

A step Forward to Atomize the Sudan Meteorological Authority (SMA) Net work

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Abstract

AWS has been introduced to Sudan Meteorological Authority since the year 1992, but many problems faced the technicians to operate the system due to lack of training, and matter of software. In 2002 (4) Automatic Weather Stations from Vaisala (Finland) were implemented and put in work, three of them used as aeronautical stations at Air ports. In the year 2006 an automatic weather station from Lambrecht (Germany) implemented and put in (Gedaref). It was the only station consists of many parameters Based on the data Obtained from both automatic and manual stations, Khartoum Air port and Gedaref, comparisons has been made on the readings of Pressure mainly, and temperature. This work is going to show in general, the differences between the readings, which seems to be within the allowed error, and to focus on the current situation of the Sudan Meteorological Authority (SMA)

The new devices

Table 1 & 2 shows the Locations of (aws) in the network and the Parameters Available for each and the photos shows the display of Gedaref AWS and the training of the staff

Table (1)

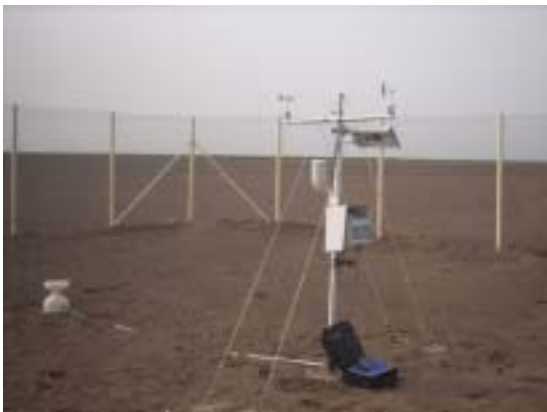
Station Name	Station No	Latitude	Longitude	Elevation
Khartoum	62721	15:36	32:33	381m
Port Sudan	62641	19:53	37:13	42m
Dongola	62650	19:10	30:29	228m
Gedaref	62752	14:02	35:24	600m
Malakal	62840	09:33	31:39	390m

Table (2)

Parameters	Khartoum	Dongola	Malakal	Port Sudan	Gedaref
Wind Direction	*	*	*	*	*
Wind Speed	*	*	*	*	*
Pressure	*			*	*
Temperature & Humidity	*			*	*
Precipitation					*
Evaporation					*
Soil					*



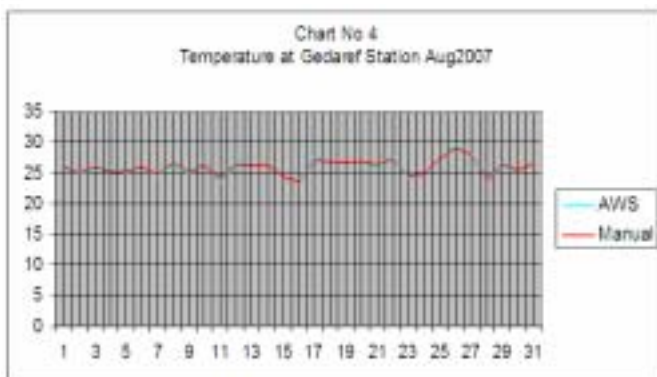
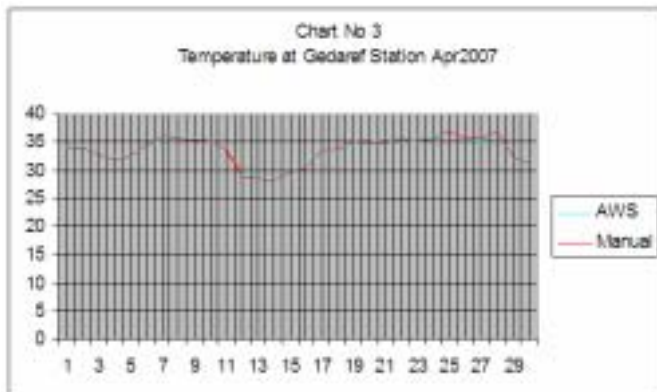
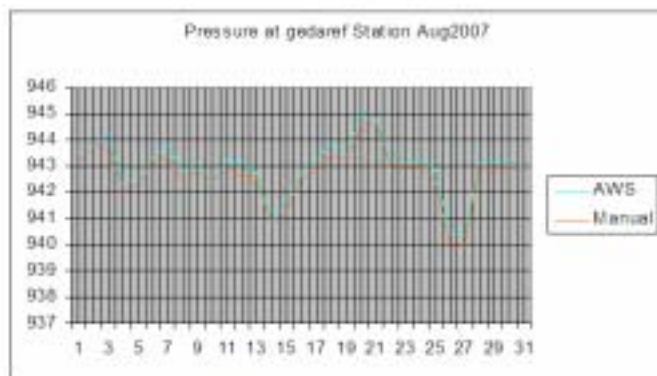
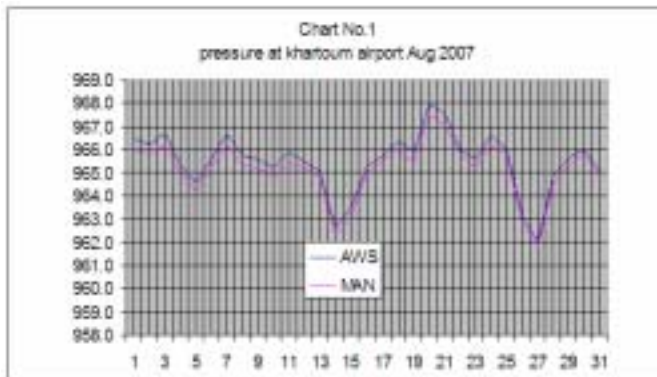
Gedaref aws
Training the staff to operate the new devices



Recently installed Automatic weather station for agro meteorology. SMA advises the private sector to make good use of the new devices

The comparisons

The comparisons took place at Gedaref synoptic station and Khartoum aeronautic station for period of one year where the equipments were put in the same places, same conditions. Charts I and 2 shows the graphical difference of (-0.5) FOR the pressure reading at Gedaref and Khartoum stations. Chart 3 and 4 shows the difference of (0.2) for the temperature readings at Gedaref station.



Focus on the existing equipments in the net work

About 86% of the network in the Sudan Meteorological Authority (SMA) is manual stations equipments looking forward to replace them by the yare 2012 to full automated weather systems

Shambles for some existing equipments



Digacora upper air
equipment needs
upgrade



Pressure standard
barometer in used
before the year 1965



Pressure calibration
chamber in use since
the year 1992

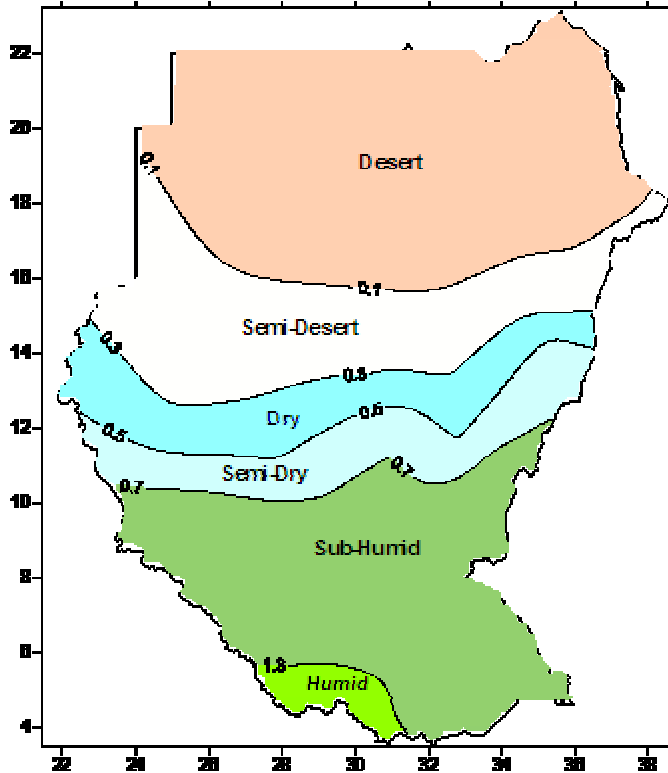
Temperature
calibration chamber
in use since the year
1992



Local made
rain gauge

Future planning

Sudan area is about one million square miles, and its climate zone varies from desert in the northern region to the semi-desert in the central to sub-humid to humid in the southern. The operational network of Sudan Meteorological Authority ,which started in 1890, consists of about (35) Manual weather Stations, While the ideal distribution for the meteorological network for such area should be more than (100) stations according to the WMO. This means that the weather of about only 30% of the Sudan area is available



Because of the climate variation in the Sudan, (SMA) is working very hard to improve the weather services. Practically (SMA) has submit a project through its future planning to establish an Ideal early warning system, by rehabilitating the existing stations by semi-automatic weather stations, and to step forward to Atomize the network with a full (AWS), and to update the communication system ,to secure the urgent needs of the end users, with the required data.

Table 3 shows the actual and planning quantities of the automated system.

Table 3

No.	Classification	Before 1980	2008	2009	2011
1	Aeronautic Stations	10	10	10	11
2	Synoptic station	37	38	43	40
3	Agro met. Station	10	8	12	10
4	Climate Station			40	75
5	Hydro met station	10	10	12	15
6	Weather Radar	5	-	3	5
7	Digicora Radiosond	5	-	3	5
8	P. Balloons ascent	12	-	15	21



Dust Storm at
Khartoum
Sudan