

# Embedding Business Model for Sustainable Collaborative Innovation in African Living Labs

Vincent GREZES<sup>1</sup>, Harry FULGENCIO<sup>2</sup>, Antoine PERRUCHOUD<sup>1</sup>

<sup>1</sup> HES-SO Valais, Technopole 3, Sierre, 3960, Switzerland

Tel: +41 27 6069001, Fax: + 41 27 6069000,

Emails: [vincent.grezes@hevs.ch](mailto:vincent.grezes@hevs.ch), [antoine.perruchoud@hevs.ch](mailto:antoine.perruchoud@hevs.ch)

<sup>2</sup>LIACS, Leiden University, Niels Bohrweg 1 Leiden, 2333CA, The Netherlands

Tel: +31 65 580608, Email: [harry.fulgencio@gmail.com](mailto:harry.fulgencio@gmail.com)

**Abstract:** The researchers tried to address the issue of Economic Sustainability and Business Model research in the collaborative configuration of African Living Labs. The authors evaluated 29 scientific articles. The results suggests: a lack of research on Living Lab sustainability; recommendations were mainly drawn from Sekhukhune Living Lab and only partial recommendations for Sustainability were available. The development factors of the initial Business Model were drawn from diverse Living Lab applications and implementation; lessons learnt from reviewed articles; and usage of Business Model concepts. The initial Business Model concept has three categories: People, Living Lab and Things. It can be useful to interested parties wanting to pursue Sustainable Living Labs or Collaborative projects. Finally, due to the multi-stakeholder nature and Societies role in a Living Lab, we recommend that Economic Sustainability might be achieved by positioning Living Labs as a collaborative organization, Social Innovation agent and a Social Business.

**Keywords:** business model, Living Lab, collaborative innovation, sustainable, social innovation

"To all those who are ready to dedicate themselves to change the world" Muhammad Yunus, (Economist, Founder of Grameen Bank, 2006 Nobel Peace Prize Winner) 2010, *Building Social Business: The New Kind of Capitalism That Serves Humanity's Most Pressing Needs*

## 1. Introduction

Collaborative Innovation Networks (COIN) is said to be the most productive innovation engine. Key to COINs successful innovation is the "collaboration in an open and transparent flow of knowledge" [1]. Traditionally, open collaborative innovation is seen mainly with inter-firm partnership and sometimes "coupled" together with other stakeholders [2]. Living Labs are seen by the researchers as haven for non-highly IP crucial product developments. Testing and validating basic ideas to solve problematic issues. Collaboration for open innovation [3] is compounded by the continued sponsorship of public bodies through the Triple Helix System. The University-Industry-Governments constant communications and negotiations can play an enhanced role in innovation due to the endless transitions and complex dynamics of networked systems [4]. Some of the examples include introduction of Public-Private Partnership (PPP), used for faster and efficient public infrastructure projects: in the 80s in USA; in the 90s in Holland [5], Britain and Germany [6]; and more recently in Asian and African region. The practice has spilled-

over in research and development [7] in the sector of pharmaceutical, agriculture, technology and others.

Building research partnerships reduces R&D transaction costs [7]; increases efficiency, synergy and power through the creation of networks; it fosters sharing of resources and investment; and technological development [8]. In addition, the Government's increased support for research partnerships is to correct R&D failures, to speed up technological innovation and to increase information exchange with Firms, Universities and Public Research Institutes. Moving on a more recent trend is the increased emphasis on "collaboration". From the researchers point of view, whereas partnership emphasized on two entities or one entity forming different ties with different firms, "collaboration" is formed with two or more stakeholders coming together to establish a cooperative project.

### *1.1 Beyond Research Partnership*

Living Lab has become synonymous to collaborative (partnership) innovation (research) in technological development and application projects; and non-technological collaboration project. What started as Human Computer Interaction has gradually moved to User Centred System Design [9] ,[10]. Living Labs have been incorporated in market or consumer oriented research projects and innovation projects. In the early 2000, ubiquitous computing research group [11] ,[12] established Living Labs and in 2006, the European Commission [13] sponsored the creation of the European Network of Living Labs (ENOLL). Living Labs stands out as an ideal solution for the challenges in generating and finding new opportunities for business to solve societal challenges due to its emphasis on user involvement. Social Innovation is "the process of inventing, securing support for, and implementing novel solutions to social needs and problems" and has been extended as "a novel solution to a social problem that is more effective, efficient, sustainable, or just, than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals" [14]. Societal challenges are also known as wicked problems because finding solutions involves satisfying the needs of multiple stakeholders. Problematic sectors are energy, health, environment, transport, safety and security [15].

### *1.2 Living Lab as Platform for Innovation*

Some examples of Living Labs are Botnia Living Lab, Collaboration@Rural, Community-Based Living Labs (COLLABS), Corelabs, and Information Technology for Adoption and Intelligent Design for e-Government (ITAIDE) - beer, paper, food, and drug Living labs. Africa has been adopting Living Labs as the choice of methods for innovative research initiatives. African Living Labs (such as Southern Africa) differ with European Living Labs in terms of availability of high technology. In 2011, IST-Africa Initiative adopted Living Lab for greater African countries [16].

In aid of understanding the Living Labs the researchers chose three definitions by Mitchell, Følstad, and Fulgencio. First is by William "Bill" Mitchell while discussing about cities as Living Labs. He describes Living Lab as an "idea of a city or a building...as a laboratory where designers have hypothesis about what it is that people do... careful in collecting data... learning from experience" [17]. Second is by Følstad's literature review stating Living Labs as an "environments for involving users in innovation and development, and are regarded as a way of meeting the innovation challenges faced by information and communication technology (ICT) service providers" [18]. Lastly is by Fulgencio, stating Living Labs as an "innovation entity set in a real environment aimed at engaging a Locale or Local society and operating in multiple modes - multi-stakeholder, and multi-discipline, leading to a multi-method approach, and multi-culturally for international Living Labs" [19].

Based on these three definitions, the study assumed Living Lab as an organization or platform, adhering to the Living Lab methodologies/ principles/ approach and founded by multi-stakeholders occupying a physical space. Multi-stakeholders are composed of five key stakeholders: Government, Individuals, Non-Government Organization (NGO), University, and Private Firms. Individuals might include consumers, users, public/citizens, members of communities, participants, and others. Users/consumers are normally part of the community where the Living Lab is situated.

### *1.3 Living Lab's Economic Sustainability*

Informal interviews and conversations with Living Lab practitioners indicate the need to address Economic Sustainability of Living Labs. Around 2008, Living Lab has been seen to increase innovative capacity by promoting user and societal involvement [20]. In the following year, viability and sustainability were partially addressed in a research paper [21]. To attain economic viability Business Excellence Model (BEM) for Living Labs was proposed [20]. BEM identifies customers and other stakeholders of Living Lab Services explicitly and recognizes investors as a source of revenue. The Business Model concept "extends beyond firm boundaries, to include network partners, other allies and the customers. Making it particularly useful as a unit of analysis where the success of the organization is closely tied to the relationships the entity has with others in the network" [22]. It indicates the "rationale of how an organization creates, delivers, and captures value" [23] and provides "description of the roles and relationships among a firm's consumers, customers, allies,...that identifies the major flows of product, information, and money, and participant benefits" [24]. Taking the first step for a Living Lab Business Model that creates, captures, and shares the value of Social Innovation and societal engagement with Living Lab stakeholder, we conducted a study on the issue of Economic Sustainability and Business Model of articles written in the African context. These are based on the theory that Business Model concept links the different strategy theories such as resource-based view, and industrial organization. Business Model concept is one of the few that integrates the "finer aspects of strategy such as resource-bases, activities, structure, products and external factors" [25]. Theoretical underpinnings about Business Model is elaborated further by Morris, Schindehutte, and Allen [2005].

### *1.4 African Living Labs and IST-Africa Initiative*

Some examples of African Living Labs are: South African Living Lab [27]: Community as a Living Lab [28], Siyakhula Living Lab [29] ,[30]; Reconstructed Living Lab [31] and Project Overture Living Lab [32]. The Living Lab projects emphasized on Information Technology for developing the community to alleviate poverty, address social issues, and cater to very small enterprises. In these studies, Sustainability and Business Models were partially mentioned and lacked details.

The adoption of Living Lab principles in the IST-Africa Initiative has been supported by African Union and European Commission; South Africa and European Network of Living Lab; World Bank; Finland; Egypt; and African countries such as Botswana, Tanzania, Uganda, Sudan, Senegal, Cameroon. It contains detailed development information of Living Labs within the African region context. The successful implementation of Living Labs will aid in the development or testing of "new products, services, processes or business models" [16]. The researchers supported the IST-Africa Initiative of promoting Living Lab as an organization for Social Innovation in a community.

## 2. Objectives

This paper aimed to provide a clear analysis of Economic Sustainability in Living Lab articles. The research question was *How can African Living Labs achieve economic Sustainability?* The objectives were:

1. Strategized Living Lab activities to serve existing needs/ issues/problems/ impetus.
2. Identified options for *e.g.* models, revenue streams, and partners.
3. Initiated development of the Business Model for Living Lab organizations in Africa.

The paper's scope did not extend to: validating the draft Business Model but was grounded on the results of literature review, analysis of the articles and research proponent's experience. The draft model that appears in section 4.3 is the first result of an on-going research and will still undergo revisions. Therefore some focus might be missing.

## 3. Methodology

The researchers performed qualitative research and employed Grounded Theory method by Strauss & Corbin [33]. We evaluated 29 articles and the IST-Africa Initiative. The data source were IST-Africa Initiative Document [16] and knowledge databases. The keywords and conditions were: "Business Model" + "Living Lab" Africa. The researchers carried out research in Mendeley, Science Direct, SpringerLink but did not found any articles that met keywords conditions. However Google Scholar generated 104 articles but due to time constraints the researchers evaluated the first 50 articles. There were 29 relevant articles that were analysed.

## 4. Results

Only few experiments gave concrete and explicit examples of Economic Sustainability in African Living Labs. Out of the 29 papers reviewed, there were 5 articles presenting solutions to maintain viability of the African Living Lab after the initial funding. There were three groups of articles: firstly, a sizeable number of papers were based on the same experiment (the Sekhukhune Living Lab of South Africa, launched in 2006); secondly, there were articles proposing sustainability through heuristic recommendations and solutions that were un-tested. However they were publicly presented or published as part of other study results; and finally, there were irrelevant articles or no contribution on Sustainability because the articles did not concretely mention or illustrate the corresponding Economic Sustainability model. A summary of the corpus review (n=29) is shown in Table 1. The detailed list of articles is shown in Appendix A.

Table 1: Summary of Literature Review and Categorization

Addressed sustainability	Iterations	Country of the Living Labs	Articles Reference
Sustainable experiments	5	ZAF, GER	A10, A18, A21, A23, A28
Sustainability propositions	6	ZAF and other C@R projects	A9, A12, A13, A15, A20, A27
No sustainability (or not addressed)	18	FIN, SWE, SPA, ZAF, CN, IND, GER, BEL, HUN and other C@R project country mentioned	A1, A2, A3, A4, A5, A6, A7, A8, A11, A14, A16, A17, A19, A22, A24, A25, A26, A29

The Economic Sustainability and Social Innovation were observed in the papers to be an issue:

- Sustainability was often expected at the end of the Living Lab process which limits the feedback on global Economic Sustainability for Living Labs. The best experiments of sustainability come from synergies through networking, resources

and experiment sharing (A10, and A18). Generally, Living Lab stakeholders encounter the issue of non-sustainability when initial public funding has depleted and yet there is a willingness to continue existing activities.

- Social Innovation was addressed by articles A12, A20, and A21. Reaching sustainability for Social Innovation can be attained by linking social entrepreneur network as stakeholder in a broader Living Lab. But majority of the articles did not explicitly mention Economically Sustainable Business Model for Social Innovation. However there were “sustainable experiments”, indicated in 4 out of 5 articles

#### *4.1 Strategized Living Lab Activities*

The most quoted activity best practice for Sustainable activities toward Social Innovation in African Living Lab is the Infopreneur activity. This activity consists of realizing business activity through information and communication technologies. Infopreneur activity aims at filling the gap of eInclusion and at creating shared value through the prior established social enterprise network. This network was then integrated in the Living Lab as a stakeholder including the traditional research institution and other traditional Living Lab stakeholders (A7, A12, and A19 to A26). Growing ICT Services such as as cloud computing, internet services, mobile applications, semantic web, social networks and intelligent systems in rural areas were also addressed (A9).

#### *4.2 Identify Clear Options for e.g. Models, Revenue Streams and Partners*

The best practices in the reviewed articles were:

- Building a network for resources and experiments sharing to resolve the small trader’s dilemma (A10 and A18).
- Building partners group and business rules to maintain a shared value level of activity (A18)
- Building a social enterprise network which would take place as stakeholder in the Living Lab (A12, A20, A21, and A23).
- Using the agency revenue model as acting on behalf of wholesale entities (A27).
- Using licensing and micro-franchise revenue model to profit from the output of the Living Lab (A12, A20, A21, and A23).

#### *4.3 Theoretically Grounded Initial Business Model*

The design of the initial model was initiated throughout the entire process of the research from literature review, data gathering and data analysis. Considering the various audience that might be interested in this paper, we opted for trio classification of People, Living Lab and Things. The proposed model can be useful for the planning, executing and maintaining an Economically Sustainable Living Lab. The idea is to simplify the nature of Business Model by laying out major components in a Lego like manner depending on the context.

- People (left) are represented by five major stakeholders: Government, NGO, University, Firms, and Users/Community/Public. We have identified: long term and short term partners/customers in innovation as they will be essential in sustaining and attracting new investment; focused/specific opportunity is indicated as a person because it needs constant attention and monitoring as this opportunity is based on common agreement which reflects their respective organizations goals.
- Living Lab (middle) is positioned as capturing and putting value on societal problems. Value is reflected in funding and revenue. Tacit or non-quantifiable value is not part of this research but should not be a barrier in valorisation process.

- Things (right) are stakeholder roles, resources, services, exiting models, criteria for success and membership, and wide opportunities. Apart from the social goodwill a stakeholder engaged in a collaboration project, the model builds on the Transaction Cost theory in economics which requires involved parties to exchange something to get something.

#### 4.4 Economic Sustainability of African Living Labs

We found that stakeholders are essential to the founding of Living Labs. Combining the results and the strategic theory. We recommend that each stakeholder should play a significant and unique role in the founding of a Living Lab. Putting a difference between striking an agreement to establish a Living Lab environment and the inclusion of varied organizational goals that each stakeholder is trying to achieve in the collaboration. In supporting the varied goals of each stakeholder, the proposed (draft) Business Model might help. The next step for the researchers is to validate and modify the existing model together with Living Lab practitioners and innovation consultants.

In a nutshell, Living Labs should treat every stakeholder as a major component in attaining sustainability, utilizing existing know-how about Business Model might lead to Economic Sustainability. This initial model will be useful for parties interested in setting up a Living Lab or for those who have already started a Living Lab.

## 5. Conclusions

In this paper, we conducted a sampling corpus review in order to identify and strategize activities able to serve existing social issues in the context of Living Labs in Africa. Based on the corpus review, we identified possible solutions in addressing Sustainability (e.g. models, revenue streams, and partners), possible profitable Living Lab activities, and sustainability of Social Innovation in Living Labs requires more study. The results of the study were applied in the initial practical and simple Business Model for Living Lab organizations in Africa.

The implication of this study for Living Lab scholars, practitioners and interested parties is that the issue of Economic Sustainability of Living Labs might be to incorporate Business Model concepts in the discourse. From a non-profit collaboration to a minimally profit and cause/issue oriented collaboration, in the form of a Social Business.

The current study only took into account Living Labs in Africa, further studies can concentrate on a European or World Wide scope of Living Labs or Collaborative innovation projects.

The article is the first step in a series of research efforts towards understanding sustainability in a collaborative and multi-stakeholder setting (e.g. Living Labs) and the applicability of Business Model research, we are open for discussions on how it can be enhanced.

## References

- [1] Gloor, P. A. (2006). *Swarm creativity: Competitive advantage through collaborative innovation networks*: Oxford University Press, USA.
- [2] Bogers, M., Bekkers, R., & Granstrand, O. (2012). Intellectual Property and Licensing Strategies in Open Collaborative Innovation. *Open Innovation at Firms and Public Administrations: Technologies for Value Creation*, 37-58.
- [3] Chesbrough, H. W. (2006). The era of open innovation. *Managing innovation and change*, 127(3), 34-41.
- [4] Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from National Systems and “Mode 2” to a Triple Helix of university–industry–government relations. *Research Policy*, 29(2), 109-123.
- [5] Klijn, E. H., & Teisman, G. R. (2003). Institutional and Strategic Barriers to Public—Private Partnership: An Analysis of Dutch Cases. *Public Money and Management*, 23(3), 137-146.

- [6] Bennett, R. J., & Krebs, G. (1991). *Local economic development: public-private partnership initiatives in Britain and Germany*: Belhaven Press London.
- [7] Hagedoorn, J., Link, A. N., & Vonortas, N. S. (2000). Research partnerships. *Research Policy*, 29(4), 567-586.
- [8] Hall, A., Bockett, G., Taylor, S., Sivamohan, M., & Clark, N. (2001). Why research partnerships really matter: innovation theory, institutional arrangements and implications for developing new technology for the poor. *World development*, 29(5), 783-797.
- [9] Gulliksen, J., Göransson, B., Boivie, I., Blomkvist, S., Persson, J., & Cajander, Å. (2003). Key principles for user-centred systems design. *Behaviour and Information Technology*, 22(6), 397-409.
- [10] Norman, D. A., & Draper, S. W. (1986). *User centered system design; new perspectives on human-computer interaction*: L. Erlbaum Associates Inc.
- [11] Abowd, G. D., & Mynatt, E. D. (2000). Charting past, present, and future research in ubiquitous computing. *ACM Transactions on Computer-Human Interaction (TOCHI)*, 7(1), 29-58.
- [12] Markopoulos, P. (2001). *Towards a Living Lab research facility and a ubiquitous computing research programme*. Paper presented at the The CHI2001 workshop Distributed and Disappearing UI's in Ubiquitous Computing.
- [13] EuropeanCommission. (2012). Europe's Information Society Retrieved 30 October, 2012, from [http://ec.europa.eu/information\\_society/activities/livinglabs/contacts\\_links/index\\_en.htm](http://ec.europa.eu/information_society/activities/livinglabs/contacts_links/index_en.htm)
- [14] Phillips, J. A., Deiglmeier, K., & Miller, D. T. (2008). Rediscovering social innovation. *Stanford Social Innovation Review*, 6(4), 34-43.
- [15] EuropeanCommission. (2012). Horizon 2020 The EU Framework Programme for Research and Innovation 2014-2020. Retrieved from <http://ec.europa.eu/research/horizon2020/pdf/press/horizon2020-presentation.pdf>
- [16] Cunningham, P., Herselman, M., & Cunningham, M. (2012). Supporting the Evolution of Sustainable Living Labs and Living Labs Networks in Africa IIMC Ltd, IST-Africa Initiative and LLiSA
- [17] LeHubAgence. (2010). William J. Mitchell - "Living Lab" Retrieved 30 October, 2012, from [http://www.dailymotion.com/video/xffh66\\_william-j-mitchell-living-lab\\_news](http://www.dailymotion.com/video/xffh66_william-j-mitchell-living-lab_news)
- [18] 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(7), 99-131.
- [19] Fulgencio, H., Le Fever, H., & Katzy, B. (2012). *Living Lab: Innovation through Pastiche (a research linking disparate and discorded ontology)*. Paper presented at the eChallenges e-2012, Lisbon, Portugal.
- [20] Katzy, B. (2012). Designing Viable Business Models for Living Labs. *Technology Innovation Management Review*, 19-24.
- [21] Bergvall-Kåreborn, B., Ihlström Eriksson, C., Ståhlbröst, A., & Svensson, J. (2009). *A milieu for innovation—defining living labs*. Paper presented at the 2nd ISPIM Innovation Symposium, New York.
- [22] Lambert, S. C., & Davidson, R. A. (2012). Applications of the business model in studies of enterprise success, innovation and classification: An analysis of empirical research from 1996 to 2010. *European Management Journal*.
- [23] Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: a handbook for visionaries, game changers, and challengers*: Wiley.
- [24] Weill, P., & Vitale, M. (2002). What IT infrastructure capabilities are needed to implement e-business models. *MIS Quarterly Executive*, 1(1), 17-34.
- [25] Hedman, J., & Kalling, T. (2003). The business model concept: theoretical underpinnings and empirical illustrations. *European Journal of Information Systems*, 12(1), 49-59.
- [26] Morris, M., Schindehutte, M., & Allen, J. (2005). The entrepreneur's business model: toward a unified perspective. *Journal of business research*, 58(6), 726-735.
- [27] Pitse-Boshomane, M. M., Marais, M. A., Morris, C., Roux, K., Van Rensburg, R., Herselman, M., . . . Mulder, I. (2008). Catalysing innovation: the promise of the Living Lab Approach in South Africa.
- [28] Van der Walt, J. S., Buitendag, A., Zaiman, J. J., & Van Vuuren, J. (2009). Community living lab as a collaborative innovation environment. *Issues in Informing Science and Information Technology*, 6, 421-436.
- [29] Khene, P., & Ileje, C. (2010). *The development and implementation of an evaluation for rural ICT projects in developing countries: an exploration of the Siyakhulu Living Lab, South Africa*. Rhodes University.
- [30] Pade-Khene, C., Palmer, R., & Kavhai, M. (2010). A baseline study of a Dwesa rural community for the Siyakhula Information and Communication Technology for Development project: understanding the reality on the ground. *Information Development*, 26(4), 265-288.
- [31] Parker, M. B., Wills, J., & Wills, G. (2010). Reconstructed Living Lab: supporting drug users and families through co-operative counselling using mobile phone technology. *South African Family Practice*, 52(3).
- [32] Adam, R., Herselman, M., Chuang, C., Smit, D., Eloff, J., & Zielinski, M. (2011). Challenges of evaluating a living lab in South Africa.
- [33] Corbin, J., & Strauss, A. (2008). Basics of qualitative research 3e. *Techniques and Procedures for Developing Grounded Theory*.

## Appendix A: Articles Reviewed

- [A1] Wu, H. Y. I. (2012). An Empirical Study of UK Living labs: International Association for Management of Technology.
- [A2] Leminen, S., Westerlund, M., & Nyström, A. G. (2012). Living Labs as Open-Innovation Networks. *Technology Innovation Management Review*.
- [A3] Gong, G., Hsiao, M., Hsieh, M. D., Liu, L., Chiu, T., Lin, L. C., . . . Fang, E. (2012). Application of the Living Lab Concept: Empirical Validation in Taiwan's Minsheng Community. *International Journal of Automation and Smart Technology*, 2(3), 209-229.
- [A4] Coetzee, H., Du Toit, I. M., & Herselman, M. (2012). Living Labs in South Africa: An analysis based on five case studies.
- [A5] Chakravarty, P. (2012). Rebranding Development Communications in Emergent India. *Glocal Times*(17/18).
- [A6] Stillman, L., Herselman, M., Marais, M., Boshomane, M. P., Plantinga, P., & Walton, S. (2011). Digital Doorway: Social-Technical innovation for high-needs communities. *The Electronic Journal of Information Systems in Developing Countries*, 50.
- [A7] Roux, K., & Marais, M. (2011). *Design for Sustainability: Rural Connectivity with Village Operators*. Paper presented at the Global Humanitarian Technology Conference (GHTC), 2011 IEEE.
- [A8] Lawo, M., Herzog, O., Boronowsky, M., & Knackfuss, P. (2011). The Open Wearable Computing Group. *Pervasive Computing, IEEE*, 10(2), 78-81.
- [A9] Jere, N., Thinyane, M., & Terzoli, A. An Architecture for future ICT services for Rural Areas.
- [A10] Gous, H., Gard, J., Baltés, G., Schutte, C., & Gerber, A. (2011). *Business architecture for inter-organisational innovation networks: A case study comparison from South Africa and Germany*. Paper presented at the Concurrent Enterprising (ICE), 2011 17th International Conference on.
- [A11] Almirall, E., & Wareham, J. (2011). Living Labs: arbiters of mid- and ground-level innovation. *Technology Analysis & Strategic Management*, 23(1), 87-102. doi: 10.1080/09537325.2011.537110
- [A12] Van Rensburg, J. R., Cronje, B., & Du Buisson, U. (2010). Infopreneurs in service of rural enterprise and economic development: Addressing the critical challenges of scalability and sustainability in support of service extension in developing (rural) economies.
- [A13] Heikura, T., & Schaffers, H. (2010). *Living labs sustainability strategies and rural development policies*. Paper presented at the eChallenges, 2010.
- [A14] Chakwizira, J., & Nhemachena, C. (2010). Towards a sustainable knowledge management and development perspective approach: The sustainable rural community development portal.
- [A15] Schaffers, H., Merz, C., & Gúzman, J. G. (2009). *Living Labs as Instruments for Business and Social Innovation in Rural Areas*. Paper presented at the Proceedings of the ICE 2009 Conference.
- [A16] Almirall, E., & Wareham, J. (2009). Innovation: a question of fit—the Living Labs approach. *Mobile Living Labs 09: Methods and Tools for Evaluation in the Wild*, 3.
- [A17] Almirall, E., & Wareham, J. (2009). *Contributions of Living Labs in reducing Market Based Risk*. Paper presented at the Proceedings of the 15th International Conference on Concurrent Enterprising. Leiden, NL.
- [A18] Tondini, D., & Lawo, M. (2008). Exploiting Research Results in Practice.
- [A19] Schaffers, H., Garcia Guzman, J., & Merz, C. (2008). An Action Research Approach to Rural Living Labs Innovation: Collaboration and the Knowledge Economy: Issues, Applications, Case Studies. IOS Press.
- [A20] Van Rensburg, J., Veldsman, A., & Lahde, K. (2008). Social entrepreneurship: A foundation for “creative capitalism” in rural African communities.
- [A21] van Rensburg, J., Veldsman, A., & Jenkins, M. (2008). From technologists to social enterprise developers: Our journey as “ICT for development” practitioners in Southern Africa. *Information Technology for Development*, 14(1), 76-89. doi: 10.1002/itdj.20088
- [A22] Guzman, J. G., Schaffers, H., Bilicki, V., Merz, C., & Valenzuela, M. (2008). *Living labs fostering open innovation and rural development: Methodology and results*. Paper presented at the Proceedings of the 14th International Conference on Concurrent Enterprising, Lisbon, Portugal, June.
- [A23] Friedland, C., Merz, C., & Van Rensburg, J. (2008). Networked micro-enterprises: the added value of collaborative procurement in rural South Africa. *Proceedings of the IST Africa*.
- [A24] Schaffers, H., van Bemmelen, J., Horak, P., & Merz, C. (2007). *Creating and Managing Synergies in a Network of Rural Living Labs*. Paper accepted for the eChallenges 2007 conference, The Hague.
- [A25] Schaffers, H., & Kulkki, S. (2007). Living labs. *An Open Innovation Concept fostering Rural Development. Tech Monitor, September-October*, 30-38.
- [A26] 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.
- [A27] Van Rensburg, J. R., Smit, D., & Veldsman, A. (2007). “Marrying the ‘System of Innovation’ and micro enterprises in real world rural SADC”: an overview of collaborative SMME incubation in the Rural Living Lab of Sekhukhune.
- [A28] Merz, C., De Louw, R., & Ullrich, N. (2007). Collaborative working environments for enterprise incubation—The Sekhukhune Rural Living Lab. *Proceedings of the IST Africa*.



[A29] Hart, S. L., & Sharma, S. (2004). Engaging fringe stakeholders for competitive imagination. *The Academy of Management Executive* (1993-2005), 7-18.

## Appendix B: Initial Business Model

