

MINUTES OF MEETING
ON
JOINT COORDINATION COMMITTEE
FOR
PROJECT FOR THE CAPACITY ENHANCEMENT OF METEOROLOGICAL
OBSERVATION, WEATHER FORECASTING AND WARNING
BETWEEN
NATIONAL INSTITUTE OF METEOROLOGY
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Based on the Minutes of Discussions of the Project for the Capacity Enhancement of Meteorological Observation, Weather Forecasting and Warning (hereinafter referred to as "the Project") signed on August 22, 2014, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the JICA Expert Team (hereinafter referred to as "the Team") to Mozambique from February 2015 to implement the Project with National Institute of Meteorology in Mozambique (hereinafter referred to as "INAM").

In the middle of the project period, INAM, JICA and the Team held a Joint Coordination Committee (hereinafter referred to as "JCC") on September 22, 2016 for reporting Progress Report of the Project and for discussing further activities. As a result of the discussions, the Progress Report and the issues mentioned in the attached document were agreed by representatives of related agencies.

Maputo, November 23, 2016.



Mr. Katsuyoshi SEDO
Chief Representative
JICA Mozambique Office



Dr. Cândida Inês Sete
General Director
National Institute of Meteorology
The Republic of Mozambique

THE ATTACHED DOCUMENT

1. Progress Report

The contents of Progress Report for the Project were agreed by INAM as explained by the Team (ANNEX II).

The Progress Report in Portuguese is reported separately with reflecting the discussion of this JCC.

2. PDM Modification

The target of technical transfer for monitoring and forecasting for heavy rain was changed from radar to satellite imagery analysis. In order to adjust PDM for the change of the target, the Team proposed PDM modification (ANNEX II) and INAM and the Team agreed to the modification.

2. Points of Discussion

Important terms which JICA Expert Team presented are as followed:

- (1) Traceability for barometer and thermometer is accomplished from International standard to INAM national standard and to INAM working standards. During the next activities, INAM and the Team extend traceability to instrument in local observatories.

- (2) Trainings for surface observation were implemented for 39 observers at Maputo in August 2016, and manuals for 'Meteorological Measurement', 'Calibration and Maintenance System' and "SYNOP observation" were drafted. INAM and the Team implements trainings at local observatories through the next activities.
- (3) Radar system could not be rehabilitated during the end of this project, therefore, the target of technical transfer for monitoring and forecasting for heavy rain was changed from radar to satellite imagery analysis.
- (4) Data storage for forecasting, weekly forecast verification and monthly report have been implemented. In order to strengthen monitoring ability for heavy rain, the Team is planning to install real-time rain gauge monitoring system in Maputo, Beira and Nampula.
- (5) OJT (On the Job Training) for satellite imagery analysis for forecasters of INAM headquarters is prepared from January to February in 2017.
- (6) The trainings in Japan for 4 forecasters are prepared in November 2016.

Discussion

[Storm surge model]

INAM requested for a training for storm surge model provided from JMA.

The Team replied that JMA expert could not implement the training in Mozambique because of difficulty of flexible expert assignment during the project.

JICA mentioned it's difficult to reply now, after evaluating frequency and damage of storm surge in Mozambique, JICA consider for the request.

[Training for forecast verification]

INAM requests trainings for forecast verification and the mean of verification values.

The Team replied the training was already done for forecasters, and training materials (in Portuguese version) is stored in JICA-PC and shared with INAM. If INAM needs additional trainings, the Team is willing to support.

[PDM modification]

INAM pointed that the number of target observers of output 1.3 is too small. If the target of training means calibration staff, the sentence should be changed appropriately. The team proposed output 1.3 was to be changed to "Training on meteorological instrument calibration is conducted for at least 3 INAM staffs in charge for calibration.", and INAM agreed with the change.

[Training for observers]

INAM pointed that the trainings for observers should be implemented in Beira and Nampula at least.

The Team promised that the Team implements the training for observers in Beira and Nampula during next activities.

[Training for forecasters]

INAM pointed that it is too small for the number of training staffs for forecast as 3.

The Team replied that 3 is the smallest number of training for forecast, The Team is going to implement OJT training for forecasters at forecasters' room every morning from January to February, and every staff is welcomed to join.

THE ATTACHED DOCUMENT

ANNEX I : Attendant List

ANNEX II : Presentation Materials for Progress Report

ANNEX III : Proposal for PDM Modification

ANNEX I: Attendant List

List of participants of JCC Meeting on Progress Report for Capacity Enhancement of Meteorological Observation, Weather Forecasting and Warning between National Institute of Meteorology and Japan International Cooperation Agency.
(Maputo, on 22th September, 2016 in Conference Room of INAM)

22 September 2016

No.	Name	Station/ Department
1	Candida Inês Sete Nhapulo	General Director of INAM
2	Bento Cambula	Maintenance and IT Dept.
3	Jonas Zucula	Planning and Research Dept.
4	Estevao Willson	Human Resource Dept.
5	Aurelio Doming	Airport Met. Dept.
6	Aurelio Aramuge	Observation and Networking Dept.
7	Mussa Mustafa	Human Resource Dept.
8	Anastacia Maulique	Administration and Finance Dept.
9	Katsuyoshi Sudo	Chief Representative of JICA Mozambique Office
10	Hidetake Aoki	Senior Representative of JICA Mozambique Office
11	Makiko Inamori	Project Formulation Advisor, JICA Mozambique Office
12	Kota Nakai	JICA Expert
13	Michihiko Tonouchi	JICA Expert
14	Noritoshi Maehara	JICA Expert for the DNGRH Project
15	Arianna Bobba	JICA team

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Based on the Minutes of Discussions of the Project for the Capacity Enhancement of Meteorological Observation, Weather Forecasting and Warning (hereinafter referred to as "the Project") signed on August 22, 2014, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the JICA Expert Team (hereinafter referred to as "the Team") to Mozambique from February 2015 to implement the Project with National Institute of Meteorology in Mozambique (hereinafter referred to as "INAM").

At the end of the project period, INAM, JICA and the Team held a Joint Coordination Committee (hereinafter referred to as "JCC") on July 7, 2017 for reporting Progress Report of the Project included Achievement of Project Purpose, for discussing amendment of R/D for extension of the project. As a result of the discussions, the Progress Report and the issues mentioned in the attached document were agreed by representatives of related agencies.

Maputo, July 17, 2017.

中井公太

Mr. Kota NAKAI
Leader of JICA Expert Team


Mr. Americo Muchanga
Director General
National Institute of Meteorology
The Republic of Mozambique

THE ATTACHED DOCUMENT

1. Progress Report

The Progress Report for the Project and the Achievement of Project Purpose were agreed by INAM as explained by the Team (ANNEX II).

The Certificate of Handover for AWSs were accepted by INAM (ANNEX III).

The Progress Report and related materials in English and in Portuguese are reported separately with reflecting the discussion of this JCC.

2. R/D Amendment

Technical skills transfer for monitoring/forecasting heavy rain with satellite and rain gauge data were not enough for cover all types of rain events only for 1 year. In order to cover 2 rainy seasons as originally designed, the extension of the project duration 8 months were proposed (ANEX IV). INAM and the Team agreed to the amendment.

3. Points of Discussion on Progress Report and R/D Amendment

(1) Correction and conversion tables for mercury barometer observation

The Team developed the software of correction tables for mercury barometer and already shared with INAM. The Team recommended INAM to issue an official letter for usage of correction tables and to use them actually at all observatories.

(2) Training for weather forecast

INAM described as follows:

- Working team for forecasting training was established by 3 forecasters. Technical skills learnt through trainings by the Team are fixed. INAM would continue the verification and briefing activities even without Japanese experts.
- The problem is the limited number of forecasters involved in the verification and briefing activities. The number of forecasters should be increased. Through the verification job, we found errors of reporting/typing data of observation and informed the forecasters about it.

- Verification is a good tool for forecast. We'd challenge early warning improvement. In last rainy season, Japanese NWP(GSM) showed good performance. We want to watch whether for next rainy season, GSM can show good performance in Mozambique.

(3) Surface observation and calibration for instruments.

INAM raised some questions and comments regarding surface observation and calibration for instruments as follows:

- Could JICA support additional trainings for observation?
- Skills for calibration were transferred, however, INAM has 2(two) problems. The 1st one is where we should recalibrate our standard instruments. It's difficult to carry the instruments to Botswana or Nairobi to calibrate. And the other is ARG installation. INAM is planning to install AWS through new project and equipment manufacturer would be Vaisala. Is it possible for JICA to support AWS installation and implement trainings for AWS?

The Team answered as follows:

- The Team already developed documents and training materials (manuals) and implemented trainings at headquarter and some observatories. We'd ask INAM to continue and expand trainings for observation using these materials by yourselves.
- Procurement, installation and trainings for equipment should be done by the same donor/provider.
- The Team may support some suggestions for making documents for inspection of AWS.

(4) Installation of weather radar

INAM requested for installation of weather radar.

- INAM has to install new technology included weather radars. Are there any recommendations for future activities?
- For weather radars, could JICA support for drawing up the specifications for purchase of radars?

The Team replied as follows:

- INAM should implement daily jobs steadily and consistency of tasks is one of future's subjects of INAM. The Team recommended step by step progress



not scurrying for new technologies.

- Radar is very complex equipment, whole process should be done with one donor/manufacturer.

JICA commented that the main problem for assisting radar is unstable electricity power supply. JICA acknowledged the Mozambique government's request for donating radars, however, at first JICA would ask INAM to try to solve the problems proposed from the Team.

Director General of INAM mentioned the problem of electricity power is different and sensitive at the location. INAM continues to consider the problems of radars by themselves.

(5) Installation of AWSs

INAM requested for installation of additional AWSs at another observatories because AWS is very useful for forecasting in INAM.

The Team answered that on the discussion at JICA Headquarters, the AWS installation is out of scope of the on-going project. Based on requests from INAM, JICA will consider another project.

JICA mentioned that about next project, JICA would see the sustainability of transferred skills through the current project. After confirming technical skills transfer and its sustainability, JICA might consider next project.

(6) Long-range forecast

INAM explained present situation on long-range forecast INAM, and requested for training for long-range forecast to JICA as follows:

- INAM published agricultural bulletin monthly and we need to use satellite imageries continuously.
- INAM issues 6 months seasonal forecast, but in future (i) we'd issue long-range forecasts monthly. Is it possible for JICA to support activities? (ii) INAM now issues precipitation seasonal forecast, is it possible to issue temperature seasonal forecast? (iii) INAM would like to study verification for long-range forecast.



The Team commented JMA implemented trainings for long range forecasting in few years ago mainly for south-east Asian NMHSs. It includes 1month forecast and 3months forecast usage issued by JMA and verification of the long range forecast. After coming back to Japan, the Team will discuss with JMA if JMA can share the training materials with INAM and reply to INAM. NCEP (USA) opens their long range forecast and verification on their web site, these might inform you useful information.

(7) Installation of new Synergie and launching of new website of INAM

INAM explained present situation of installation of new Synergie and launching of new website.

New Synergie system will be installed on the half of 2nd week of July to Mozambique. New PC, software (upgraded to Synergie 2015 from 2010) and UPS were already arrived at INAM and we wait for consultant and his setting. The system is installed by PUMA project to Zimbabwe, Mozambique and Madagascar and the consultant now stays in Zimbabwe.

INAM is launching new web site, and we can see on <http://www.inam.gov.mz/>. The server is set in another agency to connect faster internet line directly and new pages are planned to be added. Time sequence of forecast for the city was provided from WRF output with CFS model of NOAA. The system was developed by Dr. Genete, a consultant who designs INAM forecasting system.

(8) Extension of the project

The Team proposed extension plan of the project and INAM agreed to it.

4. Closing

JICA (Ms. Inamori): JICA expects INAM to adapt technical skills transferred by the Team and to utilize those for their daily tasks. JICA is always open for any request or suggestion in order to make the project better and sustainable. We wish the project makes additional fruitful outcomes through extended period.

INAM (Dr. Adelito Celso Aramuge): Lots of technical skills are transferred through the project and we'd show these effectivity. We'd keep/maintain equipment and develop abilities. We'd keep communication with experts too.

(3)

5



THE ATTACHED DOCUMENT

- ANNEX I : Attendant List
- ANNEX II : Presentation Materials for Progress Report
Achievement of Project Purpose
- ANNEX III : Certification of Handover
- ANNEX IV : Amendment of R/D for Extension of the Project

Attendant List of JCC Meeting

Title of Meeting : JCC Meeting

Date : 7th July, 2017

No.	Name	Station/ Department
1	Américo Muchanga	General Director of INAM
2	Adérito Amurage	Directorate of Observation and Network
3	Claire Jaqueline Sendela	Directorate of Analysis and Weather Forecast
4	Mussa Mustafa	Project Manager of INAM (Department of Human Resource)
5	Queiroz Alberto	Directorate of Analysis and Weather Forecast
6	Benjamim Ben Manhiça	Department of Maintenance and IT
7	Jonas Zucule Isaias Raiva	Department of Planning and Research
8	Isaias Raiva	Department of Planning and Research
9	Acácio Tembe	Directorate of Analysis and Weather Forecast
10	Estevão Wilson	Department of Human Resource
11	Anastância Manhique	Department of Administration and Finance
12	Katsuyosi Sudo	Chief Representative of JICA Mozambique Office
13	Makiko Inamori	Project Formulation Advisor, JICA Mozambique Office
14	Stélio Massuque	Program officer, JICA Mozambique Office
15	Kota Nakai	JICA Expert
16	Michihiko Tonouchi	JICA Expert
17	Kiichi Sasaki	JICA Expert
18	Daniel Macaringue	JICA Team Assistant





Agência Japonesa de Cooperação Internacional

CERTIFICADO DE ENTREGA
Entre
Agência Japonesa de Cooperação Internacional
e
Instituto Nacional de Meteorologia
no Âmbito do
Projecto para o Fortalecimento da Capacidade de Observação Meteorológica,
Previsão de Tempo e Sistema de Aviso Prévio

Certifica-se que foram entregues no dia **23 de Março de 2016**, ao Instituto Nacional de Meteorologia (devorante designado por INAM), os equipamentos constantes na lista em anexo, adquiridos no âmbito do projecto de cooperação técnica da Agência Japonesa de Cooperação Internacional (devorante designado por JICA), denominado "**Projecto para o Fortalecimento da Capacidade de Observação Meteorológica, Previsão de Tempo e Sistema de Aviso Prévio**".

Durante o processo de entrega ambas partes concordaram as seguintes responsabilidades:

1. O INAM deverá tomar medidas apropriadas visando assegurar a manutenção e segurança dos equipamentos fornecidos, bem como garantir que os mesmos sejam utilizados para os fins previamente acordados no Memorandum de Entendimento para o Projecto.
2. O INAM permitirá que os Peritos da JICA continuem fazendo uso dos equipamentos em referência durante o período da implementação do Projecto, em actividades referentes ao mesmo.
3. O Projecto irá custear todas as despesas resultantes do uso do equipamento e sua reparação somente durante o período da implementação do Projecto.

須藤 勝彦

Sr. Katsuyoshi SUDO
Representante Residente

Agência Japonesa de Cooperação Internacional



Dr. Cândida Sete
Directora Geral

Instituto Nacional de Meteorologia

Testemunha

中井 公太

Sr. Kota NAKAI
Assessor Principal do Projecto

Attachment: List of Equipment

No.	Item	Qty	Purpose/Remarks	Specification	Remark
1	PC (laptop)	1 (J)	PC for inspection of local observatories' instruments	Windows, MS-office, anti-virus software	Toshiba dynabook RZ83/TB
2	Digital barometer (3 sensors)	1 (J)	National standard of INAM (calibrated at RIC Tsukuba)		Vaisala PTB-330TS, M170, HMP155 (3 sensors)
3	Digital barometer (1 sensor)	3 (J)	Parts of National standards of INAM (calibrated at RIC Tsukuba) For inspection of local observatories		Vaisala PTB-330TS, M170, (1 sensor)
4	Digital thermometer	3 (J)	National standards of INAM (calibrated at RIC Tsukuba)	Pt sensor	Anritsu Meter Co., Ltd.
5	Assmann	5 (J)	Calibration in INAM	Assmann aspiration psychrometer	Yoshino Keisoku Co., Ltd.
6	Calibration goods for thermometer	1 (M)	Calibration in INAM	Water filter, Cooler box	
7	Calibration goods for thermometer	1 (J)	Calibration in INAM	Ice shaving machine	Chubu Corporation
8	Rain gage	5 (J)	Comparison of rain gage	Tipping bucket type, its base and data logger	
9	Rain gage calibration cylinder	1 (J)	Calibration of rain gage	Plastic Cylinder for rain gage	
10	PC (desktop)	1 (M)	Store satellite, NWP, Charts, Observation data, Trail for weather guidance	Windows, MS-office, anti-virus software	Hewlett Paccard
11	Pressure adjustment pump	1 (J)	Barometer inspection (for output 1)	Equivalent of RIC Tsukuba	Daiichi Kagaku Type -V1
12	Pipe work, jigs and related parts	1 (J)	Barometer inspection (for output 1)	Equivalent of RIC Tsukuba	Daiichi Kagaku Pipe work, Jigs and related parts
13	Liquid Bath Chamber	1 (J)	Temperature inspection	Temperature indication, Setting of 1/100 °C	Thomas Co. Celsius 100L

(M) Purchased in Mozambique
(J) Purchased in Japan



CERTIFICATE OF HANDOVER
Between
Japan International Cooperation Agency
And
National Institute of Meteorology
About
The Project for the Capacity Enhancement of Meteorological Observation, Weather
Forecasting and Warning

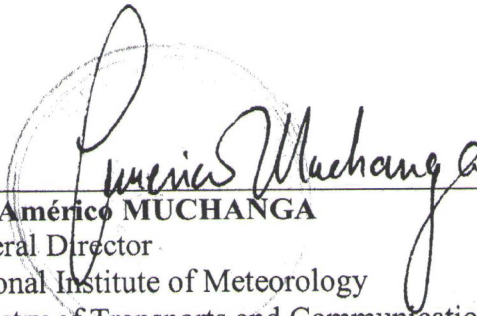
This is to certify that the equipment in the attached list for the technical cooperation project of JICA named "The Project for the Capacity Enhancement of Meteorological Observation, Weather Forecasting and Warning" was handed over properly on 1 February, 2017 to the National Institute of Meteorology (INAM).

During the handover process, it was agreed as follows:

- INAM shall take all appropriate measures to ensure that the equipment provided is safely stored, properly maintained and used for its purpose;
- INAM must allow JICA experts to keep using the equipment for the Project activities until the Project ends, even after the handover;
- The Project shall be responsible for the maintenance and repairing (if necessary) of the provided equipment until the termination of the Project.

須藤 勝義

Mr. Katsuyoshi SUDO
 Resident Representative
 Japan International Cooperation Agency
 Mozambique Office


Mr. Americo MUCHANGA
 General Director
 National Institute of Meteorology
 Ministry of Transports and Communication

(Witness)

中井 仁太

Mr. Kota NAKAI
 Chief Advisor of the Project

ATTACHMENT: LIST OF EQUIPMENT

(1) Correction of the attached list of hand over certificate between Japan International Cooperation Agency and National Institute of Meteorology signed on March 23, 2016

No.	Item	Qty	Purpose/Remarks	Specification	Remarks
*8	Rain gauge	3 (J)	Comparison of rain gauge	Tipping bucket type, its base and data logger	The number of the donated rain gauge was mistakenly written as 5 in the certificate on Mar 23, 2016.

(2) List of equipment handed over on February 1, 2017

No.	Item	Qty	Purpose/Remarks	Specification	Remarks
1	Digital thermometer	3 (J)	Field observation	Pt sensor	Climatec Co.
2	Digital hygrometer	3 (J)	Field observation	Capacitance type	Vaisala
3	Tele-communication system	3 (M)	Collecting meteorological data	Mobile phone	Vodacom
4	Large-scale display(TV)	1 (M)	Forecasting briefing	42-inch TV	Sharp Aquos

(M) Purchased in Mozambique

(J) Purchased in Japan

(*8) Refer to the item number 8 from the previous list



CERTIFICATE OF HANDOVER
Between
Japan International Cooperation Agency
And
National Institute of Meteorology
About
The Project for the Capacity Enhancement of Meteorological Observation,
Weather Forecasting and Warning

This is to certify that the equipment in the attached list for the technical cooperation project of JICA named "The Project for the Capacity Enhancement of Meteorological Observation, Weather Forecasting and Warning" was handed over properly on July 7, 2017 to the National Institute of Meteorology (INAM).

We agree that INAM takes all appropriate measures to ensure that the equipment provided is safely stored, properly maintained and used for its purpose.

Even after the handover, INAM permits JICA experts to keep using the equipment for the project activities until the project ends.

During the project period, the project will make necessary payment such as repair cost of the equipment.



Mr. Hiroaki ENDO
 Resident Representative
 Mozambique Office
 Japan International Cooperation Agency



Mr. Américo MUCHANGA
 General Director
 National Institute of Meteorology (INAM)
 Ministry of Transport and Communication

Witness


申井公太

Mr. Kota NAKAI
 JICA Chief Advisor of the Project

ATTACHMENT: LIST OF EQUIPMENT

No	Item	Qty	Purpose / Remarks	Specification	Remarks
1	Data logger	3(J)	Data logger (data storage and data communication) and battery 15Ah	TCP/IP socket and ftp	Campbell data logger CR800
2	Modem	3(J)	Data communication	GSM modem	CSN-3GR
3	Solar battery panel	3(J)	Electricity provision (DC-17V)	12W, 17V With attachment	
4	Logger box	3(J)	Box for logger, battery, modem and related gears		C-ENC14-MM
5	Thermometer	3(J)	Thermometer (Pt-100)	With JMA verification	C-HPT-10-JM Cable 10m
6	Hygrometer	3(J)	Pt-thermometer and capacitance hygrometer (output 0-1V)	With JMA verification	CVS-HMP155D-10-JM (Vaisala) Cable 10m

(M) Purchased in Mozambique
(J) Purchased in Japan

HA 



[Check sheet for self-diagnosis on technical faculty of calibration and maintenance of meteorological instruments]

Please, check the correct answer(O) in one column of A, B, C or D. And, please describe your thinking and opinion on the suitable place on this sheet freely.

A: I can fully understand it.

B: Although it is not enough, I can understand it generally.

C: Since it is difficult, I cannot understand it.

D: I have not learned it until now.

Name;

I Traceability Establishment

Item	A	B	C	D
1 I understand the concept of "traceability".	8			
2 I understand the necessary reason which INAM should hold standard instruments (national primary standard, national meteorological standard and working standard) for traceability establishment at each stage.	8			
3 I understand at which stage each standard instrument that INAM holds should be used.	7	1		
4 I understand the work which should be carried out by INAM for traceability establishment.	5	3		
5 I understand that the manuals for traceability establishment are required in IINAM.	7	1		

II Calibration of Barometers

Item	A	B	C	D
1 I understand the measurement principle of standard barometers (digital barometers) which INAM HQ holds for calibration of barometers.	6	2		
2 I understand the working principle of pressure adjuster for calibration of digital barometers , and I can perform suitable operation.	4	2	1	
3I understand the attentive points when dealing with digital barometers and pressure adjuster.	7	1		
4 I understand about instrument errors of digital barometers (meteorological standard and working Standard) which INAM HQ holds.	6	1	1	
5 I know whereabouts of the record book for calibration, and I understand that we must always use it when conducting calibration of digital barometers (working standards).	5	3		
6 I understand about the safekeeping of digital barometers and suitable setting position of pressure adjuster.	5	3		
7 I understand the measurement principle of mercury barometer and calibration method of it.	4	2		1
8 I knows the whereabouts of the record book for calibration of mercury barometers, and I understand that we always must use it.	4	2		1
9 I have been engaged in the observation work using mercury barometer at the observatory in INAM until now.	4	3	1	
10 I understand the observation method using mercury barometer which each observatory of INAM holds.	5	2	1	
11 I can carry out intercomparison between mercury barometer at the observatory and digital barometer (working standard) by myself	6	2		
12 I understand the necessity for the correction of instrumental error of mercury barometer, correction values for temperature and gravity.	1	4	2	1

13 I understand how to calculate each of above-mentioned correction values, and I can calculate correction values by myself.	1	3	3	1
14 I know the department in INAM where each correction value is calculated and distributed to each observatory and the guidance about synoptic report using them is made now in INAM HQ. If you know, please answer in which department.	4	2	1	1

III Calibration of Thermometers

Item	A	B	C	D
1 I understand the measurement principle of the standard thermometer (platinum resistance thermometer) which INAM HQ holds for calibration of glass thermometers.	7			1
2 I understand the working principle of liquid bath chamber, and I can perform suitable operation.	7		1	
3 I understand the attentive points when dealing with platinum resistance thermometer and liquid bath chamber.	7			1
4 I know the whereabouts of the record book for calibration of platinum resistance thermometer and glass thermometers, and I can understand that we always must use them.	6	1		1
5 I understand the measurement principle of the glass thermometers meter (dry bulb, wet bulb, maximum and minimum) which each observatory of INAM holds.	6	1	1	

IV Maintenance of Barometer and Thermometer at Local Observatory

Item	A	B	C	D
1 I understand the method of intercomparison observation of thermometers in the observatory using Assmann ventilated psychrometer.	5	1		2
2 I understand how many errors are there between thermometers in the instrument shelter of the observatory and Assmann ventilated psychrometer installed there.	3	3		2
3 I have been engaged in repairing and maintenance of self-record barometer (i.e. aneroid barometer) and self-record thermometer (ie. thermo-hygrograph) at the observatory of INAM.	1	2	1	4
4 I understand the method of performing intercomparison observation at the freezing point between platinum resistance thermometer and glass thermometer, using the vacuum flask. And I can carry it out by myself.	4	2	1	1

V Trouble Shooting

Item
1 Please describe your thinking how to cope, when instruments and related equipment for calibration (digital barometers, platinum residence thermometers, pressure adjuster and liquid bath chamber etc.) in INAM HQ will be broken or not be worked well.

> I study the damages of instruments and evacuate possible repair case by case.

2 Do you think whether the present condition is enough as the manuals for calibration in INAM HQ and for maintenance work in observatories? If you think not enough, please describe which kind of manual are required in future?.
--

> The existing manuales do not consider important coments.

VI Please write below your requirement items on training for calibration and maintenance of meteorological instruments which will be strengthened in future.

- > Calibration of AWS'sensor and deep thermometers and digital barometers.
- > More training on the items indicated as option.
- > More training on calibration of instruments.
- > In future, it should be included Aneroid barometer and vacuum ball.
- > Training on deep thermometer and calibration, also high level maintenance of meteorological instruments (master level).

Organization Name: All(11)

Questionnaire 1

Ease of contact with INAM

Very Good 4, Good 3, Acceptable 2, Bad 1, Very Bad, Terrible

Quality of service in case of requesting

Very Good 1, Good 7, Acceptable 2, Bad 1, Very Bad, Terrible

Term supply or delivery of the budget

Very Good 1, Good, Acceptable 5, Bad, Very Bad, Terrible

Presentation and staff attitude to a client

Very Good 2, Good 2, Acceptable 5, Bad, Very Bad, Terrible

Execution time

Very Good 1, Good 3, Acceptable 4, Bad, Very Bad, Terrible

Adequacy of the data to your needs

Very Good 2, Good 3, Acceptable 3, Bad 2, Very Bad, Terrible

Comprehensibility of language used by the INAM

Very Good 2, Good 6, Acceptable 1, Bad 1, Very Bad, Terrible

Capacity for clarification to your questions

Very Good 1, Good 5, Acceptable 5, Bad, Very Bad, Terrible

How do you evaluate the service of INAM in last year?

Very Good 1, Good 6, Acceptable 2, Bad 1, Very Bad, Terrible

Do you think you utilize our services again?

Yes 11, No

Have you ever have any damage because of lack of information about an extreme event of weather (e.g. heavy rain, cyclone, drought, flood, high temperature)?

Yes 3, No 7

Please tell us when and which extreme event, if you answer yes.

- Heavy rain and cyclone in 2000
- Flood of Limpopo River in 2003

If you had replied bad or very bad to any column, please tell us the reasons.

Also please give us your comments and suggestions to improve our services.

- Our electric address is communicative @yahoo.co.mz.
- We would like to receive information regarding weather.
- Lack of meteorological information
- Our suggestion is that INAM in future will have meteorological stations in the parts of country
- In the TV channels, even in the Provinces which receive meteorological information

Questionnaire 2

1. Have you ever heard about INAM? Yes 11, No
2. Do you know our web site? Yes 7, No 3
3. Which one of this services do you use for your activities?
Wind 3, Clouds 4, Temperature 5, Dew Point 2,
Atmospheric pressure 2, Rainfall 2, Humidity 3,
Astronomical information, Radiation 3, Evaporation 2,
METAR/TAF,
Weather certification 2, Dairy forecast 5, Seasonal forecast 3,
4 day forecast 3, Early warning 5, Maritime bulletin 3,
Agriculture Bulletin 4,
Calibration of Instruments 1
4. Other services and products you use in your activities:
5. Is the meteorological/climate information important in your activities?
Not important, Important 1, Very important 10
6. Which tool do you use to receive these services?
Radio 3 , TV, Newspaper 5, E-mail 5, Telephone, FAX 1,
Internet 4
7. Can you always receive the information through these tool properly?
Yes 6, No 3
Difficulties in the reception?
8. When there are difficulties, which alternative tool do you use to get information?
9. What do you think about the quality of information issued by INAM?
Very good 3, Good 3, Acceptable 5, Bad, Very Bad, Terrible
10. Have you ever have any damage because of lack of information about an

extreme event of weather (e.g. heavy rain, cyclone, drought, flood, high temperature)?

Yes 3, No 7

11. What do you think about the language used?

Understandable 9, Very technical 2, Not understandable

12. Do you feel any improvement of INAM in last year? Yes 8, No 1

Which?

- Improvements of meteorological service in the Provision and warning in order to improve security activity
- Better forecasting
- To have summary of meteorological information
- Forecast
- Quality of the access to the information and of EWS in case of extreme event
- Accuracy and continuity

13. What do you want to suggest that you think important in the improvements of our services?

- We would like that the information regarding weather would be improved in the national TV news especially in case of extreme events.
- Better analytical forecasting
- That the meteorological information of INAM would be more accurate, including meteorological data of localities, individual location and distinction, if possible
- To reduce the technicity of the information without losing appropriateness of the information
- That the meteorological services would be also available on the social network
- Suggestion to send the information by FAX or Email