COURSE TITLE

TRAINING WORKSHOP ON DATA MANAGEMENT IN NAIROBI AND MOUNT KENYA GAW STATIONS STAFF: SECOND PHASE

DATES

17th - 29th March 2019

VENUE

NAIROBI AND MOUNT GAW STATIONS

SPONSOR

UNITED NATIONS ENVIRONMENTAL PROGRAM AND WORLD METEOROLOGICAL ORGANISATION

INTRODUCTION

Kenya Meteorological Department (KMD), under the auspices of the World Meteorological Organisation (WMO), Global Atmosphere Watch Station (GAW) programme, has national, regional and global mandate of monitoring atmospheric chemical composition including but not limited to Greenhouse Gases (GHGs), environmental background pollutants for Air Quality Assessment & Climate Change detection and attribution over Kenya. The changing of the chemical and physical composition of the earth atmosphere on a global scale has far reaching implications on health, climate change, environmental degradation and the future of human society. KMD operates one Global Atmosphere Watch Station at Mount Kenya and one Regional GAW Station in Nairobi. KMD monitors surface Ozone O_3, total column O_3 and Vertical O_3 in fullfilment of international multilateral agreements and convections like Montreal protocal and Viena convection on behalf of Kenya Government. This measurements require experty which is locally limited in Kenya and Africa. As a developing country, Kenya requires special capacity-building initiatives as a continuous process aimed at strengthening or establishing, relevant organisations, institutions and human resources in order to provide expertise in all areas related to the implementation of the Vienna Convention and the Montreal Protocol.

As support to capacity building initiatives in developing Countries, UNEP announced a call for proposals from developing Countries jointly with developed Countries of the West in the year 2016. A proposal was put forward between KMD and twinning partners from Federal Office of Meteorology and Climatology, MeteoSwiss, the Swiss Federal Laboratory for Materials Testing and Research (Empa), in Switzerland and considered for funding. The second phase funding facilitated the Swiss experts to travel to Kenya to witness the implementation of the

skills gained during the training in Czech Republic and Switzerland and also conducted more training.

This report is compiled by Annet Nyaga from Nairobi Region Global Atmosphere Watch (GAW) Section, Kenya Meteorological Department (KMD)

OBJECTIVES

The main objective of this UNEP/WMO sponsored training was to further enhance the knowledge and skills of KMD GAW personnel in the operation of instruments and data management addressing competencies in measurements, instruments calibrations, and analysis and data management of atmospheric composition, documentation with metadata and data submission. Specific objectives addressed training on OSCAR Metadata, vertical profile of Ozone Radiosounding and Brewer operations and maintenance.

PROGRAM COVERAGE

Training, instrument calibration and audit was conducted for two weeks in Nairobi and Mount Kenya GAW stations respectively.

OSCAR METADATA TRAINING

About ten staff from KMD attended this training.

Dr. Joerg Klausen was the resource person

Participants

No	Name	Section
1.	Ms. Annet Nyaga	GAW
2.	M. Amos Waweru	GAW
3.	Mr. Josiah Kariuki	GAW
4.	Mr. Martin Oloo	Mt.Kenya GAW
5.	Mr. Mathew Mutuku	Mt.Kenya GAW
6.	Mr. Joseph Mukola	Engineering
7.	Mr. Kennedy Chabali	Engineering
8.	Mr. Tiki Tuva Mwambao	Data Processing Section

In this training, there was general introduction to WIGOS. After, WIGOS Metadata Standard and Oscar surface were introduced. The main focus was based on finding information, registering new contacts, reviewing and editing information.



Training on metadata management with OSCAR

TRAINING ON VERTICLE PROFILE OF OZONE RADIOSOUNDING

The resource person was Gonzague Romanens

Participants

No	Name	section
1.	Ms. Annet Nyaga	GAW
2.	Mr. Amos Waweru	GAW
3.	Mr. Josiah Kariuki	GAW
4.	Mr. joseph Mukola	Engineering
5.	Mr. Kennedy Chabali	Engineering

Intensive and practical training on Standard Operating Procedures (SOP) on day and -7 days were reviewed and verified during the operational ozone radiosounding. Knowledge on the acquisition software for the Vaisala data acquisition unit was also impacted.



Ozone radiosounding during the training

BREWER TRAINING

The resource persons were, Dr. Christian Felix, Gonzague Romanens and Jacques

Participants

No.	Name	Section
1	Ms. Annet Nyaga	GAW
2	Mr. Amos Waweru	GAW
3	Mr. Josiah Kariuki	GAW
4	Mr. Joseph Mukola	Engineering
5	Mr. Kenneth Chabali	Engineering

The above Staff were taken through brewer operating procedures and maintenance.

The brewer spectrophotometer being an automatic instrument for measuring total column ozone, requires regular maintenance to ensure quality data.

We were introduced to a link describing the principal maintenance procedures as follows:

Cleaning window and dome.

This should be carried out in the morning on a daily basis. The window and dome of the instrument should be cleaned by spraying isopropyl alcohol and clean with a tissue.

Checking on the running of the software with appropriate schedule should be observed daily in the morning and keep on being monitored.

The first line of the software window should indicate the current date, #071 Nairobi, then current time. If not, a certain procedure should be followed to revive it:

- Press (home) button to cancel any ongoing activity
- Type SKC (enter); start schedule
- Type schedule name “Nairobi” (enter)

Sighting and Adjustment

This should be carried out during the 1st and 15th day of the month at noon so long as the conditions are favorable. (Sun should be visible)

Procedure:

- Type (enter) on the computer software
- Go to the brewer instrument
- Remove viewing window cover
- Stand clear on the slanted window, look into the entrance slit viewer and use the four push buttons on the front of the brewer to center the suns image across the entrance slit.
- Replace the viewing widow and go back to the computer
- Press (cntrl) – (end) and press y to save the values
- Type skc (enter); start schedule
- Type schedule name “Nairobi” (enter)



Training on Brewer sighting and adjustment at KMD

External lamp tests

This should be performed once in a month with a no rain condition during the exercise. There are nine major steps to be observed.

Procedure:

- Place the brewer software on menu mode by pressing (home)
- Place the first lamp in the holder and place the protection on top of it
- Place the holder on top of the UV dome
- Install box with multimeter, then connect lamp and power supply.
- Switch on the multimeter on V DC, and press “sun” button for 2s to increase the display to 5digits
- Then switch on the lamp and let it warm for 8minutes

- Set the voltage to 12.000+/- 0.003v
- Go back to the computer and type “te”, then press “enter”
- Depending with the lamp no, you should type “pdhgulb1ulpfgh”, type in lamp number and press (enter).switch off the lamp after the procedure and repeat the same for other lamps.
- After the procedure is over, one should restart the Nairobi schedule, type skc (enter); start schedule, type schedule name “Nairobi” (enter)



Brewer external lamp tests training



External lamp power supply

Cleaning azimuth tracker drive plate

This should be carried out once in month with no rain condition.

Procedure:

- Press (home) to keep the brewer software in menu mode
- Power off the tracker, remove the back cover of the tracker and clean the edges with an isopropyl alcohol moistened tissue as one rotates the brewer manually.
- If one notes any aluminum flakes, this should be logged in the log book.
- Return the back cover and switch on the brewer button to turn it on
- Type az (enter) to reference the tracker after cleaning the drive plate

- Type skc (enter); start schedule
- Type schedule name “Nairobi” (enter)



Training on brewer azimuth tracker plate cleaning

BENEFITS

- Acquired more knowledge and skills on OSCAR Metadata, vertical profile of Ozone radiosounding and brewer operations and maintenance procedures.
- This training created opportunity for more KMD Staff enabling them to attend and participate in this important training
- The training created an opportunity for KMD staff to interact with the Meteoswiss experts on sharing scientific knowledge and experience.

CONCLUSION

Knowledge gained during the training will improve staff performance at KMD and also act as a key in sustainability of GAW operations in Kenya and beyond. Through the training, there will be improved performance in the Brewer operations and maintenance, Vertical profile on Ozone radiosounding amongst other activities.

RECOMMENDATIONS,

- There is need to train more personnel in GAW observations relevant to Montreal protocol and Vienna conventions in Kenya.
- KMD should be facilitated to be able to collect more data on chemical composition of the atmosphere for local and regional assessments of air quality.
- GAW trained staff should be given sufficient time to practice, share skills and knowledge whenever deemed appropriate to transfer one from GAW division to another division in the Department. This will ensure smooth transfer of skills and GAW knowledge.

- Establishment of more chemical measurement stations in the Country is overarching and should be considered on priority basis. This will ensure that there is more information and knowledge on AQ status especially in urban centers and densely populated areas.

ACKNOWLEDGEMENT

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1. Kenya Government through the Ministry of Environment and Forestry for allowing the Meteoswiss team to come and conduct the training.
2. UNEP/WMO for implementing the second phase of this training on a timely basis.
3. All resource persons and expertise from Meteoswiss for conducting a successful training as well as KMD staff for the participating.