HeiGIT | HEIDELBERG INSTITUTE FOR GEOINFORMATION TECHNOLOGY

Deutsches Rotes Kreuz

Geoinformation, Innovation and Research Cooperation for Effective Humanitarian Assistance

HeiGIT & German Red Cross

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Since 2019, HeiGIT (Heidelberg Institute for Geoinformation Technology) and German Red Cross (GRC) have worked closely together to advance geoinformation-based methods, open technologies, and operational innovation for international humanitarian assistance.

The partnership connects scientific expertise with the decision-making and operational logic of humanitarian programmes. While mapping and the collection of geospatial data through Missing Maps Mapathons were at the core of the initial collaboration, the focus later shifted towards the practical use of geodata and the development of geo-applications relevant to humanitarian operations. HeiGIT's Geoinformation for Humanitarian Aid team is a key partner for GRC, providing remote and in-person technical support to Red Cross Red Crescent National Societies as GRC's key partner for geoinformation technologies.

Together, HeiGIT and GRC make geodata, technologies, and local knowledge actionable for decision-makers, local communities, and volunteers enabling evidence-informed decision-making. This support spans from preparedness and anticipatory action before crisis, to response during acute humanitarian emergencies and onward in long-term disaster risk reduction and resilience building, including in complex crisis contexts. The partnership showcases how long-term collaboration between research and humanitarian practice can be structured beyond isolated, project-based initiatives.

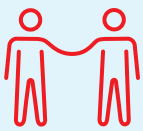
Joint Approach
Research meets practice – open, participatory and application-oriented

The collaboration is based on a shared understanding of the advantages of open-source technologies and data, as well as partnership-based cooperation. Research is not pursued in isolation from the realities of humanitarian operations; rather, it is developed jointly with practitioners from GRC programmes – including anticipatory action, disaster risk reduction, and health – as well as with sister National Societies in GRC partner countries.

The focus is not only on developing new tools but also on ensuring their transferability, maintainability, and local ownership – from pilot phase to scalable application within the Red Cross Red Crescent Network and across the wider humanitarian system.

Our focus

Operational Support
Geospatial data for the analysis and planning of humanitarian programs



Knowledge Transfer
Building capacities, sharing knowledge, strengthening networks

Applied Research & Innovation
Jointly developing and testing innovative methods

1. Operational Support
Geoinformation for the analysis and planning of humanitarian programmes

A central pillar of the cooperation is the direct technical support provided to GRC programmes and those of its partners. HeiGIT contributes geoinformation expertise to concrete operational use cases, ensuring that humanitarian decisions are based on robust data.

Joint activities include:
• *Technical advisory support for anticipatory action and disaster risk reduction,* including automated workflows integrating forecasts and risk analyses to identify priority intervention areas for anticipatory actions.

• *GIS-based operational analyses* of hazards, exposure, vulnerability, and accessibility aligned with the operational information needs of humanitarian programmes.

• *Support for Mapathons and other Missing Maps activities* to close data gaps in at-risk regions and strengthen OpenStreetMap as a humanitarian data foundation in collaboration with local communities, National Societies, and volunteers.

• *Support for the application and co-development of open-source GIS tools* including QGIS software and OpenStreetMap-based tools, to promote long-term use by partners.

This structured linkage between research, technology development, and operational realities strengthens the quality of planning, prioritisation, and impact orientation of humanitarian action.

2. Knowledge Transfer
Building capacities, sharing knowledge, strengthening networks

Beyond operational support, HeiGIT and GRC systematically strengthen the capacities of staff within the Sister National Societies to enable the independent application of geoinformation-based methods. The emphasis is not on ad hoc training activities, but on systematically enabling National Societies to embed geospatial data sustainably within programmes, decision-making processes and institutional structures.

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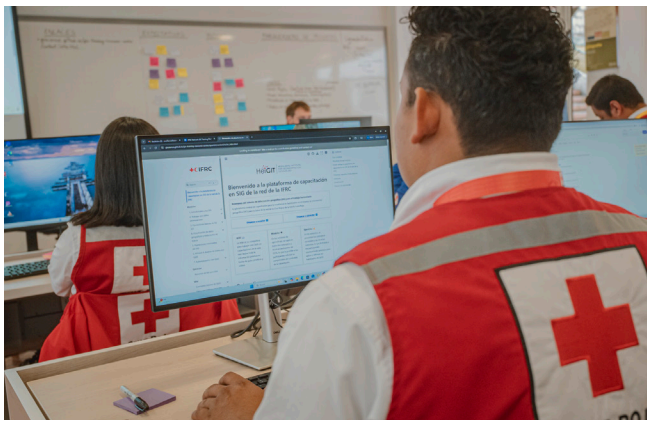

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(1) © Colombian Red Cross
Regional GIS Training in Colombia
(2) © HeiGIT
Mapathon at HeiGIT
(3) © HeiGIT
GIS Training for Healthcare Professionals

© Colombian Red Cross
Use of the Sketch Map Tool for disaster preparedness in Colombia

Joint activities include:
GIS training from basic to advanced levels with a focus on geospatial analyses for humanitarian projects in anticipatory action, disaster risk reduction, and health.

• *Methodological trainings* on data processing, automation, visualisation, and quality assurance using open-source tools.

• *Development and operation of the IFRC Network GIS Training Platform*, an open learning platform for National Societies, volunteers and partners worldwide, implemented in cooperation with the British Red Cross and Netherlands Red Cross.

• *Train-the-Trainer approaches to sustainably anchor knowledge and skills within organisations and regions, and to strengthen local multipliers.*

The close link between training and project implementation helps ensure that newly acquired skills are directly applied in programmes and contribute to long-term impact.

3. Applied Research & Innovation
Jointly developing and testing innovative methods

In the field of applied research and innovation, HeiGIT and GRC jointly develop new methods and tools that are directly informed by the needs of humanitarian practice.

Examples include:

- *(Further) development of digital tools* such as the QGIS plugin for quantitative risk analysis and the Sketch Map Tool which illustrate how participatory methods from humanitarian practice can be translated, together with research partners, into scalable digital solutions. In particular, the Sketch Map Tool supports National Societies in engaging local communities in the collection and digitalisation of

knowledge in data-scarce contexts for disaster risk reduction projects.
- *Research cooperation* on risk, perception, and historical analyses of hazard impacts.

- *Consortium-based* projects such as AI for Anticipatory Action (AI4AA) initiative and the Fit4Resilience project funded by the German Federal Ministry of Research, Technology and Space (BMFTR), which examine resilience, multi-hazard risk and decision-making in complex and interconnected crisis systems.

- The integration of humanitarian practitioners into research design to ensure relevance, applicability, and ethical grounding.

This close linkage fosters innovation through continuous exchange between science and humanitarian practice.

What's next
A sustainable partnership with a future

The cooperation phase enabled by the Klaus Tschira Foundation demonstrated the potential of long-term structural partnerships between research and humanitarian practice. The collaboration between HeiGIT and GRC will continue to grow thematically, geographically, and methodologically.

Future focus areas include:

- *The sustainable institutionalisation and scaling of developed tools and methods particularly* in GRC's partner countries.

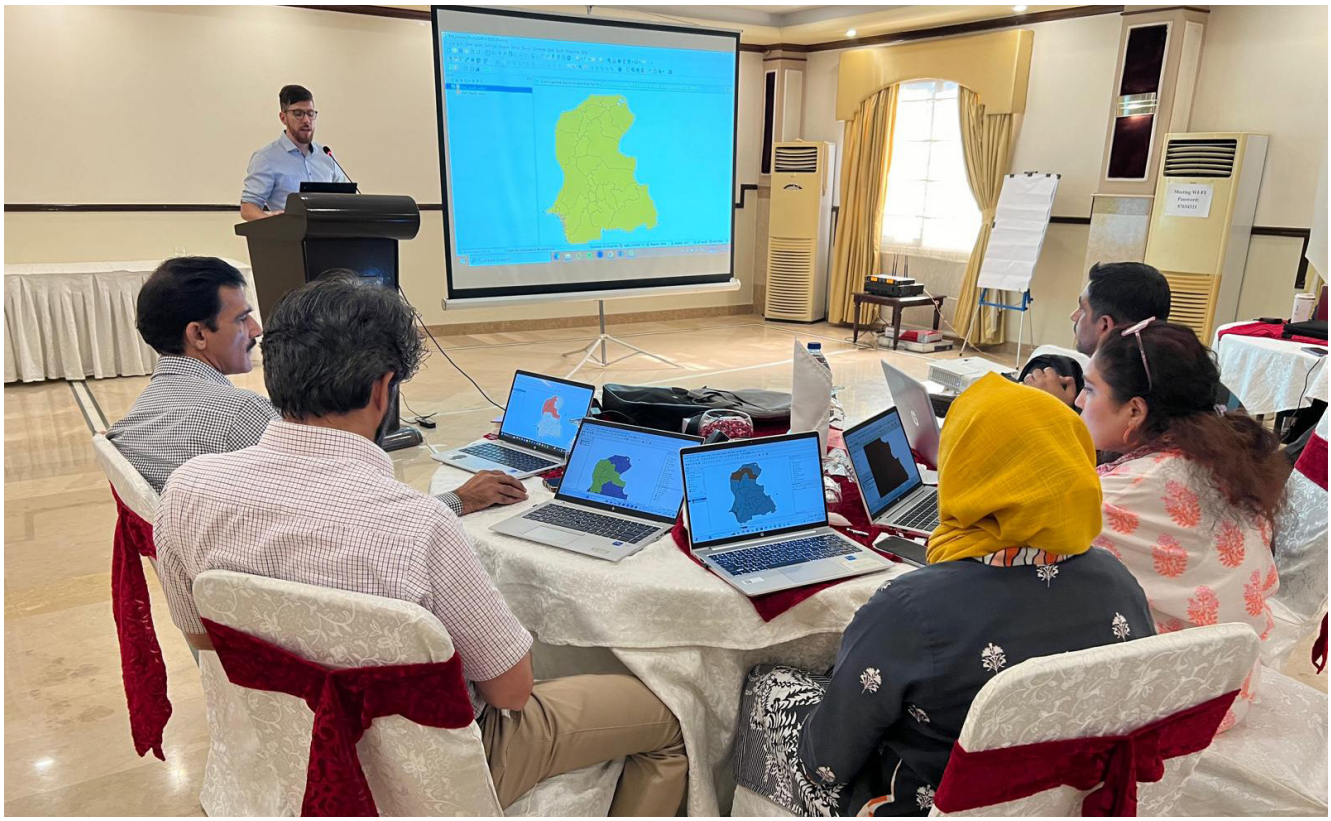
- The provision of *open access knowledge and training* for the wider humanitarian system.

- *Further development of joint research and innovation pathways.*

Through the HeiGIT-GRC partnership, locally anchored and context-adapted solutions continue to be advanced, strengthening evidence-informed and anticipatory humanitarian assistance – now and in the future.

The Klaus Tschira Foundation (KTS) has funded the cooperation between 2019-2025.

QGIS Training and River Flood Risk Assessment in Pakistan



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