Terms of Reference
ITU-T Focus Group on Artificial Intelligence for Natural Disaster Management (FG-AI4NDM)
(Approved by ITU-T SG2 on 2020-12-18)

1   Context and scope

Natural disasters are generally defined as a "potentially damaging physical event"[1] of a predominantly natural origin (e.g., atmospheric, hydrologic, geophysical, oceanographic, or biologic).[2] Adverse effects of these events include injury, mortality, displacements, damage to property (including cultural heritage) and infrastructure, and disturbance to nature and natural resources.

Between 2005 and 2015, natural disasters impacted 1.5 billion people in various ways (700,000 lives were lost, 1.4 million injuries were suffered, and 23 million were left homeless),[3] and it has been shown that these natural disasters were predominantly hydrometeorological in origin. The situation is particularly acute in small island developing states (SIDS) and least developed countries (LDC).[4] Furthermore, women, children, and individuals in vulnerable situations, in particular, are disproportionately affected.[5]

Unfortunately, the effects of natural disasters are anticipated to grow through the combination of population growth, rapid urban development (often in otherwise vulnerable regions), and the growing frequency and intensity of certain types of natural disasters, in particular, those related to atmospheric, hydrologic, and oceanographic processes.[6]

As a result of these widespread and diverse impacts, natural disasters are targeted in the activities of multiple United Nations offices (e.g., United Nations Office for Disaster Risk Reduction), programs (e.g., United Nations Environment Programme), and organizations (e.g., World Meteorological Organization; United Nations Educational, Scientific, and Cultural Organization). Furthermore, natural disasters feature prominently in reports including the *Hyogo Framework for Action 2005*[7] and *Sendai Framework for Disaster Risk Reduction 2015-2030*,[8] are the subject of a previous Study Group 2 focus group,[9] and are explored in a 2019 ITU-D report.[10]

To minimize the costs (including the adverse effects listed above) and enhance the preparedness for (and response to) natural disasters,[11] FG-AI4NDM explores the potential of AI to support data collection and handling, improve modelling across spatiotemporal scales through extracting complex patterns (and gaining insights) from a growing volume of geospatial data, and provide effective

---

[1] https://www.unisdr.org/files/1037_hyogoframeworkforactionenglish.pdf

[2] We acknowledge that there is some controversy surrounding the use of the expression "natural disasters" to describe such events (https://link.springer.com/article/10.1007/s11069-016-2726-x and https://www.preventionweb.net/experts/oped/view/72768). However, many natural scientists (and other stakeholders) still recognize and utilize the term.

[3] https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030

[4] https://library.wmo.int/doc_num.php?explnum_id=10385

[5] https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030

[6] https://www.ipcc.ch/site/assets/uploads/2018/03/SREX_Full_Report-1.pdf

[7] https://www.unisdr.org/files/1037_hyogoframeworkforactionenglish.pdf

[8] https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030

[9] https://www.itu.int/en/ITU-T/focusgroups/drnrr/Pages/default.aspx

[10] https://www.itu.int/en/ITU-D/Emergency-Telecommunications/Documents/2019/GET_2019/Disruptive-Technologies.pdf

[11] FG-AI4NDM will also consider inclusion of events of non-natural origins, provided that they are deemed to be clearly influenced by (or of influence to) atmospheric, hydrologic, geophysical, oceanographic, or biologic processes.

communication. To achieve these ambitious objectives, FG-AI4NDM will converge multiple stakeholders and experts from across the globe. Special effort will be made to support participation from low- and mid-income countries and those countries shown to be particularly impacted by these types of events (e.g., SIDS and LDC). Finally, FG-AI4NDM will advance the efforts of parent group Study Group 2 to provide disaster relief/early warning and recovery through telecommunications technologies, and build on the work of the previous ITU-T Study Group 2 Focus Group on Disaster Relief Systems, Network Resilience and Recovery (FG-DR&NRR).

2   Goals and objectives of FG-AI4NDM

FG-AI4NDM will pursue the following broad set of goals:

1. To build a community of stakeholders and experts[12] from around the globe to explore the use of AI (in the context of data, modelling, and communication technologies) for natural disaster management.[13]

2. To maximize synergies within this community to support the interlinked goals of the UN for a better and more sustainable future.[14]

3. To identify projects in the area of AI (in the context of data, modelling, and communication technologies) for natural disaster management and to find ways to optimally incorporate their outputs into the focus group activities. To identify areas where AI (in the context of data, modelling, and communication technologies) can (but does not yet) support natural disaster management with a particular focus on vulnerable and resource-constrained regions.

4. To identify any activities related to the use of AI for data, modelling (reconstructing, forecasting, and projecting), and communication in natural disaster management.

5. To identify current best practices on the use of AI to support data, modelling (reconstructing, forecasting, and projecting), and effective communication[15] in natural disaster management.

6. To support efforts being made to develop global data repositories (including cloud solutions) on relevant natural disaster data for use cases (i.e., specific natural disaster types).

7. To support the implementation of the *Sendai Framework for Disaster Risk Reduction (2015-2030)*.[16]

8. To liaise and collaborate with other ITU-T study groups to ensure a harmony of complementary activities.

---

[12] This includes representatives of the UN, government agencies and policy-makers, standard developing organizations (SDO), scientific unions and professional societies, academies, researchers in multiple disciplines including geosciences and AI/machine learning [and other areas of information and communication technology (ICT)], and industry members (including areas of ICT).

[13] In particular, to encourage SDO to participate in the activities of the focus group, to facilitate the exchange of perspectives of ICT users (in the context of AI), and to explore relevant socio-economic and policy implications. Special effort will be made to support participation (e.g., through identifying potential sources of financial support) from low- and mid-income countries and those countries shown to be particularly impacted by these types of events (e.g., SIDS and LDC).

[14] https://sdgs.un.org/goals

[15] This includes technical aspects (e.g., how AI and other digital technologies can be used to transmit communication; what opportunities exist for communication infrastructure) and sociological/demographical aspects (e.g., how individuals of different backgrounds and abilities respond to different forms of communication; and inclusiveness, for instance, the needs of vulnerable populations).

[16] https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030

3   Structure

FG-AI4NDM can create subgroups as needed. To coordinate operations and provide guidance to subgroups, there will be a chair and vice-chairs.

4   Specific tasks and deliverables

Tasks and deliverables developed by FG-AI4NDM may include the following:

1. Constructing a roadmap for AI activities (in the context of data, modelling, and communication technologies) in natural disaster management.

2. Establishing a roster of stakeholders and experts and making a concerted effort to engage them in focus group activities.

3. Holding workshops that bring together stakeholders and experts, highlight ground-breaking activities in the area of AI (in the context of data, modelling, and communication technologies) for natural disaster management, and facilitate recruitment of new focus group members. In addition, evaluating proposals of new use cases.

4. Working towards drafting non-normative deliverables (e.g., technical reports) on the use of AI to support data, modelling (reconstructing, forecasting, and projecting), and effective communication[17] of natural disasters, based on input from the use cases.

5. Working towards development of educational materials (e.g., online courses and pamphlets) in conjunction with WMO (and other partners), which make the content of (4) accessible to all stakeholders and experts, in particular, those in SIDS and LDC.

6. Creating a comprehensive report, once FG-AI4NDM has achieved the aforementioned tasks, which summarizes these accomplishments and provides suggestions for future directions.

5   Relationships

FG-AI4NDM will work closely with relevant study groups in ITU (-R, -T and -D) including co-located meetings when possible. It will also establish and maintain task-appropriated collaboration arrangements with other groups in ITU and with WMO as well as other UN bodies (e.g., UNEP, UNESCO).

Furthermore, FG-AI4NDM will collaborate (as required) with other relevant groups and entities, in accordance with the Recommendation ITU-T A.7. These include governments (i.e., ITU member states), non-governmental organizations (NGOs), policy-makers, standard developing organizations, industry forums and consortia, companies, academic institutions, research institutions, and other relevant organizations.

6   Parent group

The parent group of the FG-AI4NDM is ITU-T Study Group 2 "Operational Aspects."

Study Group 2 leads ITU's work on telecommunications for disaster relief/early warning, network resilience and recovery, including the coordination of related studies across the various ITU-T study groups. Accordingly, it would be appropriate to have Study Group 2 as the parent for FG-AI4NDM.

7   Leadership

The stipulations in clause 2.3 of Recommendation ITU-T A.7 apply.

---

[17] This includes technical aspects (e.g., how AI and other digital technologies can be used to transmit communication; what opportunities exist for communication infrastructure) and sociological/demographical aspects (e.g., how individuals of different backgrounds and abilities respond to different forms of communication; and inclusiveness, for instance, the needs of vulnerable populations).

8   Participation

See clause 3.1 of Recommendation ITU-T A.7.

Any individual from a country that is a member of ITU and who is willing to contribute actively to the work may participate in the focus group. This includes individuals who are also members of international, regional, and national organizations.

In addition, a list of participants will be maintained for reference purposes and reported to the parent group.

9   Administrative support

The stipulations in clause 5 of Recommendation ITU-T A.7 apply.

10   General financing

FG-AI4NDM will follow the guidance in clause 4 of Recommendation ITU-T A.7 with regard to financing of focus groups and their meetings and clause 10.2 of Recommendation ITU-T A.7 with regard to printing and distribution of deliverables.

11   Meetings

FG-AI4NDM will conduct regular meetings. The frequency and locations of meetings will be determined by the focus group management. The overall meetings plan will be announced after the approval of the terms of reference.

The focus group will use remote collaboration tools to the maximum extent, and collocation with existing ITU study group(s) meetings is encouraged.

The meeting dates will be announced by electronic means (e.g., e-mail and website, etc.) at least four weeks in advance.

12   Technical contributions

See clause 8 of Recommendation ITU-T A.7.

Any participant may submit a technical contribution directly to FG-AI4NDM, in accordance with the time schedule adopted. A template for contributions can be found on the ITU-T website. Electronic document transfer methods should be used whenever possible.

13   Working language

The working language is English.

14   Approval of deliverables

Approval of deliverables shall be taken by consensus.

15   Working guidelines

Working procedures shall follow the procedures of Rapporteur group meetings.

FG-AI4NDM will exchange draft deliverables and other outcomes on a regular basis with its parent group, to ensure efficient transfer of deliverables to streamline future activities (see ITU-T A.7 Appendix I).

No additional working guidelines are defined.

16 Progress reports

Regular progress reports will be provided at each meeting of the parent group, as per the guidance in clause 11 of Recommendation ITU-T A.7.

17 Announcement of focus group formation

The creation of FG-AI4NDM will be announced through a TSB Circular to all ITU membership. ITU-T Newslog post, press releases, and other means could be utilized.

18 Milestones and duration of the focus group

The Focus Group lifetime is set for one year, with the possibility for a further year subject to the agreement of the study group, from the first meeting but extensible if necessary by decision of the parent group (see ITU-T A7, clause 2.2).

19 Patent policy

See clause 9 of Recommendation ITU-T A.7.

_____