its4land Report Summary

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Periodic Reporting for period 1 - its4land (Geospatial technology innovations for land tenure security in East Africa)

Reporting period: 2016-02-01 to 2017-01-31

Summary of the context and overall objectives of the project

Sub Saharan Africa has an immense challenge to rapidly and cheaply map millions of unrecognized land rights in the region. Existing approaches for mapping and recording these land rights have failed: land disputes abound, investment is impeded, and the community’s poorest usually lose out. Good land records can help to deliver tenure security, dispute reduction, investment opportunities, and good governance: secure land rights are the cornerstone of much of the economic, environmental, and social security across the developed world. In this vein, its4land is using strategic collaboration between the EU and East Africa to deliver a innovative, scalable, and transferrable ICT solution - one that fits with the Eastern African context - whilst delivering mutual benefits to both the EU and Eastern Africa. its4land will deliver an innovative suite of land tenure recording tools that responds to sub Saharan Africa’s immense land rights challenges. The main objective of its4land is to develop an innovative suite of land tenure recording tools inspired by geo-information technologies, that responds to end-user needs and market opportunities in sub Saharan Africa, reinforcing an existing strategic collaboration between EU and East Africa. The specific objectives for its4land are to: 1) capture the specific needs, market opportunities, and readiness of end-users in the domain of land tenure information recording in Eastern Africa; [2] co-design, adapt, integrate, demonstrate, and validate a land tenure recording suite based on small unmanned aerial vehicles (UAV’s), smart sketchmaps, automated feature extraction, and geocloud services; and [3] develop and valorise a governance model that realizes the innovation process by aligning end users conditions, technological opportunity, business models, and capacity building requirements. Supporting the work, established local, national, and international partnerships drive the project results beyond R&D into the commercial realm. In addition, its4land utilizes an innovation process to deliver land recording services that are end-user responsive, market driven, and fit-for-purpose. The transdisciplinary work also develops supportive models for governance, capacity development, and business. Gender sensitive analysis and design is also incorporated. Set in the East African development hotbeds of Rwanda, Kenya, and Ethiopia, 3 major phases host 8 work packages that enable contextualization, design, and eventual land sector transformation. In line with Living Labs thinking, localized pilots and demonstrations are embedded in the design process. The experienced consortium is multi-sectorial, multi-national, and multidisciplinary. It includes SMEs and researchers from 3 EU countries and 3 East African countries: the necessary complementary skills and expertise is delivered.

Work performed from the beginning of the project to the end of the period covered by the report and main results achieved so far

"The first year of the project (2016) has focused the two major objectives: 1) understanding the needs and specific country contexts; and 2) starting design and prototyping of three of the geospatial technologies (smart sketchmaps, UAVs, and
automatic boundary extraction). The first part of the work has been led by KU-Leuven via the 'Get Needs' work package. The second part of the work has been led by WWU-Muenster and University of Twente through the 'Draw and Make', 'Fly and Create' and 'Automate It' work packages. In each, there has been close collaboration with the Eastern African academic partners at Bahir Dar University in Ethiopia, Technical University of Kenya, and INES Ruhengeri in Rwanda. In addition, private sector involvement from Hansa Luftbild and esri Rwanda is ensuring a commercial mindset is at the fore. Work on governance and business models is scheduled to kick-off more formally in the later years of the project through 'Govern and Grow' and "'Capitalise' work packages, however, the its4land team has already incorporated these aspects into needs assessment and technology development activities. On the needs assessment work, completion is nearing despite delays on field data collection activities, due to civil unrest in Ethiopia in 2016. Preliminary results suggest each of the technologies can influence land tenure security in the three countries with alignment of the technologies with contextual conditions and user groups being key: bottom-up small-scale mapping teams, top-down government support mapping programs, and market oriented private sector users are key segments. The needs assessment results are already being exploited across formats and languages - including academic publications, policy briefs, and press and media. The technology development work packages will now leverage off the results and work is progressing as planned - although the smart sketch map fieldwork experienced minor delays. For each technology - smart sketch map, UAVs, and automated boundary extraction - tool development, prototyping, and testing is well under way. For smart sketchmaps an ontology has been developed and implemented as a working prototype. On UAVs, a thorough analysis of the regulatory contexts and opportunities, and hardware/software markets has been undertaken, a purchase partnership with Delair Tech setup, and the delivery of 4 DT18 drones taken (for parallel testing across the case countries). The team is closing in on first flights - as they negotiate a dynamic playing field of registration, licensing, markets, and politics. The work on automated feature extraction has already explored the full range of available algorithms and software available: viable options are being explored and combined to deliver the most optimal workflow - for later conversion to a software plug-in. In addition, the automatic feature extraction work will also look to start incorporating other types of data into the work flow. For each technology exploitation activities have included the delivery of journal papers, conference presentations, training activities, and exposure to industry, civil society, and the international sector. Meanwhile, tool integration is planned in 'publish and share' and already being dealt with via regular 'tech4land' meetings. Meanwhile, the Management Team (MT), Advisory Board (AB), Valorization Panel (VP), communications channels, exploitation plans, and data management were all established in year-1 and functioning as expected. In addition, all ethics deliverables and research permit requirements have been completed.

Progress beyond the state of the art and expected potential impact (including the socio-economic impact and the wider societal implications of the project so far)

The project is beginning to move beyond the state of the art in all its intended impact areas: partnership building, ICT advances, end-user understandings, enhancing innovation capacity, revealing global markets, and supporting environmental and social conditions. In 2016 most impact was achieved in terms of partnership building and cooperation – and initial engagement with end-users. 2017 will see more development in terms of ICT-advances, innovation capacity, and knowledge sharing. In year-3 and 4 impact on global market access, and potential social and environmental impact become clearer. Overall the results of the project are supporting not only Eastern African local communities, governments, NGOs, and academia – but, the EU technology, donor, SME, and government sectors by advancing EU geoICT strengths, creating new and exploitable land tenure tools, strengthened EU-Eastern African partnerships (gov/priv/NGO) - and in the longer run a more socially and environmentally stable Eastern Africa.

Related information