INCLUSIVE CITIES AND REGIONS
TERRITOIRES INCLUSIFS

14° Biennale of European Towns and Town Planners, Naples

Edited by
Marichela Sepe

#Parallel Workshop

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INCLUSIVE CITIES AND REGIONS/TERRITOIRES INCLUSIFS
Edited by Marichela Sepe

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8. IT and the use of artificial intelligence in planning

Coordinator
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Community validation in generative-AI mapping

The pilot project fAIr by OSM and Microsoft in Uganda, Tanzania, Kenya and Nigeria

Chiara Centanaro, Emanuele Sommariva***

The prevention of natural disasters linked with the contingency/recovery planning disciplines has been recognised as crucial for the future of Global South, especially in contexts where in-situ analysis or direct/indirect survey is highly difficult, due to lack of existing mappings, infrastructures, and availability of professionals. In this context, the introduction of Web 3.0 for map production has led to a new form of data sharing and VGI (Voluntereed Geographic Information) mapping[1], generating a partial overcoming of the lack of structured mapping systems[2]. Mappers live in the territory, share map information and represent it in open systems. The old idea of representation is now complemented by the capacity for combination and modification provided by new interscalar logics and instruments of recognition[3]. Platforms enable inhabitant-users to respond in real time to events and to share the data generated with the community by increasing autonomy and inclusion in technology management and data collection[4]. The physical marginalisation of communities is reflected in the lack of representational. The lack of data and maps has also excluded communities politically: without information on needs or existing services, there is no basis for urban planning, leading to political exclusion[5]. Open Street Map and the derivation HOSM (Humanitarian Open Street Map), is one of the actors in this self-quantification process, becoming an ecosystem of data, processes and people, thanks to the open-source mapping software JOSM and the crowdsourced map-sharing platform. With more than 8.8 million registered users, OSM contributing more than 7.8 billion data points as of 8 August 2022[6]. Maps are also built using GPS data collection tools (ODK, OSMAnd and StreetComplete). Within this ecosystem the first open source generative AI system uses community feedback as validation process. FAIr - Free and Open Source for AI for Resilience in humanitarian mapping – project[7] is realised by HOSM in cooperation with Microsoft and local communities: the generative maps support planning in Nakuru in Kenya and Nigeria. During an AI-assisted mapping pilot (2019-2020) 18 million building footprints were extracted from satellite imagery for all of Tanzania and Uganda. The goal is to develop high quality AI-generated and community-verified spatial data in new decision-making processes. According to HOT's Technology & Innovation unit, fAIr seek to solve three foreseen problems. AI-assisted mapping for humanitarian purposed feels like a black box, the models (code) are currently not open-sourced. Having model biases means predicting over satellite imagery would be biassed toward the training dataset used to teach the AI model and the nature and quality of imagery is very different across the globe. The lack of feedback in AI systems does not allow the accuracy of the models to be improved and this is due to the fact that they are closed source[8]. Manual mapping of small areas is initially done to train the system and avoid bias. The mappers validate the prediction through feedback, all the feedbacks submitted need to be approved/validated by the project manager then reapply on the newer version of the model, so the model will be getting better as long as is receiving the feedback[9]. The Satellite Imagery

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1 Goodchild, M., F., (2007) Citizens as sensors: the world of volunteered geography in GeoJournal 69, pp 211–221

2 Holderness, T., (2014) Geosocial Intelligence in Technology and Society Magazine, IEEE n. 33, pp 17-18;

3 Gausa M., Guallart, V., Muller, W., Soriano F., Porras, F., Morales, J. (2003) The Metapolis dictionary of advanced architecture: City, Technology and Society in the Information Age, Actar, Barcelona, p. 103;

4 Centanaro, C., (2023) Real-time, crowd-sourced online maps in disaster management in De-sign Environment Landscape City 2021 , Venice Biennale Resilient Communities Conference Proceedings, Aracne Editrice, Roma

5 Heeks R., Shekhar S. (2019). Datafication, development and marginalised urban communities: an applied data justice framework, Information, Communication & Society, Vol 22 n.7

6 Minghini, M., Liu, P., Li, H., Grinberger, A.Y., Juhász, L. (2022) State of The Map, Proceedings of the Academic Track, Florence

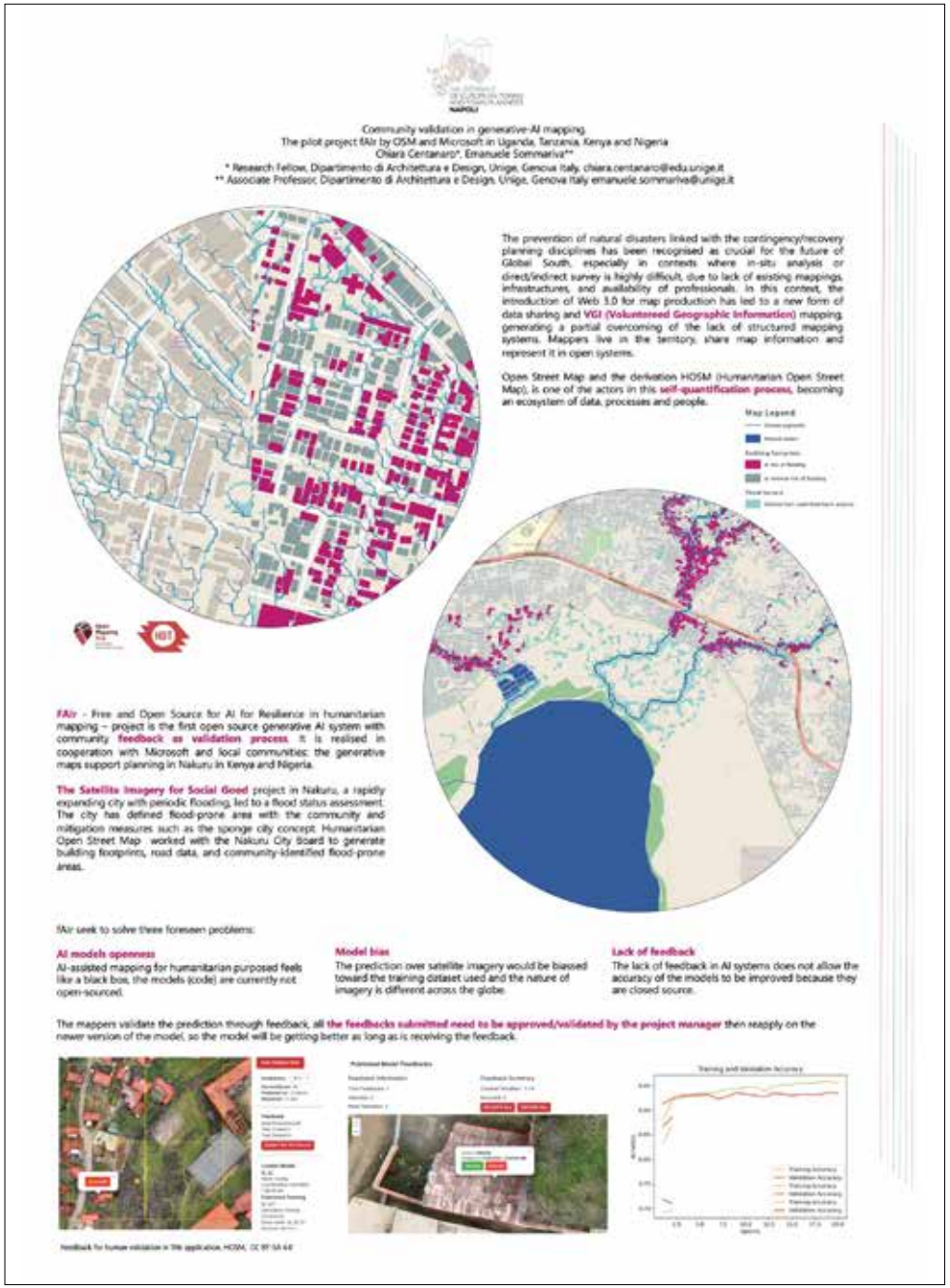
7 fAIr platform https://fair-dev.hotosm.org

8 Najjar, O. (2022) hot_tech_talk | fAIr: AI-assisted mapping https://www.hotosm.org/tech-blog/hot-tech-talks-fair

9 Raj Sharma, K., (2023) fAIr - Free and Open Source AI for Humanitarian Mapping, https://www.youtube.com/watch?v=j8qzxqkHTKc&t=626s

for Social Good project in Nakuru, a rapidly expanding city with periodic flooding, led to a flood status assessment. The city has defined flood-prone area with the community and mitigation measures such as the sponge city concept. HOSM worked with the Nakuru City Board to generate building footprints, road data, and community-identified flood-prone areas. Over a period of ten months, the team trained OSM members and planning officials on open mapping tools. The land reading done afterwards is surprising for the detail achieved: in addition to mapping 14,748,685 buildings, individual water channels and flood levels were identified. According to the municipality, the sponge city has green areas designed to absorb rain and prevent flooding. Flash floods' often lead to the destruction of buildings located within watercourses. With the maps, probable risk scenarios are generated and the representations become the necessary tool to identify areas to implement mitigation measures. In the project in Nigeria, mapping data combined with existing health data are used to identify the population not served by facilities in Bauchi, Borno, and Gombe states. More than 35 stakeholders participated in the project and training activities. Deep learning in mappings becomes relevant in rural areas or informal settlements, where spatial complexity requires local learning processes. Involving local communities in mappings in generative-AI systems ensures social and spatial inclusion: the ai tools bring new spatial and technological knowledge to communities.

Fig. 1.
fAIr pilot project and application in Nakuru



The Biennial of European Towns and Town Planners is an event of the European Council of Urban Planners ECTP-CEU which aims at discussing the main issues in the European debate relating to urban planning by sharing them with urban planners, architects, engineers, economists, sociologists, historians of architecture, citizens, politicians, private and non-governmental organizations (NGOs).
The theme chosen for the 14° Edition, organized from 22 to 24 April 2024 in Naples with the INU as the main organizer, is Inclusive Cities and Regions/ Territoires inclusifs. Inclusion is understood in its multiple declinations that define the 10 general themes of this Biennial - Regional issues and regional disparity, Metropolitan or city proposals, Urban regeneration and Public Spaces, Migration and cultural inclusion, Cultural heritage, Resilience and adaptation, New economic approaches, IT and the use of artificial intelligence in planning, Ports, airports and other infrastructures, Underground space – and in further ones proposed by the participants who further specify the general themes namely About Spatial Inclusivity, Urban regeneration and spatial justice with Nature-Based Solution, Inclusive public spaces for water cities facing climate change, "Italian UNESCO Chairs' vision and actions, A Transdisciplinary Approach to Placemaking and Inclusivity: COST Action Dynamics of Placemaking, Inclusive city Ecosystems, Youthbanism for a New Generation of Urbanists, Fragile geographies. Visions, projects and studies to mitigate and adapt to environmental and anthropogenic risk. Green Oasis for the 15 minutes city model, Making/unmaking urban circular economies with 'otherness', Public space for inclusive cities: the Biennial of Public Space, Universal accessibility and university education, the knowledge network, Findings and Evidences from the PNRR project RETURN, and River Contracts as voluntary and negotiated planning tools.
The works contained in this Catalogue, presented by administrators, professionals, academics, and researchers concern projects, policies and research that have international interest and, at the same time, attention to the local, all at different scales.
It is possible, from this vastness of topics, to understand the broad discussion that resulted, outlining new interested subjects and involved actors, as well as new possible intersections of themes.

Marichela Sepe is Associate Professor at the DICEA Sapienza Università di Roma. She has also joined the ISMed-CNR and the DiARC-University Federico II. In 2013 she has been visiting Professor in the Peking University and held lectures in the Peking, Wuhan and Xi'an Universities. Her research interests include: urban design and planning; place identity; healthy city; livable public spaces; creative urban regeneration; multimedia. On these topics, she has published several national and international journal articles, conference papers, books and book chapters.
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