

From Radio to AI

African Community-Driven Development of Sustainable Information Systems

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Summary

The overarching goal of this research was to explore and develop sustainable Information and Communication Technology (ICT) solutions for highly resource-constrained environments, particularly in the Global South. Specifically, the research sought to address whether we can overcome existing barriers and find sustainable ways to improve digital information provisioning and communication access for rural, peri-urban and urban communities in the Global South, and how we can ensure that such information and communication is locally relevant and fits the needs, priorities, and local context of communities. It also explored whether cutting-edge technologies such as Artificial Intelligence (AI) can be made useful in the resource-constrained environments of the Global South and, if so, how. This resulted in a conceptual framework dubbed the Plug-In Principle for Information and Communication Technologies for Development (ICT4D). The digital divide is not so much about absence as it is about exclusion from systems that are not designed for, or not accessible to, the people in these contexts.

Using an iterative process, the user-centered and interdisciplinary approach is immediately evident in the nature of the local context analysis, the need assessment, and the requirement analysis, utilizing Participatory Action Research (PAR) as the main methodology and emphasizing the involvement of local communities as co-creators of the solutions.

Mr. Meteo was initially piloted to over 50 farmers from 4 communities in Upper East Region of Ghana, and Focus Group Discussions and individual interviews were conducted with the 50 farmers involved in the deployment. This formed the first steps of the use-cases to be built in an iterative manner. RadioNet (TibaNsim) was piloted in the five (5) communities of East Gonja District of the Savannah Region of Ghana, and a structured interview was carried out with 106 community members, to obtain empirical data on the rural context. This evaluation showed, by way of empirical data, the success of the user-centric approach and the feasibility of hardware deployments in resource-constrained environments. Case-studies were also carried out for urban communities in the Global South with two smartphone applications (Sefarim and Woom), and in Project TIBaLLi, we stepped a bit into the future to see how AI can make an impact on development in resource-constrained environments.

Indeed, we can overcome the barriers to improving digital information provisioning and communication access in the Global South, but it requires a multifaceted approach that integrates both technological and social solutions. Rather than introducing expensive and unsustainable new technologies, the focus should be on using existing, widely available technologies such as Global System for Mobile Communication (GSM) and Radio, and leveraging innovative ways of using emerging technologies in resource-constrained contexts. Ensuring that information and technology solutions are culturally and contextually relevant increases their impact and sustainability. This resulting principle answers the missing Sustainable Development Goals (SDG) provision of how Information and Communication Technologies (ICTs) can be made available in resource-constrained environments. An immediate direction for future work is to apply the same principle to language technologies, particularly Natural Language Processing (NLP) for under-represented languages.