12 people join this discussion

1.1 An integrated and customized S/GDPFS System

- **What do we know about user groups and their needs, models, data and interface that could be integrated in Earth System?**
- **What issues related to coordination and interoperability need to be addressed? What (pre-existed systems) can be leveraged?**
- **What are the low hanging fruits to advance the S/GDPFS system?**

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who are the users

- Obviously the NMHSs, but extend to other stakeholders
- separate users into 2 types.
  - NMHS
  - Final beneficiaries: users, decision makers at various levels
- Decision makers need information to be able to plan at different levels and timescales (Global, regional, long/medium/short term, immediate emergency)
- Does end user include the research community?
- Need to discuss this in the context of the WMC … taking on the responsibility in the global context, not the local context.

Needs/models/data/interface

- Needs at policy level, contingency planning level, on the ground at the practice level. And could start at ground level and work up.
- Gap in understanding what the tools can actually do – need to inform both operational branches of NMHSs and stakeholders outside NMHSs.
- NMHSs as interface between what is possible and what is needed, what is impossible now but could become possible given more research.

issues related to coordination

Feedback

- How many elements, feedbacks do we need and does each centre have the same answers. (e.g. predictions for air quality, may need feedbacks between chemical/aerosol and physical).
- Feedback loop to GDPFS Systems…feedback from user to provider needs to be formalized.
- Feedback not only through NMHSs but also through regional bodies to collate the feedback.
- Role of verification – need to further develop and implement verification methods, even more so when linked to impact based forecasting.

Potential Pilot projects for low-hanging fruits

- Planned Asian Typhoon activity …. Has some low-hanging fruits as well as major long-term challenges
- CREWS
- Providing Air Quality information
- Link to SWIFT with potential for pilot project linking to training outcomes?
- Link of humidity and dust to meningitis ….. currently just using observations – need for forecasts 1-2 weeks ahead. End users / financial beneficiaries are known – could be linked to MAP-AQ. Requirement for Annual prediction and monthly predictions from Nigerian government. Opportunity here to see what can be done with current information as well as motivating research to meet the challenge better on the long term.

12 people join this discussion

1.2 Accessibility and web platform (leaning to WIS 2.0)

- **How S/GDPFS could take full advantage of WIS 2.0?**
- **What are the alternative systems/networks for accessibility to ensure key information is received by Members in emergency case?**

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BIG data

- Use of cloud to run processing closer to the data to avoid moving big data. This is particularly beneficial for LDC with low communication bandwidth.
- Functions of DCPC/GISCs will be revised to provide access to services to meet needs of users.
- Remote processing of data residing in different clouds is a challenge and requires interoperability between clouds.
- Issue of data storage major issue for African countries

Data exchange

- New technologies for data exchange are going to enable exchange of data in more efficient way and lower the barrier to disseminate data on GTS.
- Atmospheric Composition Data issue to be addressed: different data, not real time, not in the remit of the NMHSs, different providers (University, city, etc). Challenge is getting people to provide data to service, need agreement from providers to provide data and authorization to do so. Also, example of small sensors ….
- Data Formats are a challenge and require a function of data aggregator. We have examples of this in the GCW and JCOMM (contributing with WIS 2.0 demonstrator projects)
- Hydrology data formats are already in WMO regulations. HOS to be considered as WIS 2.0 demonstrator.
- General issue is motivating organisations / people to provide data. And the challenges involved, e.g. visibility, see that it is usable

Alternative systems for emergency cases

- WIS 2.0 will provide Message Queuing technologies to deliver alerts to population. Demonstrator projects: Canada, RA VI
- China is sending images with WeChat to population
- In Nigeria Youtube is used to send alert communication.
- Social media are seen as a good mean to send alerts to the general public.

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Breakout Group 3
Research and Innovation

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Innovation and Research themes

- Seasonal e.g. for water management, drought and desertification - challenge of improving skill (S2S)
- Cryosphere (PPP&YOPP)
- Connecting Atmospheric Composition to Earth System Framework (WGNE, GAW, …..)
- Communication (HIWeather)
- Risk to infrastructure of cities on all timescales
- HPC, Data storage, AI – a gap, but address in a cross-cutting manner
- Using analysis of forecast busts to guide NWP development
- Predictability studies in general - targeting specific regional features and assessing performance of WMC data
- Getting into the details of model system development (WGNE / DAOS / …..)

Co-design - Example from Africa

- Identify user sector, e.g. humanitarian sector
- bring those responsible for operations and research together with decision makers.
- Identify how they make decisions, what information do they need. If information exists, how can existing products be tailored.
  - Come up with prototype, use forecast demonstration phase to detail design of service, move to pilot demonstration in operational setting.
  - Link prototype to research --- gather the knowledge from those using the prototype within a country and feed that back into research
- If information does not exist, can this information realistically be developed? If it requires research, then plan for it.

Co-design

- Testbeds used in many countries – bring forecasters and researchers together for specific cases – how can these be utilised in regional and global coordination?
- General need for regional coordination and then need bridge to the WMCs – reverse cascading system
- Metrics
- Co-design in an interdisciplinary setting is a major challenge!

Obstacles to Innovation

- Example of TIGGE – freely available for research and new tools developed based on this, but then not for operational usage – business model / data policy
- Atmospheric composition: research-operations interaction less mature, need mechanisms to get the academic community involved.
- Challenges of making technological advances, need new expertise, speed of new products.
- For developing countries: resources – money for infrastructure and for human capacity to run and use it.
- Need to develop communication methods and use the appropriate communication channels on the ground

Obstacles to Innovation

Need to provide opportunity for the research players to interface with the operational players.

- Challenge of making time for operational people to interact with research (and vice versa). Challenge of having time and skills on the ground to use the available model information
- Get university people in the country / region involved in the SWFDPs.
- Motivate university researchers to work on the key challenges, funding process studies may not have the direct impact on operations though.
- Issue is pressure on academic community to publish papers – need to take into account the misalignment of metrics. Could depend on stage of career of researchers ---- need to choose who to engage with care.

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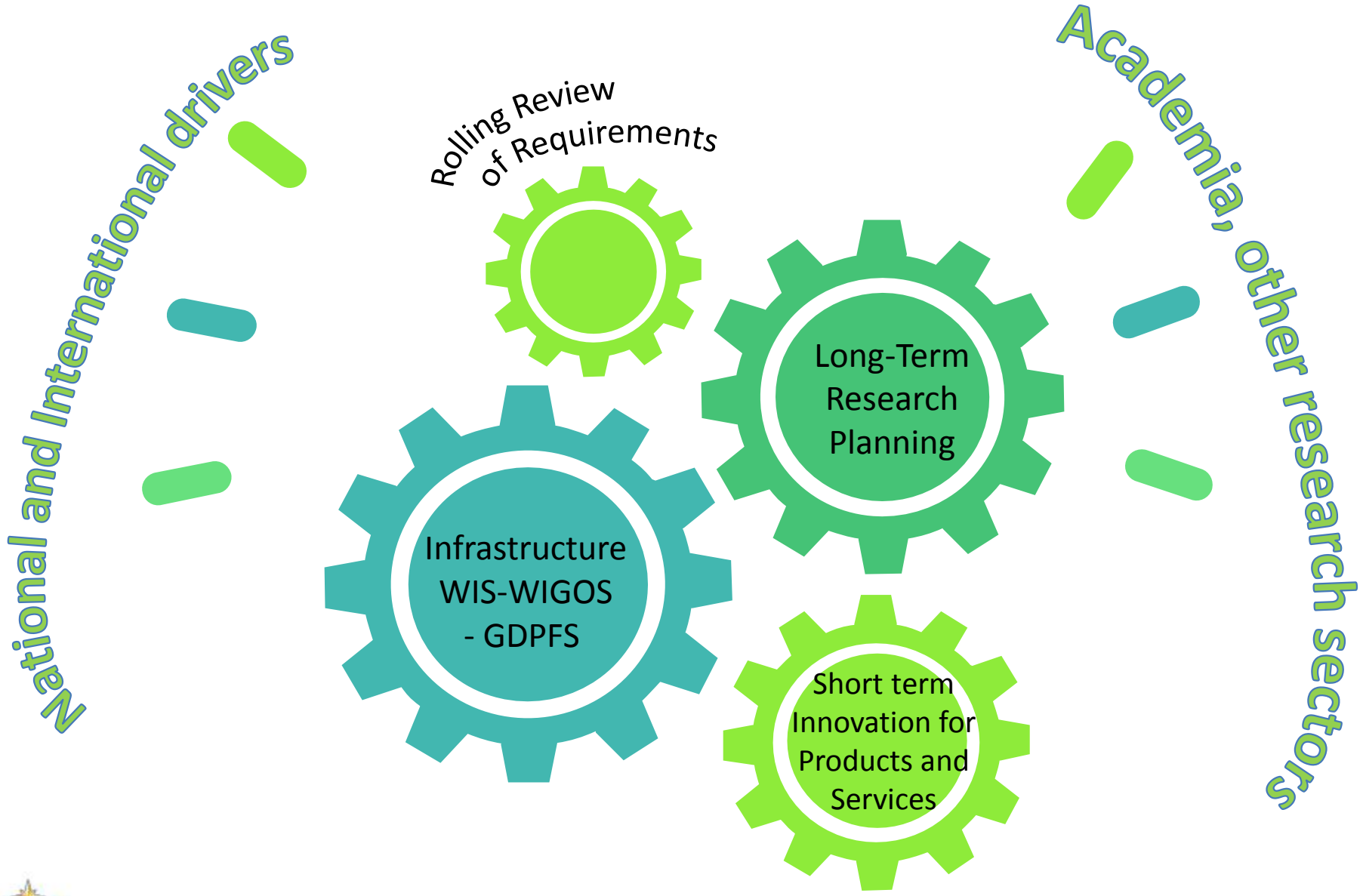
Interactive model & Co Design



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