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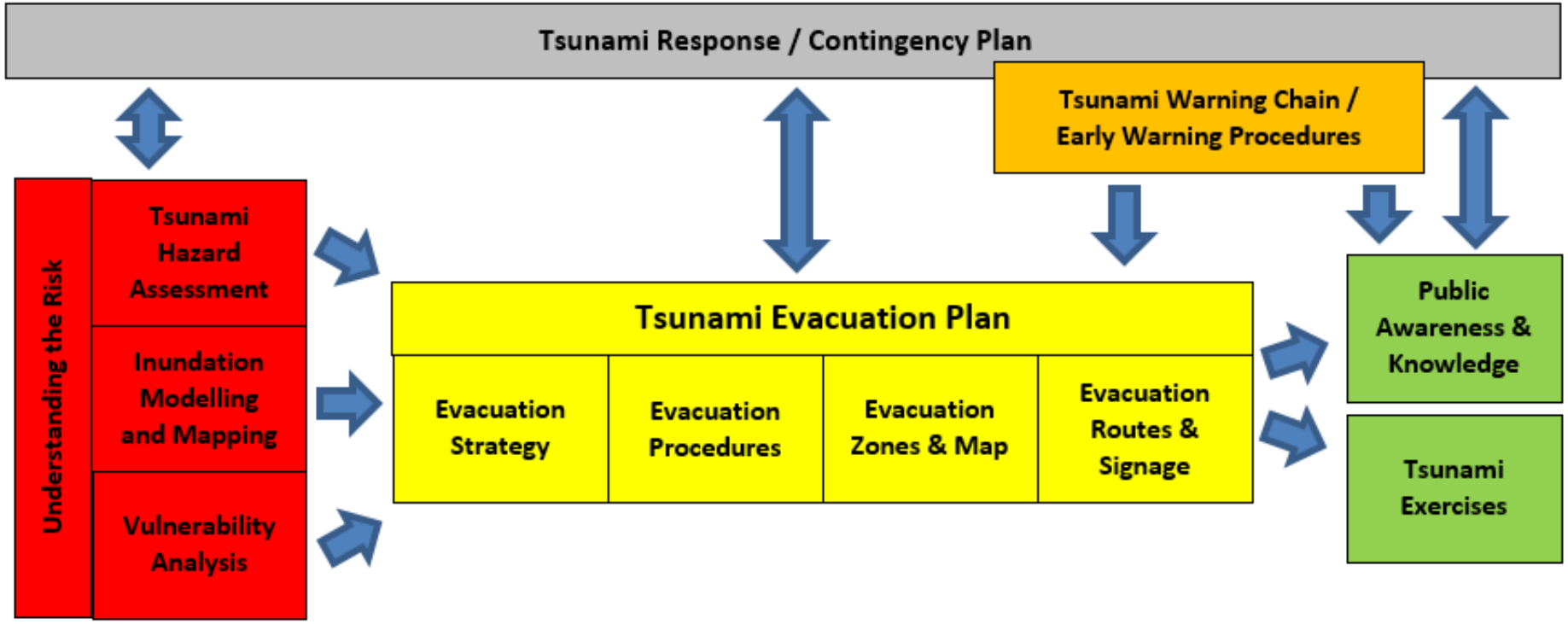
Requirements for Inundation Mapping from the Tsunami Evacuation Planning (TEP) perspective

By Harald Spahn

North-West Indian Ocean Regional Workshops on
Tsunami Inundation Mapping and Evacuation Planning
Muscat, 21-25 April 2024

Hazard Assessment and Inundation Maps

are main references for TEP



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Introductory remarks

- One of the **biggest obstacles for TEP** today is the **lack of solid and recognized hazards and inundation maps** as a basis for planning
- There are **various approaches for estimating inundation**, which can be applied depending on the circumstances. Even simple approaches can produce reasonable estimates, that may be sufficient for certain settings
- In principle, a **TEP should always be based on the best available information** on the tsunami hazard and inundation, and be consistent with official guidelines where available
- However, a TEP initiative should not be delayed or postponed just because there might be **better information in the future**. If it is ensured that better information will shortly be available, this may of course be a reason to wait a little longer

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Essential Hazard Information for TEP

- **Tsunamis of different origins (seismic and non-seismic)** which can affect the area and the respective **location of source areas**
- **Multiple threat scenarios,** from deterministic (worst case, most credible scenario, historical events) or probabilistic approaches with indication of **maximum wave height at coast**
- Decision on **selection of tsunami inundation design parameters**, that cover the inundation of tsunamis of all different origins
- **Inundation map** showing **flow (inundation) depth** on land
- **Minimum estimated arrival times (ETAmin)** for tsunamis of different origins

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Requirements for Inundation Maps

- Inundation Maps need to visualize the **entire area that can be inundated by tsunamis of all different origins** that can occur.
- Preferred are inundation maps visualizing multiple scenarios indicating the **probability of an area on land being inundated**
- In case of a single scenario map and with a deterministic approach, it should represent the **worst case or the most credible** scenario
- Single scenario inundation maps should show **flow (inundation) depth** on land
- **Resolution of 10 m** would be sufficient for TEP purposes
- Maps should provide information on **ETAmin** for different source areas
- Information on **impact energy** of tsunamis on land can be helpful, but is not essential

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Considerations on non-seismic sources

- It is understood that inundation modelling based on the results of the PTHA for the Makran Region only comprise **seismically induced tsunamis**
- However, from a community perspective, it is important to know the entire area that can be inundated by tsunamis of any type, including volcanic and landslide induced tsunamis. There is a need for further research here.
- It remains to be investigated whether it is useful to distinguish and show **inundation areas for different types of tsunamis** in such comprehensive inundation maps.

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Other Considerations

- Regarding **accuracy / resolution** of inundation maps one must have in mind that the modelling of propagation on land involves usually considerable uncertainties due to the application of a single roughness factor to represent the natural or built environment. From therefore the maxim should be: “it is better to be roughly right than precisely wrong”
- **Replicability**: the methodology for inundation mapping introduced and applied by the TTF-project in Pilot Areas should be replicable with own (national) resources for other areas in the partner country. Access to HPC technologies for inundation modelling is probably not realistic in most partner countries.
- Inundation modelling and mapping “**on the fly**” is not required nor useful for TEP

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