



Impact Assessment on Knowledge of Weather Based Agro-advisory Services among Farmers in Tiruvallur District, Tamil Nadu

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Authors' contributions

This work was carried out in collaboration among all authors. Author SAP designed the study, performed the analysis and wrote the first draft of the manuscript. Author VAV managed the literature searches and corrected the manuscript and authors RM and PY managed survey questionnaires. Author PP managed to conduct survey. All authors read and approved the final manuscript.

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ABSTRACT

Weather influences the production and productivity of various crops. If farmers aware about the real time weather factors such as temperature, relative humidity, wind speed, wind direction and rainfall it will be the effective to prevent the crop failure and achieve high yield with better economic returns. The right weather information at right time facilitates the farmers to plan agricultural operations from selection of crops to post harvest to avoid crop losses. 382 AAS bulletins were prepared and disseminated to the farmers during 2019-2020. To study the effect of weather based agro-advisory services, a random sample survey was conducted from 60 farmers from villages of Tiruvallur and Tiruttani block of Tiruvallur district. Results indicated that focusing illiterate farmers are much more important and dissemination of weather advisories in audio or visual format is preferable to make them to adapt weather based agricultural practices. The survey revealed that 65 per cent of farmers check weather forecast before going for spraying operation, 73 per cent for irrigation and 55 per cent for animal husbandry maintenance. Our study revealed that the farmers focus more on spraying and irrigation operation based on weather

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forecast. Further, awareness is to be created to realize that they should also need to follow weather forecasts from the selection of crop to post harvest in order to achieve better productivity and good income.

Keywords: Weather agro services; DAMU's & GKMS; weather forecast; Tiruvallur district.

1. INTRODUCTION

Weather plays an important role in agrarian country like India. The success and failure of crop production is highly dependent on weather parameter like temperature, rainfall, wind speed, relative humidity and hail. Weather influence both the short term (tactical) and long term (strategic) decisions in order to harness the maximum benefit in quality and quantity of the crop production [1]. In India weather services to the farmers was started by India Meteorological Department (IMD) in 1945 [2] and later Agromet advisory services (AAS) started in 1976 [3], to avoid crop failure due to abbreviate weather condition. Central and State government is concentrating more on weather based agro advisory schemes to enhance the farmers live hood. Agro-meteorological information viz., weather forecast, soil status information along with agro-advisory is real input for efficient farm management. If accurate weather forecast is available, the farmer could plan in advance on crop cultivars, time of fertilizer application, weed management, pest and diseases management [4] and make necessary arrangements accordingly to reduce the risk of failure.

India Meteorological Department (IMD) implements the Gramin Krishi Mausam Sewa (GKMS) programme at 130 centers at all states at the district level. Such Agromet Field Units (AMFUs) are established by the State Agricultural/Animal Husbandry Universities, Krishi Vigyan Kendra (KVKs), Colleges or Research stations [5]. 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, District AgroMet Units (DAMU) was implemented in nine districts of Tamil Nadu. Every Tuesday and Friday advisory bulletins are being prepared by Krishi Vigyan Kendra for block level in DSS software by Subject Matter Specialist with the help of KVK scientists and State Agricultural department for major crops of the district. The bulletin is in English and regional language and disseminated through WhatsApp, M-Kissan, Newspaper, Short Message Services (SMS), Non-Governmental organizations'(NGOs), E-mail

through State Agriculture Department, Research Stations, GKMS and Web portals. The farmers utilize the services to decide and follow the timely 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 analyse the knowledge acquired and level of impact of weather based agro advisory services among the farmers, source of weather information, of Tiruvallur district.

2. MATERIALS AND METHODS

2.1 Area of Study

Tiruvallur district is located in North Eastern zone of Tamil Nadu. The geographical position of this district is North Latitude between 12°10'00" and 13°15'00" and East longitude between 79°15'00" and 80°20'00" and with the area of 3422 Sq. Km representing 2.25 percent of the of Tamil Nadu total geographical area. The district climate is moderate, neither too hot nor too cold but with considerable humidity. The months between April and June are normally very hot with average of 37.9°C. The average temperature over winter (December - January) is 18.5°C. The coastal areas receive more rains than the inland. The average annual rainfall of the district is 1,104 mm. Out of the total, 52% of the rainfall occurs during the North East monsoon period and 41% during south west monsoon period. The district mainly depends on monsoon rains and faces distress conditions in the event of the failure of monsoons. Tiruvallur district comprises of 14 blocks namely R.K.Pet, Pallipattu, Tiruttani, Tiruvalangadu, Kadambathur, Poondi, Ellapuram, Tiruvallur, Poonamallee, Gummidipundi, Minjur, Sholavaram, Puzhal, Villivakkam (Fig. 1). Scheme on District Level AgroMet Units for weather based Advisory services has been established at KVK, Tiruvallur for weather forecasting and appropriate advisory service to farmers based on weather forecast. 382 AAS bulletins were prepared and disseminated to the farmers during 2019-2020. Eleven Farmers awareness programmes on Megdhooth and TNAU AAS - Mobile APP based Agromet advisory services for farmers have been provided to 649 farmers.

In Social science studies, survey plays most important and effective in acquiring relevant information from a large group of people [6]. The random sample survey was conducted from 60 farmers from villages of Tiruvallur and Tiruttani block of Tiruvallur district. The Survey was split into two phases where Phase I survey helped to study the knowledge on weather-based agriculture and to spread of awareness about DAMU's in order to follow and conduct the farm operations which in turn enhanced the livelihood of farmers under abnormal weather conditions. Phase II survey has been conducted to study the economic impact of Agromet advisory services. An easy understandable questionnaire was prepared in bilingual language (English and Tamil) with 24 questions in optional type.

3. RESULTS AND DISCUSSION

3.1 Distribution of Farmer's Categories Based on Age and Education

The survey results revealed that 41.7 per cent of the farmers belong to the middle age group followed by old age (31.7 per cent) and young

age (26.7 per cent) group. It was found that age had a remarkable relationship in acquiring knowledge on weather based agricultural activities. In this study 30 per cent of middle age group farmers regularly check the weather forecast to make decision on farm operations followed by old age (28 per cent) and young age (17 per cent). The education level of farmers also played a vital role in this survey where the higher secondary level showed highest per cent of 50 followed by diploma/degree holder and uneducated farmer (25 per cent) (Fig. 2). Among 60 farmers 14 of 15 farmers with degree level of education, 27 of 30 farmers at Higher secondary level of education and 4 illiterate farmers out of 15 answered yes and have the knowledge to check the weather forecast. Hence it clearly indicated that education plays a significant role in acquiring knowledge to check weather forecast to make appropriate decisions on farm operations. From these two factors it has been clearly arrived that, age and education influenced the farmers to know the appropriate technologies which are suitable in the changing weather conditions and consequently helped them to follow appropriate cultivation practices and technologies.

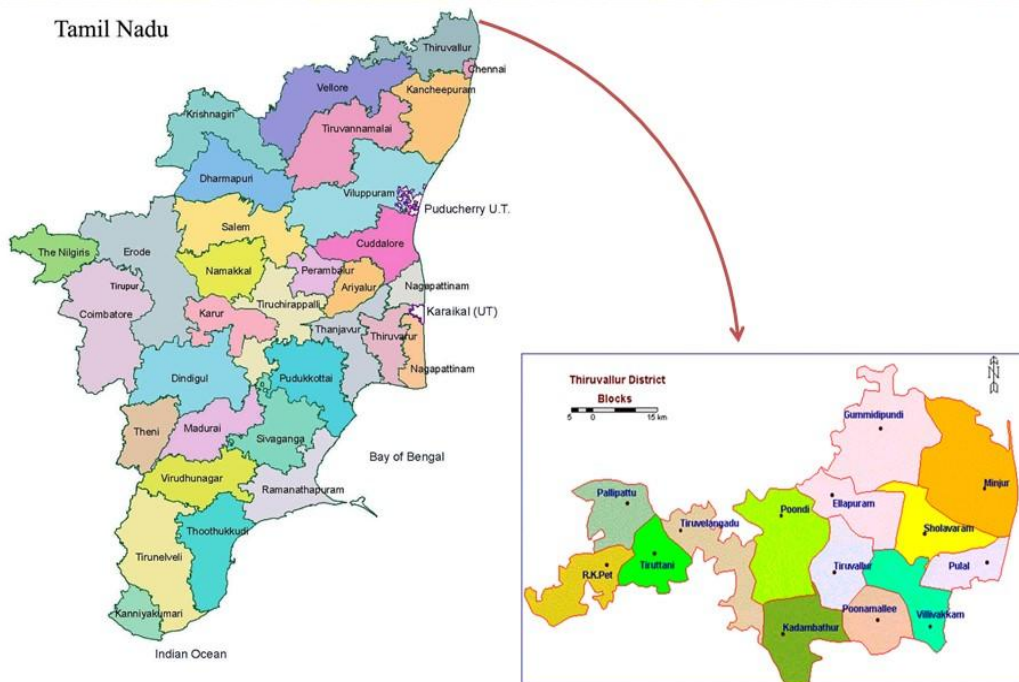


Fig. 1. Block map

Source: <http://www.dictvlr.in/profile.htm>

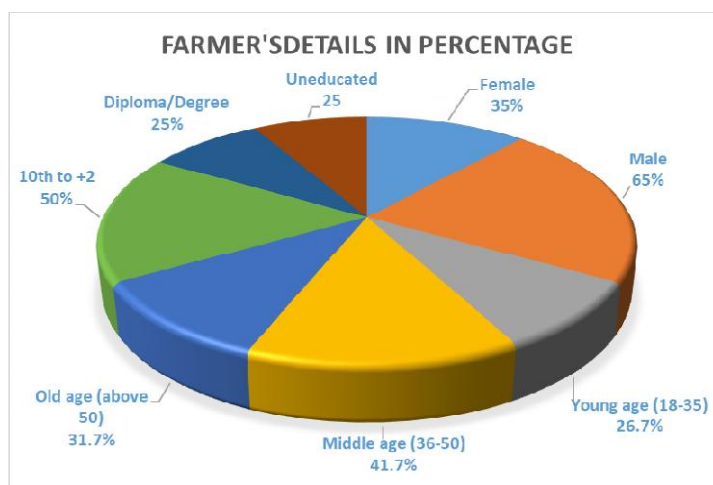


Fig. 2. Farmers details

3.2 Source of Weather Information

Mass Media have separate section for agricultural information's /programmes like Pon Vilayum Boomi, Vellan Kalam of DD national and some newspapers have separate page for farming community to discuss important topics related to agricultural, disseminate new technologies, market rate for crops [7], weather information etc., Hence mass media like Television, Radio, Agro based Apps, M-Kisan portals, Internet are being effectively utilized by government agencies to disseminate innovative technologies to cover larger audience [8]. In this regard the survey results indicated that 66.7 per cent of farmers get weather information through Television followed by 16.7 per cent through Television + Newspaper, 11.7 percent via Mobile

(SMS, WhatsApp, Phone call), 3.3 percent through Television + Radio and 1.6 percent through newspapers (Fig. 3). Hence it is clearly indicated that, dissemination of weather advisories through television reached to both literate and illiterate farming communities compared to other mass media. Newspapers are available at low cost so farmers can read it in their leisure [9]. At the same time due to arrival of new age media like computers, internet and smart phones, farmers can get updated information by every second from anywhere and this may reduce the usage of newspaper and radio. The 58 and 40 percent of farmers prefer weather information presentation in morning and evening time in their regional languages and remaining 2 per cent peoples in afternoon times.

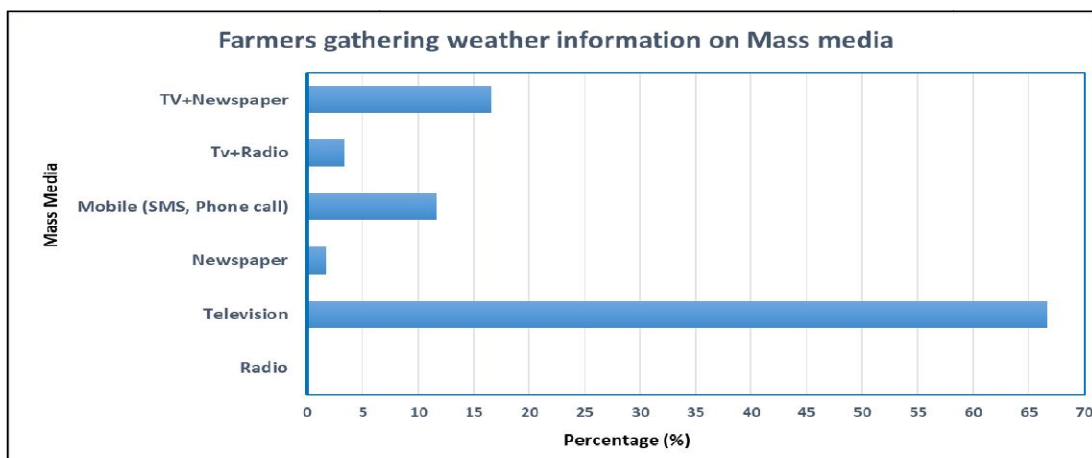


Fig. 3. Farmers gathering weather information on mass media

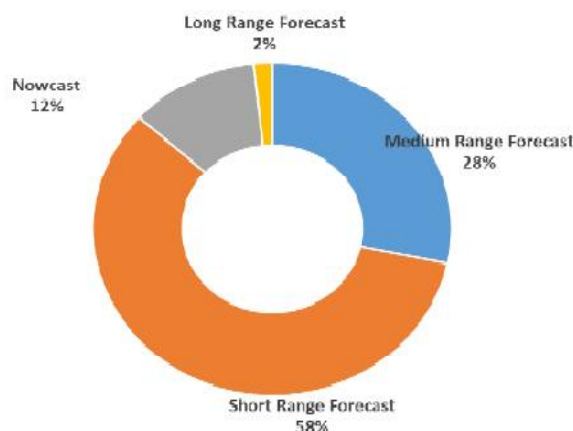


Fig. 4. Preference of weather forecast

Table 1. Farmers response on weather based agro advisories

Sl. No	Questionnaire	Farmers response	
		Frequency	Per Cent (%)
1.	Making decision on farm operation based on weather forecast	45	75
2.	Considering weather effects when planning for farm operation	44	26
3.	Languages of weather forecast message to be Tamil	60	100
4.	Weather forecast and agro advisory on irrigation	16	73
5.	Weather forecast and agro advisory on insecticides pesticides/ fungicides	33	65
6.	Benefit from abnormal weather forecast advisories related to animal husbandry	33	55

Most of the farmer respondents weather plays major role in their daily farm operation. 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 which will be performed or postponed. With reference to the analysis on accuracy of forecast it was studied that 65 per cent of farmers check weather forecast before going for spraying operation, 73 per cent for irrigation and 55 per cent for animal husbandry maintenance (Table 1). The farmers following weather forecast news have reduced investment, time and labors in farming operations. The preference for time of forecast varied among the respondents. Maximum 58 per cent of farmers need short range forecast followed by Medium range forecast (28 per cent), Nowcast (12 per cent) and Long-range forecast (2 per cent). Also 50 per cent of respondents expect a weather forecast for twice a week and 25 per cent need daily and remaining 25% once in a week (Fig. 4)

4. CONCLUSION

Awareness on weather based agro advisories will support farmers on decision making and reduce the crop risk. In Tiruvallur district educated farmers have more awareness on weather forecast. So, focusing on illiterate farmers are much more important, disseminating weather advisories in audio or visual format to make them to adapt weather based agricultural practices. The farmers expect weather forecast twice in a week, to be timely and accurate forecast at various stage of crops and for livestock. Presently DAMU scheme operating at KVK, Tiruvallur provides weather based agro advisory services twice in a week to farmers for various crop stages. The farmers focus more on spraying and irrigation operation based on weather forecast. Further, awareness is to be created to realize that they should also need to follow weather forecasts from the selection of crop to post harvest in order to achieve better productivity and good income. Farmers are also expecting to extend the dissemination of advisory services up to village level.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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