

Workshop Statement 6 April 2007

In opening the conference and welcoming the delegates, the Minister of Agriculture, Water and Water Resources from Burkina Faso opened the conference saying, "This conference will make it possible to use weather data and forecasts for the benefit of people in the Sahel, and strengthen cooperation among the NMHS's, universities and regional centers."

The delegates thank the minister for his support, and used his insight as a key point of reference in developing a series of principles and actions to realize the goal he outlined.

The principles conference participants agreed to include:

- We underline the fundamental importance of training and education for meteorological personal. Budgets for training and education are fundamental to long-term program success.
- We call out the need for long-term investment in the equipment and other infrastructure. The recommendation is that planning for the long-term maintenance of infrastructure be included in planning process
- We propose the development of numerical weather prediction research/operations capability, and further recommend a regional approach that can extend the benefit of this capability to all Meteorological Services in the Sahel.
- We strongly endorse developing means to share data freely among all countries in West Africa, especially radar data, and for developing a network of West African radars
- In overall terms, we support for sustained collaboration between the various West African Meteorological Services and with centers like ACMAD, ASECNA, CILSS, etc.
- Finally, we emphasize the need for varied methods of observation, because "there is no one perfect instrument"

Much discussion was given to the potential for rainfall enhancement. A consensus opinion is that enhancement should be done very carefully – with careful validation to measure the effects of the enhancement, and with considerable attention to the conditions necessary for maximum effectiveness. We acknowledge that investment in rainfall enhancement capability results also in benefits that extend beyond rainfall enhancement. For example, radars used to plan cloud seeding can be used for civil aviation, agricultural planning, and even monitoring the movement of dust.

Results of Working Groups:

Group one focused on the need to collect, share, and distribute weather data over the Sahel, and the added value of that data when made available to a broad spectrum of users in meteorology, aviation, health and agriculture.

The action this group identified was "the collection, compositing and dissemination of radar observations." The first step is to develop a Memorandum of Understanding on the free and open exchange of radar data in the Sahel and the adjacent countries.

Then, data can be collected in a central, sub-regional center – which depends on the existence of adequate internet. The next step is to composite data to create a regional overview, which can be provided to the mentors through partners like EUMETCAST, and then work with stakeholders to help them interpret and use the radar composite. This group also suggested a long-term database could be available to the research community to better understand the rainfall in the Sahel.

Working Group Two focused on better information about two key meteorological phenomena: precipitation and dust. Precipitation is fundamental to agriculture and economic health, and dust has an impact on human health and civil aviation.

The group proposed three innovations: the merging of satellite and radar data, the development of a network of radar across West Africa, and the capability to predict dust.

The long-term vision is a network of radars across the Sahel, and the recommendation is to begin with a survey of existing capacity. A tentative suggestion was made to initiate the network by, building on existing capacity in Burkina Faso and Mali, then extend this network to include renovating existing radars that are not operational. Training in analysis and maintenance should be provided on a regional level.

The group also recommended combining radar and satellite data, and investing in training in using these in combination. This can be done by adapting techniques developed in other meteorological services, internationally. As a milestone toward this end, the groups suggested adapting and translating operational software that can support their combination, potentially the IDV, and organizing courses about this software.

To realize the benefits of these technologies, the group recommended a multidisciplinary approach – for example working with public health officials to use the dust forecasts to improve public health, and working with agricultural officials to use precipitation information in managing Locusts.

Finally, the group recognized the importance of the collaborations, and emphasized the need for the university community, national meteorological services, regional centers, sub-regional centers and international organizations need to work together.

Working Group Three described the state of cloud seeding operations in a number of countries in these areas. Some obstacles to current cloud seeding are the need for additional expertise and equipment, but regional partnerships could allow sharing of expertise and equipment. There is a strongly identified need to do careful evaluation of seeding programs. Finally, successful seeding depends on good meteorological observations, from across the region, and sound forecast.

The group recommended partnerships and regional approaches in approaching weather modification, including continued participation of CILLS. Radar networking, numerical weather prediction are necessary to guide seeding activities. The group recommended a plan for continuity of personnel, inter-project communication, and cooperation from interstate to international levels. For example, personnel could participate in seeding programs of neighboring countries to learn cloud seeding techniques and help evaluate program successes. As another example, research and

feasibility studies, with randomized studies of the efficacy, are suited to a regional approach. This regional research approach should proceed operational programs, while building an infrastructure that can support a broader suite of meteorological operations. Countries then, are free to pursue their operational programs.

Working Group Four began by describing the fact that weather prediction models currently used in Africa weren't developed to model African weather systems, and aren't adapted to the conditions or needs in the Sahel.

Overall, the group recommended developing numerical weather models designed to simulate African weather and climate and to use these models to provide products usable by African stakeholders.

The group recommended partnerships and alliances, but suggested approaching collaboration in stages. For example, universities and operational centers within a country need to collaborate before they can effectively collaborate regionally internationally. The group noted that ACMAD has a mission of capacity building, and with funding it could be a center for training, using a "train the trainer" models. Also, this training must include not only meteorologists but the personnel to maintain the computer systems.

To evaluate, we want to assess not only the objective success of the forecast, but also the end-user satisfaction with the products of the forecast.

As a pilot project, they proposed training for workshop users in numerical weather prediction, with NCAR participation. ACMAD would host the model, to ensure widespread distribution of products, with individual countries encouraged to implement their own versions of the model.

The delegates thank the minister for his kind support of this conference, which has resulted in a shared understanding of the opportunities to improve public life with the application of meteorological and environmental understandings. With the recent exciting developments in the area, related to satellites, radar, cloud seeding, and the advances in telecommunication and goodwill that facilitate regional approaches to overarching challenges, we are poised to make great strides in better serving the people of the Sahel with our improved understanding of the environment and water resources. Thank you again, for your support of Sahel 2007: Improving lives by understanding the weather.