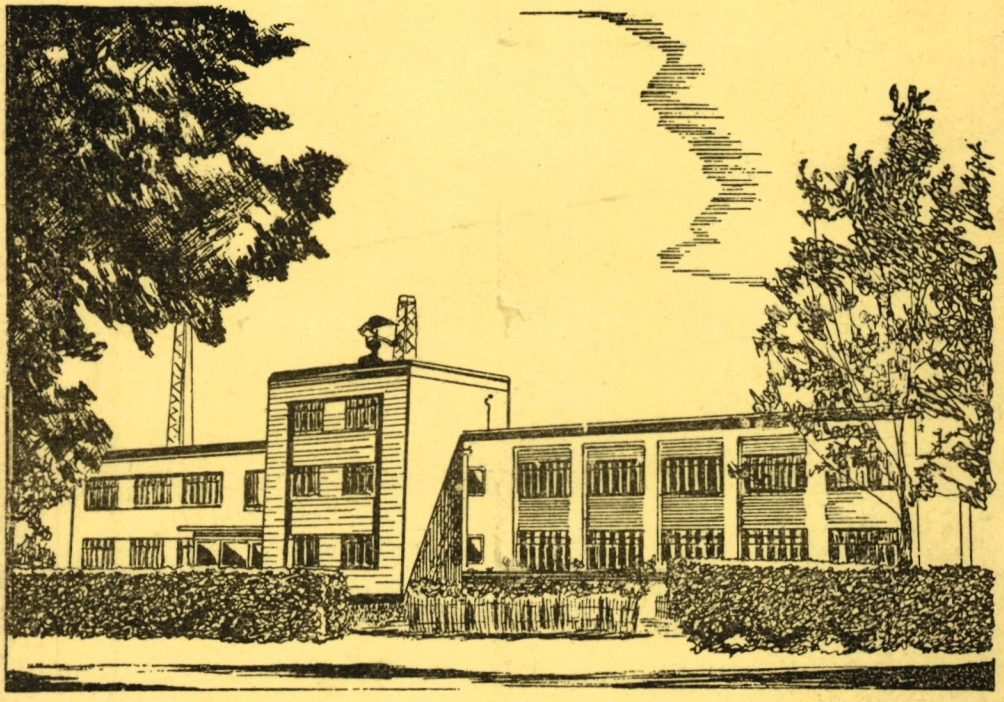


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# KENYA METEOROLOGICAL DEPARTMENT ANNUAL REPORT 1980/1981



Meteorological Headquarters

060  
KMD

**ANNUAL REPORT  
ON THE  
KENYA METEOROLOGICAL DEPARTMENT  
FOR THE PERIOD  
1ST JULY 1980 TO 30TH JUNE 1981**

Presented by the Director  
to the  
Minister for Transport and Communications

**KENYA NATIONAL ASSEMBLY**

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Issued by  
Kenya Meteorological Department  
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## **1.1 FOREWARD BY THE ACTING DIRECTOR**

During the reporting period, the Department continued to play a significant role in the international meteorological circles which culminated in its recognition as an important meteorological service in Africa. Such recognition was reflected in the hosting in February 1981, by the Department of a WMO Technical Conference on Management of Meteorological Services in Regional Association I. The conference was attended by Directors and senior officials of Meteorological Services in Regional Association I (Africa). The Director Mr. J.K. Murithi was elected Chairman of the conference. The Director continued to make important contributions in the Executive Committee of WMO during its 32nd session held in Geneva. Other officers of the Department continued to participate in their expert capacity in the work of the various Technical Commissions and working groups of the WMO through attendance of conferences, commission and working group meetings.

On the local scene, the major achievement was the concretization of our plans to modernize the Department through French Credit. The equipment provided under this Credit continued to arrive and installation works were at various stages of completion. In particular, installation of the radars at Jomo Kenyatta International and Moi Airports were completed and training of our operators carried out. An APT/WEFAX receiving station acquired through French Credit was also installed. It was expected that this would greatly improve the Department's services to Civil Aviation. Additional equipment through the WMO Voluntary Co-operation Programme (VCP) was expected. An APT/WEFAX station from Germany was expected through this programme and is to be installed at the Meteorological Institute for training purposes.

Although it was expected that our services to various sectors of the economy would improve after completion of the modernization exercise, the Department continued to be plagued by unserviceability of the old equipment due largely to the non-availability of spare parts.

A new development in our forecasting service was the introduction of monthly weather summaries for each month, including advisory expected weather for the following month. Negotiations were entered into with the VOK aimed at introducing weather presentation on television by our Meteorologists. As the plans develop and are concretized, we expect that this will greatly enhance the

appreciation of the role of Meteorology in national development.

There was continued demand for meteorological information from various sectors of the economy. In particular, requests for climatological data from construction companies, farmers and others was on the increase. We continued to collaborate with the Ministries of Agriculture, Energy, Water Development as our major public sector consumers, while data provision to researchers in our sister Department of Meteorology at the University of Nairobi continued. In order to serve our users better and to modernize the archiving function, most of the data received for 1980 had been put on magnetic tapes for faster retrieval.

The Institute for Meteorological Training and Research continued to carry out its dual function of conducting research in various aspects of Meteorology of immediate relevance to forecasting and natural resources of Kenya, and training for English speaking countries of Africa. Six research reports, one technical memorandum, and an occasional report were published during the period. Seven courses were completed while four were continuing.

During this period the Institute formally became a regional project of UNDP and the first Inter-Governmental Council Meeting was held in Nairobi from 11th — 13th November, 1980. The student intake continued to reflect the regional character of the Institute with students distributed as follows:- 203 Kenyans, 13 Seychelois, 30 Tanzanians, 10 Ethiopians, 8 Botswanas, 7 Zambians, 6 Ugandans 4 Malawians, 3 Basotho, 1 Gambian and 1 Ghananian.

A long standing problem on staff complement for the Department was resolved through discussions with the Directorate of Personnel Management and an authorized establishment was produced. All senior posts which had remained vacant for sometime were filled during the period.

We continued to have problems with recruitment and retention of technical staff. Staff resignations due to perceived lack of promotional prospects in the absence of Schemes of Service continued to be a major problem.

Our development programme was hampered by contractors who abandoned site in Eldoret, or continued to work behind schedule in Voi, Moyale Garissa and Lodwar on the outstation staff houses. The construction of Headquarters staff houses progressed at a better rate but was also behind schedule due largely to problems associated with the Ministry of Works.

In conclusion, I wish to point out that as a service Department we must work closely with various Ministries and Departments in the course of our work. I wish to acknowledge with thanks the co-operation and support I have received from my colleagues in the Departments of Agriculture, Civil Aviation, Defence, Environment and Water Development.

A.L. Alusa  
**Ag. DIRECTOR OF METEOROLOGICAL SERVICES**

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## **Functions of the Kenya Meteorological Department**

The Kenya Meteorological Department is the State Meteorological Service. It forms part of the Ministry of Transport and Communications. The Director is responsible to the Minister for Transport and Communications through the Permanent Secretary, Ministry of Transport and Communications.

The general functions of the Meteorological Department are:

- (i) The provision of meteorological and climatological service to agriculture, plantation farming, forestry development and for the better exploitation and utilization of natural resources for national development.
- (ii) The provision of meteorological and climatological service to water resources development and other government departments, public corporations, local authorities, the mass media and the general public.
- (iii) The provision of meteorological service to civil aviation for the safety and economy of civil aircraft operations.
- (iv) The provision of meteorological service to shipping in the western Indian Ocean including the issue of cyclone warning for the safety of merchant and other ships in the western Indian Ocean.
- (v) The provision of meteorological service to military aviation for the safety of Kenya Air Force aircrafts for national defence.
- (vi) The provision of meteorological and climatological advice to the private sector including industry, commerce and public utilities.
- (vii) The provision of meteorological and climatological advice for the improvement and preservation of national environment for a better human life.
- (viii) The organization and administration of surface and upper air meteorological observations within its area of responsibility and the publication of climatological data.

- (ix) The maintenance of an efficient telecommunication system for rapid collection and dissemination of meteorological information required for national and international use in accordance with World Meteorological Organization and ICAO procedures.
- (x) Research in meteorology and climatology including co-operation with other authorities in all aspects of applied meteorological research.
- (xi) The maintenance of National Meteorological Library.
- (xii) Evolving suitable training programmes in all fields of meteorology relevant to national development.

The Meteorological Department also takes a leading part in International co-operation in meteorology. The Director is the Permanent Representative of Kenya to the World Meteorological Organization and acts in concert with the other Directors of the Meteorological Services in the general development of meteorology in Africa. He is also an elected member of the Executive Committee of the World Meteorological Organization.

#### ***1.4 Principal Officers of the Meteorological Department***

<b>Director</b>	J.K. Murithi B.Sc. (London) Dip. Met. (Nairo bi)
<b>Deputy Director</b>	A.L. Alusa B.Sc. (Oregon State) M.Sc. (State Univ. N.Y)
<b>Principal Met. Officer (Office of the Director)</b>	L. Kariungi
<b><i>International Relations Section</i></b>	
<b>Principal Meteorologist</b>	G. Mwe besa (Mrs.) B.Sc. (Nairo bi)
<b><i>Operational Services Division</i></b>	
<b>Assistant Director</b>	E.A.A. Mukolwe B.Sc. Dip. Met. (Nairo bi)
<b><i>Regional Meteorological Centre</i></b>	
<b>Principal Meteorologist</b>	K.N. Mutaku B.Sc. (Dar-es-Salaam), Dip. Met. (Nairo bi)
<b><i>Aeronautical Section</i></b>	
<b>Principal Met. Officer</b>	E.G. Njoroge

*Senior Meteorological Officer (in charge of Forecast Offices)*

Jomo Kenyatta International Airport A.C. Warratho

Mombasa International Airport S. Magalasia

KAF Eastleigh Airport L.K. Njoroge

KAF Nanyuki Airport S. Wanderi

Port Met. Office, Kilindini S. Ochieng (Acting)

*Engineering Section*

Principal Engineering Technician P.S. Mwasi

*Communications Section*

Senior Communications Officer J.M. Oluoch

*General Services Division*

Assistant Director S.J.M. Njoroge B.Sc.  
Dip. Met. (Nairobi)

*Climatology Section*

Meteorologist R.S. Masika B.Sc.  
Dip. Met. (Nairobi)

*Observatories Section*

Principal Meteorologist J.H. Kinuthia B.Sc. (Nairobi)

*Agrometeorology Section*

Senior Meteorologist S.B. Oteng'i B.Sc. (Nairobi)

*Instruments Section*

Senior Instruments Officer G.M. Muchemi

*Printing Section*

Press Superintendent W. Ogada

*Institute for Meteorological Training and Research (IMTR)*

Assistant Director J.K. Njithia B.Sc., M.Sc.  
Dip. Met. (Nairobi)

*Training Section*

Principal Meteorologist L. Njau B.Sc. (Nairobi)

*Research Section*

Principal Meteorologist R.E. Okoola B.Sc. (Reading)

*National Meteorological Library*

Librarian V. Saropa

*Administrative, Finance and Supply Division*

*Administrative Section*

Senior Executive Officer M. Owino

*Accounts Section*

Senior Accountant J.E. Kamau

***Supplies Section***

**Senior Supplies Officer**

**J.O. Nasibi**

***Planning Development Section***

**Planning Officer**

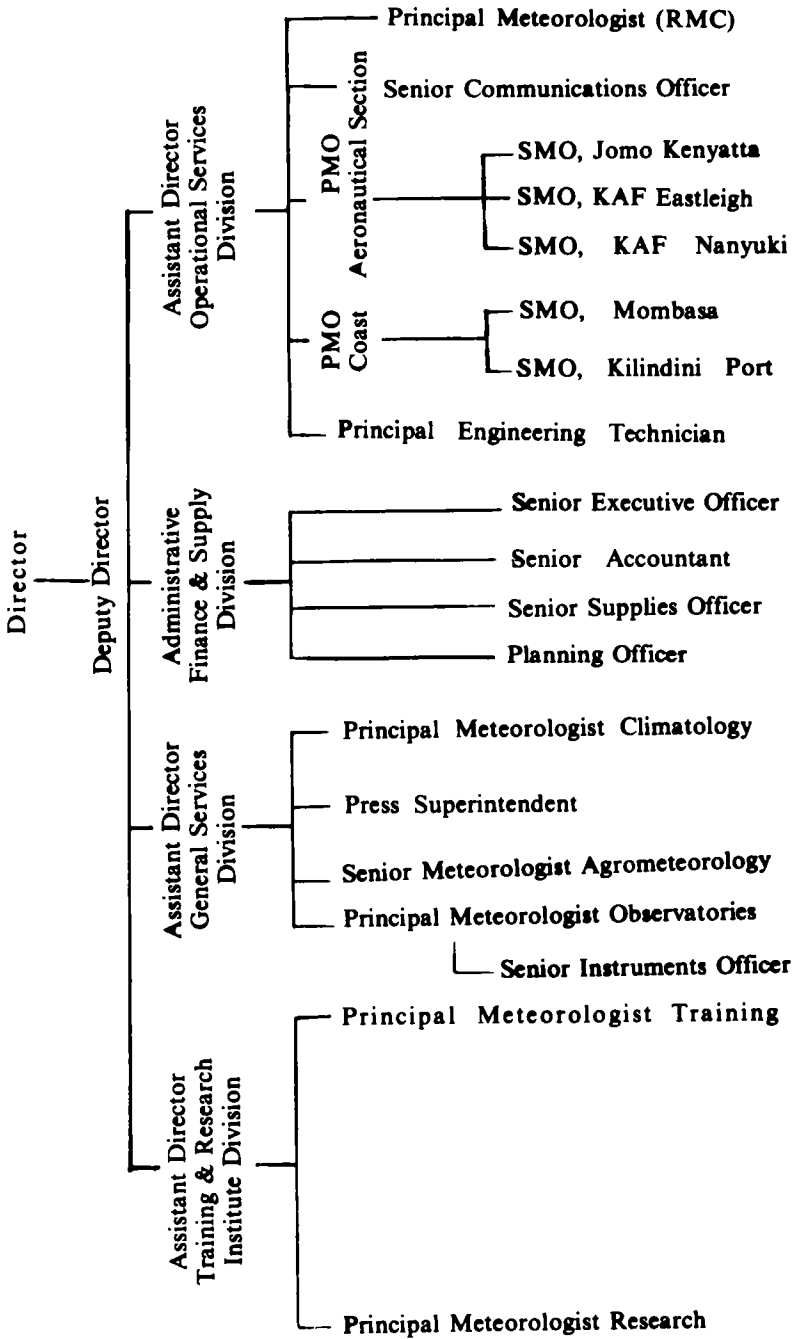
**J. Agin**

***Transport Section***

**Transport Officer**

**J.C. Ndungu**

# 1.5 ORGANIZATION OF THE METEOROLOGICAL DEPARTMENT



## **2. Technical Co-operation and International Affairs**

The Department continued to participate in International Meteorological Affairs and several officers represented Kenya in various meetings abroad. Bilateral arrangements continued to be negotiated and some were implemented during the period. The following are various international activities the Department has participated in.

### ***2.1 Overseas Training***

Under the WMO Voluntary Co-operation Programme, (VCP) the following officers received special training:- S. Magalasia on meteorological Radar in West Indies, R.E. Okoola, on the use of Monsoon data and Mr. S.H. Mwandoto, M.Sc. Agrometeorology — both in U.K., and L.N. Njau Training Seminar in Italy.

Throughout the period several Engineering Technicians attended various training courses in France on Equipment provided to the Department under the French Credit. Mr. J. Waioto attended a Software course on a telecommunication computer which is also being provided under the French Credit. For more Training Activities, see 4.6. and 5.

### ***2.2 Institute for Meteorological Training & Research (IMTR)***

The IMTR became an approved regional project of the UNDP, and the first Inter-Governmental Council meeting was convened in Nairobi from 11th to 13th November, 1980. Participating countries in the project are Botswana, Ethiopia, Kenya, Malawi, Seychelles, Zambia, Somalia, Sudan and Lesotho and the first six were represented at the 1st Inter-Governmental Council meeting. For more activities of IMTR, see 5.

### ***2.3 Equipment***

Throughout the year, equipment provided under the French Credit continued to arrive and installation work continued at various stages. The Department received equipment through the WMO, VCP Programme from the United Kingdom and France. The APT/WEFAX equipment from West Germany is expected to arrive in due course. A specialized course on the WF3 windfinding radar was hosted by the Department and conducted by two British Instructors in October/November, 1980. Five students from Mauritius, Zambia Tanzania and Kenya attended the course which they passed.

### ***2.4 Conferences and Meetings***

In December 1980, Messrs E.A.A. Mukolwe and J. Waioto

attended the Extra-Ordinary Session of the Commission for Basic Systems in Geneva. In February 1981, the Department was host to the WMO Technical Conference on Management of Meteorological Services of RAI (Africa). The conference was attended by the Secretary-General of WMO Prof. A.C. Wiin-Nielsen and his Deputy Dr. R. Schneider and Directors/Senior officials of Meteorological Services in Regional Association I, (RA I) Africa. The Director was elected Chairman of the Conference.

Mr. A.L. Alusa, the Deputy Director attended the meeting of the WMO Executive Committee Panel/Commission of Atmospheric Sciences Working Group on Cloud Physics Weather Modification. Mr. E.G. Njoroge represented the World Meteorological Organization at a UNESCO/ECA Workshop on Marine Science and Technology in Africa, held in Addis Ababa, Ethiopia in June. Mr. Murithi, the Director together with Mr. E.A. Mukolwe and Mrs. G.W. Mwebesa attended the 32nd Session of the Executive Committee of the WMO.

### ***2.5 Important Visitors to the Department***

**2.5.1** On 20th August, the Department was honoured by the visit of Hon. N.N. Njuno, an Assistant Minister, Ministry of Transport and Communications.

**2.5.2** The Deputy-General Manager of Sofreavia and some of his officers visited the Department several times in connection with the implementation of the French Credit.

**2.5.3** On 27th February, the Department was visited by delegates to the WMO Technical Conference on the Management of Meteorological Services of RA I (Africa). The visitors included Dr. R. Schneider, the Deputy Secretary-General of WMO.

**2.5.4** Mr. Rudolf Engleman and Mr. Cheng Wan-Li of UNEP visited the Department on different days, the latter was accompanied by Mr. Wang Shau Wu of Peking University.

There were many more important visitors to the Department during the year.

## **3. Operational Services Division**

### ***3.1 General***

The Operations Division had both successes and failures, with

success outweighing the failures. The failures that occurred were mainly beyond the control of the Department. Notable among these was the grinding to a halt of some of our equipment due to lack of spare parts. Some of the transmitters had to be given up completely. We received a number of complaints from the National Meteorological Centres (NMC's) relying on our RTH when the transmission frequency 17365 KHZ eventually went off the air due to failure of the transmitter because of lack of spare parts. During the co-ordination meetings by Heads of Sections within the Division, it was suggested that a stock of spare parts be bought to last a period of at least two years, and this be replenished after every six months.

While the Department has continued to recruit staff of different categories, the Division continued to be plagued by shortage of staff especially in Meteorological Assistants, Meteorological Officers, Technicians and Engineers cadres. The shortage of Technicians and Engineers was especially felt in case of breakdown in equipment when they could not be put back to operational order in good time. A number of new installations were also delayed by this shortage. The non availability of data especially in areas under the responsibility of Cairo, Kano and Brazzaville was another serious problem. While this adversely affected the quality of our output it also affected the quality of the products of the National Meteorological Centres relying on us.

With the concerted efforts of the Heads of sections in the Division through consultative and co-ordination meetings, a number of installations and projects were completed. Among these were the partitioning of the RTH in preparation for the installation of message switching system; the NARDEUX transmitters and receivers SAGEM type of teleprinters and the APT/WEFAX satellite picture receiving equipment.

Monthly weather summaries, including expected advisory weather for the following month, were initiated. These are now being incorporated in the various services that we serve. Press releases in relation to the short and the long rains were also issued. A number of educational talks were organised both on radio and television. Discussions, aimed at introducing weather presentation on television



by our Meteorologists were held between the Department and officers from the Voice of Kenya. It is hoped that the weather presentation on television by our Meteorologists will begin soon.

### ***3.2 Weather Reports and Forecasts***

Most of North, Central and West Africa (areas covered by Cairo, Brazzaville and Kano) had little data so that the forecasts based on systems over those areas were neither reliable nor could they be verified. However, with the installation of APT/WEFAX equipment in NMC the photographs from polar orbiting satellites were used to supplement the data over these areas. The use of photographs greatly improved the quality of our forecasts and plans are under way to relay these photographs to five other stations. With the installation of new 'Sagem' teleprinters, there was some improvement in data coverage but the coverage by Cairo, Kano and Brazzaville remained poor. The network of stations on the surface chart form was revised and it is hoped that the next batch of these forms will be on the revised version. Revision of the upper air level chart network is also under way.

### ***3.3 National Meteorological Centre (NMC)***

#### ***Area Forecast Centre (AFC)***

Following discussions with the ICAO Regional Meteorologist Mr. Tom Fox, a few weaknesses in our significant weather and prognostic charts were exposed. It was therefore agreed that these charts would in future be discussed during the conferences together with other forecasts. This has already been implemented. With effect from 1st January, 1982 the WMO will introduce a new synop ship code and the NMC personnel who will be involved in it were trained. Two real time monitoring exercises were conducted with the collaboration of the RTH. With the recommendation of the Area Forecast Panel (AFP) new prognostic and significant weather charts were tested with a view to introducing them for Civil Aviation purposes.

### ***3.4 Meteorological Service to Civil Aviation***

Installation of meteorological radar at Moi Airport (Mombasa) was completed and the forecasters at the airport were given training on the operations of the radar. A new form 585A (Rev. 12/80) was introduced for flights from Wilson Airport and for

the Area Control Centre. Over the period November/December a number of flights were diverted from Nairobi to Mombasa due to poor weather conditions. Discussions, based on delays observed in transmitting METAR/SPECI to aircraft on terminal manoeuvring area, were held with an IATA delegation. The delegation visited Jomo Kenyatta Airport to see for themselves how such information is manipulated within the meteorological office. Despite the efforts made by the officers at the Airports to collect aircrpts, the number received at NMC/AFC continued to be much below the expected number, determined by the expected number of aircrafts in operation (see Appendix Table A ii)

With the installation of the DCA telecommunications computer, there was a lot of improvement in AFTN traffic.

Towards the end of the period, a near-equatorial easterly jetstream was observed at 200 mb level and this was reported on the prognostic charts. Meteorological service was given to flights carrying heads of state to the 18th OAU Summit.

The forecasters manning the airports were given local familiarisation flights by courtesy of Kenya Airways so that they may appreciate the importance of the responsibilities they were charged with.

On 7th July, 1980 there was an accident involving a cessna 182 5Y- KQN in which two people aboard died. The accident occurred at Limuru as the aircraft was flying in low cloud.

**Following Is A Summary On Weather Forecasts And Services To Civil Aviation  
Issued From JKIA And Moi Airports Respectively**

**Forecast Returns From JKIA**

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
Forecast folders - Ex JKIA	1108	1087	1043	1066	975	1008	1024	015	1027	940	1018	953
Forecast folders - Ex Wilson	229	203	141	194	224	191	179	189	234	265	272	225
Routine Rofors and Proros	90	85	90	120	98	99	100	90	88	78	32	117
Miscellaneous Proros and Rofors	78	72	66	93	120	124	124	112	138	115	110	127
Trend type landing forecasts	1495	1511	1461	1506	1508	1523	1516	1351	1537	1542	1568	1516
Tafs - JKIA	372	372	360	372	360	372	372	336	372	360	372	360
Tafs - Kisumu	124	124	120	124	60	62	62	56	62	60	62	60
Miscellaneous Enquiries	2	3	3	1	0	4	2	0	2	0	2	3

**Aireps Received From JKIA**

JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
158	153	145	133	153	151	145	146	159	155	141	133

**Forecast Returns From Mombasa**

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
Documentation folders	82	73	81	88	168	193	285	234	210	203	139	163
TAFS (Mombasa)	372	372	360	372	360	372	372	336	372	360	372	360
TAFS (Malindi)	62	62	60	62	60	62	62	56	62	60	62	60

### ***3.5 Meteorological Service to Military Aviation***

In addition to the weather summaries referred to in 3.7 below, the military services were also issued with a supplement to cover the expected weather situation for the following month for areas surrounding the country. This supplement included the expected situation over the ocean and the upper wind flow patterns over these areas. A discussion on information availability from the Department was held with two officers from the armed forces. These officers expressed the need for some of their people to be trained in meteorology especially in the basic courses.

A Post Office line was introduced as a back-up for facsimile radio reception at KAF Nanyuki. Plans are under way to install satellite picture receiving equipment at both Eastleigh and Nanyuki. Summary of the returns of the services rendered are given below:-

**FORECAST RETURNS FROM KAF EASTLEIGH**

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
Ex-Eastleigh	60	51	49	60	48	40	79	54	69	66	93	63
Local area forecasts	50	44	49	54	44	41	47	48	49	48	47	55
N.E. region forecasts	46	40	44	44	40	40	43	41	44	42	41	42
TAF (Eastleigh)	47	41	45	47	43	40	43	41	46	47	43	48
METAR/SPECI	353	359	344	365	322	307	362	336	340	332	360	382

**FORECASTS RETURNS FROM KAF NANYUKI**

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
Local area forecast	25	17	18	21	64	44	22	20	22	20	20	23
Route forecast-Ex-Nanyuki	0	15	15	1	3	9	11	1	7	6	4	2
TAFS (Nanyuki)	39	36	39	40	39	41	37	38	43	39	40	45
METAR/SPECI	286	286	270	259	268	242	314	252	403	268	279	276

### ***3.6 Meteorological Service to Shipping in West Indian Ocean***

The scarcity of data in this region affected the quality of our service significantly because very few ship observations were being reported. With the help of reports received from Re-Union and Tananarive and by employing satellite photographs received over the ocean areas a total of seven tropical cyclone warnings were issued south of five degrees south, between December 1980 and March 1981. Towards the end of the period, gale warnings were issued covering areas North of the Equator.

Two meetings were held between the Department and officers of Kenya External Telecommunications Co. Ltd., (Coast) in regard to delays observed in transmitting ship observations to the MTC. The captains of many ships, that were visited, expressed satisfaction with the transmission of shipping weather broadcasts. The monthly summary of ship observations that were transmitted to MTC are given below:-

**SHIPS OBSERVATIONS RECEIVED AND TRANSMITTED**

	<b>JULY</b>	<b>AUG.</b>	<b>SEPT.</b>	<b>OCT.</b>	<b>NOV.</b>	<b>DEC.</b>	<b>JAN.</b>	<b>FEB.</b>	<b>MAR.</b>	<b>APR.</b>	<b>MAY</b>	<b>JUNE</b>
<b>Ships observations</b>	311	229	348	260	291	186	243	159	220	210	208	216

### **3.7 Meteorological Service to General Public**

Issuing of monthly weather bulletins was initiated. These bulletins contain a survey of weather during the current month and a projection of advisory expected weather for the following month. The Kenya Farmer Magazine has been including the bulletin in their monthly issue. Two press releases, one on the short rains and another on the long rains, were issued.

During both Nairobi and Mombasa Shows efforts were made to explain to the public what is available for them in the Department. The same efforts were made during the celebrations of the World Meteorological Day, by organised talks both on Television and Radio. Discussions were held between VOK officials and SMO (Moi Airport) with a view to making a television documentary featuring activities of the Department.

### **3.8 Meteorological Telecommunications Centre (MTC)**

The partitioning of MTC in preparation for the installation of an automatic message switching system (MSS) was completed. This reduced the working space to less than a third of the former working room resulting in a lot of congestion. A Duplex fifty (50) baud satellite point-to-point circuit was established with Lusaka. Within its first year of operation, a number of difficulties were experienced with the Lusaka circuit.

The Kenya Posts and Telecommunications replaced the Telex teleprinters with the OKI type. They also provided three stand-by lines; KPW 7059, KPW 7076 and KPW 7079 to act as local ends between MTC and their carrier room, to be operated when there is outage between MTC and Jomo Kenyatta Airport. Negotiations are going on for the provision of similar facilities in other communications centres. There was great improvement in data reception when siemen's teleprinters were replaced with the new SAGEM type. Data reception from Offenbach and Pretoria was good while that from Kano and Cairo remained far below average. MTC carried out a test with NMC Mogadiscio but the data was irregularly received. MTC participated in the internationally co-ordinated monitoring of Global Telecommunications System (GTS) and also carried out a real-time monitoring of data for centres under its responsibility.



### **3.9 Engineering**

#### **3.9.1 General**

During the 1980 Annual Departmental Conference, it was resolved that the teleprinter maintenance sub-section of Engineering be abolished. This was done and the staff affected absorbed in other units. The operation of the section continued to be hampered by lack of spare parts and shortage of staff. During the period French coordinators visited the section to monitor progress of HF, computer and stand-by generator installations that are to be made. A survey was also made by a French telecommunications company, THOMSON CSF, on availability of facilities necessary for installation of UHF link between the Headquarters and Jomo Kenyatta Airport. Cable trenches in the compound remained uncovered.

#### **3.9.2 Base Workshop**

A French APT/WEFAX equipment was installed in NMC. WF3 radar became faulty for a long time due to an unserviceable SCR. During the period the radio theodolite had to be used to obtain wind data. Due to shortage of staff the radio theodolite for Garissa was installed late. An operational training course on the installed radio theodolite was also held for Garissa staff. HF communications equipment was changed to the continuous tuning type NARDEUX receivers and transmitters. These were connected to the stand-by No-Break power supply. Three (3) omni-directional antennae were installed. New types of radio telephones, the RACAL and THOMSON were tested and these are now ready for installation in other stations according to the plan of the internal telecommunications network. A number of equipment could not be calibrated because of lack of appropriate test gear.

#### **3.9.3 Transmitting Station**

Obsolete STC QT3 transmitters were dismantled. During this period a fire gutted the aerial field and most of the aerials were damaged. Civil work was in progress in preparation for installation of seven (7) new transmitters. New feeders for all aerials, including the newly installed ones, were laid down and terminated to the new aerial switching matrix which was installed by French Engineers/Contractors. The remote control system for Marconi transmitters

were dismantled and a modification of wiring etc at MDF/Drive room made. Two aerials (H.L.P.A.), one for Madagascar and the other for Seychelles are under installation.

### **3.9.4 Switching Centre**

The section was undergoing modification in preparation for the installation of the telecommunications computer. Due to lack of spare parts our T15D's - typing perforators were unserviceable and we had to hire a similar type from Kenya External Telecommunications Co. A Post Office line was introduced as a back up for radio facsimile reception at KAF Nanyuki. Three (3) TR4 model of chart transmitters from United Kingdom were introduced in place of the old model type K150. Facsimile lines to Jomo Kenyatta Airport, Eastleigh and Nanyuki developed faults which were rectified

Incoming and out-going Pretoria, Re-Union, Mombasa and AFTN circuits also developed faults which were rectified. The incoming point-to-point Lusaka circuit developed a fault at the Lusaka end, but it later became operational. Offenbach lower channel at one stage became non-operational because of a fault in a modem card. The card was taken back to Offenbach for servicing and the channel was restored to normal.

### **3.10 Transport**

Towards the end of the report period diesel and later petrol were not readily available, so that a number of safaris had to be delayed or cancelled. A total of about a hundred safaris were made during the year. Although the mechanics at the Department are capable of repairing minor faults, it was not at times possible since we do not have a maintenance pit from which they could work.

**3.10.1** The Kenya Airforce withdrew transport for the non-uniformed personnel at KAF Eastleigh. A vehicle for ferrying shift staff to and from their place of work, was therefore attached to meteorological office, Eastleigh.

**3.10.2** Early in the report period GK 485S Peugeot 504 GL was involved in an accident and its body was extensively damaged. An officer was seriously injured.

3.10.3 Two vehicles were boarded.

3.10.4 Six vehicles had their engines/gear boxes overhauled.

3.10.5 Three new Landrovers and two new Leyland fourty six seater buses were purchased during the period.

#### **4. General Services Division**

##### **4.1 General**

The General Services Division continued to liaise with the relevant Government Ministries/Departments on professional matters. The Division led by the Assistant Director (ADG) participated actively in the preparations for the international conference on Renewable Sources of Energy. The ADG together with other Meteorologists from the Division held detailed discussions with the officers from the Ministry of Works and the Chinese experts on the proposed National Sports Complex and supplied them with the necessary climatological information.

It is intended to have a computer for the Data Processing Section. Initial steps have been taken to modernize the section.

The Printing Section acquired new machines, and to accommodate them within the available space, new sitting arrangements have been proposed for the microfilming section. It is intended to have this unit under one roof in one wing of the present Radio Sonde building.

The Agromet Section recorded Radio programmes for use by Kenya Farmers Association.

##### **4.2 Weather in Kenya during the year.**

###### **General**

More than two-thirds of the country received rainfall above normal during the long-rains in April and May. The temperatures were mainly normal to above normal during the period. The month by month weather in each province is described in the following sections. The map shows the areas which recorded total rainfall above and below their expected rainfall during the period July 1980 - June 1981.

###### **4.2.1 Nyanza Province**

The Province received quite substantial amount of rainfall during the period although the total rainfall for the period was below

normal. During the months of July, August, March and April the rainfall was above normal in most areas except Kisii and Kisumu which recorded temperatures above normal during the months of July, November, April, May and June.

#### ***4.2.2 North Eastern Province***

Most of the areas except Garissa received annual rainfall above average. The rainfall was above normal during the months of August, March and April and the relatively dry months were December, January, February and June. The temperatures were above average during the months of July - February while the relative humidity was normal to above normal during the months of March-May. The area had an average of 7 hours of sunshine.

#### ***4.2.3 Rift Valley Province***

The Central districts received above average rainfall during the months of November, March, April and May. The annual rainfall total was below long-term average except for the areas around Kericho and Kitale which got above average annual rainfall. The area in Northern Rift Valley and around Lodwar was dry with nil rainfall during the months of July, August, September, October, December, January, February and June; and the annual rainfall was far much below normal. The relative humidity was generally normal to above normal during the months of March, April and May and temperatures above normal throughout the period. Central Rift Valley had an average of 6-7 hours of sunshine as compared to Lodwar with an average of 9-10 hours of sunshine.

#### ***4.2.4 Western Province***

The area was relatively wet throughout the period even though the total rainfall for the period was below normal. Areas around Kakamega got normal to above normal rainfall during the months of November, March and April. The air temperature was normal to above normal and ranged from 18°C. to 21°C. Most of days had an average of more than 5 hours of Sunshine throughout the period and the relative humidity was below normal except during the months of July, March, April and June when it was normal to above normal.

#### **4.2.5 Nairobi and Central Province**

Jomo Kenyatta Airport and the adjacent areas received below average annual rainfall whilst all other areas received above normal annual rainfall. The temperatures were normal to above normal except during the months of November and April when it was below average. Relative humidity was above 60% and above normal during the months of November, March, April, May and June. The months of July and August had few hours of sunshine, on the average about 3-6 hours a day.

#### **4.2.6 Eastern Province**

The total rainfall received during the period and monthly rainfall for August, March, April and May was above normal. The afternoon Air-mass was relatively dry in Southeastern districts during the months of July to March while in northern and central districts in the Province i.e. Moyale, Marsabit, Meru and Embu the afternoon air-mass was dry during the months of September, October, January and February. The temperatures were normal to above normal during the period:

#### **4.2.7 Coast Province**

The total rainfall for the period was above normal in the Province except for the areas around Mombasa and Lamu which received below normal annual rainfall. The air-mass was humid for most of the period and the relative humidity was above normal during the months of December to May while air temperatures were above average during the months of October to February.

### **4.3 Agrometeorology and Agromet Observations**

#### **4.3.1 General**

- (a) During 1980/81 financial year very little was achieved by the way of implementing projects approved for the year.
- (b) At the beginning of the year, staff situation grew worse as several of the Meteorological Assistants at both Headquarters and outstations resigned. However, the situation improved later as they were replaced. 3 Agrometeorologists were posted to the section with Mr. Oteng'i to head the section.

- (c) The section participated actively in both Mombasa and Nairobi Shows.
- (d) Agrometeorological information and data continued to be issued on an ad hoc basis.
- (e) The section continued attending the 'Food Forecast Working Group' meetings at the Central Bureau of Statistics (CBS).

#### **4.3.2 Station/Network**

- (a) In general, most stations executed their duties reasonably well apart from those stations where shortage of staff was experienced. Many Instruments were serviceable but the soil moisture equipments i.e. ovens and balances broke down more frequently than any other year.
- (b) **EXPANSION** No new stations were established or upgraded during the period under review. So, the network of stations stood at:
  - (i) 4-AGRO/SYNOPTIC STATIONS i.e. NYERI, EMBU, MERU, and KITALE.
  - (ii) 7-GRADE - 'A' - AGROMET STATIONS i.e. KABETE, KATUMANI, THIKA, MTWAPA, KISII, NYAHURURU and KAKAMEGA.
  - (iii) 2-GRADE-'B'-AGROMET STATIONS i.e. NJORO and MSABAHA.

#### **4.3.3 Routine Publications**

The issuing of the 'Farming Weather' publication continued at a steady pace despite a few month's of delayed publications due to lack of printing stationery. The 'Weekly Weather Review' was dropped as was agreed during the 1st Divisional Conference. In its place, a 'Ten days Weather and Crop Bulletin' was launched in April 1981.

The distribution list for the two publications went beyond the 300 mark by the end of the year.

#### **4.3.4 Research/Investigations**

Very little of group research work was carried out during the financial year. This was due to lack of adequate qualified personnel.

### **4.3.5 Other Activities**

- (a) The stations were inspected at least twice during the financial year.
- (b) Mr. Cheluget's farm at Mau Forest was surveyed on the possibility of opening a station but it was found not to be ideal.
- (c) Ol-joro-Orok Agricultural Research Station was surveyed as an alternative site to transfer the Nyahururu Agromet Station since we had problems in housing our staff in the latter station.
- (d) 2-Leaf wetness recorders were installed at Kabete and Kakamega.

### **4.4 Hydrometeorology**

The section continued its co-operation with the Water Department and the Hydromet Survey Project of Lake Victoria. Mr. Otieno, a Meteorological Superintendent stationed at Kisumu continued to supervise and co-ordinate the Hydrometeorological work there. The Department was represented at two meetings of the Kenya standing (Technical) Research Committee for IPH.

### **4.5 Climatology and Data Processing**

#### **4.5.1 Climatology**

##### **4.5.1.1 General**

The principal activities of the Climatological Section continued to be the collection, processing and archiving of all meteorological data from all agrometeorological, temperature, synoptic and rainfall observing stations, all of which, except temperature and rainfall observing stations are manned by the Department staff. Before processing, all meteorological data received were checked and corrections made for any mistakes. They were then processed and taken to machine room where they were stored on magnetic tapes. The charts, surface to 200 mb, and observation and metar Registers were photographed and stored in microfilms.

**4.5.1.2** The processing and archiving of the meteorological data have been completed as follows:-

All the meteorological data in observation Registers for all synoptic stations up to and including April, 1981.

All the meteorological data for Agromet and Hydrological stations and Radio Sonde for Nairobi and Garissa for 1980 have been completed.

All charts for up to April 1981 and Observation and Metar Registers for 1980 have been completed.

4.5.1.3 The processing of the pitot balloon observations which had been stopped for stations that had attained ten years of record was revived and all the unprocessed data had to be updated. To this end all pilot balloon observations for all stations for January to April 1981 have been processed.

4.5.1.4 The section continued receiving customers who needed climatological information and data. More than 600 enquirers were received and served. Student groups from various schools also visited the section.

#### **4.5.2 Data Processing**

4.5.2.1 During the year under review the biggest task for this section was the conversion of computer magnetic tapes from 7-track to 9-track recording mode to conform with the host computer hardware requirements. Although this task was completed at one stage, we still generate 7-track tapes on our Key Edit System which have to be converted before use.

4.5.2.2 There was a marked increase in the number of people and organisations both from the public and private sectors who now see the need for climatological data. This number was 106 during the period July 1980 through June 1981 compared to 82 for the period 1979/80. This number precludes requests for smaller volumes of data which would normally be referred to the climatological section.

4.5.2.3 The routine services offered to researchers was carried out with particular reference to our sister Department at the University of Nairobi. The Ministries of Agriculture, Water Development and Energy continued to be our most frequent public sector consumers.

4.5.2.4 By the end of October, 1980, all the data for 1979 was put into magnetic tapes verified and validated ready for use. By the end of



February, 1981 the following data had been put into tape:-

- Precipitation data for up to April 1980.
- Synoptic data for the whole of 1980.

By the end of the reporting period all the data for 1980 received by this section had been transferred onto magnetic tape. Most of the tapes have been validated and converted to 9-track ready for use. In June 1981, Mr. E. Nyoni in close liaison with this section produced a small pamphlet under the heading 'Notes on Archived Meteorological Data in the Kenya Meteorological Department'. This document will be very useful to our potential data users and should serve as a guide to research students at the University as to what data is available and in which format or media it is stored.

#### ***4.6 Training Activities***

The Division continued to co-ordinate training activities for the Department. Apart from the training report under 5, more training took place at various institutions in the country and overseas.

4.6.1: 2 Engineering Technicians and 1 Instrument Assistant were trained at the Kenya Polytechnic, Nairobi.

4.6.2: 5 undergraduates were continuing with a B.Sc. Meteorology Programme at the University of Nairobi.

4.6.3: 2 Meteorologists were continuing with M.Sc. Meteorology on part-time basis.

4.6.4: 3 Instrument Assistants completed their training at the Kenya Polytechnic, Nairobi in December, 1980.

4.6.5: 5 Communication Assistants completed their training at the Civil Aviation School, Wilson Airport in December, 1980.

4.6.6 Mr. J. Nyamulu left for Australia to pursue a Diploma in Library studies at the Royal Melbourne Institute of Technology.

4.6.7 Mr. F.M. Ngindi attended a Crown Agents Course on Supplies Management Procedures and Trainers in the United Kingdom.

4.6.8 Three Clerical Officers from the stores attended a six month Course at Government Training Institute, Maseno.

## **4.7 Observatory**

### **4.7.1 General**

The Principal Meteorologist in charge of Observatories attended a six month French course at KIA. After the completion of the course he participated in the service of the Organisation of African Unity meeting.

The negotiations for meteorological sites in all the stations were completed and the letters of allotment issued by the Commissioner of Lands. The letter of allotment for the Nakuru site has not yet been received.

There were breakdowns of instruments reported from nearly all the stations but these were attended to, promptly.

An Observatory was opened in Kabarak High School while the enclosure for Moyale station was moved to a new site.

### **4.7.2 Synoptic Stations**

During the period under review many outstations maintained good standard of work.

Jomo Kenyatta Airport, Moi Airport, Kisumu, Malindi and Kitale continued to function for 24 hours. The rest of the stations continued to perform for 18 hours. Meru, Embu and Nyeri continued to do synoptic and Agromet observations.

### **4.7.3 Upper Air Observations**

The pilot balloon and Radio Sonde stations maintained good standard of performance. Summary of pilot balloon ascents made during the year are shown below:-

**ASCENTS MADE BETWEEN 1-7-80 TO 30-6-81**

<b>Station</b>	<b>No. Possible</b>	<b>No. Made</b>	<b>Percentage Made</b>	<b>1500 Ft. Above Percentage</b>	<b>Highest in Feet</b>	<b>Date</b>	<b>Remarks</b>
1. Makindu	730	627	86	130	53,280	27-2-81	
2. Voi	730	604	83	98	54,890	20-11-80	
3. Nakuru	730	578	79	446	81,141	5-10-80	
4. Kisumu	730	530	73	386	43,769	14-9-80	
5. Narok	730	525	72	309	55,200	21-10-80	
6. Lodwar	730	524	72	315	74,190	10-4-81	
7. Mombasa	730	517	71	88	55,202	13-3-81	
8. Kitale	730	494	68	314	55,200	22-1-81	
9. Marsabit	730	454	62	288	55,913	23-2-81	
10. Eldoret	730	445	61	327	49,999	28-1-80 and 1-3-81	
11. Meru	730	362	50	211	52,600	19-7-80	
12. Mandera	730	325	45	65	55,755	15-12-80	
13. Malindi	730	324	44	75	53,070	21-1-81	
14. Nyeri	730	309	42	126	41,177	8-3-81	
15. Embu	730	262	36	106	46,900	5-3-81	
16. Garissa	730	233	32	45	45,482	19-9-80	
17. Wajir	730	193	26	34	41,000	6-10-80	
18. Moyale	730	151	21	58	43,100	26-9-80	

## **5. Institute for Meteorological Training & Research, Nairobi**

### **5.1 Administrative and Support Services**

#### **5.1.1 Staff Matters**

5.1.1.1 Twenty one officers joined the Institute during the period covered by the report.

5.1.1.2 Twelve officers left the Institute during the period covered by the report.

#### **5.1.2 Student Accommodation**

5.1.2.1 The majority of our students were accommodated at the Institute Hostel while a few made arrangements for their accommodation elsewhere. We offered accommodation to a few non-departmental students from East African School of Aviation, Strathmore College and Kenya Polytechnic.

5.1.2.2 At the very end of the reporting period we admitted 88 students for basic course - No. 44. These, together with 15 students (Departmental) enrolled for telecommunications assistants course at the East African School of Aviation, expected to be accommodated at the East African School of Aviation, expected to be accommodated at the Institute Hostel but there was no space for all of them.

5.1.2.3 Towards the end of the reporting period, a long standing problem of supervision of cooks outside office hours was solved by putting Mrs. J.N. Okora, Miss I.N. Munene and Miss M.N. Njoroge on supervisory shift duties.

#### **5.1.3 Accounts and Stores**

5.1.3.1 The revenue collected during the period under review was as follows:

(i) Hostel charges	KSh.	658,854.00
(ii) Tuition fees	KSh.	152,200.00
(iii) Sale of tea/coffee	KSh.	2,050.00
(iv) Sale of Departmental Publications by Library	KSh.	<u>2,795.00</u>
Total	KSh.	<u>815,899.00</u>

### **5.2.1 Library Services**

**5.2.1.1** During the period under review, the Library continued to offer its services to all its clients especially the students, the academic staff and the professional users outside the Department, with the co-operation of all Library staff.

**5.2.1.2** The Librarian on behalf of the Library Committee compiled for circulation a list of all books that had been donated by the British Council.

**5.2.1.3** Mr. Maina Elias was appointed Librarian II. He will assist the Librarian in day-to-day smooth running of the Library plus cataloguing, classification and indexing and abstracting of all Library collection.

**5.2.1.4** During the Technical Conference on Management of Meteorological Services of RA I (Africa) held at Kenyatta International Conference Centre from 23 - 28 February, 1981, the Library staff participated fully in the sorting and the distribution of various conference documents to the delegates. A sale of selected Departmental Publications was also carried out during the conference period.

**5.2.1.5** The Library acquired through purchase two very important reference tools viz. 'The Encyclopaedia Americana, 30 volumes, 1979 edition' and the 'McGrawHill Encyclopaedia of Science and Technology, 15 volumes, 1977 edition'. These have been very useful addition to the Library's reference collection.

**5.2.1.6** The Library continued to receive numerous requests and orders for certain Departmental Publications which are out of stock and required reprinting. Due to lack of adequate paper and various chemicals it has not been possible for the Printing Section to undertake reprinting. It is, however, hoped that this problem would be solved during the next financial year.

### **5.2.2 Library Statistics**

New publications	1,880
Copies of Departmental Publications distributed and sold	1,410
Books borrowed	1,730
Books bound	173

## **5.2.3 Departmental Publications Issued**

### **5.2.3.1 Periodical Publications**

- Issued Weekly* — Rainfall at selected stations in Kenya
- Issued Monthly* — Farming Weather
- Issued Annually* — Kenya Meteorological Department Annual Report 1978/79
- Summary of Rainfall in Kenya during the year 1973
- The Weather of East Africa during the year 1974

### **5.2.3.2 Occasional Publications**

Notes on archived meteorological data in Kenya Meteorological Department by Elzear Nyoni, 1981.

*Technical Memorandum No. 24*: Monthly distribution of water balance components in Kenya by G.O.P. Obasi and P.M.R. Kiangi.

### **5.2.3.3 Research Papers Published**

- (i) *Research Report No. 5/80*: Climatological aspects of air pollution dispersion in Nairobi by John K. Ng'ang'a July, 1980.
- (ii) *Research Report No. 6/80*: Measurement of diffuse solar radiation at Dagoretti Corner by P.A. Mwingira, September, 1980.
- (iii) *Research Report No. 7/80*: The distribution of actual evaporation/evapotranspiration over East Africa by B.S. Nyenzi, October, 1980.
- (iv) *Research Report No. 8/80*: The interpolation of rainfall in Nairobi area by S. Niewolt, October, 1980.
- (v) *Research Report No. 9/80*: The influence of maize plant density on mean air temperature distribution by Joseph Kagia Njihia.
- (vi) *Research Report No. 1/81*: Use of Weibull distribution in modelling pentad rainfall by S.B.B. Otengi, May 1981.

### **5.3 Training Activities**

**5.3.1** The population of students attending various courses during the period was 291 - 203 Kenyans, 13 Seychellois, 30 Tanzanians, 10 Ethiopians, 8 Botswanas, 7 Zambians, 6 Ugandans, 4 Malawians, 3 Basotho, 1 Gambian and 1 Ghanian. These students were sponsored either by their national Governments or by international organizations. Majority of the students were accommodated at the Institute Hostel while a few made alternative arrangements for their accommodation.

**5.3.2** During the period, a number of courses commenced, others were in progress while a good number also ended. All these professional courses are shown in table 5.3.2. The middle of the period was a busy one for both students and instructors. Some students were preparing for their final examinations while the instructors required extra time in the supervision of simulated on-the-job training and research project activities.

The period was marked by a graduation ceremony of the Operational Training Course No. 10, a highly professional course, held on 27th February, 1981. On this occasion, the Guest of Honour, Dr. R. Shneider, the Deputy Secretary-General of the WMO in Geneva, presented certificates to the successful candidates. Also present was Mr. S. Mbele-Mbong, Regional Director for Africa of the WMO and other dignitaries.

**5.3.3** *The Institute offered services to E.A. School of Aviation in running of the following courses:*

- (i)* Telecommunication Course A17.
- (ii)* Air Traffic Control Officers (ATC 25) - Licence and Aerodrome Rating Course.
- (iii)* Special Approach Course 4 - ATS (Non-Radar).
- (iv)* Air Traffic Control Assistants Course.
- (v)* Telecommunications Course A5.

**5.3.4** The University of Nairobi continued to provide both the undergraduate and postgraduate courses. One Instructor continued an undergraduate B.Sc Course while four Instructors were working on their M.Sc thesis under the supervision of Department of

TABLE 5.3.2 DETAILED SUMMARY OF COURSES HELD WITHIN THE PERIOD COVERED BY THE REPORT

Course and Duration	Kenya	Uganda	Tanzania	Malawi	Zambia	Botswana	Lesotho	Seychelles	Gambia	Ethiopia	Chana	Total	Successful
WMO Class II Course No. MOC. 16 7/1/80 TO 5/12/80	2		8	2	3	4	1	2				22	21
WMO Class II Course No. MOC 17 7/1/80 TO 4/12/81	5		5	1		1		2		8		22	Continuing
WMO Class II Course No. MOC 18 5/1/81 TO 3/12/82			3	1	4	3	1	1		2		15	Continuing
WMO Class III Course No. AOC 2 /1/80 TO 5/9/80	12		7									19	16
WMO Class III Course No. AOC 3 5/1/81 TO 9/10/81	17		4						1			22	Continuing
WMO Class IV Course No. B. 42 19/5/80 TO 12/9/80	30						1	6				*1 37	35
WMO Class IV Course No. B 43 27/1/81 TO 22/5/81	38							2				*2 40	36
WMO Class IV Course No. B. 44 29/6/80 TO 23/10/81	88											88	Continuing
Specialized Course Agromet No. 6A 30/1/80 TO 1/8/80			3									3	3
Refresher Course No. 9 13/10/80 TO 7/11/80	5											5	5
Operational Training Course No. 10 1/10/80 TO 27/2/81	16	6									1	*3 23	19

\*1 One Kenyan left before completing the Course

\*2 Three Kenyans left before completing the Course

\*3 Four Kenyans left before completing the Course



Meteorology, an Institute Component at the University of Nairobi.

5.3.5 Mr. L.N. Njau under the partial assistance of WMO attended the first course on Training Methodology for Instructors in Meteorology organized by the Turin International Centre for Advanced Technical and Vocational Training of the International Labour Organization in Italy between 6th and 31st October, 1980.

5.3.6 On 19th February, 1981, Mr. M.N. Mwebesa travelled to Alliance Girls' High School to give a lecture on 'Weather Observations, Collection of Data and Presentation' to the Senior Geographical Society Members.

Mr. J.K. Njihia attended the second Training of Trainers Seminar held in Kisumu from 2nd to 7th March, 1981. The seminar was attended by a total of 26 participants drawn from various Government Ministries and Institutions. The objective of the seminar was to examine various aspects of manpower training and development, mainly in the public sector.

#### **5.4 Research Activities**

5.4.1 During the period under review, Meteorologists in the Department were engaged in a wide range of research activities. Completed research findings were published as Departmental Publications (see 5.2.3). These publications included contributions from the Department of Meteorology, University of Nairobi.

5.4.2 The following research projects were completed and were awaiting publications by the end of the period.

(i) Chemical Composition of Precipitation in East Africa - by H. Rodhe, E. Mukolwe and R. Soderlund

(ii) The stability of the Monsoon Flow over the Central Arabian Sea during June, 1979 - by R.E. Okoola.

5.4.3 The following research projects were still going on and the progress was good by the end of the period.

(i) Study of the Mean Upper Tropospheric Horizontal Motion Field in the near Equatorial Region by N.D. Pyuzza. Winds for this study have been extracted from 300 mb. charts at 5° latitude/longitude grid points. This project was nearing completion by the end of the period.

- (ii) Study of the Mean Upper Tropospheric Horizontal Motion Field in the near Equatorial Region by D.N. Wambura. He has extracted winds from 200 mb. charts at 2.5° latitude/longitude grid points.
- (iii) Tropospheric Wave Disturbances in East Africa by L.N. Njau.
- (iv) A study of the Water and Energy balance for the maize crop by P. Olunga
- (v) Fluctuations in the Intensity of Monsoon circulation at the Equator and to the South during June to August, 1979 by R.E. Okoola.
- (vi) Solar Power Potential in Kenya by R.E. Okoola. An attempt is being made to map mean annual and monthly radiation and sunshine duration over Kenya.
- (vii) Fog Forecasting at Jomo Kenyatta Airport by J. Wairoto. A statistical model is being evolved to forecast fog at the Airport.

**5.4.4** During this period five seminars were held at the Institute:

- (i) Use of Satellite Information for Operational purposes by J.G. Wairoto of Operations Division, Kenya Meteorological Department, Nairobi.
- (ii) Wave Propagation over and around the Tibetan Plateau during winter by Prof. T. Murakami of University of Hawaii, USA.
- (iii) A newly found jetstream near Marsabit by Prof. G.C. Asnani of Department of Meteorology, University of Nairobi.
- (iv) Radar Rainfall Measurements - Hydrology by S. Magalasia, Operations Division, Moi Airport, Mombasa.
- (v) Computation of Pilot Balloon winds when the angle of elevations are low (4°) and the accuracy of the

computed winds in such cases by J. Shyanguya, General Services Division, Kenya Meteorological Department, Nairobi.

#### **5.4.5 Miscellaneous**

- (i) A report on our research activities in the field of Tropical Meteorology was forwarded to WMO on 6th February, 1981.
- (ii) Mr. R.E. Okoola returned in April, 1981 from the Meteorological Office, UK, where he had been on a seven month Visiting Scientists Programme.

#### **5.5 Mt. Kenya Baseline Station for BAPMoN**

5.5.1 The Mt. Kenya Project Bridging Operation activities ceased after 1st July, 1980 as recommended by the Scientific Advisory Working Group (SAWG) in a meeting held on 27th to 30th June, 1978 at the Kenyatta International Conference Centre. The SAWG meeting recommended a Bridging Operation period of 18 months which expired on 1st July, 1980.

5.5.2 It was felt necessary to continue observations on Mt. Kenya by maintaining an Automatic Weather Station there. The intended minimum observational programme was hindered by frequent mechanical breakdown of the Automatic Weather Station, which was eventually grounded for some major repairs.

5.5.3 A durable type of Automatic Weather Station expected to perform well was tested in the field. This instrument required minor repairs and acquisition of the spares remained a major drawback. The Gardner Counter used in the sampling of Condensation Nuclei (CN) remained unserviceable due to lack of batteries which were not available locally.

5.5.4 The rainfall collection for precipitation chemistry analysis was progressing well at Meru Meteorological Station. All the collected samples were dispatched to Stockholm in Sweden for the analysis and all the analysed samples are available in our research archives.

### **6. Administrative, Planning, Finance and Supply**

#### **6.1 Staff Administration**

6.1.1 Discussions on staff establishment between the Department's

representatives and the Directorate of Personnel Management were held during the period. The exercise resulted in the production of authorized establishment for the Department. All senior posts which had remained vacant for sometime were filled.

6.1.2 Resignation of Meteorological Assistants, Communications Assistants and Engineering Assistants continued to be a major staff problem. These resignations are mainly caused by lack of promotion opportunities. The problem is likely to continue until the Schemes of Service are issued.

## 6.2 Accounts

The Financial Year 1980/81 was closed on 30th June, 1981. The Expenditure incurred during the year was as follows:-

### Recurrent Expenditure

<i>Provision</i>	<i>Expenditure</i> KSh.	<i>Expenditure</i> KSh.	<i>Balance</i> KSh.
Headquarters and outstations	40,576,000	33,550,980	7,025,020
Training	6,954,080	2,380,640	4,573,440
Development	<u>59,900,400</u>	<u>17,201,940</u>	<u>42,698,460</u>
	<u>107,430,480</u>	<u>53,133,560</u>	<u>54,296,920</u>

## 6.3 Planning and Development

### 6.3.1 Staff Changes

Mr. E.G. Njoroge took over the Section with effect from 1st July whilst Mr. J. Agin was posted to Operational Division - Aeronautical Section.

### 6.3.2 Staff Housing at Headquarters

Construction of intermediate blocks of flats continued throughout this period. Originally, six blocks of flats containing thirty six units were to be built. In order to make maximum use of the limited space available, Ministry of Works agreed to add another six blocks so that the project will have a total of seventy two flats. Due to various problems, the project was behind schedule and the estimated cost of the project will be Shs. 13,500,000.00.

### 6.3.3 Extension to Printing Workshops & Offices

This project was changed to a six-storey office block and two

workshops. However, because of financial constraints, the project could not be started during the reporting period.

#### **6.3.4 Junior Flats and Power Plant House at Transmitter Station**

A contract to build eight junior houses and Power Plant House at Transmitter station was awarded in February. The whole project is estimated to cost Shs. 1,199,173.60

#### **6.3.5 Renovated Junior Houses at Headquarters**

The quarters renovated in 1978/79 had major leakages and sub-contractor who renovated the roofs avoided to rectify the situation despite having given a 5-year guarantee for the good performance of his workmanship.

Action was initiated to break the deadlock and an inspection meeting was held on 7th July, 1981 between the main contractor, Sub-contractor, Kohli & Associates, Architects and Ministry of Works.

At the time of writing this report we had been advised to hand over the matter to Attorney-General's Chambers.

#### **6.3.6 Minor Construction at Headquarters**

6.3.6.1 Construction work on access road, gate and watchmen hut was completed in November at a total cost of Shs. 966,530.80. However, when the long rains started in March, the whole area was severely damaged by rains. The area is full of potholes.

The retention fund of Shs. 48,326.55 due to be released in May was withheld as the Department was not satisfied that the work was properly done. At the time of writing the report, the matter had not been resolved.

#### **6.3.6.2 Partitioning of Meteorological Telecommunications Centre**

The partitioning work to accommodate the new computer was started in late December and completed by May.

#### **6.3.6.3 Modification of Power Plant House at Headquarters**

The work was done by SOFREAVIA under the French Loan. The old 50 KVA DORMAN no-break generator was removed and a new 210 KVA ALSTHOM GENSET installed.

At the time of writing this report, the old 50 KVA genset had not been disposed of neither had the new 210 KVA genset been

commissioned.

### **6.3.7 Equipment and Plants**

As mentioned above, the 50 KVA genset was replaced by 210 KVA genset. A new air-conditioner for the computer was in the process of being installed while the old one that was serving MTC was switched off.

PABX gave poor services and tenders for a new one were sent out towards the end of the reporting period. E.A. Power & Lighting installed a new 300 KVA transformer at a cost of Shs. 80,420.00 for the exclusive use of the Department and to accommodate the new equipment under the French Loan.

### **6.3.8 Outstations**

#### **6.3.8.1 Narok**

The construction of the office and houses at Narok at a total cost of Shs. 2,271,352.50 was completed and the quarters handed over to the Department in April. The retention fund is Shs. 102,177.60 and is due for release in October, 1981.

#### **6.3.8.2 Voi, Moyale, Garissa & Lodwar**

Work on offices and houses continued at these stations although at a slow rate due to various problems. The projects are due for completion by the end of 1981.

#### **6.3.8.3 Eldoret**

The contractor, Tumaini Builders abandoned the work in early 1980 and the contract was determined. Another contractor was in the process of starting the work to finish the project during the reporting period.

## **6.4 Supplies**

The Supplies Section at this Headquarters noted some changes both in Personnel and in Supplies Procedures.

### **6.4.1 Supplies Staff**

During the month of October, 1980 the Senior Supplies Officer, Mr. J.O. Nasibi was posted to this Department from Ministry of Basic Education, Kenya School Equipment Scheme.

### **6.4.2 Documentation**

Procedures and documentation in accordance with the Kenya

Government Supplies Manual have been introduced and are working satisfactorily. These documents were recently introduced and re-modifications for simple running of the Department has been integrated without problems.

#### **6.4.3 Stock/Control Section**

The introduction of S.3 cards as stores receipts and issues records as opposed to ledgers was satisfactorily introduced and the procedure of accounting for our receipts and issues was gradually improving.

#### **6.4.4 Procurement Section**

This section has been streamlined with strict Supervision of the staff who make quotations. The duties of Tendering and signing of quotations were personally supervised and countersigned to avoid irregularities. During the year 1980/81, Eleven Open Tenders were advertised, 302 Quotations were invited and four Crown Agents Indents were submitted. Except for items ordered against Crown Agents Indents, all other items on tenders and quotations had been received in stock or put into immediate use. The outstanding Crown Agents Indents were gradually being received.

#### **6.4.5 Warehouses**

As it was reported last year, the Warehouse has now been rearranged with Electrical Items in a separate store and miscellaneous items in the Main Store. The many unserviceable items which were lying in the stores yard were boarded and cleared from both our records and the yard. More of the unserviceable items held at the Institute would be included in the next Board of Survey to recommend the mode of disposal.

#### **6.4.6 Payment of Merchant Bills**

In consultation with Accounts Section, the payments of the Merchants Bills had been streamlined according to agreement between Senior Supplies Officer and Senior Accountant and during the period, there was no delay in settlement of the Bills.

#### **6.5 Security**

Security Section which in the past had been credited with splendid performance in safeguarding Government property suffered

set backs; a number of thefts involving valuable Government property occurred during the period in question. Six experienced security staff were recruited towards the end of the period under review. It is hoped that the additional security staff will minimise the re-occurrence of such incidents.



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