

WORLD METEOROLOGICAL ORGANIZATION

Regional Workshop on Climate Monitoring Including the Implementation of Climate Watch Systems for Arab Countries in West Asia

-Final Report-

Amman, Jordan
27-29 May 2013

OPENING

The Regional Workshop on Climate Monitoring Including the Implementation of Climate Watch Systems for Arab Countries in West Asia was opened at 09:30 hours on Monday, 27th of May 2013, at Holiday Inn Hotel in Amman, Jordan. Dr Semawi, Director-General, Jordan Meteorological Department and Permanent Representative of Jordan with WMO welcomed the participants, stressed the importance of early warning systems for meteorological hazards and wished fruitful discussions. Mr Hechler, WMO, highlighted the integrating role of the Climate Watch concept, which builds on recent improvements in data and product exchange (WMO Information System, WIS), observations (WMO Integrated Global Observing System, WIGOS) and climate services (Global Framework for Climate Services, GFCS). Eventually, he thanked the host for organizing the workshop in Amman, Jordan. Dr Sadek addressed the participants on behalf of ESCWA and underlined the need for regional collaboration.

SESSION 1: Key lectures on rising awareness

After a short introduction of the workshop concept by Mr Hechler, Prof Dr Almazroui provided a scientific key note lecture on climate variability, extremes and change in West Asia. Based on the work of the Centre of Excellence for Climate Change Research at King Abdulaziz University in Jeddah, Saudi Arabia, as well as on the activities of the joint CCI-CLIVAR Expert Team on Climate Change Detection and Indices (ET CCDI; relevant paper: Donat et. al, Changes in extreme temperature and precipitation in the Arab region: long-term trends and variability related to ENSO and NAO, International Journal of Climatology 2013, DOI: 10.1002/joc.3707) he described meteorological extremes in the region as well as related trends. Dr Almazroui called for improved data exchange in the region to allow more detailed analyses of climate variability and change aspects including extremes and emphasized the need for data rescue as well as improved climate data management including high level quality assurance. Eventually, he encouraged participants to consider publishing papers in order to share knowledge, build networks of competency and raise profiles of individuals and institutions from the region.

Prof Dr Khresat, Chief Technical Advisor, Jordan Ministry of Water and Irrigation provided insight into expected climate change impacts on agriculture and water sectors in Jordan. Specifically water management in Jordan is challenging due to missing alternatives of water resources, which are not only threatened by increasing evaporation but also, e.g. by sedimentation caused by the increasing number of heavy precipitation events.

Mr Hechler, WMO, introduced the purpose and requirements of the WMO Climate Watch system as an early warning mechanism to alert societies of ongoing or evolving climate anomalies with potential adverse impacts on people and economies. He highlighted the fact that the final national climate advisory is a product of an overall system, comprising climate observations and climate data management, climate monitoring and long-range forecasting as well as close user liaison. Climate Watch implementation, therefore, builds on basic capabilities of NMHSs.

Two presentations on the physics, observation and climatology of sand and dust storms as well as on the observed variability of dust storms over Egypt were provided on the second day of the workshop by Dres. Almazroui and Elashmawy, respectively.

Note: Presentations can be accessed at <http://www.wmo.int/pages/prog/wcp/wcdmp/Meetings.php>

SESSION 2: International and regional projects and activities relevant to Climate Watch systems

Dr Bissolli, presented in detail an example of a RA VI Climate Watch alert during the 2012 summer heat wave(s) in parts of southern and south-eastern Europe, which was initiated by the RA VI RCC-Network Node on Climate Monitoring.

After an overview of Climate Watch-relevant elements of the GFCS Climate Services Information System (CSIS) by Mr Hechler, Dr Bissolli introduced the RA VI RCC-Network to the participants.

Dres. Al-Bakri and Sadek introduced the 'Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region' (RICCAR) and some results achieved hereunder. RICCAR offers an excellent regional co-ordination mechanism for climate change-related activities and projects. Risk studies of climate change on water and food security have already been carried out accordingly.

Eventually, Dr Areikat presented an overview of the mandate and mission of UN DESA, UN's Department of Economy and Social Affairs, and introduced specifically the capacity development project 'Strengthening national capacities to manage water scarcity and drought in West Asia and North Africa'. The implementation of effective drought monitoring and early warning systems is one of the key deliverables of the project. Five pilot countries will be selected by the project.

Note: Presentations can be accessed at <http://www.wmo.int/pages/prog/wcp/wcdmp/Meetings.php>

SESSION 3: Country presentations on the status of, and priority needs for, monitoring and predicting climate anomalies and extremes

The country presentations (cf. <http://www.wmo.int/pages/prog/wcp/wcdmp/Meetings.php>) revealed that all countries run observational programmes. Six out of nine countries manage their climate data within a Climate Database Management System, namely CLDB, CLISYS and JCDMS. Only three out of nine countries regularly provide climate monitoring information to external users. Six out of nine countries do not yet perform any long-rang forecasting-related activities. Some countries lack sufficiently long time series for related climate analyses and hence data rescue including tracing data in archives outside the countries is of critical importance.

SESSION 4: Climate Watch implementation

The session was organized along a series of seeding questions as referred to hereunder:

I Identification of hazards and climate variables to be targeted on

- Sand and dust storms
- Precipitation (extreme rainfall and produced flash floods)
- Temperature [extreme cold spells and heat waves (duration), frost, high variability of daily temperature]
- Hail
- Strong winds (e.g. related to meso-scale phenomena)
- Thunderstorms
- Droughts
- Fog
- Visibility (dust, haze)
- Humidity (esp. in coastal regions, potentially causing human discomfort and health problems)

Meteorological phenomena potentially causing hazards:

- Cold and warm fronts: potentially causing hazards like sand or dust storms as well as high temperature variability

- Tropical cyclones: potentially causing heavy rainfall, strong winds, flash floods, storm waves, inundation

Other potentially hazardous phenomena influenced by meteorological factors:

- Volcanic ash transport as well as transport of radioactive and chemical pollutants
- Locust movements caused by combination of temperature, humidity and wind factors

General note: Consider orology and geography of individual countries in the region

II Who are potential user groups for Climate Watch advisories?

- Civil defence and other disaster and crisis response authorities
- Aviation
- Media
- Public (e.g. through social media, e.g. Twitter, Facebook)
- Agriculture
- Water authorities
- Health sector
- Municipalities, local governments incl. police
- Power providers
- Transport/traffic authorities
- Industry incl. food production, construction sector, oil companies
- Environmental agencies
- Labour (regulating of work hours e.g. during heat waves)
- Marine authorities

General notes:

(i) One element to attract users and provide them with updated information is the establishment of a Website with climate monitoring information and Climate Watch advisories; such a Website can serve as an information platform

(ii) Consider language issue: Climate Watch advisories to be issued in the languages spoken in the individual countries/regions or even communities

III How to compile and update relevant user requirements for national Climate Watch advisories?

- User surveys
- Follow up feedback mechanisms
- Direct communication through Email, telephone, meetings etc.
- Face to face meetings with community representatives ('consultation workshops')
- Target NGOs
- Train trainers on how to reach the public
- Establish marketing divisions
- Invite to 'open house' events
- Awareness rising to ensure appropriate involvement of NMHSs/meteorological community in national and regional strategic (development) planning
- Awareness campaigns, brochures etc.

General note: Provide catalogue of NMHS data, products and services to users

IV How to access and handle socio-economic data to understand impacts of Climate Watch advisories on user decision processes?

Need to liaise with the appropriate authorities (e.g. health, agriculture, civil defence, water); consider establishment of co-operation agreements as well as focal points/liaison teams

Promote hazard mapping; promote and support related vulnerability studies as a basis for further specific research and actions; use of existing socio-economic country profiles

Promote (systematic) impact research; initiate impact studies; attract universities/academia to carry out or support such studies; consider smart cooperation approaches beyond just providing meteorological data to academia (balanced give and take; real win-win cooperation); consider scenarios for impact studies (*with* and *without* early warning/alert) and elaborate on related cost-benefit ratio

Consider definitions/methodologies and aspects of quality assurance applied to socio-economic data sets

Consider need for high-resolution meteorological data for impact research

Analyse UNFCCC national communications regarding impact studies (usually scenario-based qualitative assessments)

Example from Bahrain: governmental actions to avoid work during hot noon hours based on a study from the health ministry with input from the Meteorological Directorate

Example: UN DESA drought management initiative: Consider early involvement of NMHSs in planning process

Example from Europe: EU project EUPORIAS (European Provision of Regional Impacts Assessments on Seasonal and Decadal Timescales) to bring communities together including provision of seed funds (www.euporias.eu)

V. Is there a need for **regional** (e.g. West Asia or Arabian Peninsula or Middle East ...) Climate Watch advisories/guidance?

- YES
- Consider regional focal point network
- Promote establishment of a WMO RCC in the region

VI. Which R&D aspects need to be tackled and resolved in order to provide better Climate Watch advisories?

- Conduct climate impact studies to enhance respective knowledge
- Improvement of monthly and seasonal forecasting (forecast skills, communication etc.)
- Provision of tools and methodologies for quality control/quality assurance of climate data- Further investigate climate variability in the region and its drivers
- Provision of gridding and mapping methodologies incl. integration of satellite and model data

General notes:

(i) High-quality daily data are crucial for in-depth research; accordingly, data rescue incl. digitization of daily data is needed; gridded data sets are needed as well

(ii) Consider resource availability for e.g. hiring research consultants, publishing papers (fees) etc.

VII. Which guidance products (including timing) and tools are needed from global and regional institutions and mechanisms to enable NMHSs to issue national Climate Watch advisories?

- Access to respective model results (GPCs, RCCs etc.)

VIII. What kinds of capacity building requirements are involved in the implementation of a Climate Watch system at the national level (infrastructure, equipment and training)?

Training

- Training on quality control/ quality assurance incl. homogenization methods
- Training on long-range forecasting
- Communication training

Hard- and Software

- Installation of meteorological stations
- Increase in number of Aeronet stations
- Computer and basic software for some countries incl. basic training

General notes:

- (i) Consider implementation of RCOF mechanism in the region for training/capacity building
- (ii) Promote staff exchange programmes of experts including clarification of related administrative and financial regulations
- (iii) Consider roving seminars to overcome potential travel constraints

IX. How to benefit from ongoing regional activities, such as ESCWA/RICCAR and UN DESA Drought Management initiative? Are there other regional activities to liaise with?

- Establishment of RCOF mechanism through RICCAR (WMO lead)
- Consider potential RICCAR assistance to DARE activities
- Consider promotion of publications in climate science papers through RICCAR
- ESCWA is participant in League of Arab States bodies and can promote relevant activities
- Consider UN DESA's drought management initiative, which also targets on drought monitoring and drought early warning (fits well with related Climate Watch activities)
- Benefit from promotion of regional co-operation mechanisms by ESCWA and UN DESA
- Consider the 'blue peace initiative' to strengthen capacities of NMHSs in the region

SESSION 5: Recommendations, conclusions and the way forward

Conclusion A: The workshop provided a wealth of information on (i) aspects of climate variability, extremes and change in the region including related impacts, (ii) the WMO Climate Watch concept, (iii) international and regional projects and activities relevant to Climate Watch implementation, (iv) sand and dust storm science, (v) countries' capabilities and needs and (vi) Climate Watch implementation aspects.

Action 1 (end of June): WMO to provide a workshop report with focus on the Climate Watch implementation aspects as discussed

Action 2 (immediately): JMD to provide all workshop presentations to the participants

Action 3 (end of 2013): NMHSs to identify from the list of Climate Watch implementation aspects as summarized above (Session 4) (three) main priorities and start implementing relevant actions (e.g. identify three hazards/variables to be continuously monitored, identify three users to start working with, identify three awareness rising measures to be realized etc.).

Conclusion B: In view of missing appropriate Climate Watch-related co-ordination mechanisms in the region, such as RCOFs and WMO RCCs, it is recommended to establish a regional network of national Climate Watch focal points to share information and to work together on Climate Watch implementation. This proposal takes into account that Climate Watch-related activities also require NMHS-internal co-operation between weather forecast departments and climate departments.

Action 4 (end of August 2013): WMO to draft Terms of Reference for national Climate Watch focal points and request NMHSs to nominate focal points

Action 5 (end of year 2013): NMHSs to nominate national Climate Watch focal points as a basis for respective internal and international collaboration.

Conclusion C: Climate Watch implementation is a national responsibility, which can greatly benefit from regional co-ordination mechanisms.

Action 6 (ongoing): WMO Representative of West Asia to bring workshop outcomes to the attention of the Permanent Committee of Meteorology of the League of Arab States in order to (i) raise the awareness of the PRs in the subject, (ii) promote national Climate Watch implementation and (iii) promote establishment of appropriate regional collaboration mechanisms, such as RCOFs, WMO RCC, data exchange, joint R&D agenda etc.

Conclusion D: The above mentioned RICCAR and UN DESA activities can greatly benefit from, and contribute to, Climate Watch implementation efforts in the region. Climate Watch pilots could be considered as suitable candidates for country-level activities within the above mentioned UN DESA initiative (cf. Session 2, last paragraph).

Action 7 (as soon as possible): NMHSs are invited to establish Climate Watch systems on a pilot basis.

Conclusion E: In view of the fact that long-range forecast capabilities are not yet fully developed in most of the participating countries it has been highlighted that Climate Watch implementation can be started successfully on the basis of operational climate monitoring activities complemented by climatology information. Up-to-date information on the extent of an ongoing meteorologically induced hazard including its placement in the climate record in terms of past climatology is a valuable piece of information for users, which is often not available so far.

SIDE NOTE on the WMO Decadal Global Climate Summary

Initially, it was planned to run a dedicated session on analyzing annual and decadal climate data to help participating countries to provide their input to the WMO Climate System Monitoring and especially the decadal global climate summary 2001-2010. Fortunately, some countries responded to the respective call for input attached to the workshop invitation and provided their input in beforehand. Those countries still in need for assistance at the time of the workshop were supported by Dr Bissolli during workshop breaks. Finally, all participating countries were able to contribute to the decadal report in time while the respective session was removed from the workshop programme.

CLOSURE

In closing, Mr Hechler thanked all the participants for their valuable inputs to the discussion. He expressed his wish that the active collaboration among participants during this regional workshop can be extended to strengthened (institutional) collaboration among Arab countries on climate matters in general and on Climate Watch implementation in particular. He also thanked the host for the very efficient arrangements to facilitate the meeting as well as the warm hospitality. Dr Semawi thanked the participants for their dedication and WMO and ESCWA for their support and assistance. He expressed his hope for an early implementation of the Climate Watch system and wished the participants a safe return.

The workshop was closed on Wednesday, 29 May at 16:00 hours.

Final Workplan

**Regional Workshop on Climate Monitoring
Including the Implementation of Climate Watch Systems for Arab Countries in West Asia**
27-29 May 2013, Amman, Jordan

DAY 1

<i>08:30</i>	<i>Registration</i>
09:30	Opening and welcome addresses by JMD, WMO and ESCWA
Session I: Key lectures on rising awareness	
Chair: Dr. Semawi	
10:00	Short introduction of workshop concept, Mr Hechler
10:10	Climate variability, extremes and change in West Asia, Prof Dr Almazroui
<i>10:55</i>	<i>Break</i>
11:25	Climate variability and climate change impacts on agriculture and water resources in Jordan, Prof Dr Khresat
12:10	Climate Watch systems: Purpose and requirements, Mr Hechler
<i>12:45</i>	<i>Lunch</i>
Session II: International and regional projects and activities relevant to Climate Watch systems	
Chair: Dr Abu As'ad	
14:00	Climate Watch implementation: RA VI practices and experiences, Dr Bissolli
14:45	Elements of the GFCS Climate Services Information System (CSIS), Mr Hechler
15:05	The WMO RA VI RCC-Network, Dr Bissolli
<i>15:25</i>	<i>Break</i>
15:55	Regional initiative for the assessment of climate change impacts on water resources and socio-economic vulnerability in the Arab Region (RICCAR), Dr Sadek & Dr Al-Bakri
<i>17:00</i>	<i>Adjourn</i>

DAY 2

09:00	Dust storms, Prof Dr Almazroui
09:30	Dust storm variability over Egypt, Dr Elashmawy
Session III: Country presentations on the status of, and priority needs for, monitoring and predicting climate anomalies and extremes Chair: Dr Bissolli	
Note: Country presentations are recommended to focus on (i) national activities related to climate data aspects, climate monitoring and long range forecasting systems and methods including existing products, future development and projects, (ii) current status, challenges and future plans related to monitoring and prediction of extreme events (onset, intensity, affected areas, etc...) and (iii) national activities in support of early warning systems including data bases, preparedness and mitigation procedures, e.g. for drought, flooding, heat waves, heavy precipitations, dry spells, cold waves, etc... Examples including product generation, related methodologies and organizational aspects would be good to share with the other participants. <i>Break around 10:30; Lunch around 13:00</i>	
10:00	Country representatives (reverse alphabetical order; <u>around 15 minutes per country</u>): Yemen United Arab Emirates Qatar State of Palestine Lebanon Jordan Iraq Egypt Bahrain
15:00	Strengthening national capacities to manage water scarcity and drought in West Asia and North Africa, Dr Areikat
<i>16:00</i>	<i>Adjourn</i>

DAY 3

Session IV: Climate Watch implementation Chair: Dr Rabadi	
<ul style="list-style-type: none">- Identification of hazards and climate variables to be targeted on- Requirements and needs for national Climate Watch implementation including aspects of basic infrastructure, regional cooperation mechanisms, research and development and capacity building- Format, content and dissemination of national climate advisories	
09:00	Discussion on Climate Watch implementation
<i>td</i>	<i>Break in between and 12:30 Lunch</i>
Session V: Recommendations, conclusions and the way forward Chair: Mr Hechler	
14:00	Recommendations, conclusions and the way forward
16:00	Closure of the workshop

List of Participants

Name	Country	Phone & Fax	EMail
Ms. Hala Al-Aali	Bahrain	+97339900149 +97317329045 Fax: +97317320630	hhalaali@caa.gov.bh haali81@gmail.com
Dr. Fathi Elashmawy	Egypt	+1227159797	Met1558@yahoo.co.uk
Dr. Peter Bissolli	Germany	+496980622936	Peter.Bissolli@dwd.de
Ms. Amal Habeb	Iraq	+9647902209173	iyaiya2000@yahoo.com
Ms. Alaa Hatem	Iraq	+9647901561470	iyaiya2000@yahoo.com
Prof. Jawad Al Bakri	Jordan	+962796169966	jbakri@ju.edu.jo
Mr. Talal Al Fayiz	Jordan		Talal.alfayez@fao.org
Dr. Loay Frook	Jordan	+962777312889	lfrookh@yahoo.com
Prof. Saeb Khresat	Jordan	+962796600222	skhresat@just.edu.jo
Dr. Ahmad Abu Obied	Jordan	+962796944883 +96264894409	Metra_68@hotmail.com Doc_1@jometeo.gov.jo
Mr. Raed Rafid	Jordan	+962777643263	raedrafid@yahoo.com
Mr. Wisam Abdallah	Lebanon	+96101628000 Ext: 2000 +96170938614	Abdmet74@gmail.com Abdmet74@yahoo.com
Mr. Yousef Abu As'ad	State of Palestine	+97022403103	yabuasad@yahoo.com
Mr. Mohammed Jassim	Qatar	+97466681888 +974444666021	Bmw3358@hotmail.com
Mr. Ahmed Al Khayat	Qatar	+9744444007 +974444666021	Alkhaya- alkhayat@hotmail.com
Dr. Mansour Almazroui	Saudi Arabia	+966558885170	mansour@kau.edu.sa
Mr. Abdulwahed Al Hammadi	UAE	+971506470600	aalhammadi@ncms.ae
Mr. Mohammed Murshed	Yemen	+967711920842	Morshed2@hotmail.com
Mr. Tareq Sadek	ESCWA	+9611978520 Fax: +9611981510	sadekt@un.org
Mr. Sami Areikat	UN-DESA	+12129637844	areikat@un.org
Mr. Peer Hechler	WMO	+41227308224	phechler@wmo.int
Dr. Jaser Rabadi	WMO	+9733906430	jrabadi@wmo.int