

Agro-meteorological Advisory Services: An Effective Approach in Modern Agriculture

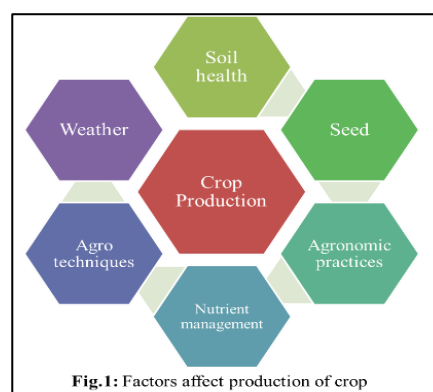
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Introduction

Agro-meteorological Advisory Services (AAS) are a complimentary service offering by the Ministry of Earth Sciences (MoES) in collaboration with the Indian Meteorological Department (IMD) to support Indian farmers. In agriculture, numerous elements influence crop production, including soil health, seed choice, agronomic methods, nutrient management, agricultural techniques, and weather conditions. Weather stands as the foremost determinant in the growth and productivity of crops. Unlike other factors, inputs, and agricultural methodologies that can be managed, the unpredictable nature of weather remains beyond our control. Nonetheless, the adverse impacts on crops can frequently be alleviated. Consequently, the risks associated with agricultural activities can be reduced by supplying weather information that is aptly interpreted to convey its agricultural implications. Such information should also include actionable advisories for farm operations and be disseminated well in advance of impending weather events. Undoubtedly, this service is paramount in efficiently supporting the farming community. AAS contribute to collect and organize climate/weather, soil and crop information and to integrate them with weather forecast to assist farmers in taking management decisions in their farms (SOP, IMD, 2020).



Network of GKMS Scheme

The Gramin Krishi Mausam Seva (GKMS) comprises Agrometeorological Field Units (AMFUs) and District Agrometeorological Units (DAMUs). There is a total of 130 AMFUs located at various State Agricultural Universities (SAUs) and Indian Institutes of Technology (IITs). These AMFUs serve multiple districts and their respective blocks, providing Agro-meteorological Advisory Services (AAS). Additionally, there are 530 DAMUs situated at

ICAR's Krishi Vigyan Kendras (KVKs) across India, each covering a single district along with its associated blocks (Fig. 3).

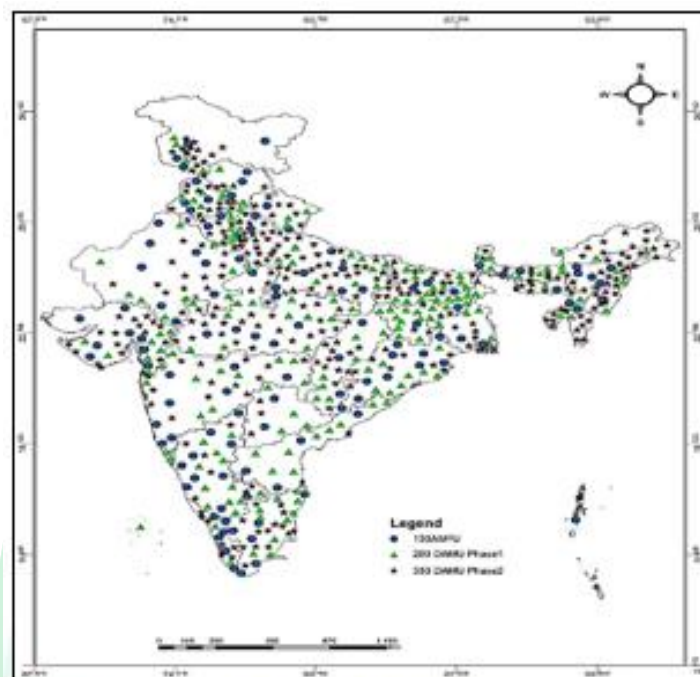


Fig. 2: Network of GKMS Scheme (SOP, IMD, 2020)

Objectives of the GKMS Scheme

- To continuously improve the existing District level AAS and extend them further to block level.
- To establish DAMUs, complimentary with already operating AMFUs/DAMUs.
- To expand the existing channels of communication of AAS to the farmers so as to outreach to cover all farmer households.
- Promote Research & Excellence in Agro-meteorology in support of targeted improvement to the operational services.

Agrometeorological Advisory Services

AAS contribute to collect and organize climate/weather data, soil and crop information and to integrate them with weather forecast to assist farmers in taking management decisions. These services encompass a wide range of offerings, including weather forecasts (such as Nowcast, medium-range, and long-range weather forecasts), weather-based crop advisories, fundamental cultural practices for crop production, short message services, and the dissemination of Agrometeorological Advisory Bulletins (AABs) (SOP, IMD, 2020).

Process of Agrometeorological Advisory Services

- The Indian Meteorological Department (IMD) shares the direct output of model forecasts with State Meteorological Centres.
- State Meteorological Centers value-added the model output forecasts and transmit this value-added forecast to their corresponding AMFUs and DAMUs.
- AMFUs and DAMUs gather crop and livestock data from various sources such as District Agriculture Officers (DAOs), Krishi Vigyan Kendras (KVKs), Agriculture Technology Management Agencies (ATMAs), and Non-Governmental Organizations (NGOs) in their respective districts.
- Agromet Advisory Bulletins (AAB) are made based on the past week's weather data, weather forecasts, and crop/livestock information. These bulletins are then disseminated directly to DAOs, KVKs, ATMAs, NGOs, and farmers through various communication channels.
- AMFUs and DAMUs actively collect feedback from farmers themselves.

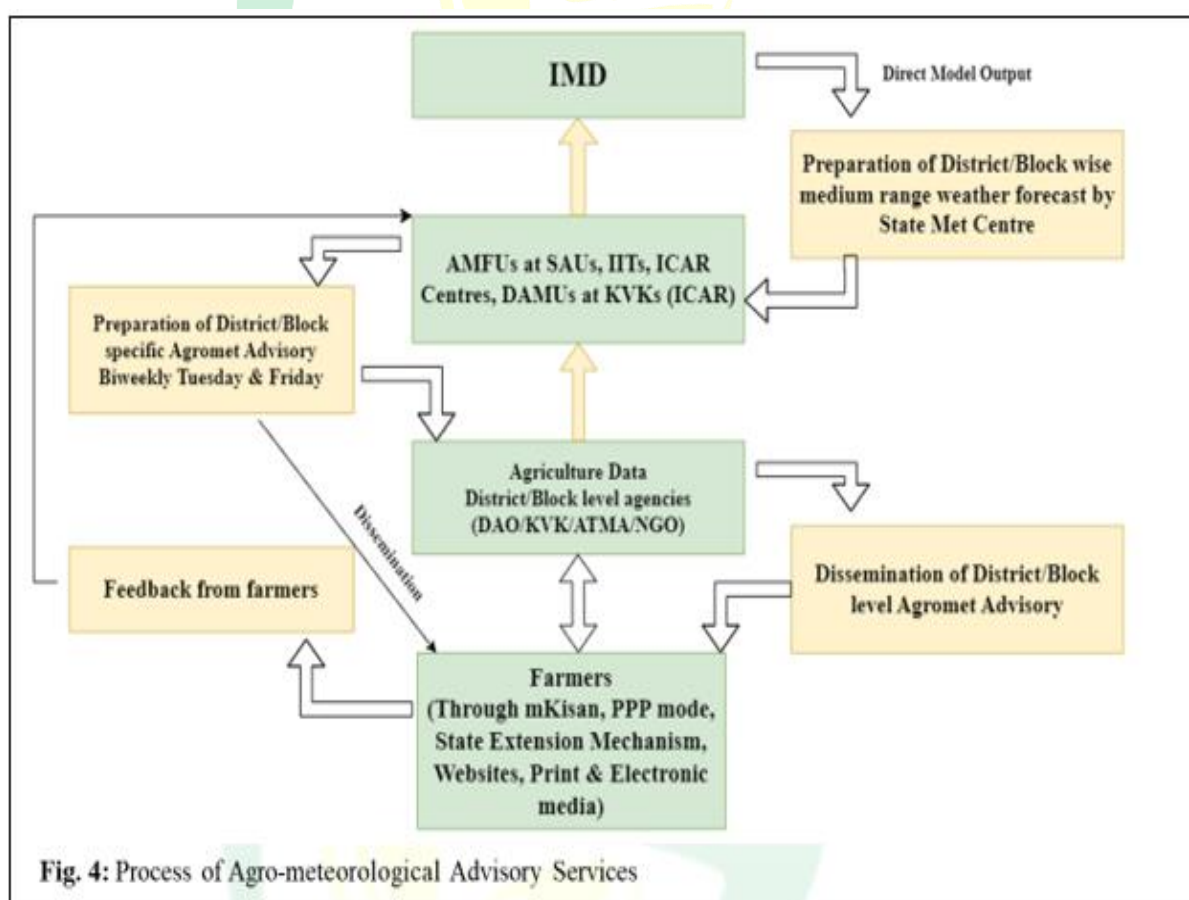


Fig. 4: Process of Agro-meteorological Advisory Services

Dissemination of AAS

The effectiveness of Agromet Advisory Services relies on timely communication to farmers, and as such, various communication channels are utilized for their dissemination such as in Fig. 5.



Fig. 5: Dissemination of Agromet Advisory Services

Benefits of Agromet Advisory Services

Agrometeorological Advisory Services aid farmers in making informed decisions for their agricultural operations based on weather forecasts. This not only helps in cost savings during cultivation but also mitigates the impact of adverse weather on agriculture. Agrometeorological advisory services (AAS) offer several benefits for farmers and the agricultural sector:

- Improved crop management:** AAS provides farmers with timely information on weather forecasts, which helps them plan their agricultural activities effectively. This includes decisions on when to sow, irrigate, and harvest crops, leading to better crop management practices.
- Mitigation of weather-related risks:** Weather plays a crucial role in crop growth and health. AAS provides farmers with insights into impending weather conditions, including extreme events like storms or droughts. Farmers can take proactive measures to protect their crops, reducing the risk of weather-related losses.
- Enhanced yield and quality:** By aligning farming practices with weather forecasts and advisory recommendations, farmers can potentially increase crop yields and improve crop quality. This is achieved by optimizing planting dates, irrigation schedules, and pest control measures.
- Resource efficiency:** AAS promotes the efficient use of resources such as water and fertilizer. Farmers can avoid unnecessary irrigation during rainy periods and optimize

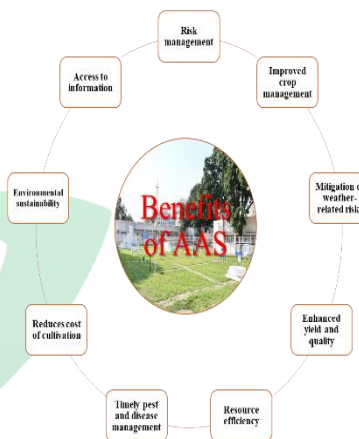


Fig. 11: Benefits of Agromet Advisory Services



nutrient applications based on weather and soil conditions, reducing input costs and environmental impact.

- **Timely pest and disease management:** AAS often includes guidance on managing pests and diseases that are influenced by weather conditions. Farmers can implement preventive measures or treatments at the right time to minimize crop damage.
- **Reduces cost of cultivation:** Higher yields and reduced crop losses can lead to increased farm income. Additionally, AAS can help farmers save cost of cultivation by avoiding unnecessary expenses on irrigation and inputs.
- **Environmental sustainability:** AAS encourages sustainable farming practices by promoting resource-efficient techniques and reducing the environmental impact of agriculture.
- **Access to information:** AAS is typically disseminated through various channels, including mobile apps, SMS alerts, and community meetings. This ensures that farmers, including those in remote areas, have access to valuable weather and agricultural information.
- **Risk management:** Farmers can use AAS to manage the inherent risks associated with agriculture, making their livelihoods more resilient to changing weather patterns.

Conclusion

Indian agriculture is heavily reliant on the monsoon, making it a risky endeavor. However, if farmers are provided with information regarding the upcoming monsoon season, they can make informed decisions about crop selection based on predicted monsoon rainfall. Additionally, medium-range weather forecasts can aid in managing farm operations and mitigating the negative effects of adverse weather conditions. To this end, the Ministry of Earth Sciences (MoES) and the Indian Meteorological Department (IMD) have collaborated with various institutions, including ICAR, State Agriculture Universities, and IITs, to disseminate location-specific weather forecasts to farmers. The GKMS project has established 130 Agromet Field Units (AMFUs) and 530 District Agromet Units (DAMUs) throughout India. According to the IMD, 4.37 crore farmers get Agromet Advisories directly through SMS, while social media, mobile applications, and WhatsApp are also utilized to disseminate this information. The provision of medium-range forecasts is a valuable aid for farmers in effectively planning their upcoming operations, thereby contributing to a reduction in cultivation costs. However,



the lack of awareness among farmers regarding Agromet Advisory Services highlights the need for a comprehensive approach to bridge the gap in the adoption of modern agricultural practices.

References

Kumar A., Pandey, A., Singh S. K., Prasad, L. and Ghosh, K. (2022). Tools for preparation of agropmet advisory bulletins. AMFU Roorkee, WRD&M Department, IIT Roorkee, pp 1.

Prasada Rao, G. S. L. H. V. (2014). Agricultural Meteorology. Kerala Agriculture University, Thrissur, Kerala, India. Pp 279-283.

Standard Operating Procedure for Agromet Advisory Services (2020). India Meteorological Department Ministry of Earth Sciences, New Delhi.
https://mausam.imd.gov.in/imd_latest/contents/pdf/gkms_sop.pdf

