Scientific collaborations on Living Labs: Some lessons learnt from South Africa and Tanzania

[1 & 4]Marlien Herselman, [1]Thato Foko, [2]Amos Nungu, [2]Portin Ng'amba, [3]Mwanajuma Mgeni
[1]*Meraka, CSIR, PO Box 395, Pretoria, 0001, South Africa*
Tel: +27128413081, Fax: + 27128414720, Email:mherselman@csir.co.za [2]*Dar es Salaam Institute of Technology, Tanzania, P.O.Box 2958, Dar Es Salaam, Tanzania*
Tel: +255222150174, Fax: +255222152504, Email: amosnungu@dit.ac.tz
[3]*State University of Zanzibar, P.O.Box:146, Zanzibar.*
Tel: +255 (24) 2233337, Email: ajumy_1980@hotmail.com
[4]*Unisa, School of Computing, South Africa, 0001*

Abstract: The purpose of this paper is to provide an overview of the specific lessons that were learnt when Tanzanian and South African Living Labs (LL) collaborated to support one another. It was a scientific collaboration which focussed on Living Labs and co-creation with stakeholders, between Tanzania and South Africa and this provided new insights on innovative mechanisms and success elements that can be applied to make LL more self-sustainable in an African context. The research methodology which was applied was qualitative research and multiple case study as the strategy to exploratory how the SA LLs viewed success elements compared to the Tanzania LLs. Two workshops were used to collect data on success elements and innovative mechanisms and this resulted in data which was triangulated and analysed to provide results. The main challenges facing these LLs were funding and to become a legal entity especially in Tanzania in order to be able to apply for funding using European mechanisms or calls. The main success elements were that LLs should be relevant in their own contexts and should make use of external experts to support their vision, business plan developments and revenue streams. The most popular innovative mechanisms that were applied by LLs from both countries are reflection sessions, co-creation workshops and the creation of innovation spaces to support creativity and new innovative ideas.

Keywords: Living Labs, innovative mechanisms, sustainability. Lessons learnt and new insights

1. Introduction and background

As part of the initiative to develop and strengthen the research cooperation, local innovation, entrepreneurship and wider socio-economic and community development, the Tanzania Living Labs were established with the assistance from the European Commission (EC) and African Union Commission (AUC) Living Lab task force for Africa. Its overarching goal was "to support Science Technology and Innovation (STI) and Information Communication Technology (ICT) capacity-building initiatives for mass diffusion of ICTs and related services, as key enablers for poverty reduction, economic growth, social development and regional integration" (Cunningham, Cunningham & Herselman, 2011).

Based on this initiative, researchers and LL experts from South Africa and Tanzania developed a scientific collaboration proposal with the purpose to create a space for both

countries to meet and exchange ideas through workshops and to support new Living Labs and innovation in both countries. The proposal was accepted by the Research funding support organizations in both countries (National Research Foundation (NRF) in South Africa and Tanzania Commission for Science and Technology (COSTECH) in Tanzania). The significance of this project is to have a long lasting bilateral research and development relationship through LLs between Tanzania and South Africa as the LLs. The LLs will act as the catalysts for this relationship to grow and self-reliance to be attained. The purpose of this paper is to share the results of two LL workshops in both countries. Each of the workshops focussed on different themes and wanted mainly to determine what can be regarded as elements of success, challenges and innovative mechanisms which are applied to get new innovative products and services and to allow for co-creation between different stakeholders in LLs in both countries.

2. Living Labs in an African context

The Living Lab paradigm creates inter-disciplinary spaces where participants or stakeholders can co-create solutions to challenges. LL research typically incorporates ICT research and development, with a core focus on human-computer interactions (De Arias et al., 2014). LLs are seen as places where input from users as co-creators can be utilised to research the context of ICT use, find new uses, and evaluate new solutions within their everyday contexts (Følstad, 2008).

The importance of LLs as catalysts of innovation is voiced not only in South Africa, but also in African countries. This has been indicated in the Second Action Plan (2011 – 2013) of the 8th Africa - EU Strategic Partnership (Science, Information Society, and Space). LLs create opportunities for collaboration between different sectors (public and private), as well as research communities in Africa and Europe. The synergies between the European Union (EU) 2020 Digital Agenda and the African Union (AU) ICT Development Framework create the opportunity to complement investments in, and deployment of, ICT infrastructure.

The nature of the Living Lab environment fosters cooperation, innovation, entrepreneurship and development (Schaffers & Turkama, 2012). LLs can support Science and Technology, infrastructure and ICT innovation and diffusion as "key enablers for poverty reduction, economic growth, social development and regional integration" (De Arias et al., 2014; Guzmán, Schaffers, Del Carpio & De la Cruz, 2010). Various groups (AU Commission, IST-Africa national partners, World Bank, EU Commission, LLiSA, and European Network of Living Labs - ENoLL) support the establishment of more LLs to address Africa's socio-economic and developmental needs (Cunningham, Cunningham & Herselman, 2012; LLiSA, 2014; ENoLL, 2014).

Living Labs (LLs) are typically established to understand what can ultimately be described as human behavioural responses to ICT and IT within a specific context and according to Følstad (2008), this includes, for example, to investigate the context in which ICT is used (i.e. context research), to discover new uses and service opportunities for ICT, to involve users as co-creators, to evaluate new ICT solutions with users, and to conduct technical testing of ICT products and/or services in an everyday (user) context. However the greatest benefit of Living Labs is within emerging economies (Smit et al., 2011). This is especially

relevant for an African context, the focus seems to be on the application of ICT-related products and services as catalysts for capacity building and community development or empowerment (Herselman, 2011). Living labs can thus be seen as 'functional places' where enabling actors may have settled a public private partnership (or the like) of collaborating universities, research institutes, public entities, companies and individuals. Most experience so far is in healthcare, wireless communication, and in energy saving in connection with building and architecture, mainly in user-driven innovations. Although the idea is that living labs are firmly anchored in local communities, there may be various important links on distance between user groups, universities and large firms (communities of practice, other living labs) to increase learning from practice and to make use of the diversity of global technical knowledge. Accordingly, living labs may also emerge as networked living labs connecting different places **(**De Arias, 2014).

Living Lab in Southern Africa (LLiSA) Network who participated at the 3rd Annual LLiSA Workshop at Rhodes University, Eastern Cape, South Africa (20 - 21 June 2011), organised by the Siyakhula Living Lab, indicated that Living Labs worldwide, are too focused on external tangible outputs of living labs (e.g. process, product or service) and not sufficiently focused on equally valuable but less easily quantifiable outputs and benefits at a community development, socio-cultural and socio-economic level (Cunningham, Cunningham & Herselman, 2012).

One key dimension seen as critically important in an African context, is the rural community perspective and engagement, and proposed adaptation of the innovation concept and process, which is often misinterpreted as only tangible, ignoring knowledge or idea creation.

Thus for LLiSA members, a successful Living Lab requires a strategic, mutually beneficial partnership between a minimum of two key stakeholders (e.g. government, industry/business, research/academia, community) with complementary expertise and experience, a common vested interest in the outcomes of enabling users (community) to actively participate in the research, development and innovation process, and at least one stakeholder ensuring the necessary methodological rigor is applied so that results are valid.

The minimum requirement for a successful Living Lab in an African context includes a clear focus/vision, credible community champion(s), the potential for sustainable community development and a strong sense of community own challenges in relation to rural socio-economic development and sustainable quality of life, due to the current state of evolution of infrastructure, educational and employment opportunities and the resultant migration - particularly of youth, to urban environments and sometimes to other countries or even different continents. The multi-stakeholder partnerships on which Living Labs are based can provide the necessary foundation for addressing some of these challenges, but only when communities are fully engaged.

Based on an integrated developed and developing country perspective, Cunningham, Herselman and Cunningham (2012) propose this definition for Living Labs from an African perspective: "*Living Labs are environments, a methodology or an approach which caters for user-driven open innovation within real-life rural and urban settings/communities, where users can collaborate with multiple committed stakeholders (whether NGOs, SMMEs, industrial, academic/research, government institutions or funders) in one or more locations, to become co-creators or co-designers of innovative ideas, processes or products within multidisciplinary environments. Successful deployments can result in improved*

processes or service delivery, new business models, products or services, and can be replicated (with necessary socio-cultural adaption) to improve overall quality of life and wider socio-economic impact (including entrepreneurship) in participating and other communities".

This definition was also accepted by all Living Labs in South Africa and Tanzania as a working definition which needs more evidence of application before it can be further defined.

3. Objectives purpose and question

The main purpose of the scientific collaboration between South Africa and Tanzania was to develop a framework which shows how co-creation with stakeholders within a Living Lab can contribute towards innovation in both countries. The main objective for this proposed project is to organise workshops in the two countries and with all stakeholders involved in research, development and innovation from the Living Labs perspective to share ideas while also identifying challenges that collaboratively could be addressed. This grand objective can be subdivided into the following:

- To apply the LL successes and lessons learnt from other Southern Africa countries in order to support the new LL in Tanzania.
- To allow Living Labs from Tanzania to indicate their challenges and identify how LLiSA can support them.
- To identify possible postgraduate research opportunities between Tanzania LL and Southern Africa LLs;
- To develop a framework of how LL methodology can be used to strengthen and to support innovation possibilities in Tanzania and apply their experiences within a SA context.

Based on these objectives it was decided to have two workshops, one in Tanzania in 2014 and one in South Africa in 2015 and to use these workshops as platforms to elicit success elements, innovative mechanisms and challenges as experienced by ten (10) established Living Labs in both countries. LLs in South Africa have been in existence since 2009 and have evolved into strong LLs each with their own focus and business models. The LLs in Tanzania was only established in 2012 so their track record was not that long. However some of these Tanzanian LLs were called projects before and realised that they actually LLs as the all comply with the requirements of being LLs.

4. Methodology

In order to address the purpose of the scientific collaboration, a qualitative approach was chosen in order to ascertain through feedback at workshops how LLs have contributed to research and development, human capital needs and capacity development and innovation. It involved the application of qualitative type research through applying multiple case study methodology within the theoretical framework of interpretavism as a philosophy. **To address this purpose t**his study has applied interpretavism as its **philosophy** and theoretical underpinning. Klein and Myers (1999:1), define interpretive research as based on knowledge obtained through "social constructivism such as language, consciousness, shared meanings, document tools and other artifacts". The researcher is seen as

investigating the phenomenon based on the perceptions of participant's history or experience that the participants have encountered.

Walsham (2006:320), states that the philosophical base of interpretive research is phenomenology and hermeneutics. This is because interpretive research seeks to investigate meanings of words or texts as they are expressed within definite social contexts by various participants according to individuals' previous experiences (Carr and Kemmis, 1986). It is in the social context that one can find various groups interacting with one another and with objects within a given context. Therefore interpretive researchers underpin the perceptions of the social actor in order to make sense of the activities that exist within the defined contexts (Hesse-Biber and Leavy, 2010:5).

A qualitative research approach was followed, as it allows for a careful and nuanced examination of the data, while reducing the likelihood of biased assumptions from an outsider's perspective by providing a more objective view from an insider's perspective (i.e. people's subjective views of their world and reality) (Babbie & Mouton, 2001; Creswell, 2007; Yin, 2013).

A case study strategy (Fouche & Delport, 2002) was used during which a bounded system or, in this case, multiple bounded systems (various existing models of Living Lab networks and platforms for co-creation) were explored over time through detailed data collection involving triangulation of information sources, including a questionnaire, document study and telephonic and personal interviews. This resulted in thick descriptions of the LLs in the Eastern Africa context and allowed for the emergence of case-related themes as well as central or recurring themes between the cases (different models in LLs). The advantage of using a case study strategy is that it allows new ideas and hypothesis to develop from careful and detailed triangulation of methods (Creswell, 2007; Terre Blanche, Durrheim & Painter, 2006). Multiple case studies represent the class of cases better, it allows for comparisons across cases and it also allow for more breadth and depth (Rule & Vaughn, 2011).

5. Findings on LL comparisons and lessons learnt between Tanzania and SA

Report from the workshop in Tanzania

The workshop in Tanzania took place on 11th March 2014 in Dar Es Salaam, Tanzania. Theme of the workshop was " Living Lab innovation and stakeholder integration". Three specific goals for this workshop were: awareness creation on what is generally regarded as a Living Lab; differentiate types of Living Labs and their sustainability models; and share experiences between South Africa and Tanzania Living Labs.
A total of thirty eight (38) participants representing the official ten (10) Living Labs in the two countries, researchers, development partners (UNPD and ILO), government Officials, community practioners (prospective LL managers) and upcoming entrepreneurs attended the workshop. The Living Labs participated in this workshop from SA are: the WIN project, Siyakhula, Rlabs and Siyadala. Those from Tanzania were: Tanzania Youth Icon (TAYI), Elabs, Rlabs-Iringa, Arusha ECOLAB, Mbeya and Kigamboni Community Center (KCC).
Fishbowl methodology was used where a number of Living Labs stakeholders were identified and the participants were asked to give their inputs as to how these stakeholders can participate in the Living Lab programmes and also their views on innovation, how and

why they contribute to a Living Lab. The identified sectors were: Institutions of higher learning, NGOs, industry, and government. Participants shared their experience/knowledge on how these sectors can participate in the Living Labs.
From the group discussions; several issues were found to be agreed:

- Emerged a need for a framework development on how different stakeholders can contribute to co-creation of innovation.
- Different stakeholders saw their roles within a living lab in many ways.
- Development partners or Community Based Organisations saw LL as a platform where they can promote their work globally and raise funds.
- NGOs see LL as platforms which are community driven where development partners reach the community.
- Government sees LL as platforms which give an opportunity to support and finance, provide working tools and infrastructure which mobilize communities to solve their problems.
- Universities consider them as where research and community work and integrated learning community engagement meet to share ideas and information between the universities and the community.
- In terms of Innovation different groups saw it as doing something differently to solve a problem
- in terms of the LL they found a need for community involvement in finding their own solutions.
- There are key words which were seen running through different group discussions regarding this concept of innovation and co-creation. These include: create, improve, solve, new products and services and community involvement.
- In relation to the LL labs these groups think that innovation mechanism can be in the form of co-creation workshops/ seminars, road shows; Media: websites, television, radio, magazines, social media, banners, newspapers; Exhibitions (Show and Tell). They all provide opportunities for exposure.

Report from the workshop in South Africa

The workshop was held in Pretoria on 17 March 2015 at the Meraka, CSIR buildings, South Africa. This event was organized by the Meraka, CSIR in collaboration with the Dar Es Salaam Institute of Technology (DIT) of Tanzania. The workshop participants were nineteen (19) from eight (08) Living Labs in the two countries and consisted out of Living Lab researchers, government Officials and Living Lab representatives from both countries. The aim of the workshop was to focus on identifying elements that can sustain successful Living Labs within an African context. Based on the inputs from the participants the following important success factors emerged which were seen as crucial for sustainability:

- Outputs: Publications, postgraduate students which provides the dissemination of results of your Living Lab;
- Products or services: technical models for rural connectivity or skills development and training are important to develop or establish,
- Keep stakeholders satisfied as this creates a value proposition for your Living Lab
- Have a clear focus with a strategy or business plan

- Integrity: be open, transparent and act in such a manner that others will trust you and be motivation by you to succeed as well. Believe in the vision of the LL. Expose users to the LL value system to create change in their behaviour
- Understand the needs of the community and context
- Arrange regular reflection sessions as learning from mistakes grow people
- Be open to others for them to feel part in what you are doing? (open learning environment)
- Create a common ground for understanding each other (Communication) – everyone understand the same message
- Publicity/marketing of events at LL should be done regularly
- Define user-driven as the common denominator in order for the user to value the innovation and to stay motivated;
- Create a positive user experience in training and involve those who want to stay work in the LL to become part of an internship or mentorship program to incubate new products and possible services. Grow individual entrepreneurs and form clusters of entrepreneurs to collaborate with one another;
- Have a solid management process, lead people and have a strong administrator to do record keeping
- Create network links (have these and use these to grow the LL)
- Understand the definitions of legal entities and the processes involved to become a legal entity in your own country;
- Create and maintain a revenue stream and allow for new ideas to emerge by creating innovative spaces for people to collaborate and to reflect
- Invest in tools and infrastructure for growth and expansion

6. Challenges

For Tanzania the major challenge identified was the lengthy process of becoming a legal entity. Not being a legal entity hinders the living labs when it comes to formal representations or collaborations especially for European funding.
The Tanzania LLs already formed a network known as “Pamoja Labs”. However, as mentioned above, it is not yet a legal entity that can legally represent all living labs in the country. However this is a first step to ensure that an East Africa network for Living Labs will be established which can then collaborate with both LLiSA and other networks of Living Labs. This network will also bring their Living Lab managers together to learn from each other and to grow as new mechanisms of innovation in their own right.

7. Conclusion

The two workshops allowed for every LL to learn from one another and to share best practices and gain new links and networks. This allowed for sharing at a different level and provided new ideas and opportunities for improving current products and services amongst Living Labs in two countries in Africa. This also allowed for a new view on what a foreign concept like Living Lab means within an African context. The value of these engagements ensured that innovation can have a new face in Africa through the Living Lab methodology where all stakeholders have an equal chance of providing inputs.
A next step can be to collaboratively work on new proposals for funding and to use the successes of the existing Living Labs to grow new ones and to make a difference on innovation in each country.

References

Babbie, E. & Mouton, J. (2001). The practice of social research. Cape Town: Oxford University Press.

Carr, W., & Kemmis, S. (1986). Becoming critical: Education, knowledge and action research. London: Falmer Press.

Chesbrough, H. (2003). *Open innovation: the new imperative for creating and profiting from technology*. Harvard: Harvard Business School Press.

Coetzee, H., Du Toit, I. & Herselman, M. (2012). Living Labs in South Africa: an analysis based on five case studies. *The Electronic Journal for Virtual Organization & Networks.* Vol 14, 29-31.

Creswell, JW. (2007). Qualitative inquiry and research design: Choosing among five traditions.
Thousand Oaks, CA: Sage.

Cunningham, P., Cunningham, M. & Herselman, M.E. (2012). *Socio-economic impact of growing Living Labs and Living Lab networks into Africa*. IST-Africa 2012 Conference Proceedings, Dar es Salaam, Tanzania, 09-11 May 2012.

Cunningham, P., Herselman, M. & Cunningham, M. (2012). *Supporting the evolution of sustainable Living Labs and Living Labs networks in Africa*. Retrieved from http://www.istafrica.org/home/files/Supporting_the_Evolution_of_Sustainable_Living_Labs_and_Living_Labs_Networks_in_Africa.pdf [Accessed: 31 January 2015].

De Arias, A.R., Masi, S.D., Dorigo, D., Rojas, F.A., Vega, M. C. & Rolon, M. (2014). Living Labs, spaces for open innovation and technology transfer. An alternative to the solution of social problems in Paraguay. *Social Sciences*, 3(3), 74-79.

Department of Science and Technology. 2007. *ICT R&D Innovation Strategy*. Retrieved from http://www.ist-africa.org/home/files/RSA_ICTResearchDevelopmentInnovationStrategy_Final.pdf. [Accessed: 12 March 2015].

Denzin, N. K. & Lincoln, Y.S. (Eds.) (2003). The landscape of qualitative research: Theories and issues. London: Sage.

ENoLL (2014). *Open Living Labs by ENOLL.* Retrieved from http://www.openlivinglabs.eu/. [Accessed: 31 January 2015].

Fahy, C., Ponce De Leon, M., Ståhlbröst, A., Schaffers, H. & Hongisto, P. (2007). Services of living labs and their networks. In: P. Cunningham & M. Cunningham (Eds.), *Expanding the Knowledge Economy: Issues, Applications, Case Studies.* IOS Press, Amsterdam, 713-721.

Følstad, A. (2008). Living labs for innovation and development of information and communication technology: A literature review. *The Electronic Journal for Virtual Organizations and Networks*, 10 (Special Issue on Living Labs), August 2008. Vol 10, 99-131.

Fouche, C.B. & Delport, C.S.L. (2002). The place of theory and the literature review in qualitative approaches to research. In A.S. De Vos (Ed.), Research at grassroots for social and human service professions. Pretoria: Van Schaik.

Geerts, G. (2011). A design science research methodology and its application to accounting information systems research. *International Journal of Accounting Information Systems*, 12(2), 142-151.

Guzmán, G.J., De la Cruz, N.M., Schaffers, H. & Kulkki, S. (2007). Methodological framework for human and user centric rural living labs. In: P. Cunningham & M. Cunningham (Eds.), *Expanding the Knowledge Economy: Issues, Applications, Case Studies.* IOS Press, Amsterdam, 730-737.

Guzmán, J.G., Del Carpio, F.A., Colomo-Palacios, R. & De Diego, V. M. (2013). Living labs for user-driven innovation: a process reference model. *Research-Technology Management*, 56(3), 29-39.

Guzmán, J.G., Schaffers, H., Del Carpio, Á.F. & De la Cruz, M.N. (2010). Assessment of results and impacts of the C@R rural Living Labs. *Living Labs for Rural Development*, Madrid: TRAGSO and FAO.

Hesse-Biber, S.N., & Leavy, P. (2011). The practice of qualitative research. London: Sage.

Merz, C., Friedland, C., de Louw, R., Dörflinger, O., Maritz, J., van Rensburg, J. & Naudé, A. (2010). Sekhukhune: a Living Lab stimulating economic growth of rural micro-enterprises

in South Africa (Chapter 8), In: H. Schaffers, J.C. Guzmán, M.N de la Cruz & C. Merz, (Eds.). *Living Labs for Rural Development Results from the C@R Integrated Project*. Retrieved from: http://www.ami-communities.eu/pub/bscw.cgi/d700042/C%40Rbookfinal.pdf. [Assessed: 02 March 2015].

Herselman, M. (2011). *Living Labs in Southern Africa network.* PowerPoint presentation at 3rd Annual LLiSA Workshop in Grahamstown, Eastern Cape.

Innovation-Management. (2015). *Managing change and innovation: Getting the most from the Innovation funnel.* Retrieved from: http://www.innovation-management.org/managing-change-and-innovation.html [Accessed: 02 March 2015].

Katzy, B. (2012). Designing valuable business models for Living Labs. Technology innovation management review, September 2012. Retrieved from: http://timreview.ca/article/604. [Accessed: 02 March 2015].

Klein, H.K.& Myers, M.D. (1999).. A set of principles for conducting and evaluating interpretive field studies in information systems. Management Information Systems Quarterly, 23(1):67-94.

Lievens B., Van den Broeck, W. & Pierson, J. (2006). *The mobile digital newspaper: embedding the news consumer in technology development by means of living lab research.* Presented at Congress of International Association for Media and Communication Research, IAMCR, Cairo, Egypt.

LLiSA. (2014). *Living Labs in Southern Africa*. Retrieved from: http://llisa.meraka.org/. [Accessed: 31 January 2015].

MacEachren, A.M., Cai, G., McNeese, M., Sharma, R. & Fuhrmann, S. (2006). *Crisis management: geo-collaborative crisis management: Designing technologies to meet real-world needs*. International Conference on Digital Government Research, San Diego, California, pp. 71-72, ACM Press.

Mulder, I., Fahy, C., Hribernik, K., Velthausz, D., Feurstein, K., Garcia, M., Schaffers, H., Mirijamdotter, A. & Ståhlbröst, A. (2007). Towards harmonized methods and tools for living labs. In: P. Cunningham & M. Cunningham (Eds.), *Expanding the Knowledge Economy: Issues, Applications, Case Studies*. IOS Press, Amsterdam, 722-729.

Rule, P & Vaughn, J. (2011). Your guide to case study research. Pretoria: Van Schaik.

Santoro, R. & Conte, M. (2009). Living Labs in open innovation functional regions. *Proceedings of the 15th International Conference on Concurrent Enterprising 2009*, Leiden.

Schaffers, H. & Turkama, P. (2012). Living Labs for cross-border systemic innovation. *Technology Innovation Management Review*, (September 2012: Living Labs). Vol 1, 25-31.

Schaffers, H., Cordoba, M.G., Hongisto, P., Kallai, T., Merz, C. & Van Rensburg, J. (2007). Exploring business models for open innovation in rural Living Labs. *13th International Conference on Concurrent Enterprising*, Sophia-Antipolis, France.

Smit, D., Herselman, M., Eloff, J.H.P., Ngassam, E., Venter, E., Ntawanga, F., Chuang, J. & Van Greunen, D. (2011). Formalising living labs to achieve organisational objectives in emerging economies. *Presented at IST-Africa 2011 Conference & Exhibition*, Gaborone, Botswana.

Statistics South Africa. (2010). *General household survey 2010.* Pretoria: StatsSA. Retrieved from: http://www.statssa.gov.za/publications/P0318/P0318June2010.pdf, [Accessed: 19 March 2012].

Statistics South Africa. (2012). *Latest key indicators.* Retrieved from: http://www.statssa.gov.za/keyindicators/keyindicators.asp [Accessed 12 March 2015].

Terreblanche, K. Durrheim & D. Painter (Eds.), (2006). Research in practice: Applied methods for the social sciences (2nd ed.) (p.455-475).Cape Town: UCT Press.

United Nations Development Programme. (2011). *Human development report 2011. Sustainability and equity: a better future for all.* New York: United Nations. Retrieved from: http://www.za.undp.org/content/dam/south_africa/docs/Reports/Project%20Documents/HDR_2011_EN_Complete.pdf. [Accessed: 11 March 2015].

Walsham, G. (2006). *Interpreting information systems in organizations*. Chichester: Wiley.

Yin, R.K. (2013). *Case study research: Design and methods*. London: Sage publications.