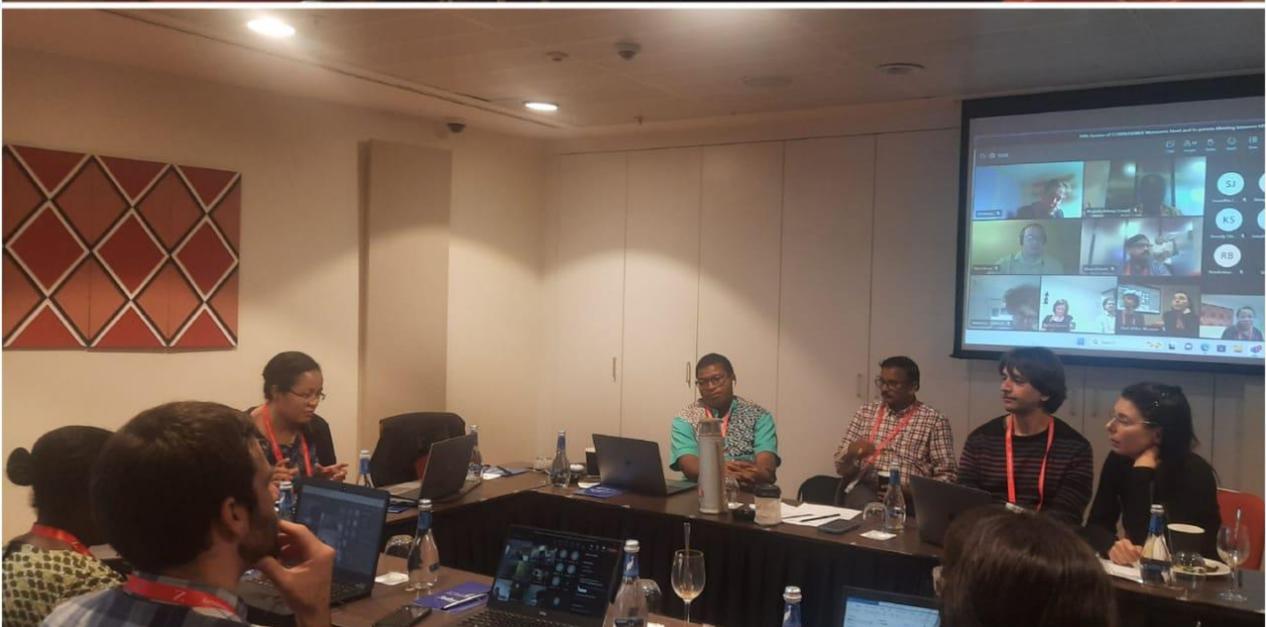


## Minutes of the Fifth Session of the CLIVAR/GEWEX Monsoons Panel held on 27<sup>th</sup> October 2023 at Kigali, Rwanda



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## MEETING INFORMATION

Meeting Number	2023-5	Meeting Title	Fifth Session of the CLIVAR/GEWEX Monsoons Panel
Objective/Purpose	To conduct the 5 <sup>th</sup> Session of the Monsoons Panel (MP) along with an In-person meeting of MP and Working Group on African Monsoons (WG-AFM)		
Time & Date	27 October 2023 12-15 UTC	Venue	AD-4, KCC, Kigali, Rwanda/ Microsoft Teams Meeting

## MEETING DETAILS

<b>Chairperson(s)</b>	Suryachandra Rao Anguluri (MP Co-Chair)	<b>Rapporteur(s)</b>	E.N. Rajagopal & Somnath Mahapatra (IMPO)
<b>Attendees</b>	<p><b>In-person Attendees:</b>  <b>MP (5):</b> Suryachandra Rao Anguluri, Thea Turkington, Rondrotiana Barimalala, Mary Kilavi, Ajay Mohan Ravindran  <b>WCRP Secretariat:</b> Wushan Ying  <b>IMPO:</b> E.N. Rajagopal  <b>WG-AFM (8):</b> Caroline Wainwright, Ismaila Diallo, Izidine Pinto, Masilin Gudoshava, Mojisola Adeniyi, Neil Hart, Paul-Arthur Monerie, Rachel James  <b>Special Invitees:</b> Jan Polcher (Co-chair, SSG/GEWEX), Michelle Simões Reboita (Member, WG-AMM)</p> <p><b>Online Attendees:</b>  <b>MP (3):</b> Annalisa Cherchi, Gill Martin, Hiroshi Takahashi  <b>IMPO (2):</b> Susmitha Joseph, Somnath Mahapatra  <b>WG-AFM (3):</b> Kénédy Silvério, Ross Dixon, Shingirai Nangombe</p>		
<b>Apologies</b>	<p><b>MP (6):</b> Leila Carvalho, Ruth Cerezo-Mota, Shabehul Hassan, Salvatore Pascale, Hui Su, Pankaj Kumar (Unwell at Kigali)  <b>WCRP Secretariat:</b> Hindumathi Palanisamy  <b>IMPO:</b> Rupa Kumar Kolli  <b>WG-AFM (8):</b> Akintomide Akinsanola, Aissatou Faye, Alain Tamoffo Tchio, Appolinaire Vondou Derbetini, Benjamin Lamptey, Claudine Wenhaji Ndomeni, Victor Ongoma, Wilfried Pokam Mba</p>		

## ACTIONS

Deadline	Action	Responsible
As and when required	MP/WG members to contact IMPO for establishing connections for new cross-panel activities.	IMPO, MP & WGs
Ongoing	Continue to build connections with other panels and Light House Activities (LHA) of WCRP and make strong linkages with partner projects.	MP members & Co-Chairs
As and when required	Updating of contents of webpages and websites of Monsoons Panel, populating the IMPO webpage with more information on the activities of panel and WGs.	MP & IMPO

Deadline	Action	Responsible
Ongoing	MP members to participate in WG meetings of their interest and collaborate on any activity.	MP members & Co-Chairs
30 November 2023	Organisation aspects of the second WCRP/WWRP MP Webinar Series on Asian-Australian Monsoon.	WG-AAM Co-chairs, IMPO & WCRP
31 December 2023	To provide their feedback on the WCRP's concept note on "Global and Regional Monsoons" which is led by MP Co-chairs.	MP and WGs
5 January 2024	Send doodle poll for the next online meeting of MP, preferably in the second half of January 2024	IMPO
Early 2024	Organisation of the Joint WCRP/WWRP MP Webinar Series on African and American Monsoons.	Co-chairs of WG-AFM and WG-AMM, IMPO & WCRP
As soon as possible	To involve actively in MP coordinated Monsoon Sessions in GEWEX OSC in July 2024 at Sapporo, Japan.	MP and WGs
As soon as Possible	To get involved with Pacific Region Panel and OMDP (Ocean Model Development Panel) to improve the ENSO teleconnections in models.	MP and WGs
As soon as possible	To get involved in the "SynObs Project" for the evaluation of Ocean Observing System as a cross-panel activity.	MP and WGs
As soon as possible	To provide ideas/activities for GPEX LHA that will be useful for the monsoon community.	MP and WGs
As soon as possible	MP & WGs should build links with the other disciplines like agriculture, agronomy, hydrology, and health.	Co-chairs of MP & WGs
As and when required	To involve actively in the MP coordinated Monsoon Sessions in the IWM-8 in 2025 at New Delhi, India.	MP and WGs

## AGENDA AND KEY OUTCOMES

Sl. No.	Description
1	<p><b>Opening Remarks (Surya):</b></p> <ul style="list-style-type: none"> <li>Surya (Co-Chair, MP) welcomed all MP members (in-person and online) to the 5<sup>th</sup> Session of the CLIVAR/GEWEX Monsoon Panel (MP 2023-5). He also welcomed all WG-AFM members (in-person and online) to the In-person meeting between MP and WG-AFM. He also welcomed the special invitees, Jan Polcher (Co-chair, SSG of GEWEX) and Michelle Simões Reboita (Member, WG-AMM) to the session. He then requested all participants to introduce themselves.</li> </ul>
2	<p><b>Introductions of physical and online participants</b></p> <ul style="list-style-type: none"> <li>Members of Monsoons Panel (MP) and WG-AFM, participating in the meeting in physical/online mode, introduced themselves briefly. Jan Polcher (Co-chair, SSG/GEWEX), Michelle Reoita (WG-AMM) and Rajagopal (IMPO) also introduced themselves.</li> </ul>
3	<p><b>MP &amp; WG-AFM In-person Interactions:</b></p> <ul style="list-style-type: none"> <li><b>Detailed discussions on WG-AFM Activities (Lead: Rondro)</b> Rondro (MP/WG-AFM) appreciated IMPO for the organization of the meeting and for supporting early career early and mid-career researchers of the WG for participation in the conference/meeting. She mentioned that the WG-AFM was initially</li> </ul>

	<p>little confused (when the group started), but gradually through regular interactions (during last 2 years) the objectives of the WG became clearer to the members.</p> <p>This group members started working on separate regions of African Monsoons, like South African region, West African region, East African region, Central African region, etc. She emphasized on the role of Central African monsoons, especially over Kongo basin.</p> <p>The West African Sub-group is currently looking at the GEWEX/GASS <a href="#">DYAMOND</a> high resolution model outputs to see how the model represents the mesoscale convective system in the area and how does it affect the monsoon. She remarked that the progress was done slowly but continuously and would appreciate the feedbacks from other regions.</p> <p>She informed that the WG-AFM is conducting regular online meeting once in every 2 months. The group prepared a manuscript for a review paper regarding research works done over various regions of African monsoons (on what is known about African Monsoons &amp; what is unknown). Now, they are revising it (after the initial manuscript was not accepted). She mentioned that we should try to know what the role of Central Africa on the monsoons of Southern Africa and Western Africa is. She welcomed suggestions from other members in WG-AFM and MP.</p> <ul style="list-style-type: none"> <li>• <b>Comments and Suggestion from Members on WG-AFM Activities (Lead: Surya):</b> <i>Pl. refer Appendix-I</i></li> </ul>
4	<p><b>Updates from the other Regional Working Groups:</b></p> <p><b>(A) WG on Asian-Australian Monsoons [WG-AAM]: - (Gill Martin)</b></p> <p>WG-AAM took a step back a couple of years ago now, trying to work out what the group's aims were going to be, and the WG-AAM decided that it wanted to have two overarching aims: a) promoting/facilitating active engagement and interaction among research, operational predictions and stakeholders for the different regional monsoon components of the Asian-Australian Monsoons, b) to try and provide authoritative information on understanding how good the models are in their regional components, in their representations of those regional monsoons, and also some amount of skill assessments. The WG-AAM have representatives who go to the some of the Climate Outlook Forum meetings and try to provide some background information and inputs into those meetings. WG-AAM is also trying to make sure that they are participating in monsoon sessions in conferences and presenting work.</p> <p>To organize the WG-AAM a little bit better, it is split into 3 sub-groups. The WG-AAM as a whole meets every three months, but the sub-groups meet on monthly basis and report back to WG-AAM, so there are usually things that can be reported back to the MP. The sub-groups are working on the ongoing processes in: (1) Teleconnections for the Asian Australian Monsoons (SG1), (2) Research to Operations (R2O) for monsoon seasons in SE Asia (SG2) and (3) High Impact weather events (SG3).</p> <p>The SG1 has been doing a little bit of research, looking at the seasonal predictions and how good those are. There have also been a lot of discussions on how well those processes and teleconnections are represented. The SG1 has also spend time looking at what has happened in the previous monsoon years and the working group as a whole, is trying to document the unusual characteristics of the last couple of monsoons.</p> <p>R2O subgroup (SG2), has been proactively looking at definitions for onset and intensity of the monsoon in the different parts of the Southeast Asia region, which is a complicated region in terms of timing and definitions for monsoon. They been looking at that and very much participating in ASEAN COF meetings, talking about those definitions, and coming up with different ways of doing that, talking to the different operational groups of which have</p>

representatives in the WG. SG2 presented a poster on their work at OSC, and their work is progressing nicely.

In the High Impact weather events sub-group (SG3), the idea is to really look at how well the forecasts are communicated, how good are the forecasts and more importantly, how useful are the forecasts to the affected communities. It has a lot to do with how the forecasts are communicated from the weather agencies to the people on the ground. So, SG3 is doing bit of an overview of some high impact events in the last few years by looking at how those have been forecasted and to understand whether those forecasts were useful. They are in the process of writing an overview article on that as well.

Hence, WG-AAM trying to bring together some sort of fundamental underpinning research that is done by some of the sub-groups that are represented in the working group and also our operational forecasters. In the WG-AAM meetings there are updates from the subgroups, discussions on the monsoon experienced in the whole region. Discuss about the low monsoon rainfall in some regions, the unusual monsoons of the last 2 years and their contrasting characteristics. The experiences from the operational forecasters and some of the fundamental reasons behind some of the things that have happened are also discussed.

The reports/updates from the MP meetings are discussed in the working group meetings, in a way to bring the information into the working group, which then allows the WG-AAM to report back to the MP in the other direction. So, there is a two-way feeding from the working group through the MP and then wider into the community.

- WG-AAM supported a session at AOGS this year, looking at some of the research to operational needs from Asian-Australian Monsoon perspective.
- WG-AAM is organizing the next WCRP/WWRP Webinar on Asian-Australian Monsoon on 30<sup>th</sup> November as an outreach activity.
- A couple of WG-AAM Members are joining in the cross-panel monsoon related activities with SPARC/ACAM project

**Highlights of the Recent Activities of the Sub-Groups (SG):** *Pl. refer Appendix-II*

**Comments from members:**

*Surya (MP):* WG-AAM is doing excellent work and they are a good example for other WGs to follow.

**(B) WG on American Monsoons [WG-AMM]: - (Ruth - Absent)**

*Rajagopal (IMPO)*

- The Co-chair (Ruth) also a MP member is absent and there is no update in the [Monsoons Panel Notebook](#). The co-chairs will be requested to update the Notebook.
- Monitoring WG-AMM meetings has been an issue for IMPO due to the inconvenient time zone. The group has not met online even once during the last 2 years and there have been only some email exchanges between the members.
- Alice Grimm (Co-chair) delivered an excellent on-line take in S03: Global and Regional Monsoons.

**Comments from members:**

Michelle (WG-AMM), informed that Alice Grimm (Co-Chair of WG-AMM) is working on South American Monsoons and presented her works on monsoon-systems & teleconnections in a conference. Michelle works with CMIP-6 model evaluations for South American region and explores about finding defects of convective parametrization schemes in the models. She is also interested in monsoons of South Africa and SE Africa and what is the role of Central Africa on Southern African and Western African monsoons.

## Updates from IMPO (Rajagopal):

### 1) Activity Highlights:

- *MP/WG-AMM Membership Changes:* Dr. Robin Chadwick of Met Office, UK was appointed as a new member of WG-AMM till 31<sup>st</sup> December 2026. His brief details are available in IMPO's webpage at <https://impo.tropmet.res.in/mpwg-amm-members.html>
- IMPO played a key role in the successful organization of the first Joint WCRP/WWRP Webinar Series on Global Monsoon, held online on 13<sup>th</sup> September 2023, which featured talks by eminent scientists, Prof. Bin Wang and Dr. Annalisa Cherchi. Dr. Suryachandra A. Rao (Co-Chair MP) chaired the webinar.
  - 175 attended the webinar out of the 307 registered attendees
  - [Video recording](#) of the first webinar was uploaded to IITM YouTube channel for wider reach & publicity on 26<sup>th</sup> September (284 views as on 25<sup>th</sup> October).
- IMPO participated in the IPOs & WCRP Secretariat Group's online meeting held on 22<sup>nd</sup> September 2023 and highlighted the activities of IMPO during July-Sept 2023
  - Volunteered to function as Moderator for online Poster presentation.
  - Volunteered to function as Moderator and Speaker Coordinator for the on-site presentations at Kigali.
- OSC Related Activities:
  - Allocation of MP Travel funds for 2 MP members (Ajaya & Pankaj) by CLIVAR for participation in OSC
  - Allocation of MP Travel funds for 2 WG-AFM (Mojisola & Shingirai) and 1 MP (Thea) members by GEWEX for participation in OSC
  - Due to proactive intervention of IMPO, WWRP agreed to provide the registration fee of \$750 to Michelle Simões Reboita, Member, WG-AMM/ WGTMR.
  - Actively involved in drafting contributions from Concept Paper on Regional and Global Monsoons for the OSC Kigali Declaration. The Concept Paper is Co-lead by MP Co-chairs.
  - A 5-minute video on MP & IMPO was created for display at the WCRP Booth during the OSC in Kigali - [MP IMPO Oct2023 OSC.mp4](#)
  - Functioned as Moderator of the online poster (session S03) presentations on 11<sup>th</sup> Oct in which 11 posters were presented.
- 2 WG-AAM members (Lin Wang and Wei-Ting) were identified for involvement in SPARC/ACAM project as a cross-panel activity suggested by CLIVAR SSG.
- 3 MP members (Hui Su, Hiroshi Takahashi and Pankaj Kumar) were identified for involvement with CliC on monsoon related cross-panel activities.
- Inputs on "GEWEX OSC-2024 Program: Sessions and Themes" were submitted to IGPO based on the inputs received from MP & WGs
- Participation in SASCOF26 during 26-27 Sept 2023 related with NE Monsoon Rainfall forecasts for Oct-Dec 2023.
- WWRP has agreed to allocate 15K CHF from IMPO funds to provide travel support to invited speakers in the conference on "Stratosphere-Troposphere Interactions and Prediction of Monsoon weather EXTremes (STIPMEX) proposed by IITM with the financial support from MoES, SPARC and WWRP/WGTMR/IMPO, to be held at IITM, Pune in June 2024
- Pursued with IMD for holding the WMO's IWM-8 in 2025 and IMD has agreed.

### 2) Future Activities:

- Organization of the second Joint WCRP/WWRP MP Webinar on Asian-Australian Monsoons on 30<sup>th</sup> November 2023 during 7-8:30 UTC, which will feature talks by Prof. B N Goswami (India) and Dr. Tim Cowan (Australia)
- Submission of MP Annual Report 2023 by the CLIVAR deadline of 15<sup>th</sup> Nov. 2023.
- MP 2024 Membership finalization based on CLIVAR, GEWEX and MP recommendations.

6	<p><b>MP Activity Highlights of 2023 and Future Plans (Surya):</b></p> <ul style="list-style-type: none"> <li>Some of the MP and WG members are Co-lead authors of the WCRP's concept note on "Global and Regional Monsoons" which is led by MP Co-chairs (Leila and Surya). Once the concept note is ready, it will be circulated to MP members for their feedback.</li> </ul>
7	<p><b>Discussions on MP coordinated Monsoon Sessions in GEWEX OSC-2024 at Sapporo, Japan (Lead: Surya)</b></p> <ul style="list-style-type: none"> <li>GEWEX has agreed in-principle to host an in-person meeting between MP and WG-AAM along with GEWEX OSC in July 2024. If there are members from other WGs at GEWEX OSC, they can also the join the meeting.</li> <li>There will be 2 sessions on monsoons in GEWEX OSC coordinated by MP members, namely, Monsoon Processes and Society (Convenors: Hui Su (MP) and Paola Arias (GHP)) and Monsoon - Atmospheric-Land and Atmospheric-Ocean Interactions (Convenors: Surya and Hiroshi (MP)).</li> </ul>
8	<p><b>Discussions on MP coordinated sessions in IWM-8 (Lead: Rajagopal)</b></p> <ul style="list-style-type: none"> <li>Initially the idea was to have an International Monsoon Summit coordinated by MP sometime in 2025. In the meantime, IWM-8 came up and so to avoid having 2 events on monsoon topics in the same year, we thought it would be better to have few special sessions coordinated by MP just like what is planned in GEWEX OSC.</li> <li>IWM-8 is a one-week activity of WWRP/WGTMR, and it will be mostly held in New Delhi in early 2025 coinciding with IMD's 150<sup>th</sup> anniversary celebrations.</li> <li><i>Surya:</i> So, the most important thing is that every year there is going to be one conference which will have special sessions on monsoons – like in GEWEX OSC (2024), IWM-8 (2025) and MP activities should be reflected effectively in these conferences.</li> </ul>
9	<p><b>Discussions on Joint WCRP/WWRP MP Webinar Series (Lead: Wushan)</b></p> <ul style="list-style-type: none"> <li>We had the first webinar focussing on the Global Monsoon and it was held on 13<sup>th</sup> September 2023</li> <li>The second webinar on Asian-Australian monsoon will be on 30<sup>th</sup> November 2023</li> <li>There has been not much progress on the webinars on African and American monsoons, we will pursue with them on this.</li> </ul> <p><i>Thea (MP/WG-AAM):</i> In the Asian-Australian Monsoon webinar Prof. Goswami is going to speak on a very popular research topic "Impact of climate change on Indian monsoon" and Dr. Tim Cowan on the "Development and implementation of operational services for Australian monsoon".</p> <p><i>Wushan (WCRP):</i> Will contact soon the Co-chairs of WG-AMM and WG-AFM for organizing their webinars early next year. He added that he will require at least 1 month notice to announce, prepare, and schedule a webinar through the WMO Zoom platform.</p>
10	<p><b>Discussions on Cross-Panel Activities and Opportunities (Lead: Surya)</b></p> <ul style="list-style-type: none"> <li>Happy to mention that MP has started cross-panel activities with 7 panels, and it will be increasing further.</li> <li>An upcoming cross-panel activity will be on tropical ocean basin interactions. In the CLIVAR SSG meeting on 22<sup>nd</sup> October, made a presentation on "Monsoons: Observations, Processes and Modelling". One thing that is noticed in most of the models is that monsoon predictions are strongly connected to ENSO than observations. This is one of the challenges, we need to find a way to improve the teleconnections as ENSO</li> </ul>

	<p>is the strongest modulator of monsoons throughout the globe. The Pacific Region Panel and OMDP (Ocean Model Development Panel) wants to work with MP on this prediction challenge. If anybody is interested to get involved in this cross-panel activity, contact Rajagopal (IMPO) to get connected with the 2 panels.</p> <ul style="list-style-type: none"> <li>• Another cross-panel opportunity is to get involved in the “SynObs Project” which is on the Evaluation of the Ocean Observing System which is supported by CLIVAR and CLIVAR SSG wants MP to be part of it. Already ECMWF and NCEP are participating in the project. Both have hindcast datasets from various OSE simulations. MP can analyse the hindcasts and identify observations that have most impact on the hindcasts. This opportunity is open to all WGs.</li> <li>• Monsoon rainfall evaluation in GPEX LHA will be another activity which will come up. Request all members to inform about these cross-panel opportunities to other members of the WGs.</li> </ul>
11	<p><b>Discussions on MP Annual Report (2023) for CLIVAR/GEWEX (Lead: Surya)</b></p> <ul style="list-style-type: none"> <li>• This is already described in IMPO update.</li> </ul>
12	<p><b>Any other business:</b></p> <ul style="list-style-type: none"> <li>• <i>Rajagopal (IMPO)</i>: The funding of 5000K USD each from CLIVAR and GEWEX for travel is just sufficient for 2-3 people is not sufficient. Initially we thought we can get more than 10K, but subsequently had to scale down the requirement, in process had to turn down few requests from WG-AFM.</li> <li>• <i>Jan Polcher</i>: It is a problem which I wanted to bring to the notice of WCRP JSC Chair and Vice-chair. It is nice that they have generated a lot of new activities (LHAs), but there is no new budget behind that. So CLIVAR and GEWEX budget have been cut for 2024. So, this is an issue that all the 6 core projects of WCRP are struggling with. It is one of the consequences of having six new acronyms and lighthouse activities.</li> <li>• <i>Rachel (WG-AFM)</i>: There were some of the discussions that have been coming up during this week about like inclusion in the global South. How does this WG-AFM compare with other such groups? Is this WG-AFM the biggest group of African scientists in the WCRP? If yes, that could be a leverage for us, to request for funding by saying that this is amazing that we have got so many of us from Global South working together.</li> <li>• <i>Jan Polcher</i>: Monsoons are tropical phenomenon, and the global South is mostly in the tropics, which is a good argument for getting funding.</li> </ul> <p><b>Discussions on GPEX:</b></p> <ul style="list-style-type: none"> <li>• <i>Rajagopal (IMPO)</i>: How much more can MP and WGs get involved in GPEX activities?</li> <li>• <i>Jan Polcher</i>: GPEX is only being set up. There is no clear definition yet on what should exactly be done. In the GPEX session there were a number of ideas of studying how the precipitation was related to this or that or precipitation processes. But this is already covered in CLIVAR, GEWEX and other panels. <ul style="list-style-type: none"> <li>○ If we want to do a year of precipitation, that should be really to try and bring everybody together on the observations. If we can convince all the weather agencies, FAO, hydrological centres who make rainfall observations during that one year and then pull all that data together, we have one-year excellent coverage of data of rainfall data that would be very good.</li> <li>○ Another activity which will be very valuable is working back from our rainfall archives and reconstructing the rainfall data over the last century or so in many regions of the world – this will be very valuable.</li> </ul> </li> <li>• <i>Rajagopal (IMPO)</i>: IMD has 150 years of data. we should make efforts to get operational national meteorological agencies interested in GPEX.</li> <li>• <i>Jan Polcher</i>: The GPEX idea initiated by NOAA and should be of interest to other operational agencies</li> </ul>

	<ul style="list-style-type: none"> <li>• <i>Neil (WG-AFM)</i>: A long standing problem is the missing observational data in Africa. How hard has GPCC attempted to get data over Africa? Would a voice within the continent through MP move anything?</li> <li>• <i>Jan Polcher</i>: This aspect is super important. GPCC is getting the African station data about 3-4 years after. On GPCC website there is graph on how many stations they have for each of the views. Getting a part of Indian station data is also very difficult, it is easy to get Indian precipitation diagnostics, but not the actual station data.</li> <li>• <i>Jan Polcher</i>: Have discussed this with the previous WMO President, he was in favour for changing the “Resolution 40 of WMO” which is stumbling block for the evolution and replacing it by something called the “Fair Convention in science” for having really open, fair, and accessible data. However, there was a big push back from a lot of the Southern countries and so we need work on both fronts.</li> <li>• <i>Analisa (MP)</i>: GPEX starting has been announced this week at OSC, but the activities are yet to start. So, it is now the time to think of specific activities. For us the Monsoons Panel, it would be very important to have ideas and some activities that we want to bring to the GPEX. It can be related to datasets or to join, to collect networks of data in monsoon regions that exist since many years and that can be put together or can think of having the need of new campaigns. If the observational campaigns are really needed, funds can be found through GPEX and other sources. The activity can be on processes or what we can learn from the GPEX collaboration between the communities in terms of data processing, in terms of modelling, in terms of what we need to improve, to have better precipitation, even in terms of the prediction and projection. The monsoon is the optimal test, so we need to think how we can be an active part in GPEX as a group. We need to volunteer and come up with ideas for putting up to the Steering Group of GPEX.</li> </ul> <p><b>Discussions on Hydrology:</b> <i>Pl. refer Appendix-III</i></p>
<p>The meeting ended with the Chair thanking all members for their active participation.</p>	

### NEXT MEETING

<b>Meeting Number</b>	<b>2024-1</b>	<b>Meeting Time &amp; Date</b>	Second half of January 2024. IMPO to send out doodle poll
<b>Location</b>	Video conference, details of the meeting will be sent out by IMPO		

## Comments and Suggestions of Members on WG-AFM Activities (Lead: Surya):

*Surya* queried whether any MP member has any suggestions or questions to the WG-AFM.

*Michelle (WG-AMM)* intervened to add that Alice (Co-chair, WG-AMM) is working on teleconnection patterns and the influence in South America Monsoon. Michelle is examining the signal of the climate change on the south American monsoon onset in the 76 models, and she is also working with other members to understand the performance of convection permitting models in simulating extremes in Southeastern Brazil to know the performance of the high-resolution models.

*Rachel (WG-AFM)* mentioned that the summary of WG-AFM sounds like a lot of awesome research is being done. “And I am wondering like how much of that is kind of just initiated from being in the working group versus also like kind of your other projects. When you ask about knowing what the working group is working on is it just the activities coordinated by the WG or is it also our other research?”

*Gill (MP/WG-AAM)* responded “We are each working, sometimes with another member of the group through a funded project and sometimes just independently”.

*Ismaila (WG-AFM)* mentioned that he is participating in the [LS4P-II](#) (Land Surface for Predictions) project of GEWEX/GASS and trying to see how we can use land surface to predict extreme event over control regions. From the history we start in North America where we have Billion dollars of disasters. And we also have applied over the Tibetan Plateau and subsequently we discovered that large temperature anomaly over the Tibetan Plateau could be used to improve the prediction of the global monsoon. Currently working how to implement LS4P-II techniques to improve the prediction of extreme of Africa. He is also working on developing a tropical band version of the model instead of using a global model, where one can go on a higher resolution by focusing on West Africa over Africa.

*Analisa (MP)* – Q1: How do we approach the fact that the South African monsoon is as a part of the seasonal precipitation framework that came out in a global monsoon framework, but there is not yet a full framework where the South African monsoon is recognized as a monsoon as it occurs for the other monsoons because there is not the same kind of history and recognition of the of the system as it is. So how is it approached this in the WG-AFM and what kind of advice can come from the Monsoons Panel in general in this framework?

*Rondro (MP/WG-AFM)*: There is an ongoing discussion on this Southern African monsoon. The way we see it, there are 2 strings of ideas, one based on the monsoon as the reversal in seasonality in precipitation and wind, but then there is also this idea on looking at the monsoon as the conservation of the angular momentum. We look it in the way of conservation of angular momentum and take that region as the Southern African monsoon region. So, we are aware of that ongoing debate but also one thing that we feel is that because it is somehow in the global monsoon but not in the regional monsoon then it becomes very understudied. And the question and how do we approach it? There are some studies already looking at the mean state of the monsoon, the variability and predictability. But these are only few studies if you compare it to the West African monsoon. So, the activities that we would like to pursue on this, is really to understand the predictabilities from intra seasonal time scale to longer time scale.

On the WG-AFM review paper, at the very beginning, she mentioned that they were talking about having a review paper on what is known on the African monsoon and what is not. However, they ended up having this paper on the representation of the precipitation in the in the models which is what we are still working on. The paper does not fully address on “what is known and what is not known in the African Monsoon” to shape the research in the community.

*Analisa (MP) – Q2:* The land surface improvements mentioned by *Ismaila*, how this can affect the prediction of the monsoon. What kind of simulations/products were used to verify these improvements? Are they based on ad-hoc experiments that were produced or is it using some general framework, or do we need to think for the next generation of experiment which is targeted to this that can be done by the community and can be shared to improve our understanding?

*Ismaila (WG-AFM):* This is a kind of framework that we developed combining observation and modelling. We first start by doing a data analysis from observations where we show a relationship between large surface temperature and precipitation and then we identify from the real world some case where we have flooding or drought in some place, and we develop a method to implement that appears in models to force the model to get the anomaly and to see if you get the response that you want. One Italian model also was also part of it. It is data, one can develop an approach and then try to put it on a model to see if the model can replicate what we have in observations and then now we are working on the process. He welcomed members to join the GEWEX/GASS in this [LS4P-II](#) activity.

*Surya (MP):* Queried if just like the GEWEX/GASS activity mentioned by *Ismaila* if anybody else is working with other WCRP core projects' activities.

*Rondro (MP/WG-AFM):* Safe Landing Climates LHA has contacted WG-AFM for getting involved in some sensitivity modelling experiments over Africa.

*Surya (MP):* Mentioned that CLIVAR SSG wants WG-AFM to get involved with RiFS as they are very much interested to work with the working group. He also informed that in the CLIVAR-SSG meeting (held on 22<sup>nd</sup> October), the SynObs project was discussed. They have various ocean observations and want to study of the different type of observations in subseasonal scale. They want monsoons panel to collaborate with them on these observation sensitivity experiments.

*Rondro (MP/WG-AFM)* informed that African WG is also involved with GPEX LHA activities.

*Jan Polcher (Co-chair, SSG/GEWEX)* wanted to know if the members are happy with observational datasets in the tropics. Are the model initial conditions working fine? If not, the panel should go to concerned panel/project and demand better data. He advised that WG-AFM can collaborate with GPEX.

*Rondro (WG-AFM)* informed that WG-AFM has evaluated the GPEX dataset over Africa and appraised GPEX about the issues.

*Jan Polcher:* Have you evaluated full precipitation estimates that we all use every day in our work? Are you happy? What they are saying about the quality of these data sets on monsoons? Most of the evaluations done so far are by the northern scientists and they have expressed their appreciation of the products. It is now Indians and Africans to mention about the quality of the datasets for the monsoons.

*Surya (MP):* Reiterated that there is a concern that we are not interacting with other Panel members (rarely involved in any Cross-Panel activities). We should now take it up, approach other panels to collaborate with them. We shall try to comply with whatever GEWEX or CLIVAR project SSGs advise for us. Actually we have started 3 cross-panel activities since last GEWEX SSG meeting in May 2023. WGs can contact IMPO to establish connection with other panels for starting cross-panel activity.

*Rachel (WG-AFM)* remarked that she really likes the idea of members' role as representatives and contacting others, sometimes lobbying for the data, spread the word about what is important. These discussions have provided to have a big picture about what are the problems, challenges; what research is needed, what data and modelling are needed. What would you recommend as WCRP representatives, is the best way for one if there are others understanding all the different panels and what they do and whom we should connect with.

*Surya (MP)* replied that as soon one has a scientific problem, immediately communicate with IMPO, who in turn will contact GEWEX or CLIVAR panels that are interested in the same. Then, they will provide the necessary guidance.

*Jan Polcher* suggested that if something is lacking in monsoon related studies, person to person interaction is seen to be working much nicely. All are encouraged to be involved in cross-panel activities. Come out with an idea, discuss with the panel and work on that line.

*Rachel (WG-AFM)* expressed her concern about availability of suitable data, there is a challenge about availability of data (e.g. data over Kongo basin in central Africa). Members from all over the continent and different organisations, do they have potential to influence or to lobby met services, to highlight the importance of funding for data rescue?

*Polcher* responded that for all historical data over Kongo basin, if DFID or other agency is ready to fund the data recovery project, we can consult the community and write a recommendation letter for the relevant data. If community considers your proposal to be important, data will be shared. You can contact GDAP or GPCC and convince them your work will be useful for the community. For hourly rainfall data collection, there needs to be big projects. About 10 years ago, people started to focus a lot on hourly rainfall, and so they had a big project and they said that we see signals in the hourly data, which we didn't see in the daily data and then GEWEX went to the German Weather Service and told them here you are responsible for collecting the world's rainfall data and we believe that our strong scientific arguments suggest to collect the hourly data. And that was teamwork as a whole because we had discussed that internally and since DWD has the infrastructure to gather the hourly data and sends out requests for it. Similarly, the same can also be done for the Kongo basin.

*Mary (MP/WG-AFM)* mentioned that the agenda of the Working Group meetings should be more brainstorming type (invoking new ideas) and should be much productive sessions. Thus WG meeting can include a brainstorming session highlighting some special problems and requirement of relevant data, and the outcomes can be communicated to MP, for their advice/taking it up further with CLIVAR/GEWEX.

*Jan Potcher* added that there is a need to identify the issue, work on it, document the same, establish all the arguments/suggestions and then come forward say that this a problem to the other panels/community.

*Thea (MP/WG-AMM)* expressed that after joining Asia-Australian WG, she gradually understood what is going on in the monsoon region and what are to be done. She felt that there should be some basic guidelines to the incoming members to understand the WG activities quickly.

*Surya (MP)* mentioned that whenever we have these online meetings, the times are very different for each one of us and many of us skip, so that is the biggest challenge. Now we now have come up the idea of joint MP and WG meetings (like the current one). There will be a session on Monsoons at GEWEX OSC (in July 2024) and there will be a joint MP & WG-AAM meeting. If there are members from other WGs, then it will be another opportunity to discuss about all monsoons.

*Caroline (WG-AFM)* felt that regular updates on all the different lighthouse activities would be helpful. The discussions in this meeting were really helpful for her to know many things, including the need for observations over the Kongo basin, the activities of other WGs.

*Neil (WG-AFM)* wanted the updates from other WGs to elaborate on how the WG has agency into the whole monsoon and the WCRP. This will be helpful to learn about the way in which the regional WGs are able to animate research activities at a larger scale.

*Surya (MP)* added that there are some common members in MP and the WGs, they can play an important role in connecting the roles of MP and WGs. In MP meeting there is a discussion of activities of each WG and common members are expected to provide an update on the MP meeting to the respective WGs.

*Rachel (WG-AFM)* had a question about like the scope and how much these kind of activities or kind of connections with other panel of WCRP, what topics they can cover. There seems to be like quite a big range or difference between how people view future model projections, like in the OSC's Climate science sessions, people were considering models as just tools to explore processes and that projections are not reality, while in some of the climate services sessions, CMIP products and CORDEX projections have been applied as if they are the reality, and adaptation strategies are planned accordingly. She added that she mainly work on future projections of Climate Change scenarios, and is not directly connected with Monsoon research but feels that there is relevance with monsoons, especially for adaptation with relevant monsoon regions. She thinks that as a scientific community we really have a potential role in trying to communicate what the models are for and try to come with methods for using model projections alongside lots of other different

sources of knowledge to inform about what would be future like. This is very relevant in Africa as there are CORDEX and other activities going on in Africa and it is important that we ensure that the climate adaptation strategies are not based on limited selection of knowledge.

*Jan Polcher* added that the models have that duality, they are the concentration of our knowledge. So we test our knowledge with the models, but at the same time they are the only way we have for predicting the future and both (Climate Science and Climate service) are covered within the WCRP as a whole. So what is your question?

*Rachel (WG-AFM)*: What kind of topics can we consider and so it would be really nice to get some advice on the WCRP structures and where one could go with that kind of concern.

*Jan Polcher*: You can try to answer if you ask around the table here, about half of these people are looking at the models to see if the monsoon processes are well represented in the model and the other half which is using the models to predict how the monsoons are going to evolve. And depending on how you have questions or you agree that there are fundamental problems, you will go to one or another group within the WCRP.

*Ismaila (WG-AFM)*: I just have a question, we have these climate service climate projections, but we spend a little time analysing these models. There are so many basic processes or aspects that are missing in these CMIP models and how these models that are not even getting the basic historical state correctly can be relied upon. For modelling over Africa is there a way to get funding for a field campaign to get data to understand more process, in order to push the modelling communities to first improve the processes in the models before looking for the future projections. We need to understand what is happening now before working on the future, if we miss what is happening now, how really could we rely on the projection of the model?

*Jan Polcher* mentioned as an analogy that there is a group of scientists now, mostly meteorologists, who think that the Andes are very interesting, it is complicated, there are a lot of problems and think that they really have some fundamental question to investigate. And then they came to GEWEX and they were asked to try to write a white book with all the questions, identify what the issues are. Subsequently, GEWEX had that white book reviewed. During that process we said ok, now you really have a question and the Community – you need have both and we will call you an RHP (Regional Hydroclimate Project) and we will go and lobby your government. GEWEX have been meeting funding agencies to say could you please help these people because they really have fundamental questions, that is what GEWEX do. It is also how AMMA was generated 30 years ago. We had an ANDEX meeting in April, in which we told them it is not a Sprint but it is a Marathon. So if you are ambitious about doing a regional experiment where you want to really analyse the climate change from the climatological problem up to the societal problem, you will need 20 years, but you will need to start now, because it is really urgent and important.

*Surya (MP)*: We have MP meeting every once in every 2-3 months. So if WG-AFM meetings are once in three months then the updates will not be proper. It should be held once in 2 months

*Rondro (WG-AFM)* responded that WG-AFM meets once in 2 months.

*Surya (MP)*: One has to also ensure that whenever the working group meeting happens, majority of the members should attend. There should also be no information loss, WG-AFM is an important WG, as I was unaware of GEWEX/GASS related activity of the group, I did not present it in the last GEWEX SSG meeting. Henceforth, we as co-chairs or project office, should make sure that the activities of each and every individual of the group should be reflected in the group activities, if it is relevant to the WCRP activities.

*Surya (MP)*: The next point is regarding the review article on African Monsoons, if it comes out very clearly, it will be good way to start for all group members to understand where we stand and what problems you want to take further to other panels.

*Ismaila (WG-AFM)*: I am wondering because some of the challenges that we have, especially for Africa or looking on the monsoon, there should be a way to get funding from WCRP or to help the people working on the monsoon especially in Africa.

*Surya (MP)*: CLIVAR, GEWEX and WCRP are very much interested to fund the activities of Monsoons Panel. They have been very generous and have given total support whenever we asked

for it. So if we as a Panel/WG have really a very good proposal, let us take it to CLIVAR, GEWEX and WCRP. We have good support coming from all different core projects. We should have a problem that can be made important for all core projects.

*Rachel (WG-AFM):* Could you just clarify, I did not quite understand as before we were talking about going to the CLIVAR, GEWEX and other panels and and them helping us with a letter of support. From what you just mentioned, it sounded like there might also be some actual funding that is held by CLIVAR, GEWEX, other panels. Is that what you mean?

*Jan Polcher:* GEWEX and CLIVAR can fund travel only. Both do not have a lot of money and both rely on the funding of others. So letters of support, lobbying, going and talking to people are really the best that both can do.

*Ismaila (WG-AFM):* For example, there is a Professor based in Nigeria who wants to hire a PDF but has no funds available within in the country. We are in the US, but we are still working on African monsoons, but we can not be in US, focusing full-time on Africa. We need to find a way through lobbying to give funding to faculties in Africa who are part of this Monsoons Panel, where they will be able to hire some bright people and bright mind work on some challenging things.

*Jan Polcher:* As individual and as small research groups, you will struggle to convince for getting funds. However, if you come together as a community and that is what ANDEX is currently achieving, then you have much stronger arguments. You probably did not realise it, but many of the northern hemisphere funding agencies had representatives at the conference here, and I spent a part of the morning today to discuss with one of them. And they are open, they listen and the northern countries especially Europe. Europe is very willing to help Africa, but it can not help all universities in Africa. But if there is a community which emerges from some of the universities, then the solutions may emerge. The WASCAL (West African Science Service Centre on Climate Change and Adapted Land Use) project is an exmple which has been running for nearly 20 years. It is about the monsoon and the water resources which is being funded by Germany.

*Ismaila (WG-AFM):* We have some faculties from Africa, who are part of these panel/WGs. We need to find a way to fund them. Let us find a way to identify things that we could work on and fund them to have a student. And through collaboration we could work also with those people.

*Rondro (WG-AFM):* That still goes back to the misunderstanding of the mandate of the group because since the very beginning the mandate of the group is to identify where do we see the whole Community, where shall we go from where we are now, how do we solve a problem and as a community, we bring that or lobby that to the funders, and then it happens instead of individual works and funding individual works and doing the research ourselves. So I think that has been a big mistake in the WG-AFM, like it becomes that we want to do the research ourselves instead of identifying the issue and then bringing it to the large community for a solution.

*Neil (WG-AFM):* After this WASCAL project decsribed by Jan, I can name may be more than 10 PhDs and postdocs that are based in Africa, funded by European projects.

*Gill (MP/WG-AAM):* I just want to reiterate that, we spent a long time, maybe two or three years ago, quite a long time in the monsoons panel trying to work out what the terms of reference should be and what it is that we are for and what the remit is. And I think that was it sort of started out as well. Let us solve this monsoon problem. Let us do research to do that and actually we came back from there to say actually we cannot do that because we are as individuals all working on our own funding streams and working on that research and what we can do more powerfully is bring that together for the lobbying, for encouragement and support to funding agencies, as has been mentioned around the table. So, if you do look at the terms of reference which are on the monsoons panel webpage, they do articulate that quite well and I would say if you were a new member joining a working group, that is a good place to start as those here are also relevant for the working groups. So, it is about trying to bring things together. I think sometimes when we have the difficulties, we then go away and bring our research together that can take up all our time and in trying to write things, write papers and things like that and then actually we do not have as much time for the sort of supporting capacity building and supporting, bringing the research together, so we need to balance that. I would say, which I think is consistent with what was said around the table as well.

### **Highlights of the Recent Activities of the Sub-Groups (SG)**

- SG1: Monsoon Processes and Teleconnections.
  - Two new energetic members, Hui and Joseph, have now joined the group but had not yet had an online meeting. Hui's team has been doing a study of Arctic Sea Ice impact on East Asia extreme cold event and will present the results to the group at the next meeting.
- SG2: R2O for monsoon seasons in SE Asia
  - Different definitions for onset and peak intensity based on low level winds are being tested using reanalyses, and group members are contributing analysis for different regions (see [Science presentation](#)). Having found some issues with the original definitions, with varying success between different local regions, a new theoretical framework is currently being tested. The group meets monthly and will be presenting the work at the WCRP OSC as well as planning a paper and discussing at ASEANCOF meetings.
- SG3: High impact weather events
  - An outline for a white paper on how meteorological agencies across South Asia, Southeast Asia and East Asia communicate weather warning forecasts to the public has been discussed and is taking shape. Rather than looking at each individual country, we will aim for a more thematic structure where we discuss and evaluate various elements of the warning forecasts.

#### **Other activities:**

- Update on paper on monsoon 2022
  - A draft paper was started, and a small group has discussed the way forward, but not much further progress has been made in recent months. The WG decided it might be better to compare and contrast with another year, e.g., 2023 since this is proving to be another interesting year.
- Discussion of summer monsoons 2023
  - The WG decided to hold a separate meeting to review Monsoon 2023 (boreal summer and outlooks for austral summer) in mid-November.
- MP Annual Report
  - The WG compiled their input for the MP Annual Report and submitted this on 29 Sept.
- WCRP Monsoons Webinar Series
  - The WG-AAM is arranging the second webinar in the Joint WCRP/ WWRP Monsoons Panel Webinar Series on Monsoons, with talks on the impact of climate change on Indian monsoon and on the development and implementation of operational services for the Australian monsoon, followed by a discussion on outstanding challenges in monsoon predictions and projections.
- AOGS 2024
  - The need for further quasi-biennial WG-led sessions on “Asian-Australian Monsoon: linking research to operational needs” of this series is under review as there are other well-attended regular monsoon sessions at AOGS.
- WCRP OSC
  - Several WG-AAM members will attend and present at the WCRP OSC in Kigali, October 2023.
- GEWEX OSC
  - Several WG-AAM members will attend the GEWEX OSC in Japan during July 2024. A joint meeting between the Monsoons Panel and the WG-AAM is being planned for the end of that week.
- Cross-panel activities
  - Dr Wei Ting Chen and Dr Lin Wang are joining the SPARC activity on Atmospheric Composition and the Asian Summer Monsoon (ACAM).

### Discussions on Hydrology

- *Jan Polcher*: Nobody is talking about hydrology in this meeting. Hydrology in monsoonal or tropical areas is very different, there is very little research on hydrology. Hydrology is very important because one is in weather regimes or climate regimes where it rains three months in a year at best during the year and one needs to keep the water during the other nine months. Are you talking to hydrologists? Why there are hydrologists in this meeting? They could be our allies to get more observations of rainfall or soil moisture. I will also suggest agronomists as they also have a wealth of data and I am very impressed by [CGIAR](#)'s South project of agronomy, they should be example for this monsoon group. How do you respond to that?
- *Michelle (WG-AMM)*: Soil moisture is a big problem, there are not many measurements. It is an important variable that we can assimilate to provide better weather forecasts.
- *Jan Polcher*: Have you asked that question to the agronomic service of Brazil? If they have such observations? It is very important to have to know how much water is in the soil. That is how they decide their agriculture practices. They have observations and the question is if they are ready to share it or not.
- *Michelle (WG-AMM)*: Because in Brazil, the big community is the meteorologist community, they are responsible for soil moisture measurements.
- *Jan Polcher*: The hydrologists in Brazil are very important. Soil moisture is difficult to observe, so these hydrology/agronomy communities are our allies, their help should be sought.
- *Surya (MP)*: In MP most of the members are monsoon specialists, they also have interactions with regional Climate Outlook Forum (COF). In these interactions several suggestions/collaboration activities come to MP. Another panel dealing with hydrology is the GEWEX/GHP. Hence, it would be better to keep MP's focus on Monsoons as most of members are monsoon meteorologists who want work on monsoon, its prediction, its variability, and its processes. We are ready to collaborate with hydrologists as a cross-panel activity.
- *Jan Polcher*: If you want to set up a regional hydroclimate experiment, it is both hydrology and meteorology together. So, we expect MP to build links with the other disciplines like agriculture, agronomy, hydrology and health (which is an issue in the tropics).
- *Thea (MP/WG-AAM)*: Two days after the next ASEANCOF, there is the first SE Asia Hydrological Forum meeting. We are exploring on how to get involved in this hydrological forum meeting. Shall share the outcomes of the meeting with all.
- *Jan Polcher*: It is quite fascinating to work with hydrologists. The monsoons are the strongest rainfall events in the world, they are going to get even stronger, and the hydrologists are worried because they designed all their stuff based on monsoon rainfall of 50 years ago. We need to talk to hydrologist and establish that thing. The young scientists in the group should be eager to meet new people and new trains of thoughts.
- *Surya (MP)*: In the COFs, many agricultural and hydrological scientists participate to discuss about their issues.
- *Thea (MP/WG-AAM)*: The idea with these hydrological forums, is to shift the focus from being climate centric to being hydrology centric with meteorologists supporting their needs.
- *Surya (MP)*: Hydrologists have been asking for seasonal prediction at river basin scale, at present it is a very difficult task. What seasonal predictions can provide now is only the large-scale seasonal rainfall. May be by using AI/ML techniques river basin scale seasonal predictions can be attempted in the future.
- *Neil (WG-AFM)*: Many of the members of WG-AFM are working in science for applications or science driven by applications and things like planting dates for which soil moisture really matters. So, we are starting to think about that and learn about land surface schemes. These discussions in this meeting are provoking us to think about the way in which we are really thinking about that in our research and bring that into the MP.
- *Rachel (WG-AFM)*: We have talked about how it would be good if we engage with the WMO around observations with funders, and that there also might be trouble funding available through WCRP. Bruce Hewitson was talking earlier in the week about South-North collaborations and the need to have a scientist from the South. He mentioned that he was in the Europe for a month, knocking on

people's doors and talking with them on how to build more South-North partnerships. In view of the above, would it be appealing to WCRP for some members of the working group to travel around to speak to WMO, speak to funders, etc.? Whether there is any opportunity for mentorship from those who have had success in those kinds of conversations before, so we can make them as effective as possible?

- *Jan Polcher*: That needs to be done, but those people who go around and talk, need to have the backing of the community. So, you need to be clear on what should be the priority and where you want to go.
- *Jan Polcher*: To reiterate, we started in 1993 with the idea of AMMA, we talked with the community, we went everywhere and as we discussed, the people said it is a good idea, which is feasible. It took until 2003 to get the AMMA project funded. However, by talking with people and really making sure that everybody understands that the project is a worthwhile challenge, you get the support, and the Funding Agency then advertises calls for specific research proposals under the project. To overcome the poor radiosonde network in west Africa, the AMMA team discussed with [ASECNA](#) in West Africa to develop the radiosonde network which was an incremental step. You as a community need to do that, need to focus on some aspect or some monsoon and then lobby and talk with the people. Hence it is a good idea to pursue with.
- *Rajagopal (IMPO)*: In most of the countries meteorological department and hydrology department are separate item entities. In India, the Central Water Commission deals with hydrological aspects. Now due to the increase of extreme events leading flooding events, there is more interactions between the 2 departments and inter-departmental datasets are becoming available. India is now also planning to have a national portal for hosting all the data together at one place, details of which will be available in the coming years.
- *Jan Polcher*: In UK after 2013 floods, the Met Office started to seriously engage with the water agencies for data exchange and forecasting. We must make hydrology community aware that hydrology is a part of the Earth system and we need to work together.