanu block.

Results and Discussion

Though the Palghar district receives average rain fall of 2537 mm, but fact is that out of 300 farmers 122 (40.7%) respond farmers whom have rainfed farming system followed by 119 (39.7%) farmers have both rainfed & irrigated farming system and 59 (20 %) have only irrigated farming. (Fig : 2) As per the survey it found that, Farmers of Palghar district have very less area under farming, among all respondents of farmers 37%, 36%, 21.7%, 5.3% farmers have 1-2 hector (small farmers), < 1 hector (marginal farmers), 2-4 hector (medium farmers) and 4-10 hector (large farmers) respectively. (Fig:3)

Due to arrival of new era of media like computers, internet and smart phones, farmers can get updated information by every second from anywhere and this may reduce the crop loss. It is revealed from survey that, 95% (285) of farmers continuously carried out timely farm management according to given forecast and Agromet Advisory Bulletins (AAB) through what's app, only 5 % (15) of farmers did not. (Fig:4) 51% (153) of the farmers said that they were highly satisfied with these Agromet Advisory Services (AAS) receiving by what's app, followed by 36.7% (110) of farmers satisfied and 12% (36) farmers partial satisfied with AAS. (Fig:5)

The timing and accuracy of weather forecast helps in effective planning of agricultural activities. This may facilitate the farmers to determine the farming operations like sowing, irrigation, fertilizer and pesticide application (Prasad *et al.*, 2020) which will be performed or postponed.

In this context it is revealed from survey that, about 63% (189) of the farmers said that these weather-based agro advisories were useful in all practices of crop cultivation, followed by 14.7% (44) of the farmers said that the advisories were play major role while taking decision at harvesting stage of crop and reduce the loss of matured crop due to natural calamities, 11.3% (34) of the farmers used forecast and advisory during sowing and transplanting stage. Specially 3.7% of farmers expressed their opinion

that AAS became useful while spraying chemicals and 2.7% farmers used advisory for application of fertilizer & irrigation scheduling (Fig. 6). Majority of the farmers was interested to respond those are belongs to age group of 21- 40 years (38.6%), It means the age group which is truly engaged full time in farming, they are adopting weather based agromet advisory and believe on it. followed by 41-60 years (16.2%). (Fig: 7)

Educated farmers well known different ICT tools like IMD's websites, Facebook, Telegram and Twitter but some illiterate farmers also good knowledge about What's application. Illiterate farmers receiving weather advisories through audio-visual formats too in regional language to take decision about agricultural operations.

Presently DAMU, KVK, Palghar provides weather based agromet advisory services twice in a week to farmers for major crops of Palghar district though what's app groups. What's app was found to be major ICT tool in dissemination of weather based agro advisories.

Farmers depend more on weather forecasting during fertilizer application and irrigation. However, farmers need weather advisories starting from selection of crop/varieties till post-harvest processing in order to achieve better productivity and good income. 75% of them responded that they saved Rs.0-10,000 of their production cost because of timely getting weather forecast by DAMU. 18 % farmers saved 10000-20000 by following agro advisory regularly.

Meghdoot, a simple and easy to use mobile application which provides crop advisories to the farmers based on the weather information. It is a joint initiative of India Meteorological Department (IMD), Indian Institute of Tropical Meteorology (IITM) and Indian Council of Agricultural Research (ICAR). Advisories are available in both English and local languages. An interested user has to download 'Meghdoot' application and sign in using their mobile number and preferred language.

Fig.1 Location map of study area



Fig.2 Type of farming

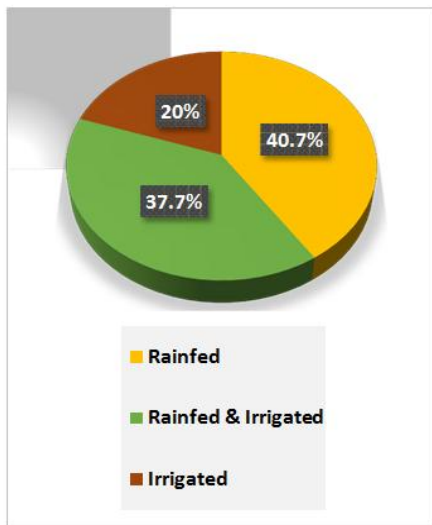


Fig.3 Land holding of farmers

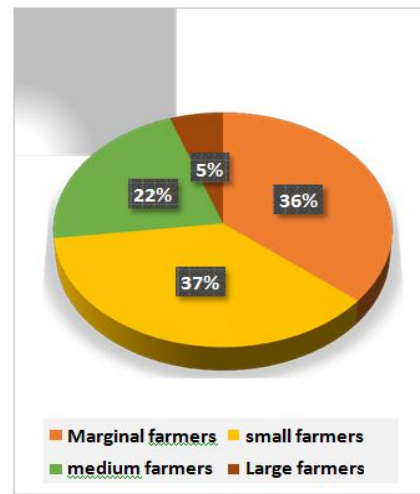


Fig.4 Number of farmers follow AAS for farm operations

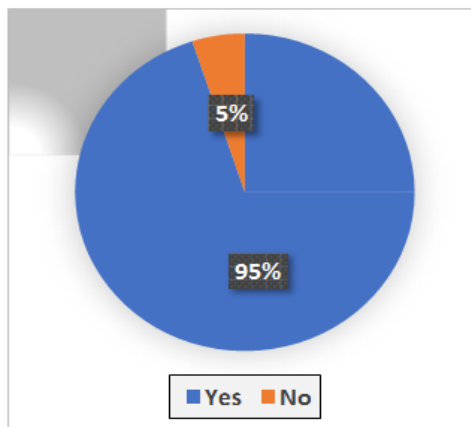


Fig.5 Farmer's satisfaction level by the Agromet advisory services provided by DAMU.

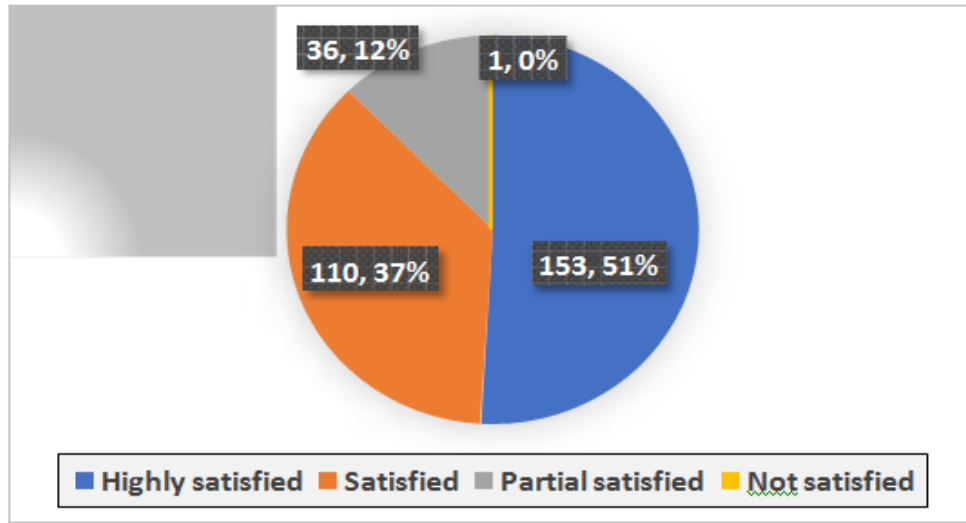


Fig.6 Usefulness of weather forecast/ Agromet advisories providing on what's app while taking decision of farm operations

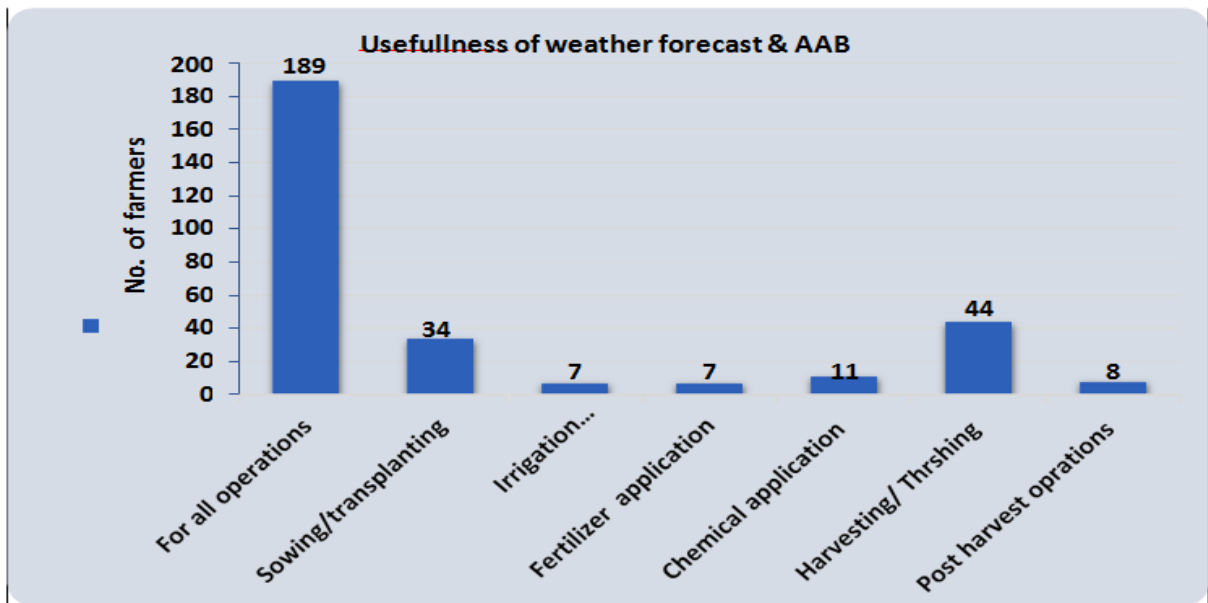


Fig.7 Age group of the responded farmers

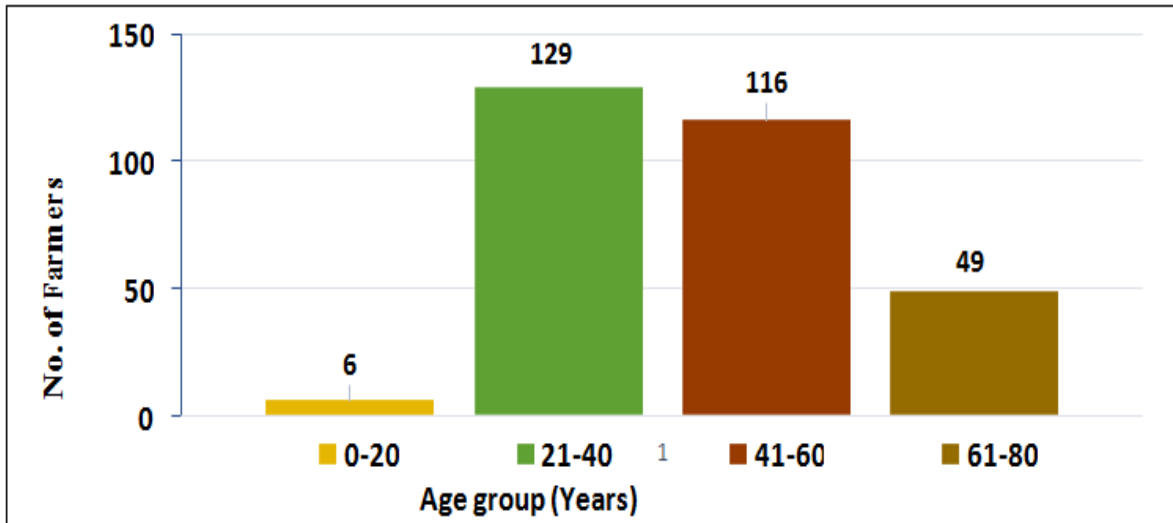


Fig.8 Economic benefits of advisory in rupees

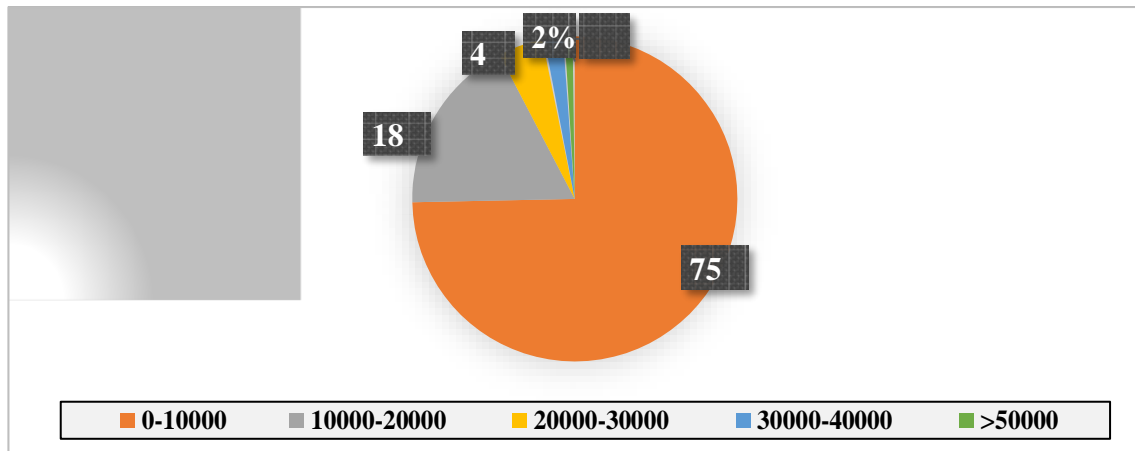
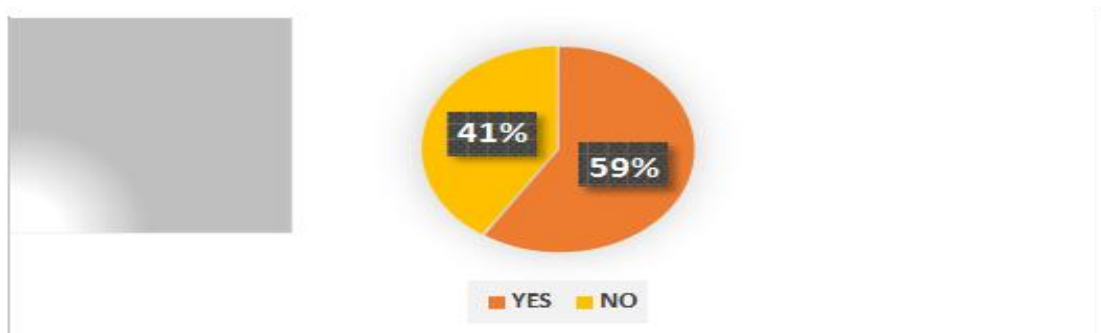


Fig.9 Number of farmers using DAMINI & MEGHDOOT Application



The app provides district-wise advisories on crop and livestock management issued by District Agromet Units (DAMU) every Tuesday and Friday based on the past and forecasted weather information. It will help the farmers to take weather-sensitive decisions like sowing of crops, pesticide and fertilizer application, irrigation scheduling and vaccination of animals.

“Damini” Application has developed by the Indian Institute of Tropical Meteorology (IITM-Pune) and Earth System Science Organization (ESSO) under the ministry of earth science. This app monitors the lightning occurrence all over India and alerts the user of lightning near them by a GPS notification under 20 km and 40 km. Lightning Alert application is for gives warning to the user about the lightning on the basis of user location. User can know Lightning will occur in next 5 min, 10 min & 15 minutes. Damini DAMU also laying major role to create awareness of these applications among farmers of Palghar district, and currently 59 % farmers using these applications.

This study concludes that, information communications tools are necessary for disseminating weather forecast & agromet advisory in short time in order to take decisions of farm operations & effective crop management to reduce crop damage and enhanced yield of crops and farmers income too. DAMU playing vital role in achieving the goal of reducing the crop loss through preparation of AAB & disseminating it through (ICT) like What’s app, AIR Channel, Television channels, Newspapers, Facebook and Twitter account. Simultaneously Most of the farmers were highly satisfied with these Agromet Advisory Services (AAS) providing by the district agromet unit through What’s app groups. Age group of 21 to 40 years, is following agromet advisory service who frequently access various mass media like what’s app and Facebook etc. MEGHDOOT and DAMINI application also became an effective tool for farmers to receive weather forecast, Agromet Advisories and lightning alerts anywhere and

anytime. Need of awareness programs should be conducted to make the farmers aware about the importance and utility of agromet advisory service in management of various farm operations. The Advisory Services given by DAMU became more effective because of simple and regional language that farmers can understand it and make the Agro-Met Advisory Services more successful. It needs to be extended the dissemination of advisory services up to panchayat level.

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