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# Social Computing for Food and Sustainable Living: an African Context

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## Abstract

The change of individuals' dispositions to food in daily life towards sustainable food practices presents chances for bringing about improvements in the sustainability of food cultures at a broader level. This research work addresses three questions: exploring and investigating current food practices and how these change, including opportunities and challenges associated with people's know-how and skills (e.g. how food is sourced and prepared), the socio-cultural meanings and values associated with foods and meals, and the availability of sustainable foods. We intend to work with communities carrying out interventions and doing participatory design to understand what is useful and appropriate for them and explore the role of HCI design in encouraging individual users to participate in creating sustainable food cultures.

## Author Keywords

Cassava Fufu fortified with tiger nut;  
Food culture; Participatory Design;  
Quorn; Sustainability.

## ACM Classification Keywords

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## **Overview of the research**

The change of individuals' dispositions to food in daily life towards sustainable food practices presents chances for bringing about improvements in the sustainability of food cultures at a broader level. A "food culture" of the community at a broad level refers to a culture of imagining, producing, preparing, and consuming food. In the UK, food system is unsustainable with production, distribution and consumption and accounting for 27% of total direct greenhouse gas emissions. This current environment presents challenging issues in everyday food interaction with increased popularity of ready-made meals and processed food. There is a risk that the lack of sustainability within the food system will impact on the functioning of the system itself, since it depends highly on natural resources and ecosystem services.

I have a keen academic interest in environmental sustainability. Given the negative consequences of food sustainability, the following questions naturally arise. How do we produce sustainable food? How do we get people to eat it in a sustainable way? What contributions can we make from the perspectives of human-computer-interactions towards sustainable food culture? Finding answers to these three questions could make a critical difference to the sustainability of today's food system. In particular, my research will address these questions in an African context, as this has been largely absent from sustainable HCI

research, which commonly focuses on the West. More specifically, my research shall address these three questions by, first, exploring and investigating current food practices and how these change, including opportunities and challenges associated with people's know-how and skills (e.g. how food is sourced and prepared), the socio-cultural meanings and values associated with foods and meals, and the availability of sustainable foods. As a specific case study, I will investigate the food practices of African people living in the UK, and how these have, and are continuing to transition. I will use these new understandings of transitions in food practices to inform the design of more appropriate digital tools to support food transitions that are sustainable. Second, I shall discover different approaches in designing digital technologies that support transitions to sustainable lifestyles. One case study of this could be around social networks to support the uptake of new sustainable foods such as Quorn in the UK, or cassava fufu fortified with tiger nuts in Nigeria. Such HCI approaches might support the development of skills and know-how (recipes, how to prepare) as well as to scaffold the integration of new foodstuffs into cultural practices. Moreover, I intend to take an action research approach where I work with communities carrying out interventions and doing participatory design to understand what is useful and appropriate for them. Above all, this research shall focus on "the role of HCI

in bringing about sustainable food practices.”

### **Positioning of the research**

Food consumption is a major issue in sustainable consumption and production (SCP) because of its impact on the environment, individual and public health, social cohesion, and the economy (Reisch et al., 2013). According to IMECHE (2013), an estimated 30-50% of all food produced is spoiled or wasted –representing a waste of land, water and other inputs, the generation of ‘unnecessary’ emissions, and contributing to food insecurity. Moreover, the need for sustainable food consumption in African countries has emerged as a result of food and nutrition security. In order to cushion the effect of population growth, the current African food system is characterized by intensive agricultural production that results in environmental damage and inefficient practices. Currently, African countries are facing climate change and depleted land, energy, and water resources, making food consumption no longer sustainable. To date, African countries have fallen short of achieving food sustainability, because of focusing solely on increasing food supply while overlooking its quality and sustainability. This situation is impacted by a high burden of diet-related non-communicable diseases and micronutrient deficiencies and these bring about the need to promote sustainable food consumption patterns to alleviate these challenges.

For example, Nigeria has launched programmes such as Operation Feed the Nation (OFN), Green Revolution, Accelerated Food Production Programmes and currently the FADAMA project to avert agricultural and food crisis, yet, many families are currently facing food insecurity despite the efforts of the government. This is because of the improvement of the quality of the domestic agricultural food has not been realized. Cassava, for example, presents a vast potential for agribusiness because it has played important roles in the diet of several African populations, yet there has been limited utilization of the crop in different forms (Raheem and Chukwuma, 2001). Fortunately, there are three yellow root cassava varieties, UMUCASS 36, UMUCASS 37, and UMUCASS 38 that are being grown (under the Harvest Plus Project) (Nascimento et al., 2007; Egesi 2011) in Nigeria and some other African countries for their high concentrations of  $\beta$ -carotene ( a precursor to Vitamin A). There is the need to increase the yield per capita because Nigeria has the capacity to do so; and to increase the yield per hectare to equilibrate international standards, especially the processing and manufacturing aspect of agriculture and food. Therefore, research offers the opportunity for enhancing agricultural and food production in Nigeria (Chukwuma, 2011).

However, the essence of this research is to ascertain roles for human-computer interaction in

sustainable food practices. This requires a broad focus that includes production (e.g. farming and land use practices), consumption (how sustainable foods like cassava can be integrated into people's diets) and adaptation to climate change impacts. This requires new know-how and skills (e.g. how to prepare cassava) and the challenging of existing sociocultural meanings of food and meals, and the development of new ones. To achieve this, we propose to work with groups both in the UK and in Africa. For example, there are large and new and old communities of African's living in the UK. We will investigate how these people adapt their existing diets, to study what effects this has on environmental impact, and study how HCI can support communities like this in transitioning. Lessons about how communities like this transition their diets from living in Africa to the UK might provide valuable insights for how we can apply digital technologies for sustainable transitions, both in the UK and in Africa. This implies that I shall be disposed to carry out this research both in Africa (about 3 weeks of fieldwork, annually) and UK. It is very important for me to highlight here that I have discussed this extensively with Dr. Adrian Clear, and we have jointly developed this research topic that shall focus on "the role of HCI in bringing about sustainable food practices".

In addition, for the 'sustainability of' a HCI design for sustainable food culture, we intend to integrate the design needs of the groups to ensure participation of users

in recreation of the design to users' satisfactions and incorporating socio-cultural, health, and environmental impact in the design of the sustainable food culture. This shall be achieved by a continual examination of the design's effectiveness, which is an imperative part of the overall development of the technology.

### **Research design & methodology**

This is an action-research project. I intend to work with communities (including producers and consumers, and existing programmes such as OFN and FADAMA) carrying out interventions and doing participatory design to understand what is useful and appropriate for them and I shall explore the role of HCI design in encouraging individual users to participate in creating sustainable food cultures. For example, in my previous publications I dealt with carrying out interventions and participatory design on a persuasive messaging system for reducing patient's dissatisfaction with prolonged waiting times within the hospitals (Ikwunne and Orji, 2016 (<http://ceur-ws.org/Vol-1582/>); Ikwunne and Orji, 2016 (<http://dl.acm.org/citation.cfm?id=2998590>)). I might similarly take a persuasive approach to intervention design in this work, initially, and use resulting understandings of its success or otherwise to go in a different direction in creating sustainable food cultures.

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