

GEWEX OSC 2024

ECR Workshop

WGII: Understanding “actionable” information in hydroclimate research

GUIDING QUESTIONS FOR DISCUSSION:

First part (4th July, 13:15-14:30)

Notes #1 (Nadia)

Notes #2 (Dhiraj)

Second part (4th July, 15:00-16:30)

Notes #1 (Nadia)

Notes #2 (Dhiraj)

Third part (5th July, 10:45-12:00)

Notes #1 (Nadia)

Notes #2 (Dhiraj)

GUIDING QUESTIONS FOR DISCUSSION:

- **Q1:** What are successful examples of using hydroclimatic data to implement sustainable water management practices or resilience-building initiatives?
- **Q2:** What are key challenges in accessing, interpreting and applying hydroclimatic information for decision making? What practices increase the trust and motivation between community, stakeholders and researchers to generate accessible hydroclimatic information?
- **Q3:** What role should early career researchers (ECRs) play in generating actionable information and fostering adaptive solutions to hydroclimatic extremes, and how can they be supported in these efforts?

First part (4th July, 13:15-14:30)

Notes #1 (Nadia)

Idea -

Working with the community from the beginning. Co-production of knowledge.

Experience -

Pakistan - agriculture - ONG - farmers - academia

Translate academic language to a different more understandable language* for the community: example - in Pakistan a ONG provide to farmers (specially women farmers) instruments to measure the soil water so that they know when to irrigate; collaboration with academia with questions from the community (research areas also change to areas with less “beautiful” data but to places where it is more usable) in monthly meetings with social mobilizers. Students' topics for their thesis come from here, but they find it less attractive, it is more difficult, takes more time!. Gender barriers: in the government agriculture departments

have to be at least 50% women (for all the departments indeed) - it did help improve the communication between the departments and the farmers, this was reflected in more production. They built trust in academia. Funding barriers! → look beyond the window, fill the gap → demonstration, show this actionability to funders for example.

**understandable language: ? ; also adding pictures.*

**Idea -
Uncertainty**

How to communicate the uncertainty; who would cover (economically) the uncertainty; liability - demonstration (but not only into academic boundaries);

**Idea -
Accionable**

Country level. This last one: researchers have to have freedom → findings on the research should be translated by the government. Productivity of the researcher. But is all research actionable? We do not think so. Limited time, resources, etc.

**Experience -
Pakistan #2**

Support scientists to get inside the problems that require their knowledge. Government department with social scientists, climatologists, different sectors together to face extreme events. The main challenge for academia: data! free ground-based data is not available (not free), only satellite-based data. The second issue for academia: not having servers. Lack of resources.

To get close with the community. First: you are not part of the community, you are not welcome; it needs time and demonstration.

**Experience -
Bangladesh (Indian border)**

Rainfall area. Government put resources into controlling the floods, but without adding hydroclimate scenarios! sustainability during time is at risk. So from Japan they propose that during the implementation they implement climate scenarios: how to manage the uncertainties: cost is going to be high and the sustainability of the projects.

**Ideas -
Communication**

With local communities; policy makers (not technical, without time, interest in money) - cooperate more with economists. For example: write a paper and also the "translation" of it into an actionable language. The academic system has to start taking into the account the creation of documents for policy makers or the community.

**Ideas -
Data**

Sharing the data - cross-boundary. It does happen in some regions (Europe, Canada, EEUU) but not in all. Creating data: satellites does not replace ground-based data; continuity of data creation is important.

Ideas -

Evaluation of research

It is not appropriate to make actionable data. Produce papers.

Ideas -

Role of ECR

Knowledge of the gap with the community. Take time to be involve with the policy makers.

Experience -

Canada - Open seminar

Open presentations of the research to the community. It opens rich discussions. This didn't work in Pakistan

Experience -

Germany

The project includes a resource to communicate or inform the research to policymakers and the community.

Notes #2 (Dhiraj)

Q1, from experience (already known from practice) or co-production

academic knowledge to practice is a complicated thing, especially working with the community,

Research to framers, translation from technical to easily understandable formats using, pictures, and examples,

sharing weather information (e.g. soil sensors for crop water requirement helps optimize water supply,

pakistan, NGO to women farmers (75% are women), weather information system which translates technical terms into simple information. This helps farmers to prepare in advance.

academic to more simple formats, sharing information it and also getting feedback from the farmers.

Need-based research is in place with consultation with farmers.

crop production in a research center is different from the actual farm sites.

How to build questions to communicate with farmers. Monthly meetings with farmers, and social mobilizers do the facilitation.

Cultural barriers and social norms is overcome in pakistan, 50% of government officials are women. This has increased production.

The 2022 Pakistan flood impacted women and children disproportionately.

How do residents know about academic research? the researcher lived in a small village and they know each other well.

In Hokkaido University lacks this and there is a need to bridge between academia and locals. Community trust from locals to academics is a challenge. When project ends (financial support concludes), the activities also get stopped - sustainability of these.

Lack of funding support to Non profit organizations (smaller one) is getting bigger issue. Funding is mainly focused to big organizations, like FAO.

Community trust could be increased by continuous communication.

Students don't want to work with community as it takes time.

These are barriers for academic research

piloting and demonstration are needed.

Uncertainties in weather and climate data and forecasts

Liability and Insurance (e.g. crop insurance)

actionable - community or country level? we can't bind the researchers to do in the country level. there should be separate persons/team

bottom up approach should be backed up with top-down approach. Scientific people, not doing research need to

All scientific research could be actionable, responsibilities of researchers,

NDMA - prime responsibility is to connect Met Dept to policy making, and society, and all, under one platform, - An example of Pakistan,

challenge for an academia is ground-based data collection is not allowed. So the researchers are dependent on remote sensing (satellite) Data should be freely available for the scientific community. Grant to be allocated for research and data collection. - Lack of resources for research.

Non-residents have difficulties in accessing and collecting data from the community.

Example from an environmental sensitive area in Bangladesh, near India, every year there are floods, implemented projects are failing due to uncertainties.

challenge is uncertainty in hydroclimatic (climate sensitivity) and making infrastructure climate resilient. 2010, World Bank before the PPCR project. The sustainability of the projects is the issue and the cost is high to incorporate climate change factor.

Communication in both ways,

Anticipation in advance is needed

Data lacking is still there

Transboundary data sharing is important, Germany, Belgium, and Netherlands,

Policy making people are not scientists, their focus is on money, scientists need to have economists.

Data sharing is not an issue in Europe.

Creation of data needs evolution in data generation, and reproducing data need to focused.

Community ready data, data generation from citizen science, continuation of data generation, valuing the previous project and research (continuation of data generation)

agencies need to be responsible for continuation, hydropower generation, communicating research,

policy briefs could be added in scientific research publications, and submitting and ECR like community could be brought into this connection, and

Translating academic research work to simple language.

The academic system needs to consider bridging between researchers and policy-makers.

Open seminars (public) are popular in countries like Canada, but not in countries like Bangladesh. There are good thoughts of having this but there is a lack of interest from both sides,

posters or leaflets to the public,

TEA BREAK

Second part (4th July, 15:00-16:30)

Notes #1 (Nadia)

Experience-

Netherlands

Open PhD dissertations, stakeholders don't show up. We should listen more: "what do you need to know?" instead of: "listen to what I have to say"

Experience-

Australia

Going to the media, radio, TV. Work together with the media. Meeting with the government.

This interaction is really useful when it concerns money and risk assessment - economic loss (also companies are interested in this last one). "Bridge position" of scientists.

Ideas-

Bottom-up

Communication is not in one only way.

Ideas-

Definition of actionable

Sharing the definition

- Japan: for municipality - future potential risk ; for residents - have the trigger from themselves for evacuation
- Australia: during dry periods - how much water can you use?
- Nepal and India: flood upstream (Nepal) to downstream (India) community communication.
- India: Cell Phone flood alerts. In Pakistan they want to

Experience -

Africa - *Domesticating the information.*

Africa: *Domesticating the information.* Early warning systems - most scientists understand it but that data coming up everytime is not something that farmers would want to read. Video Clips for the farmers instead of data.

Idea -

Background knowledge

Education is important for increasing background knowledge.

Idea -

Dialogue within different research communities - global scale information

Global scale information needs to have this approach? E.g. improving forecast - who is the community? - Importance of global research to be able to make actionable information at local scale.

Idea-

Local scale

"The valuable research is the global one" (in the academic sector). How to support? Local information is as relevant as global information. What is relevant/not-relevant? Which scale? The local scale research is not "listen".

Idea-

Dialogue within different research communities

Impact modeler - in the mercy of the quality of the global scale information. Actionable information for different sectors like engineering, etc. Think also of the ones who use the outcomes. Constant horizontal communication. We could incorporate the community into this dialogue.

Idea-

How to involve local communities?

Why should people listen to you? incentive for community e.g. tools. Community needs specific and reliable information according to their needs, no general information or for a great region.

Experience-

France - dialogue within different research communities:

Research communities on hydrological models don't do a BIAS correction of the models' data and then share their outcomes! - Same with crop models. It is really important to have dialogue within different research communities.

Idea-

Data

Who is responsible for the lack of data in low mid-low income countries? role of collaboration, understanding science as global.

Idea-

Collaborations

What do we want to build together? How to collaborate between different regions and different disciplines.

Idea-

Role of ECRs

ECRs role: We can learn new technologies.

Notes #2 (Dhiraj)

Summary from the previous session

Data sharing and generation of data

Communicating with

Diversity of research and recruitment, valued in the job, a slow changes in early career research.

Open house and public talks could not attract general public. Creating awareness is still a gap.

Australia, 5 big universities started a program (radio and TV) inviting research when hydroclimatic calamities are there. Feedback mechanism from scientists, risk assessment is very popular, not only for government but also insurance companies. A dept is dedicated for climate risk assessment with models. They work both with local and central governments. Local governments make plan for 5-10 years based on risk assessment.

How do we define 'actionable'?

Actionable examples from each country/region:

1. Japan, municipalities and communities have criteria, mountainous passed observation to
2. Australia, drought warning level.
3. Nepal, community alerting another downstream community for flood warning.
4. Cell phone providing companies do the mass communication to public for flood warning.
5. 7 M people are affected by floods, upstream people helping by sharing data to downstream; only lone raingauge was there, now communities have raingauges at schools, hospitals, and share these data to downstream people. Numbers (mm of precip) were not customized in the past. We need to be creative in building new knowledge. Long messages could not make sense, therefore, communities need to be consulted how we could cutomize
6. Nigeria, NMHS, scientists and research are focused on data, but farmers don't like data. they like short video clips.
7. two ways communication is needed (one sided is not useful).
8. paramaterizion improvement is important in models.
9. improvement of paramaterization
10. Actionalbe information. Radiation - as an example
11. we need to focus on what is needed?
12. data, server are - global meodels.
13. Local information is indeed. Shallow water table example an example, local scale is not recognized.
14. Localized, impact modeller, data quality is important. It is more localized, as one thing that works in one place may not exist in another.
15. Not only from scientists to communities, but also from one discipline to another, and one journal to another.
16. Global climate model needs to be localized.
17. There should be incentives for communities for project participation. Meteorological instruments are old and outdated.
18. People don't listen to weather warning. Social media (tiktok, youtube, etc.) are popular in communicating. But, we need to be very careful about fake
19. drip irrigation, example, a short videos are helpful in communicating, how efficient (saveing 60% of water) it is against flood irrigation.
20. Interaction with the community is needed. building knowledge, and actionable information.
21. Climate modellers (global climate) explain technicalities to the other scientists. And, a feedback mechanism should be in place to improve model performance.
22. You and your audience verses you and public! penetrating information to public.
23. France, hydrological modellers not knowing bias correction in climate forcing data. Crop modellers used ERA-5 used and results were very different.
- 24. Regional scale of ERA-5 is not really good, so they need to bias corrected before using it.**
25. Bangladesh flood 2010 have very different interpretation and results from different sources. There is a need to have consistence framework.
26. We continue creating data, we still have data gaps.
27. Reliable data is the major issue. Impact information is important.

28. Data alone is not sufficient. No new information is there.
29. Instead of having continuous data from the same location (global north) and not installing stations in global south.
30. Global models are validated only in global north and not global south. Global communities need to have support, not because we giving them, but, they are part of the global model.
31. Collaboration is needed, not for just utilizing available data. But, collaboration is needed not withing a single discipline, but also multidisciplinary.
32. IPCC report could also be reviewed by ECR, as it was doing in the last report.
33. ECRs can utilize cheaper new technologies.
34. AWS are getting cheaper and can cover 10 km
35. There are many aspects to "actionable" information. For data producers, they might need to inform scientists about the errors present in their algorithms so that users can understand what constitutes "actionable" information. For scientists, they might need to inform people about which data is "actionable" information and what errors are present. In fact, these "actionable" information pieces are interlinked, and even people from different fields need to communicate through "actionable" information. This approach can maximize the avoidance of knowledge gaps. (by Jie Hsu)

Summarized for Q2&Q3:

For example, people engaged in model simulation research might not know that there are significant biases between reanalysis data and observational data (gauge, satellite observation). Additionally, users of gridded data might not be aware of some observational limitations in the initial observational data (e.g., sparse stations in mountainous areas). These data present a certain knowledge gap for users at different levels, not only because of their different fields but also because using different types of data to explore different research topics (at different scales) affects the credibility of research results. For these reasons, it is sometimes challenging to confidently use model simulations to convince people about future scenarios or the results of idealized model simulations, because observational patterns and present-day patterns can be quite different.

Therefore, I believe the role of ECR can be to assist and bridge knowledge gaps at different levels, explaining the multiple aspects of the results seen in these data, including data uncertainties and "actionable" information. Thus, ECRs can further support "climate services". This might be a transitional period, as the increasing frequency of extreme weather events will naturally prompt people from various industries and fields to approach issues from a fundamental scientific perspective. This progression is a part of the advancement of science, tools, and knowledge, driving human progress. (by Jie Hsu)

Third part (5th July, 10:45-12:00)

Get 5 bullet points to structure for the white paper

Notes #1 (Nadia)

Bullet points - first ideas

- Re-define actionable information:
 - ask users which data is actionable,
 - inform users what errors and uncertainties are present,
 - communication between disciplines,
 - reduce gaps
- Collaboration, cooperation, co-production. Clearly know the parts involved. Collaboration between scientists-users-stakeholders. Dependency of the context: sometimes communication is directly between scientists and stakeholders but others we need a bridge. Know the limitations of the actionable information.
- Global and local scale - how to interact. Sharing knowledge and learning from each other.
- Trust and transparency (of limitations for example) - importance of documentation -
- Source (co-production/etc) - data (transparency) - end-user → this is a possible way of dividing the points (main components of actionable information)
- Data collection and uncertainty (transparency of the limitations)

Bullet points - second iteration - working on the ppt

- Usable and useful information
- Customization of the information
- Domestication of the information
- Quality of the information
- Money/funding/lack of resources
- Collaboration:
 - go from communication to co-production with stakeholders
 - interdisciplinary work
- Whenever we do scientist
- ECR: Capacity building
- Importance of characterization
- Transparency in data, information, values, and process. Accurate data and information. Be clear about the limitations.

Bullet points - third iteration

- Data: call for action to fill the gap
- Co-production: iteration - feedback mechanism - horizontal way - what they need.
- Collaboration: across scales -global to local-
- Information
- How to prevent limitations - success examples of overcoming the limitations
- Trust and transparency
- Research collaboration: key role of ECR (have program and funding mechanisms to empower ECR). Communicate the position of ECR. **Push for this to be valuable.**

- **Create fair collaborations between ECRs of different regions.** Empower the ECR role in leading efforts or processes. Symmetrical and horizontal scheme.
- ECP (early career professionals → to include researchers, professors, etc)
- Importance of demonstration and piloting (validating any processes)
- Transboundary data sharing, gender issues.

Notes #2 (Dhiraj)

1. Actionable needs to be redefined. Many aspects of 'actionable', are informing the data users about uncertainties of data, and getting their inputs (feedback).
Source-Data-End users are the three components of actionable. Understanding the errors and uncertainties of data
2. Collaboration: from communications to coproduction, clearly identify parties (researchers, stakeholders, end users) and make trans, inter-disciplinary), and bridge between science and end-users.
3. Global-regional-local learning, challenges - lack of resources
4. Reliable forecasts, trust generation, and having transpirations of limitations, and errors.
5. customization, localizations (domestication), along with piloting and demonstration.

ECR - ECP (professionals, practitioners, researchers, professionals)

1. Collaboration and co-production with all stakeholders including local communities, while building the capacity of user communities - by ECR.
2. Limitation of information, lack of resources (infrastructure and funding) trust building, transparency, and documentation, and sharing data collection and its uncertainty.
Transparency of the values and data sources.
3. How to overcome the limitations? Success stories, Demonstrations, Piloting
4. ECR needs to be empowered, with resources and authority to lead research projects; ECR to be valued.
5. North-South-South collaborations among ECRs, and valuing ECRs.

Presentation:

<https://docs.google.com/presentation/d/1MjkJK8V8YpDDfQy48Xwizt12lgijQU9cawxydDUHqHE/edit?usp=sharing>