

## **The VeSeL project - *Ethnography***

VeSeL was funded for three years from September 2006 by the UK Engineering and Physical Sciences Research Council (EPSRC), as part of the Bridging the Global Digital Divide initiative. It is a multi-disciplinary project involving five UK universities plus the University of Nairobi, with specialists in education, HCI, power engineering, computing, communication technologies and agriculture. The aim is to engage with rural communities to develop sustainable and suitable ICT that can help improve farming practices and education, leading to better living conditions.

The Village e-Science for Life (VeSeL<sup>1</sup>) project is part of the Bridging the Global Digital Divide (BGDD<sup>2</sup>) network funded by the EPSRC<sup>3</sup> in the UK. It is a multi-disciplinary project involving five UK universities plus the University of Nairobi in Kenya, with specialists in education, HCI, power engineering, computing, communication technologies and agriculture. The aim is to engage with rural communities to develop sustainable and suitable ICT that can help improve farming practices and education, leading to better living conditions.

Since November 2006 VeSeL team has made several visits to Kenya to inquire about the context and culture of the communities in situ. Following many considerations, it was agreed to focus our research activities on two locations: Kiangwaci and Kambu. These are both rural agricultural communities, but with vastly different economic and climatic conditions. The choice was made to work with both communities in order to facilitate comparison across two very different sites, and in case relationships with one community broke down. The decision to work with these two communities in particular was largely because we felt we could work

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<sup>1</sup> [www.veselproject.net](http://www.veselproject.net)

<sup>2</sup> [www.bgdd.org](http://www.bgdd.org)

<sup>3</sup> [www.epsrc.ac.uk](http://www.epsrc.ac.uk)

most easily and directly with them, as access to the other communities we visited seemed to involve many ‘gatekeepers’ such as extension workers, with potentially conflicting interests.

### **Kiangwaci**

Kiangwaci is located in the central highland area of Kenya, close to Mount Kenya (Africa’s second highest peak). The land is generally lush, green and fertile, and rainfall is regular, although some degradation has been caused by deforestation. There are large, well-watered fields of maize, beans, wheat and vegetables and the soil is a rich, dark red-brown and moist (see Figure 2). Water is available locally, although petrol pumps are also used to irrigate the crops.



**Figure 2: Fields in Kiangwaci**

The group of farmers we met had recently organised into a community self-help group. The villagers belong to the Kikuyu ethnic group but many speak English fluently. Most have between two and five acres of land (referred to as *shamba*) on which they grow mixed crops such as bananas, maize, French beans, and baby corn. Livestock farming is also in practiced, with cows, goats and poultry.

The farmers engage in various activities to minimise the risk of a falling market or low harvest, and are generally not afraid to learn and try new things to improve their practices.

These farmers expressed the need to know when to plant, when to harvest and how to obtain good prices for their produce.

Rainfall is fairly consistent in the area. A river provides sufficient water for all nearby farmers; it never dries up and its current is fairly strong. However, not all the farmers are making the best use of the water. Most use motor pumps to transport water to their farms. Very few farmers collect rainwater for re-use.

Few properties have electricity, but most members have mobile phones which can be charged in the local town or by neighbours with access to electricity. Some villagers have solar panels which supply small amounts of power for lighting. The nearest fixed access point to the Internet is in a town 20 km away.

*See more of Kiangwaci [in pictures](#).*

## **Kambu**

Kambu, by contrast, is a small community in the south of Kenya, halfway between Nairobi, the capital, and Mombasa, the second biggest city. The area faces severe drought and environmental degradation. It is claimed that given enough rainfall, crops grow much faster in Kambu than in most other regions; however, drastic climate changes have included the delayed onset of rainfall, unpredictable weather patterns, and poor rainfall distribution. As a result, the area around Kambu is one of the poorest parts of Kenya. See Figure 3.



**Figure 3: Field in Kambu**

There is no sign of running water in the villages; tap water can be found only in town centres. In fact, water is so precious in this area that it costs more than fuel for motors. As a result, local farmers we visited do not irrigate their main crops, which include maize, millet, sweet potatoes, pumpkins, beans, pigeon peas, greens, arrow root, cassava and yams. The nearest spring water is 30 km away.

Villagers blame the lack of water for their condition and the decline of agriculture. Most do not use mixed farming, which ensures food availability in all seasons. Consequently, two out of three families experience food shortages. Between November and June there is plenty of food, then there is nothing. Only the few who plan well get through the year painlessly. People do not farm to sell but only to consume, so they are left with no food and no money to buy food in the dry season. Improved seeds for dry land, though they exist, are not affordable for even the most successful farmers here. There is a clear lack of knowledge of well-planned, safer farming.

Low literacy levels (about 50 percent) have exacerbated environmental degradation through destructive practices such as charcoal burning, sand harvesting, overstocking and overgrazing. High population growth has meant cutting down trees for settlement and

charcoal burning. This creates a negative cycle as the land loses water and wild animals, and the soil erodes further.

The farmers have indigenous knowledge, but expressed the need for better farming information. Since the land is dry, several Non-Governmental Organisations (NGOs) have shown interest in and worked with the community, but these efforts have not always been successful. For example, the United States Aid for International Development (USAID) and the German Agro Action donated a well (with pump) to provide drinking and irrigation water. Unfortunately, the community do not make the most of the well. Its usage is limited to a small number of families who get only their drinking water from it. See Figure 4.



**Figure 4: USAID well in Kambu**

The farmers — primarily older women — continue to work the land, as this is seen as a source of independence and economic security. The community based organisation we met, which facilitated access to farmers, is well-organised and self-motivated. A system of national extension officers has supported local farmers in the past, but this facility is now very limited due to a reduction of farming activities, which in turn is due to the lack of rainfall.

*See more of Kambu [in pictures](#).*

The contrasting characteristics between these two communities are of tremendous research interest, as this allows us to test, refine and measure our approach and methodologies across contexts.

In our contextual inquiry, we adopted and tried mixed methods consisting of formal interview with farming group and primary schools, card sorting, agricultural trails to name but few.

Research into contact between different cultural groups in technology design has long recognised the scope for conflict and misunderstanding, (Honold, 1999; Roth, 2001). Small differences between groups are often exaggerated and distorted to provide a mutually negative image or stereotype based on an ‘us’ and ‘them’ differentiation (Bochner, 1988).

The latter showed that harmonious relations arise when both parties share a superordinate goal — a goal that both groups want to attain yet that neither can attain if they compete against each other.

Consequently, some of our planned activities could not take place or were brought to a halt as our users revealed discomfort or difficulties, all the while acknowledging the usefulness of the interventions. Technical difficulties such as reliable Internet connectivity were also barriers in most areas.

The communities’ discomfort and anxieties when faced with the new proposed activities and corresponding technology can be described as high uncertainty avoidance (UA), as proposed by Hofstede (Hofstede, Hofstede, & Association for Management Education and Development, 2005). UA is a society’s level of tolerance (comfort or discomfort) when facing unstructured situations (of which users have no prior knowledge). Users with a higher UA tend to minimise the possibility of such situations by strict laws and rules or safety and security measures. In both Kambu and Kiangwaci, users tended to avoid some of our

activities when they had no control or prior experience with them. On the other hand, they revealed a strong interest, enthusiasm and curiosity when they deemed an activity suitable and worthwhile. Below are some of the outcomes of specific activities.

### ***Blogging***

The researchers were provided with digital cameras for this exercise. However, the activity could not always be carried out due to a lack of power or Internet connection. Some image material was dispatched back to the UK, but communications in the rural areas were challenging. However, it appeared, from the one-to-one interviews, chats and discussions, that blogging could be successful and popular for farmers, For example, farmers were keen to show off their largest marrow or advertise their organic produce.

### ***Mapping of communities***

Researchers investigated the communities' concepts of maps. In the school context, one of the problems with this activity was that classes in the primary schools are large and teaching is largely whole-group. Children are not given worksheets or small group work, and staff-to-student ratios are high. Teachers do not have classroom assistants to help with small group activities. For example, in Silanga Primary school in Kambu there are ten teachers and 387 students, a teacher-to-pupil ratio of 1:39. As teachers were not confident enough to undertake new activities, researchers simply withdrew them and in some cases did not even mention them.

How land is partitioned is the most obvious indicator of a community's concept of boundary. In Kambu the boundaries between one farm and the other are not clearly marked; instead trees, a path, a river or bushes are demarcations. Boundaries are thus blurred. This is difficult

in terms of a mapping activity. Additionally, adults do not perceive a need for this type of information and are not motivated to engage in the activity. Workdays are long and focused on essentials, so it is difficult to motivate farmers to engage in activities not directly seen to be of immediate benefit.

In contrast, in Kiangwaci, although the shambas are very closely laid out, there are always clear boundaries to separate them. Trees, a line of the same crop, fences and ditches are all used to delineate ownership. In addition, there is not enough land for everyone to own, so some have to rent. It could be argued that the villagers like boundaries to everything. For instance, within single compound a farmer makes a clear split between distinct areas, such as areas for the household, animals, agriculture, cooking, seating, and crop sorting. However, even here were understanding and recording boundaries might seem important our mapping activities were not considered interesting enough to justify expending time on them.

### ***Agricultural podcasting***

Most farmers in both communities are women. Yet women in the Kiangwaci area are not interested in or excited about technology in general. For example, most men wanted to ask questions about the technologies a researcher was using, such as an iPod, digital camera or recorder. By contrast, one woman, although she liked an iPod showing some crop diseases with voice narration, text and images, she did not want to handle it. She merely looked at the demonstration but did not ask questions about how it worked or what it did. Women tend to identify the purpose of an electronic gadget ('What is it for?') but have no interest in having one. This was common even for the most literate women.

When given a device, men were happy to repeat steps to explore an idea. However, they did not attempt anything they had not first been shown or did not already know. The researchers would often hear questions like ‘How do I get back?’ or ‘How do you see the picture/text of this?’

A couple of men in different visits were very interested in the camera phone and appeared to want to know how to operate it. Once shown and left with the camera to take pictures of whatever they liked, they often came back to the researcher as soon as there was anything they had not seen demonstrated. Often they had questions such as, ‘How do I turn the light back on?’ or ‘I didn’t hear the sound of the camera, is there one?’ Although they could see the captured pictures on the screen, they would not ask to replay them or to show them to someone else. In fact, after taking four or five pictures, they would bring back the camera, possibly because they were not sure if they had exceeded a limit or if the camera was still working.

### ***Agricultural trails***

Nervousness with the technology on the part of the community also applied to this activity. Agricultural knowledge sharing issues frequently come up; the major agricultural problem after finding better markets is the issue of plant diseases. Farmers believe that some diseases are difficult to deal with and that the recommended pesticides are not effective at all.

The lack of sufficient power and Internet connectivity did not allow us to follow up this activity for podcasting. But it was determined from the experience of ‘greeting requests’ on the local radio station in Kambu that broadcasting such content could be effective for disseminating knowledge to farmers. In addition, some farmers expressed an interest in being

able to listen again to a favourite agricultural programme they had previously heard and enjoyed. They liked the idea of being able to share such knowledge with fellow farmers.

It is important to emphasise that most of the activities in this field trip had to be modified, limited or avoided in order to stay in line with ethics in this cultural discovery. The priority for the researchers was to inquire into users' context and culture: the people, their activities, their problems and the locations/environments.

Specifically, we have found it crucial to provide initial, minimal communication technologies (**resource kits**) to facilitate ongoing interaction with the targeted rural communities. This informs scenarios for designing ICT in response to users' needs, based on our initial contextual inquiries.