

Economical and Social Values of Meteorological service

By
Tesfaye Gissila
National Meteorological Agency
Development Meteorology Department Head
Addis Abeba
Ethiopia

Introduction

- Meteorology in Ethiopia first attained its importance in Aviation, and a small Meteorological unit was established in 1951 within the Civil Aviation Department (now Civil Aviation Authority) to cater services solely for aeronautical purposes.
- As the other socio-economic Sectors slowly began to realize the importance of meteorological information and advice for their respective activities, requests began to flow into this small unit. Thus the unit has been promoted to Meteorological Department under the auspices of Civil Aviation Authority in 1974.
- Further expansion of the service resulted in the establishment of the National Meteorological Agency, as an autonomous Government Organization, by proclamation number 201/1980 on 31st December 1980.
- Since then, it has reorganized itself in different times to meet the growing demand in meteorological services from diversified socio-economic sectors. In 1994, for a better attainment of its objectives, NMA is organized in one Director General, one Deputy Director General, five departments, eleven teams, five services, four sections, eight branch offices and three sub-branch offices.

Identification of Customers and stakeholder, and their needs and expectation

Customers.doc

Customers Feed backs

- The result of the feed back from the customers indicates that of the questionnaires distributed to the customers and stakeholders, it has been found that about 50% of the answers indicate that they are satisfied with the forecast early warning and advisory services, where as the need of improvement is stressed by most of the customers in-terms of quality of services and also timeliness.
- The the percentage of the customers and stakeholders saying that they have confidence in the services is much less. The major reason we identified can be low awareness of the users of the forecast and early warning advisory services.
- The most important type of forecast and early warning service identified by the users is the Seasonal forecast as this is greatly related with both Agricultural production and also hydro-electric generation. Thus we would like to concentrate more on the possible economic implication of Public Weather services to Agriculture and the Hydro-electri generation(Power sector).

- Agriculture is the main sector of the Ethiopian economy. It accounts for approximately 45% of the Gross domestic product, provides employment for 80% of the population and generates about 90% of the export earnings. Crop production is estimated to contribute on average 60%, livestock accounts for 27% and forestry and other sub-sectors account for 13% of the total agricultural value. Since agriculture in Ethiopia is mainly rain-fed, the importance and also value of the Meteorological services to the agricultural sector has risen greatly in recent times. Agriculture is mainly rain-fed in Ethiopia and the climate of the country is greatly characterized with great variability, both in the rainfall amount in the time of onset, cessation and thus in the length of the growing period. Thus seasonal forecasts can be very important in maximizing agricultural production through the determination of the plating time, the type of crop to grow, and in the identification of the best type of planning operational activities during the agricultural cropping season starting from planting to harvesting, and also in pre and post harvest activities. Thus the contribution of the impact of the Meteorological public weather services in the Agricultural and in the hydro-electric power generation sector is sure to have its greatest economic impact.

Economic value of Meteorological services to prevent Agricultural crop losses and maximize production

- Over different parts of the country long cycle crops, sorghum and Maize are cultivated in the country which contribute about 40% of the national agricultural production. These crops are high yielding crops and thus farmers who have been accustomed with these crops also prefer to these crops and moreover these crops are also related
- with the food security of the country, They are mainly planted in March/April and mature in November/December.
- The major problem with these crops however is if the rainfall is not consistent from March/April to September and if there is a prolonged dry spell, due to Atmospheric and oceanic anomaly like the ENSO, which means that there would be total Agricultural production loss. However, if the seasonal forecasts anticipating these problems were used, then the farmers can be persuaded to cultivate short cycle crops which can greatly help them in decreasing their loss. The implication of the monetary value of these types of service can be estimated in terms of millions of dollars including the saving of seeds and also other inputs such as Commercial fertilizers, human labor etc.
- The importance of these types of meteorological forecast, early warning and advisory services is greatest over eastern, northeastern, central and southern parts of the country, where climate variability is larger as compared with the western half of the country.

The economic value of seasonal forecasts to Agriculture

- The correct March-May seasonal rainfall forecast of 2008, which was disseminated to decision makers
- and to the Agricultural sectors is one example here, where those areas which used the forecast correctly were able to be saved from incurring agricultural losses, which if estimated can clearly go from hundreds of thousands of dollars to millions of dollars.
- Agricultural advisories can also be based on seasonal forecasts, where the expectation of below normal rainfall implies that the advisories given to the farmers be based on the efficient management of moisture the use of supplementary irrigation through rain water harvest and also through the identification of suitable crop types.
- Moreover, recently a pilot project on drought Insurance in the calendar year has shown that the Meteorological services can become very important in the expansion of the Agricultural Insurance Sector. The major reasons for the expansion of this sector can be ascribed with the increase in crop prices in the World market, where an agricultural loss in one to two years out of five years can be profitable in the Insurance sector. As this market is a slowly emerging one its economic impact is yet to be assessed in the coming years.

2.2 Economic Impact of Meteorological services for the management of Climate variability to prevent its negative impact on hydro-electric power generation

- More than 90% of the electricity generated in Ethiopia has its source in hydro-electric generation. Most of the water of the hydroelectric dams is harvested during the June to September summer rainfall season in the country. If the rain is excess it means that constant monitoring of the weather is important to keep the safety of the dams. If the expected rainfall is below the normal it means that the operational activities of the hydro-electric dams should be adjusted, which other wise can lead to power crisis. The economic impact of the application of correct seasonal forecasts to hydro-electric power generation can be as large as yens of millions of dollars in the country.

3. Conclusion and Recommendation

- One important aspect of the feed back we got from our questionnaires is that of the low confidence of the users to use them, which of course has shown improvement recently. However, apart from the need to increase the awareness of the users the other important aspect is that of the need to increase the quality of the service in accuracy and usability.

References

- Food and Agricultural Organization United Nations (FAO), 2009: National Agricultural Statistical Programs in Ethiopia.
- T. Gissila et al, 2003: Forecasting of the Summer rains of Ethiopia. International Journal of Climatology.
- National Meteorological Agency, 1996: Agro-Climatological Resources of Ethiopia.

Annex 1 Distributed Questionnaire

- [Annex 1 Distributed Questioner.doc](#)