Tropics & Sub-Tropics

How can available hydrological tools be made usable by practitioners:

Data Poor Situations
1. Protocol for catchment function diagnostics and model setup.

- Use of a decision tree as a preliminary stage to modelling.
  - Guidelines and decision support to aid in setting up models in different situations.

- Sequences in modelling (possibly iterative)
  - Basic process understanding.
  - Data assessment and compilation.
  - Model choice (typically limited for practitioners)
  - Model parameterisation and output assessment.
2.1 Basic process understanding.

• Available information to assist:
  – Clearing house of global datasets and access details (need a starting point).
  – Metadata and guidelines to the value of different information sources.

• How to interpret this information?
  – Guidelines for the process of interpretation.
  – Determining dominant processes.
2.2 Clearing house and guidelines

• Recommendation to initiate a project to develop a watershed & hydrological information portal (WHIP) and decision guidelines:
  • Sources of information.
  • Guidelines on use of data, inferences that can be made.
  • Examples of how to use the data.
3.1 Data assessment & compilation

• Guidelines related to:
  – Appropriate scale, resolution and accuracy.
  – What is appropriate is informed by model and objective of modelling.
  – Data checking and integrity analysis.
  – Problem of disinformation.
  – Integration of local and global datasets.
  – Value and use of soft data (indigenous knowledge).
  – Forensic hydrology (especially for extreme events).
3.2 Additional data required?

- Guidelines on what additional data can be collected or how to further process the data:
  - Limited field campaign:
    - Timing of visits (boundary/transitional periods) to identify non-linearities.
    - Informed by process uncertainties.
  - Examples of data processing (disaggregation and aggregation).
4.1 Model choice

- Typically restricted in practical situations:
  - Guidelines therefore need to be model specific.
  - Generic guidelines related to model type (conceptual, etc.) rather than a specific model.
    - Such as checking that dominant processes are represented at appropriate scales.
    - Model scale is appropriate to the scale of the available data and the objective.
5.1 Model parameterisation

- The same information used for process understanding can be used for model parameterisation:

- The main issue is how to create methods that are accessible to practitioners:
  - Develop estimation methods.
  - Some generic components, but details are model specific.
  - Should include uncertainty distributions.
  - Offer training courses and manuals on all methods.
5.2 Including uncertainty

• Guidelines on how to run different models in an uncertainty approach:
  – Different methods would apply depending on the model and whether it already allows for uncertainty inputs.
5.3 Output assessment

- Guidelines would be needed for practitioners to assess the validity of uncertain outputs and what to do with them.
- Guidelines on potential for reducing uncertainty.