


**DEFICIENCIES IN THE OPERATIONAL
APPLICATIONS OF LONG - RANGE
WEATHER PREDICTIONS FOR
AGRICULTURE - RECOMMENDATIONS
FOR IMPROVING THE TECHNOLOGY FOR
THE BENEFIT OF AGRICULTURE AT THE
NATIONAL AND REGIONAL LEVELS**

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PRESENTATION LAYOUT

- ◆ Introduction
- ◆ Recent advances in the science of climate forecasting
- ◆ Deficiencies in the operational applications of climate forecasts for agriculture
- ◆ Recommendations for improving the technology for the benefit of agriculture
- ◆ Conclusion

INTRODUCTION

- ◆ Weather related hazards can adversely affect agricultural production leading to food insecurity, famine, loss of livestock and negative economic growth
 - ◆ Weather forecasting is a prediction of the state of the atmosphere some days in advance
 - ◆ Long-range weather predictions or climate forecasts are valid for a month to a season
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INTRODUCTION

- ◆ Deficiencies in the long-range weather forecasts have limited the applications in increasing agricultural production
- ◆ Application of the forecast is effective if information reaches the right audience on time

Science of climate forecasting

- ◆ Long-range weather prediction methods range from empirical-statistical techniques (analogue, time series, correlation, multiple linear regression) to dynamical-numerical models

Science of climate forecasting

- ◆ Dynamical-numerical models based on systems of equations that predict the evolution of the global climate system in response to initial atmospheric conditions, and boundary forcing from the underlying ocean and land surfaces

Climate forecasting

- ◆ In Africa, climate forecasts produced during Regional Climate Outlook Forum (RCOF)
- ◆ Quantitative forecasts transformed into qualitative forecasts building 3 categories of below normal, normal and above normal

Deficiencies in operational application climate forecasts for agriculture

- ◆ Insufficient lead time for planning and disaster preparedness - delay of a few days may mean disaster as farmers fail to plant their crops in time
- ◆ Lack of regular updates of climate forecasts - updating climate forecast improves accuracy of forecasts

Deficiencies cont.

- ◆ Insufficient climatic parameters - decision- onset and cessation of rains, rainfall amount and distribution of rainfall, sunshine duration, mean, maximum and minimum temperatures, and irrigation demand not provided

Deficiencies cont.

- ◆ Inadequate spatial and temporal resolution – model spatial resolution too coarse to predict local scale variations
- ◆ Forecast inaccuracy - forecasts more accurate than historical averages required

Deficiencies cont.

- ◆ Lack of needs assessment of farmers - information produced without taking into consideration the needs of farmers, differences in requirements of agricultural activities, and climate-sensitive activities of the farmers

Deficiencies cont.

- ◆ Meteorologists have inadequate knowledge of the conditions that shape the livelihood of farmers
- ◆ Lack of education and training of personnel in NMHSs in climate forecasting and downscaling to local level

Deficiencies cont.

- ◆ Intermediaries such as extension workers cannot interpret climate forecasts
- ◆ Inappropriate packaging of climate information - climate forecasts are phrased in terms that are not specific to agriculture

Deficiencies

- ◆ Use of the probability of the seasonal rainfall confuses some users
- ◆ Lack of economic valuation of applying climate forecasts

Deficiencies cont.

- ◆ Ineffective means of information dissemination –Newspapers, radio and television least effective in reaching marginalized groups such as the elderly, cultural minority groups, people with low incomes and without electricity

Deficiencies cont.

- ◆ Insufficient training in information dissemination - intermediaries lack training in communicating skills
- ◆ Use of foreign language - forecasts are written in the foreign official languages not understood by ordinary farmers

Recommendations

- ◆ Provide climate forecast information that is timely, useful and relevant for different climate-sensitive activities in agriculture
- ◆ Advise the farmers on the onset of growing season, the sowing date, the rainfall amount and distribution and the length of growing season etc.

Recommendations cont.

- ◆ Improve the accuracy of the climate forecasts for agriculture by regular updates
- ◆ Promote the use of geographical information system (GIS) and the development of new remote sensing products

Recommendations cont.

- ◆ Promote the development of combined crop-climate forecasting systems bearing in mind the needs of farmers
- ◆ Promote use of different methods through the utilization of the data and products available on the internet

Recommendations cont.

- ◆ Encourage regional approaches to long-range weather prediction and give financial and technical support to regional climate centres
- ◆ Build regional capacity for climate forecasting by training NMHSs staff

Recommendations cont.

- ◆ Generate quantitative evidence of the usefulness of long-range weather forecasts
- ◆ Provide users with case studies on the applications of climate forecasts in agriculture
- ◆ Involve users in model validation, verification and evaluation processes

Recommendations cont.

- ◆ Carryout research in climate forecast applications focussing on impact assessment of the forecasts
- ◆ Promote adoption of climate forecasts by farmers and investigate reasons for non-adoption of new technologies

Recommendations cont.

- ◆ Combine climate forecasting with research from other physical and social sciences to mitigate natural disasters
- ◆ Integrate climate forecasting into the development of adaptation strategies for different hazards

Recommendations cont.

- ◆ Promote education on application of climate forecasts in agriculture
- ◆ Organize Climate Field Schools where community intermediaries are trained in the use of climate forecasts in agriculture

Recommendations cont.

- ◆ Establish pilot projects dealing with the applications of climate forecast in agriculture
- ◆ Encourage the active participation of the intermediaries in the pilot project implementation

Recommendation cont.

- ◆ Design effective information delivery systems - audiences differ in sources of information they use, consider and trust
- ◆ Involve community intermediaries information delivery

Recommendations cont.

- ◆ Apply principles of persuasive communication to information delivery
- ◆ Present short, simple information in climate forecasts

Recommendations cont.

- ◆ Train intermediaries in forecast interpretation and translation of the probabilistic forecasts into easily understandable language by farmers
- ◆ Conduct cost-benefit analyses of applying climate forecasts in agriculture

Recommendations cont.

- ◆ Carryout awareness campaigns on the value of applying long-range weather predictions in agriculture targeted at the policy makers and farmers

Conclusion

- ◆ Significant advances have been in the science of long-range weather prediction in recent years
- ◆ Operational applications of the forecasts in agriculture have been hampered by several deficiencies such as timing, accuracy, language and insufficient parameters

Conclusion cont.

- ◆ Effective communication of climate forecasts and products to users can be achieved through training of intermediaries
- ◆ Education and awareness of farmers on the usefulness of long-range weather prediction will ensure effective application of the forecasts in agriculture

THANK YOU

