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# Adoption of agromet advisory services (AAS) for improving livelihood of rural farmers

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## ABSTRACT

**Study was conducted during 2005-06 to 2006-07 at Bangalore rural district of Eastern dry zone of Karnataka to quantify economic benefits through adopting the agromet advisory in their day to day agricultural operations. For this purpose, two groups of farmers were selected namely, a group adopting the agro met advisories regularly in their operation (AAS farmers) and other group of farmers not aware of agromet advisories (Non-AAS farmers). 80 farmers (both AAS and Non AAS) from 4 villages have been identified and AAS information issued for only 40 farmers in two villages during *Kharif* season and care was taken to implement the advisories by this group. Crop situation of these farmers was compared with near by fields having the same crops where forecast is not adopted in non AAS farmers. Further Expenditure incurred by the farmers from land preparation till the harvest at every stage has been worked out and crop growth and yields were monitored regularly in the farmer's field belonging to both the groups. The crop growth and yield was observed to be good and high in case of farmers who have adopted the AAS information regularly compared to the farmers who have not adopted the AAS information. The net income of AAS farmer's was about Rs. 3990 in case of finger millet (ragi) and Rs. 10579 in case of redgram crops over non AAS farmers of Rs.2865 and Rs.8619, respectively. The farmers who have adopted the Agromet Advisories in their day to day operation have realized an additional benefit of 28.18 %, and 18.5 %, in finger millet and red gram crops, respectively.**

**Key words :** Weather forecasting, AAS bulletin, Finger millet, Redgram and economics

## INTRODUCTION

Agriculture in India is a gambling with monsoon. Under such circumstances, the farmers are unaware of the future behavior of monsoon for making decisions in their day to day agricultural operations. Farming community needs to be advised in time by producing custom-tailored weather forecasts to initiate suitable measures to increase the production and to minirnize the impact of unfavorable weather on agriculture. A reliable system of medium range weather forecasting for farm level decisions was established under National Centre for Medium Range Weather Forecasting (NCMRWF) at Delhi by Government of India for the application of weather forecasts in agriculture through Agro meteorological Advisory Services (AAS). The major objective of AAS is to help the farmers in capitalizing prevailing weather conditions in order to optimize the resource use and to minimize the loss due to harsh / aberrant weather conditions (Venkataraman, 2004).

Agro met Advisory Services is a vital tool which provides the valuable information about all agricultural operations from land preparation sowing to harvest based on weather forecasting. In this, weather is a key element which controls the success or failure of agricultural crop productivity.The main aim of Agro met Advisory Services is to conserve the natural resources effectively and call for minimizing the weather hazards. It is fact that AAS can be modified or may be the agricultural operations can be reoriented to the forth coming weeks (3-10 days forecast). Accurate and timely forecast of rainfall patterns and other weather variables continued to be a major challenge for scientific community. The emerging ability to provide timely, skillful weather forecasts offers the potential to reduce human vulnerability to weather vagaries (Hansen, 2002). Therefore, any forecast on weather would have tremendous benefits in terms of *ex ante* management of the negative impacts of vagaries of weather.

## MATERIALS AND METHODS

### Location of site:

The experiment station is located between $11^{0}30'$ N and $13^{0o}05'$ N latitudes and between $76^{0}05'$ and $77^{0}45'$ E longitude. The elevation varies between 600 m to 900 m above mean sea level in eastern dry zone of Karnataka state (Rajegowda, 1999). The state comprises of ten agro climatic zones. The geographical location of the study area lies in the Eastern Dry zone with an altitude ranging from 800 to 900 m above mean sea level having annual rainfall ranging from 679 mm to 889 mm. This region includes four districts such as Bangalore urban, Bangalore rural, Kolar and parts of Tumkur district which represents

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9.11 per cent of the total geographical area of the State (Anonymous, 2006). The Southwest (SW) monsoon season is more important for crop production in this region and it is highly helpful to the small and marginal farmers. Considering the agro meteorological observatory located at the Gandhi Krishi Vignana Kendra, UAS campus, Bangalore ($12^0$58' N latitude and $77^0$35' E longitude, altitude 930 m msl) as the reference centre of the Eastern Dry zone of the State, medium range weather forecast was issued to the zonal farmers. The annual rainfall of the station ranges between 525 and 1300 mm with an average of 915 mm.

**Methodology for data collection:**

A field survey was conducted in eastern dry zone of Karnataka, which comes under Doddaballapur taluk in Bangalore rural district. About 80 farmers of different categories such as big, small and marginal have been identified in AAS villages normally Seethakempanahalli and Shanabhoganahalli AAS villages and also in non AAS villages Dibburahalli and Itgalpura which are about 35 Km away from the AAS unit Bangalore. To know the economic benefit obtained by the farmers who have adopting the Agromet advisories (AAS farmers) and those who have not adopted the advisories as any information is provided to them. The expenditure incurred to raise the crop in both the situations have been documented in each stage.The medium range weather forecast received from NCMRWF centre was given in AAS villages to the identified farmers during both *Kharif* and *Rabi* seasons of the year in order to plan and execute various operations in time. Regular observations were made on the situation and constantly compared with near by fields having the same crops where forecast is not adopted by non AAS farmers. Further, Economic impact was also assessed based on the input incurred during all cultural operation from sowing to harvest. Executed adoption of forecast was critically evaluated, including the yield differences and comparing prices in both AAS and non AAS farmers based on our Agromet advisory services

**Agro-climatology and production zones of sleeted crops:**

Finger millet is well known to responds for change in the climatic condition due to its adoptability and susceptibility to moisture stress, high relative humidity and high rainfall. However, physiology of finger millet can not respond all time change in the climatic condition regions in southern India comprising Karnataka, Andhra Pradesh and Tamil Nadu ($75^0$ to $80^0$ and $10^0$ to $15^0$ N). Temperature during the crop season varies between $25^0$ and $32^0$C, and a crop season might receive nearly 400 to 500 mm precipitation.Preferred altitude range for ragi is between 1000 and 1800 msl.

Redgram is annual / perennial, pulse crop. It is indeterminate in growth habit and perhaps evolved as a backyard crop. It is a warm season crop but adapted well to lower altitudes of tropics and subtropics with well-distributed rainfall of 500-900mm, temperature regime is $10^0$ to $40^0$C but optimum is 20 to $28^0$C. Thermal time for emergence is 58 days degrees (DD) as against 70 to 76 DD for groundnut and soybean. It is a mesophyte, well adapted to drought prone areas but does not tolerate water logging and frost.

## RESULTS AND DISCUSSION

The economic benefit obtained by farmers following the Agro met has been evaluated for *Kharif* seasons for the period 2005-2007. Total cost of cultivation, crop yield and net returns for finger millet and redgram grown by the AAS and non AAS farmers during *Kharif* season are presented in Table 1 and 2. The total cost of cultivation was found to be lower in the case of AAS farmers who have effectively adopted the ago-advisory compared to non AAS farmers. Further, the main product, by product; net returns and B: C ratio were 6630.18 Rs./ ac, 1809.98 Rs./ ac and 3990.08 Rs./ ac and 1.90, respectively in case of AAS farmers and 6165.80 Rs./ ac, 1523.28 Rs./ ac and 2865.52 Rs./ ac and 1.60 in case of non-AAS

**Table 1: Economics of finger millet as influenced by AAS during *Kharif* season (Mean of two years, 2005-2007)**

| Particulars | Finger millet (Ragi) crop | | |
|---|---|---|---|
| | AAS Farmers | Non AAS Farmers | Percentage increase over non AAS |
| 1.Seed | 81.44 | 96.78 | |
| 2.FYM | 964.39 | 1071.49 | |
| 3.Fertilizer | 586.40 | 636.88 | |
| 4.Human labour | 1372.81 | 1619.505 | |
| 5.Bullock labour | 350.00 | 300.00 | |
| 6.Machine labour | 1100 | 1100 | |
| Total cost of cultivation (per acre)(Sum of 1-6) | 4455.07 | 4824.50 | -8.29 |
| Main product (Rs./ acre ) | 6630.18 | 6165.80 | 7.00 |
| Byproduct (Rs./ acre) | 1809.98 | 1523.28 | 15.84 |
| Gross return (Rs./ acre) | 8440.15 | 7689.28 | 8.90 |
| Net return (Rs./ acre ) | 3990.08 | 2865.52 | 28.18 |
| B : C ratio | 1.90 | 1.60 | |

**Table 2 : Economics of red gram as influenced by AAS during *Kharif* season (Mean of two years, 2005-2007)**

| Particulars | Red gram | | |
|---|---|---|---|
| | AAS Farmers | Non AAS Farmers | Percentage increase over non AAS |
| 1.Seed | 120.35 | 133.35 | |
| 2.FYM | 944.45 | 1103.15 | |
| 3.Fertilizer | 530.40 | 639.70 | |
| 4.pesticide | 467.00 | 662.35 | |
| 5.Human labour | 1162.25 | 1341.45 | |
| 6.Bullock labour | 200.00 | 200.00 | |
| 7.Machine labour | 950.00 | 950.00 | |
| Total cost of cultivation (per acre)(Sum of 1-7) | 4374.40 | 5030.00 | -14.98 |
| Main product (Rs./ acre ) | 14420.35 | 13117.00 | 9.03 |
| Byproduct (Rs./ acre ) | 535.20 | 532.90 | 0.42 |
| Gross return (Rs./ acre) | 14955.60 | 13649.55 | 8.73 |
| Net return (Rs./ acre ) | 10579.15 | 8619.00 | 18.53 |
| B : C ratio | 3.41 | 2.71 | |

farmers for finger millet crop. From the Table 1 it is observed that the AAS farmers are realised good benefit than non-AAS farmers. Similarly, in case of Red gram crop the main product, by product; net returns and B: C ratio were 14420.35 Rs./ ac, 535.20 Rs./ ac, 10579.15 Rs./ ac and 3.41, respectively in case of AAS farmers and 13117.00Rs./ ac, 532.90 Rs./ ac and 8619.00 Rs./ ac and 2.71 in case of non-AAS (Table 2). Even here also the yield and other returns were lower in case of non-AAS farmers compared to the AAS farmers. This may be due to the advisories issued for the AAS units contain advises for crop production strategies like ploughing, sowing, pest and disease management, harvesting, threshing and post harvest procedures to derive maximum benefit of the benevolent weather and to mitigate the impact of malevolent weather for enhanced productivity of all crops. Bi-weekly forecast given to the AAS farmers helped to avoid the adverse effects of weather events like heavy rain, dry spell, high wind speed which influence the growth of the crops. Most of the AAS farmers have realized higher additional benefit of 28.18% and 18.53%, in finger millet and redgram crops, respectively. Similar observations were also reported by Singh *et al.* (2004) and Venkataraman (2004). According to them the need for Agromet advisories and input requirements for Agromet advice on field operations, crop prospects and avoidance of pest and disease under adverse environment condition is essential. The economic benefit of the advisories for different Agromet field units that ranged between Rs. 330/ and 3750/- and 1410 to 1885/- per hectare for maize, wheat and rice crop, respectively (Rana *et al.,* 2005). Fifty farmers aware the agro advisory bulletins, which was utilized for all farm activities is 76 per cent farmers rated the usefulness of forecast between good to excellent. Similarly, Ravindrababu *et al.*, 2007, reported that the forecasts were found to be encouraging and of benefit to the AAS farmers compared to non AAS farmers sampled. The above points concluded that high benefit depends on efficient management practices based on the AAS bulletin which contains the information mainly on weather parameters and not depend on high input application. This helped the day-to-day agricultural operation so AAS farmers got higher benefit than non AAS farmers. This article clearly shows that enhance livelihood of rural farmers who were adopting agro advisory services than the not aware of Agromet advisory services.

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