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ORGANIZING INNOVATION IN BASE-OF-THE- PYRAMID PROJECTS

Keywords:

Methodology, business model, collaboration, co-creation, scaling, capabilities, strategic alignment, innovation

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Abstract:

Base-of-the-Pyramid (BoP) inclusive innovation projects aim to design, produce and market products and services for large and relatively poor market segments in developing countries, for example for people who have less than several dollars to spend per day. BoP projects have 'normal' goals, deliverables, budgets and timelines. In addition, there are six guidelines that are 'special' for projects in a BoP context. 'Special' as they might be different from how they are dealt with in regular innovation processes. Based on a literature review a conceptual framework is proposed following six guidelines: 1) Collaboration building and cooperation; 2) Business models and financing; 3) Scaling-up innovation; 4) Co-creation, active participation and social embeddedness; 5) Institutions, policies and strategic alignment; and 6) Focus on capabilities and evaluation. These guidelines are plotted on the phases of a typical inclusive innovation project, as a first attempt to support practitioners to practically apply the suggested guidelines.

JEL codes: O31, O32, N7, Q48

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1 Introduction

Base-of-the-Pyramid (BoP) innovation projects aim to design, produce and market products and services for large and relatively poor market segments in developing countries, for example for people who have less than several dollars to spend per day.

The difference between BoP context and traditional western markets, is nicely captured by London and Hart (2010) in the phrase: “Needs, needs, needs, but no market”. In both contexts there are consumer needs but whereas these needs are served in the western context through a functional ‘market’, such a market is non-existing in the BoP; the poor’s unmet needs can be regarded as untapped market opportunities. Research indicates that innovation strategies that are effective in serving or entering existing consumer markets are ineffective in creating new consumer markets (Heeks 2002, London and Hart 2010).

When developing inclusive innovations for the BoP, an entrepreneur faces specific challenges that are uncommon in ‘regular’ innovation projects. Although many inclusive innovation projects nowadays aim for a market based approach they are working in an environment that has a history of aid and development cooperation. Therefore, one of the major concerns to consider is “the development effect” during the project. This concept is influential in decisions about the adoption of new technologies and subsequent behavior (Crewe and Harrison 1998).

This paper presents an exploration into six methodological guidelines that describe the specific challenges a BoP entrepreneur can come across in the implementation of real-life inclusive innovation projects. It combines lessons learned from the development discourse and insights from practitioners with state of the art research on inclusive innovation at the BoP.

The structure of this paper is as follows. Chapter 2 presents insights from BoP theory and practice leading to the ample evidence of the relevancy of the guidelines as described throughout this paper. Chapter 3 describes each of the six elements comprising this framework, with additional relevant lessons learned to overcome challenges in developing inclusive innovations. Chapter 4 discusses some of the implications found in the development of the framework, with the final chapter dedicated to conclusions and avenues for further research.

2 Methodological guidelines for organizing BOP projects

BoP projects are 'normal' innovation projects in that they have goals, deliverables, budgets and timelines. However, BoP projects are 'special' in that they combine commercial entrepreneurship and commercial goals with social and local entrepreneurship and social goals. In other words, a BoP innovation project needs to be organized and managed as any 'normal' innovation project and in addition it requires 'extra' attention for several specific elements that are related to this combination of commercial and social perspectives.

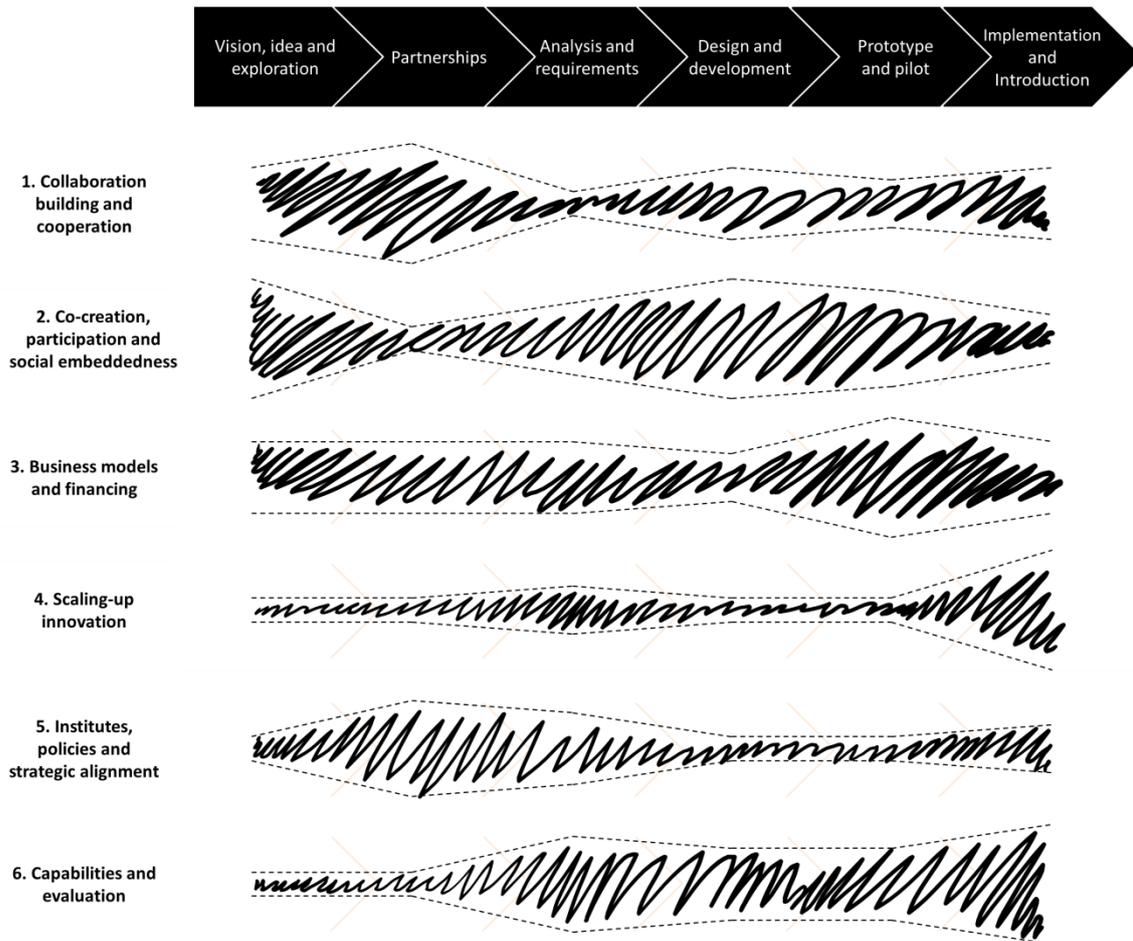
A number of scholars have provided different approaches for the implementation of innovation projects (c.f. Tidd, Bessant et al. 2001). In general terms, an innovation process starts with an idea and then proceeds in several iterative phases towards realization (see upper row of figure 1). The six methodological guidelines¹ presented in the left column in figure 1 have been derived from lessons learned from four case studies in inclusive innovation projects by TNO, ICCO, DSM and their partners (see appendix 1). We identify the following aspects:

- 1) Collaboration building and cooperation;
- 2) Business models and financing;
- 3) Scaling-up innovation;
- 4) Co-creation, active participation and social embeddedness;
- 5) Institutions, policies and strategic alignment; and
- 6) Focus on capabilities and evaluation.

Please note that this conceptual framework presents no hierarchical order or timely prescription for implementation of innovation projects. Below a brief explanation of each area is presented.

¹ The studies contributing to the empirical evidence of the proposed framework are published in the report "Organizing Innovation in Base-of-the-Pyramid Projects", Netherlands Organisation for Applied Scientific Research TNO, Delft, 2012

Figure 1 Theoretical framework for the implementation of BoP projects



1. Collaboration building and cooperation

Collaboration building and cooperation is at the heart of BoP thinking, for example in the work of London and Hart (2004). BoP projects need multiple stakeholders on different levels, with different backgrounds to work together. Therefore it is needed to strategically choose partners and manage the partnership professionally (Crewe and Harrison 1998).

2. Business modeling and financing

Sustainable business models for the BoP are scarce and it is challenging to find initial investment when outcomes are uncertain. Creative ways to acquire funding (micro financing, crowd funding) and innovative business model creation is needed for the adoption of the service. Theoretically, BoP financing and business models was identified by scholars such as Prahalad (2005), Seelos and Mair (2007), etc.

3. Institutions, policies and strategic alignment

Policies and policy makers of governmental and global institutions will have influence on the adoption of the service. Lobbying with these institutions should therefore be incorporated in the development process. Theoretically,

institutions are the rules of the game (North 1990), and their role in BoP innovation and innovation systems have been identified, e.g. in Coenen and Díaz López (2010), Foster and Heeks (2013), etc.

4. Scaling up Innovation

Many projects fail after initial pilot phase. For sustainable solutions scaling up is crucial, and developing a scaling strategy early in the project is needed to ensure sustainability of the project after the pilot phase (Simanis and Hart 2008). Scaling up innovation is also key topic in the innovation literature, e.g. Rogers (1983), Coenen, Suurs et al. (2011), etc.

5. Co-creation participation and social embeddedness

There is a lack of knowledge of market demand and target group characteristics in the BoP literature. Participatory approaches should be used to ensure ownership by end-users and appropriateness of technology. Co-creation and social embeddedness are also at the core of the BoP literature, with contributions from Prahalad (2005), Simanis and Hart (2008), de Boer and Chevrollier (2010), etc.

6. Capabilities and evaluation

Reaching social goals cannot be done without increasing people's capabilities (Sen 2000). Incorporating proper evaluation mechanisms to ensure the project has the impact it was supposed to have (Nussbaum 2011, Oosterlaken and Hoven 2012). This is not to be confused with the technological capabilities approach an innovation perspective, shedding light on actual skills and competences needed in innovation projects, e.g. (Prahalad and Hamel 1990).

In the remainder of this paper an overview of the main rationale and characteristics of each guideline is provided.

3 The methodological framework explained

3.1 Collaboration building and Cooperation

“The opportunities at the BoP cannot be unlocked if large and small firms, governments, civil society organizations, development agencies and the poor themselves do not work together with a shared agenda” (Prahalad 2005). Inclusive innovation projects involve different stakeholders, from diverse (cultural, educational, ethnic) backgrounds, often from different demographic regions. Collaboration is needed between these stakeholders to ensure everyone is on board. Ignoring this network of organizations and assuming all knowledge and skills can be found in one’s own organization, or “when time comes” can be problematic in further development. “MNCs working at the BoP learn rapidly that they have to learn to live with a wide variety of relationships with a large number of institutions” (Prahalad 2005).

Organizing and promoting a productive and creative cooperation between organizations and between people is therefore especially critical for BoP innovation projects. Typically different ‘knowledge bases’ are combined: they involve commercial businesses and not-for-profit organizations and combine commercial and social logic. Despite the fact that “technical expertise in development is still associated with expatriate advisers and with men” (Crewe and Harrison 1998), more transfer of knowledge from South to North taking place. BoP projects have the potential to combine the transfer of knowledge and technology in ‘both directions’, e.g. technology goes from North to South, while market intelligence goes from South to North. The last couple of years, examples of ‘reverse innovation’ have been identified: cases in which an innovation ‘from the South’ is exported ‘to the North’ (Immelt, Govindarajan et al. 2009). For a BoP entrepreneur this is relevant, as in scaling the innovation, also the North is a potential market, which might make a more economically viable innovation.

As NGOs, civil society organizations and donors dominate the development agenda and are important stakeholders to collaborate with in BoP projects, specific attention needs to be paid to the different connotations that can be given to the term *partnership* in the development sector. The term partnership is rather vague and how this partnership is shaped and working out in practice depends on the power relations between partners. Although the term partnership might sound like all partners are equal, in reality this is not the case (Carvalho, Klarsfeld et al. 2011). In this respect it is important to keep in mind that the different partners involved in a collaboration are not equal, although the term partnership does imply equality. “Categories such as ‘targets’ and ‘recipients’ have been replaced by notions of “partnership” for “capacity building.” (Crewe and Harrison 1998). Knowing that the target group and local partners that are involved in the innovation project have the background in development projects, might mistake certain terminology and expectations that come with it.

In conclusion project partners should be strategically chosen, keeping in mind the (political and strategic) agenda of the collaboration and the partners involved (Tjemkes, Vos et al. 2012). Especially with local partners, that have seen agencies come and go in that past years, “trust might be difficult to build

after 50 years of suspicion and prejudice based on little evidence and strong stereotyping” (Crewe and Harrison 1998). Strategically selecting partners, setting up partnerships and manage the partnerships, should therefore be the main focus of collaboration and cooperation.

3.2 Building models and financing

During the development process there is ample time needed to develop a viable business model in several iterative stages. In developing a business model, one should take into account that the principles on which the market in a BoP context is currently functioning, might differ from the Western market place. Neoclassical economics assumes that it is always the market that allocates resources most efficiently (v. Staveren 2001), however for social goals in for example health and education (that are typical in BoP projects), this is very likely not the most effective and efficient model (v. Staveren 2001, Carvalho, Klarsfeld et al. 2011). Decisions for purchasing goods is not a full rational process and is done entirely on the basis on self-fulfillment, rather people make decisions by the commitment, emotional attachment, deliberation and human interaction (v. Staveren 2001). Sen (2000) describes this as an exchange economy which depends on mutual trust and the use of norms – explicit and implicit.

In initial stages of the innovation project it is challenging to find sufficient financial resources, due to the (possible) uncertain outcomes of innovation projects. Many current initiative in BoP ICT projects are becoming ‘dead pilots’, partially because they are fully grant-based (Carvalho, Klarsfeld et al. 2011). In ‘regular’ development projects, financing usually comes through donors. Donors often require certain outcomes and impact of the project, as well as proper monitoring of the project. But donors find it difficult to finance open-ended needs assessment as “these are difficult to assess according to sector-based criteria” (Crewe and Harrison 1998). Also the way donors spend their money has found much critique; Moyo (2009) suggested that the aid money has done very little for Africa. However, many projects, though possibly market-based today, often have used grants in their initial phases to grow (Carvalho, Klarsfeld et al. 2011).

Therefore BoP innovation projects often require innovative financial approaches (Prahalad 2005). Micro financing is one of the options, but it is typically available for individuals and for micro-businesses. Regular banking services are typically available for larger companies. Small and medium businesses, however, often lack access to appropriate financing options (‘missing middle’), which can limit their potential growth (BoP Inc 2012). “Investor interest in BoP markets is based on expectations of a large-volume, low-risk and high return on capital employed business opportunity” (Crewe and Harrison 1998), but they state that they are still missing adequate models to measure the social impact of the entrepreneurs they want to invest in. Current developments in crowd funding platforms, incubator labs and venture capitalist for African entrepreneurs can contribute to the development of BoP projects. Also a Business model Canvas instruction useful for BoP entrepreneurs has been launched (Osterwalder and Pigneur 2002).

3.3 Scaling up innovation

Scaling-up the results of an innovation project into full deployment and, e.g., bringing new business initiatives to new regions or new sectors, is always a challenge, and especially so for BoP project. Even the most popular ICT4D initiatives, have too high expectations over too short time. In 2005 Nicholas Negroponte announced an initiative called One Laptop Per Child (OLPC) at the World Economic Forum in Davos, Switzerland. The vision was that with this relatively cheap laptop children in underdeveloped regions could help teach themselves and others. It was envisioned that within 2 years 20 million OLPCs were introduced. This appeared to be a rather ambitious goal as is explained in an evaluation of this project in the Communications of the ACM in June 2009. It is stated that *"expecting a laptop to cause such a revolutionary change showed a degree of naiveté, even for an organization with the best intention and the smartest people"* (Kraemer 2009).

In the study by Hystra it is stated that many ICT4D projects can be regarded as "dead pilots". Projects that have reached the million customer landmark, remain the exception (Carvalho, Klarsfeld et al. 2011). Dambisa Moyo in her critique on aid also points out that there is a "Micro-macro paradox; a short term efficacious intervention may have few discernible, sustainable long-term benefits. Worse still, it can unintentionally undermine whatever fragile chance for sustainable development may already be in play" (Moyo 2009). In 2009 Unicef Uganda published a picture of all the mHealth pilots in Uganda (Unicef 2009), which again shows the difficulty of coming out of the pilot-phase and go to commercialisation of the service. This illustrates, despite the fact if these pilots will become sustainable, many pilots are started, also very often trying to solve similar problems. Reaching scale in this sector therefore is a big challenge and could possibly partly be attributed to the fact that donors mainly finance projects that have a well stated goal. There are some often occurring structural flaws resulting in a failure to achieve scale are listed (London and Hart 2010):

- A purely top-down approach to Base of the Pyramid enterprises. Successful Base of the Pyramid enterprises are mostly built bottom-up.
- Lack of knowledge of the basic tools of business.
- Lack of textbook solutions for local, micro level challenges: creating markets where there are none, engaging a community already fractured along caste or tribal lines, non-traditional approaches to marketing, building bridges to governments and other stakeholders that often seem distant and unreachable, managing distribution chains in the face of unreliable transport and power, etcetera.

Special effort is typically needed to ensure the sustainability of the innovation and effective scaling-up. If money streams are secured to continue the project, a proper scaling strategy has to be put in place. Making use of the social network to diffuse the innovation would be one of the strategies to include (Posthumus, Aarnoudse et al. 2013).

3.4 Institutions, policies and strategic alignment

The scaling-up of BoP innovation projects typically requires well-functioning institutions and institutional structures to support the scaling-up of the innovation, the so-called innovation system (c.f. Coenen and Díaz López 2010). Unless possible to adequate approach and know how to interact with a particular rules-of-the-game in low-income countries, gain access to resources and negotiate inadequate innovation systems (Foster and Heeks 2013), the best policy instruments fail to obtain their full potential to sparkle innovation and change [16]. In the development sector the well-functioning of institutes and institutional structures is related to activities in 'good governance'. Alongside the opening up of markets, deregulation and privatisation ran an agenda for political reform: calls for democracy and 'good governance' (Black 2003).

In the development discourse there is a strong donor's assumption that they have better understanding of a country's needs than its' own government (Crewe and Harrison 1998). Most of the time certain preconditions are set for overseas development aid, and agendas of multilateral donors is mostly based on the UN millennium development goals. This means that what happens in a local context, is mostly depending on agendas of national and international institutions. Strategic alignment either for future buy-in of the idea, or to influence a future agenda, is necessary from the early stages of the development process.

Despite BoP projects not having an explicit ambition to change policy agendas, governance agendas and policies will have influence for example in the uptake and implementation of the service on a local and international level. For example it is critical to understand national or local policies and to use them constructively and strategically in further developing and deploying the innovation. Sometimes, it may be necessary to work at influencing or modifying policies, e.g. if they directly affect success or failure of the innovation. Overall, sufficient institutional capacity and sufficient infrastructure are critical for scaling-up innovations.

3.5 Co-creation, active participation and social embeddedness

A significant part of the BoP population is not integrated into the global market economy, which makes it difficult to understand market demand and to relate these to people's needs (Prahalad 2005). In development projects the lack of knowledge about market demand, can be the lack of knowledge about a culture: "Cultural barriers and gaps in local knowledge are often seen to impede the progress of development interventions." (Crewe and Harrison 1998). Culture is often used for categorizing what cannot be identified or explained" (Crewe and Harrison 1998) and is therefore given as the reason for failure of the project. In development cooperation they have therefore applied participatory approaches and involve the local people to understand the culture and create ownership. "Many development projects had floundered because people had been left out, where they were allowed in, much more was achieved with less" . Embedding BoP projects in local communities can help to understand culture and history, and to integrate them into the community in order to co-create innovative and systemic solutions for mutual value (Simanis and Hart 2008).

But now the question arises: who are the local people? “A distinction between donors ‘partners’ and the ultimate beneficiaries – the real locals – is impossible to sustain” (Crewe and Harrison 1998). Therefore in co-creating with “local people” and “local organizations” is similar, but one just has to wonder who is the BoP?. The BoP entrepreneur also brings his or her own culture in the development of the service. Van Stam made a comparison between different aspects of a Western culture and the Ubuntu culture in Zambia (v. Stam 2012). The way ‘local people’ look at the BoP entrepreneur is influencing the way they respond. “Whether colonial or government, donor supported development projects, has a profound influence on the way in which local people respond to the latest one” (Crewe and Harrison 1998). In tandem with various interventions, people have learned to adapt their behavior in anticipation of where they see potential benefit” (Crewe and Harrison 1998). In co-creating with them, involving them in the development process this should be kept in mind as it can influence the response and also the own view of what is good.

Co-creation can be done on multiple levels. It is related to user involvement in product and service development. An user can be involved in multiple ways, and co-creation is the most advanced and intensive one. It is therefore also a more time-consuming method and should be used strategically and not as a rigid model for developing new services.

The idea of co-creation is that instead of one organization gathering a lot of information and transforming that into a product, this is a process in which both sides contribute and create the product together (Simanis and Hart 2008). What should be kept in mind is that in co-creation processes it is important there is a stakeholder that has a stake in the final product to succeed, meaning wanting to create a business with it. Only then the right decisions can be made. It requires an open mindset from people that are used to thinking “what is best for them”, as the ‘them’ in this case are often people that are difficult to relate to. Furthermore, what is aimed for with the service, often a social goal, might not be what users want, which means that it needs to be “repackaged” in order to reach its potential. Only through co-creation and active participation of the target group, such structures can be discovered

3.6 Focus on capabilities and evaluation

At the start of the development agenda, just after the second world war, development was measured in terms of GDP per capita. Later a focus was shifted to more social goals, ultimately resulting in the millennium development goals. This resulted in projects and programs that were set-up around reaching the targets as set by the United Nations. Furthermore there was a shift in providing money, to providing goods and later providing knowledge and people. Still outcomes of projects needed to be measured in terms of e.g. how many people were reached, benefited from it, and how it contributed to the millennium development goals. Notwithstanding that the MDGs are indeed good pillars to alleviate poverty, a new discourse was introduced Amartya Sen (2000) that said to focus on increase of people’s capabilities to live the life they want to lead. Focusing on capabilities instead of e.g. numbers of beneficiaries or providing goods, is an innovative approach that is felt to relate more to sustainable development.

However, to be able to measure the increase of capabilities, and which works better than the other, proper evaluation mechanisms need to be put in place. Common methods are counterfactual analysis (what would have happened if we would not have done the intervention) or follow the money (how much (people) are reached, with the money that is spent). Banerjee and Duflo (2007) introduced a method that is new to the development sector and provides proper insight in what works and what doesn't an her evidence based approach with randomized control trials.

The last methodological guideline therefore describes the importance of the focus on capabilities and evaluation to ensure that the initial goals of the BoP project will in the end achieve it, one way or the other. It is critical for BoP innovation projects to focus on increasing people's capabilities, while organizing and managing the project. This Capability Approach (Nussbaum 2011, Oosterlaken and Hoven 2012) involves a focus on people's development and freedom—instead of a focus on 'merely' supplying hardware or equipment ('too little'), or 'overdoing' it by prescribing specific behaviour ('too much') (Sen, 2000). This focus on people's capabilities, development and freedom can be integrated into the project plan, and needs to be evaluated in iterative cycles of the project, in order to ensure a productive combination of commercial and social goals. The ways to evaluate the improvement of people's capabilities is currently discussed, both practically and theoretically (c.f. Kleine 2009, Oosterlaken and Hoven 2012).

4 Discussion: learning points in implementing BOP innovation projects

To make the framework hitherto presented applicable in practice, the guidelines are mapped on an innovation process (see figure 1). It is not the purpose of this section to discuss the ideal BoP innovation process, and therefore describe an innovation process only in general terms.

In very general terms, an innovation process starts with an idea and then proceeds in several iterative phases towards realization. The first phase focuses on vision and idea development and on exploring possibilities. The second phase is concerned with identifying appropriate partners and building partnerships. The third, fourth and fifth phases are concerned with analysis and requirements, design and development, and building and evaluating prototypes and organizing pilots. The sixth phase focuses on implementation and introduction of the new product or service, and on deployment.

Moreover, these phases are ideally organized as an iterative process, promoting step-by-step learning, and revisiting and adjusting assumptions. In addition, the process is ideally organized in a multidisciplinary fashion, involving people with different backgrounds, from different organizations.

Although each of the six guidelines need to be taken into account throughout the entire innovation process, we would like to propose that specific guidelines need extra attention in specific phases of the process. Figure 1 illustrates the relative importance of each of the guidelines in each of the phases of innovation in a conceptual framework. In the first two phases (Vision, Idea and Exploration and Partnerships), Collaboration building, cooperation, Co-creation, active participation and social embeddedness, and Institutes, policies and strategic alignment are critical. In the next three phases (Analysis, Design and development, and Prototype and pilot), Capabilities and evaluation, Co-creation, active participation and social embeddedness, and Business models and financing are critical. And, finally, in the final phase (Implementation and introduction) Scaling-up and Capabilities and evaluation are critical.

5 Conclusions

We identified and discussed several critical methodological guidelines of inclusive innovation processes for the BoP. However, we are aware that further theoretical research and more systematic case studies analysis are needed to get a more solid understanding of how innovation processes for the BoP need to be organized and managed. One area that would need to be studied, for example, are projects that aim at creating sustainable innovation infrastructures (eco-systems) in BoP countries. Such projects address the organization of environments that foster BoP projects by focusing, for example, on setting-up educational programmes or providing seed funding for social entrepreneurs.

Moreover, it would be valuable to further study questions like the following:

- How does the initiator/owner of the project influence the way in which the innovation process is organized? Would the innovation process be different/more effective if it were initiated by, for example, an industrial partner, or by a not-for-profit organization?
- How does the sector (for example, education, agriculture, healthcare, finance, etc.) in which the innovation project takes place, influence the ways in which the innovation process needs to be organized?
- How does the type of innovation (for example, a technical innovation, a social, service innovation, a new product, a new service or process) influence the innovation process? Are some types of innovation more successful? What are then the key success factors?
- Which approaches, tools and methods are used in innovation process? And which are most effective? Do we need other or better approaches, tools or methods in order to overcome the challenges related to the six elements that were identified?

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The usual disclaimer applies.

Appendix

Case studies of Inclusive Innovation Projects

In order to illustrate the six guidelines of the innovation process for the BoP, we have looked into four different BoP innovation projects that were conducted recently or that are still on-going. Key project team members were interviewed to obtain information on the projects and on insights and lessons learned. In the following sections, each project is briefly described, following the six guidelines that were identified in the research paper.

	Description
Handy Hoe	Ergonomic hand tools for <i>farmers</i> in <i>Ghana</i>
Biogas Socket	Electricity from biogas for <i>households</i> in <i>Rwanda</i> and <i>Bangladesh</i>
Medical Testkit	Testing antibiotics in drugs for <i>pharmacists</i> in <i>Kenya</i>
DSM Neev	Increasing milk yield of cows by improving their feed for <i>farmers</i> in <i>India</i>

Table A1 Overview of the four BoP Projects that were interviewed

Handy Hoe for farmers - Ghana

Project Goal	The use of traditional, simple hand tools in rural Africa causes health problems and loss of harvest. Ghanaian farmers use short-handled hoes to agitate the soil surface. They need to bend over continuously to reach the ground. In the long run these hoes cause permanent, crippling lower back pain. With a long-handled hoe, farmers can work upright. This leads to less physical complaints and sustained, higher productivity.
Initiator	TNO
Key –Partners	Kalabash, University DS, (in later stage: CSP, GSFP, UrbaNet, FTC) and partner organisations
Other stakeholders	Community Chief, Ministry, local blacksmiths and carpenters, farmers
Time	January 2008 – December 2011
Key take-aways	Co-creation with UDS and Kalabash and farmers has worked very well Local champion that is able to contextualize the things that needed to be found out to develop a good hoe.
Challenges	To ensure a necessary behavioural change by farmers within timelines of the project To find the entrepreneurs and blacksmiths that can produce the products on a large(r) scale
More information	www.tno.nl/i4d
Innovation process	

Handy Hoe



Lessons learned Handy Hoe (Project leader: Reinier Könemann, TNO)

1. Collaboration building and cooperation:

In partnerships both partners for developing the technological innovation, as well as partners that can develop and facilitate an educational programme necessary for introducing the innovation on the market, is crucial.

“We were very much focused on the tools as a consortium, and initially we didn’t take the farmer training into account. If a partner on farmer training was involved from the beginning we might have had a different process.”

“The initial goal of the project was to stimulate the local economy, build up new knowledge and improve quality of life of farmers in Ghana. This made us decide to work with local tools manufacturers, as well as involve the local farmers. We also didn’t want to take an authoritarian attitude, but instead tried to build ownership from the beginning, really take a bottom-up approach.”

2. Co-creation, Participation and social embeddedness:

To ensure adoption by end-users it is important to keep a constant (open) dialogue. Cultural differences and the specific context of Africa lead to different approaches for embedding an innovation in a community. *“In Ghana people are more convinced because a man of authority believes in it and says it is a good thing. This is different from Western contexts, as we believe something when there are good arguments for it. This is a different way of making decisions on using or developing new products.”* *“We might have jumped too fast from initial problem definition to the project, without the farmers realizing whether this was their number one problem to solve. We therefore encountered problems in adoption and use of the tool during the rainy season. There is a lot of pressure to harvest around that time which made farmers reluctant of trying the new tool.”*

3. Business models and financing:

Including activities that determine on what conditions to continue or stop the project (key success factors) is relevant to keep focus and ensure that it lead to a relevant innovation. *“People in BoP Context are very much used to aid money and being helped. It wasn’t until we made clear that we would stop with the project if they were thinking it wasn’t a good idea, that they started to come up with other suggestions.”*

4. Scaling-up innovation:

Behavioural change takes more time than developing our technological : *“We initially planned to have rolled out in the northern part of Ghana. It took us more time to create awareness on the need of behaviour change to use the new tool. Ghanaese farmers felt that it was lazy to work standing, instead of bowed over. We also had to do marketing that took longer than expected.”*

5. Institutes, policies and strategic alignment:

Involvement of government doesn’t need to have a big role, but is necessary *“We started bottom-up and informed/involved the ministry at some level, I think that was exactly the right approach”*

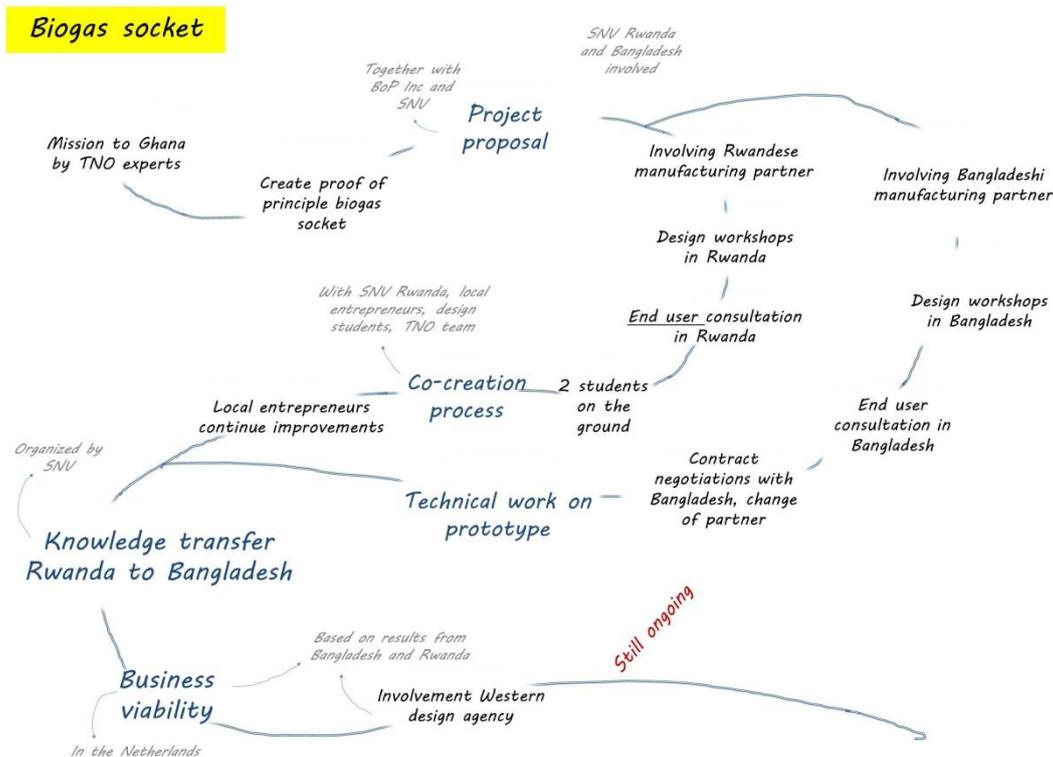
6. Focus on capabilities and evaluation:

The adoption of the innovation not only depends on the extent to which it can fulfil a need, but whether the community was able to make a behaviour change. *“After the first pilot we didn’t get so much evaluative response. Also the response of one village was often depending on one person that everyone in the village would listen to. This meant that we relied on only two voices (two villages) after the first pilot. We decided to include other villages, in other areas of Ghana to make the evaluation more valuable and realistic. We did a similar process as we did with the first two villages, but a lost faster”* *“We had insufficient knowledge and focus on the required behaviour change for the new tool. It takes time and persuasive power which was not foreseen. We had to change some focus and we decided to look for a farmer training organizations who could spread the idea to other areas of Ghana instead.”*

Biogas Socket for households - Bangladesh and Rwanda

Project Goal	Over 1 billion people have no access to electricity. Low-income households at the BoP spend enormous amounts of time and money securing inefficient or unsafe alternatives such as firewood and kerosene. This limits the ability of people at the BoP to engage in income generation and educational activities and has a negative impact on health. The production of electricity from biogas can be a sustainable solution to this problem. Many rural households are already using household biogas digesters that provide them with gas for cooking. This pilot aims to develop, produce and sell an electricity socket that will allow those with biogas digesters to produce electricity in their homes. In this way, they will for example be able to charge cell phones and power LED-lamps.
Initiator	TNO
Key –Partners	BoP Inc, SNV Netherlands, SNV Bangladesh, SNV Rwanda
Other stakeholders	The Netherlands: TU Delft; Rwanda: ABEM, IPRC, Gasabo 3D; Bangladesh: BCSIR, BUET, WinSources
Time	January 2011 – present
Key take-aways	The transition from an R&D focus to an entrepreneurial focus needs to be coordinated, as partner roles and desired capabilities shift during this process.
Challenges	To identify appropriate suitable local manufacturers and entrepreneurs To co-create the product, based on a technical concept with people that have less educational background and design skills To find a commercial/entrepreneurial partner on the ground from the start
More information	www.tno.nl/i4d

Innovation process



Key lessons learned Biogas socket (Project leader: Pieter Verhagen, TNO)

1. Collaboration building and cooperation:

Defining and finding the right partners can be a tremendous challenge when specific capacities, knowledge and skills are required. *“For a local manufacturer/entrepreneur to be interested in the product, the product has to be more mature and moving out of the R&D phase. Although we initially planned to involve an entrepreneur early in the process, we had to postpone that ambition to the next stage of the pilot.”*

“SNV Rwanda is acting as a crucial bridge between the technical knowledge at TNO and the practical implementation in the field. At the moment we have seconded two industrial design students to Rwanda that are our eyes on the ground. They are guiding the local partners in test protocols, user testing and designing the product and that is what the project needs.”

2. Co-creation, Participation and social embeddedness:

Long distance communication and different working cultures can lead to delays and misunderstandings about expectations. *“Co-creating online and through digital means is hard to achieve in this context. We found our Rwandan partners experienced difficulty creating documentation on what they were doing, and understanding our expectations from our written documentation. Creating instruction videos proved a useful tool to communicate test protocols.”*

3. Business models and financing:

Multiple goals (caused by the ambition of different partners or funding mechanism) can lead to conflicts in decision making for the process on “what’s best for the project”.

“It was an initial goal to create local enterprises/stimulate the local economy. Therefore we need local manufacturers of the biosocket. On the other hand it was also the goal to create market based innovations, which require very low cost, which in reality almost always means mass production in China. These two goals are not easy to combine as local entrepreneurs have limited capacity to create and finance the innovation. Currently, we aiming for a two-pronged approach, with local entrepreneurs making the first batch, and mass production taking over when the market grows larger.”

4. Scaling-up innovation:

Skilled people are necessary to engineer the product to such a level it can be transferred to the local community and hence scaled to a large user group. It is a challenge to decide who and where the skilled people are and what is the wisest strategy to involve them.

“We wanted to involve local capacity in designing and building the product, because the initial market is too small to justify mass production. Eventually we aim for an international enterprise to mass-produce the biogas sockets in order to drive the price down, while local partner roles will shift to distribution and maintenance.”

5. Institutes, policies and strategic alignment:

Striking a deal with government on import tax waivers is often mentioned as a solution to lower costs, but is very hard to actually accomplish.

“We found import tariffs to be a mayor bottleneck in making the product affordable. Local partners indicate that import tax waivers can be negotiated with government. Because of the R&D status of the product, such discussions with government are premature at the moment, but will need to be started soon.”

6. Focus on capabilities and evaluation:

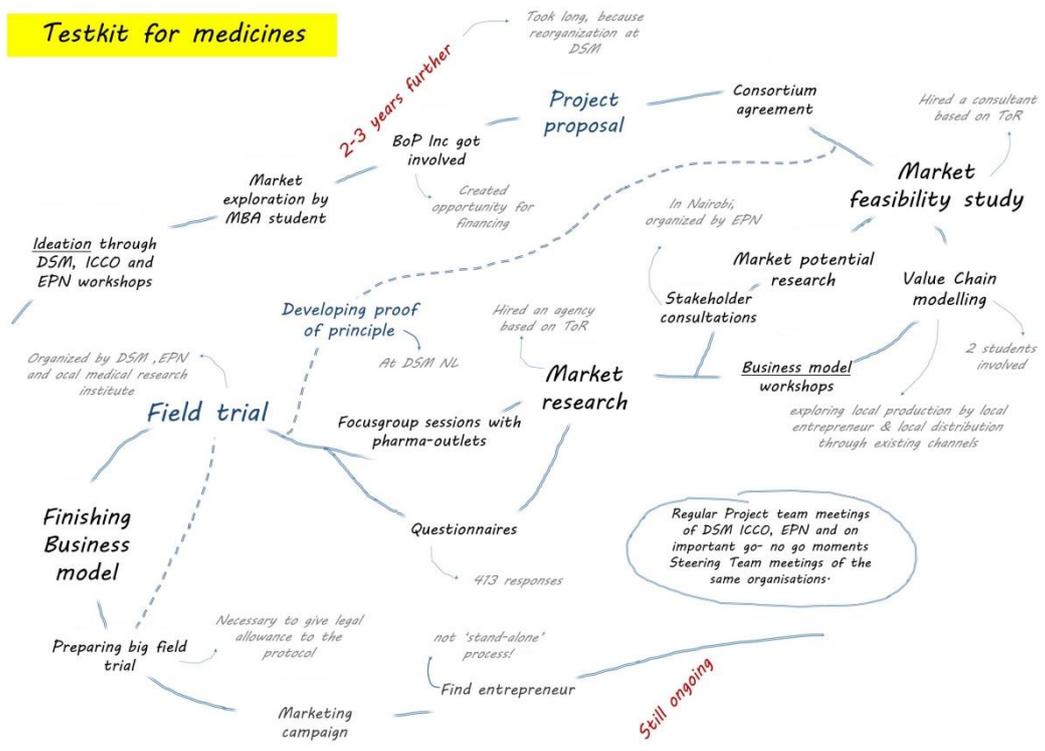
Next to capabilities to use the innovation, also capabilities on how to make, develop, implement and further innovate it, are necessary to ensure adoption.

“TNO made the technical invention. It is hard to transfer this knowledge to local partners that have less educational background and conceptual understanding of innovation, and also lack financial means to run the risk involved in developing and commercializing a new product. Our current local innovation partners do not have the capacity to oversee an international mass production process, or start R&D on the next version of the product.”

Testkit for medicines for pharmacists – Kenya (and beyond)

Project Goal	Substandard quality drugs are a threat to human life, either directly or via an increase in antibiotic resistance. Up to 40% of the drugs bought by the poor are suspected to be of substandard quality. This problem can have tragic consequences for those who take the drugs and it undermines the necessary confidence in the health sector. Apart from counterfeit drugs entering the market, problems with medicines arise during transportation, handling and storage. A medical test kit is a highly relevant tool for checking the quality of medicines. This project aims to develop, produce and launch on the market a new antibiotic test kit that can check whether medicines contain the necessary amount of active ingredients.
Initiator	DSM Sinochem Pharmaceuticals (DSP), ICCO and EPN
Key –Partners	DSP, ICCO, EPN - Ecumenical Pharmaceutical Network (ICCO partner organisation) , BoP Inc
Other stakeholders	Public, Faith Based and private agencies in the health & pharma sector in Kenya , external consultants, regulatory & policy making agencies
Time	January 2011 – present (excluding setting up the project)
Key take-aways	Having partners with insight in the local health system context and research agencies that are familiar with social issues are highly beneficial Despite uncertainties on the product innovation, it is relevant to explore early in the process the market & business opportunities
Challenges	The potential value chain actors could not be identified early in the process which lead to fuzziness on the added value of certain stakeholders. The development of the proof of principle took longer than expected. R&D is unpredictable, and thus often misfits with tight project timeframes.
More information	www.bopinc.org

Innovation process



Key lessons learned Testkit for medicines (Project leader: Helene Mancheron, BoP Inc)

1. Collaboration building and cooperation:

In order to create the right eco-system that will foster the innovation, early involvement of (the right) NGOs, governmental bodies and local companies is necessary.

“NGOs were involved to understand the interest of the medical testkit in the eco-system. EPN as our partner NGOs could help in raising awareness which would be useful in scaling the testkit. We approached the embassy of the Netherlands and various pharmacy associations also to understand the eco-system. We need to buy in on potential support for a later stage.”

2. Co-creation, Participation and social embeddedness:

Having a knowledgeable partner in the South that is also aware of Western way of working can be highly beneficial for the process

“We went through the preliminary test protocol with the whole team. This was done in Delft and someone from EPN came to the Netherlands. This was giving input to the DSM lab to improve the protocol for the field trials.” “EPN gave a lot of insight on the business feasibility study, somebody from local environment that develop the ideas with you is very helpful.”

3. Business models and financing:

An innovation comes often with a new value network in which several organizations get a new role. Involving them in creating a viable business model is necessary for sustainable development of the innovation.

“DSM and ICCO did some initial co-creation sessions in the Netherlands on the business model. That was in 3 meetings which were facilitated by BoP Inc . Similarly we did an initial stakeholder mapping workshop based on insights from EPN and feasibility studies. These mapping exercises will be validated with our partner EPN and other local stakeholders. The added value is to have all the different competence around the table.”

4. Scaling-up innovation:

To be able to scale the product, it is necessary to have an entrepreneur or industrial partner involved that wants to deploy the product. Finding this partner in the course of the project, might be a risk. *“We are not building a business model for DSM, but for a medical testkit for the BoP. This inherently means there is a product owner/business developer required that will take ownership over the medical testkit. DSM will provide one essential component. We have not yet found this ‘owner’.” “The level of ambition for the project changed by the group of partners at the table. As now we have a consortium that can change the eco-system. When you do it alone, that would not have been possible. For this product to work it is crucial to change the eco-system.”*

5. Institutes, policies and strategic alignment:

Having regular interaction with key people in organizations that can have an (indirect) influence on the progress of the project, is highly beneficial. It creates trust.

“In finding the right partners it took some time to find the right person within an organization or institute. Who is most influential and beneficial for the project. EPN was helping a lot in finding this person.”

“In February 2012 we went to Kenya with a developer of the proof of principle, project manager, and someone from EPN. The aim was to prepare the field trial. We were explaining what we want to do and get their feedback on our story. It was also to do a follow-up of last field visit, especially to talk to the government and strengthen our network. It is important to follow-up on previous visit to show that you do as delivered. In that way you create trust.”

6. Focus on capabilities and evaluation:

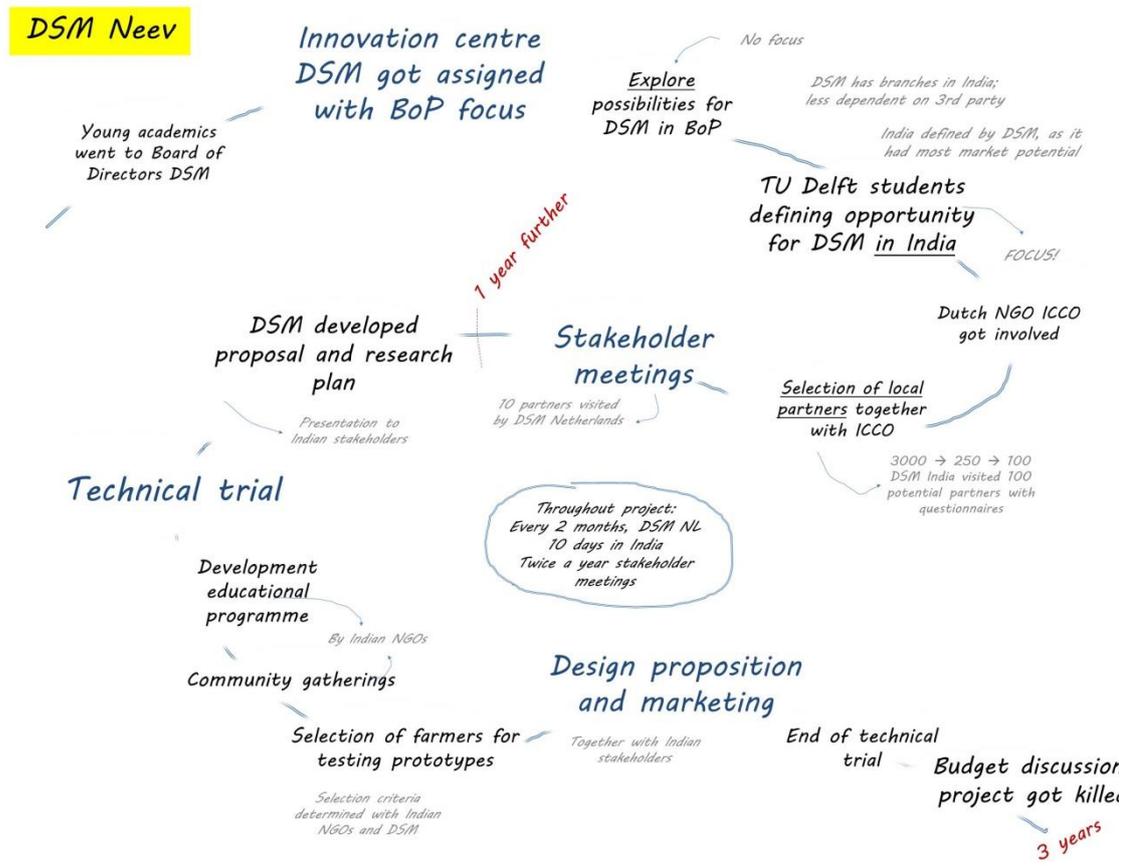
Having clarity on the complexity of the innovation, and the required skills to use it, gives a better direction to what activities need to be deployed for adoption of the innovation.

“Right now there is a challenge to organize a good field trial, as the current protocol might actually be too sophisticated for the pharma outlets. We need to give a proper explanation how to read the results.”

DSM Neev increasing milk yield of cows - India

Project Goal	The purpose of this activity is to contribute toward increasing the income of the farmers, by increasing the milk yield of their cows. Increasing milk yield provides farmers with a chance to sell a greater proportion of the milk for consumption, thereby generating an additional income stream. To improve milk yield, the period between calving must be reduced. The fertility of the cow must also be improved and that, in turn, depends upon improving the health of the animals. That is the need to which DSM is responding: improving the health of cattle by improving their feed. (quote DSM Magazine Q1 2008)
Initiator	DSM (innovation centre)
Key –Partners	Amul, Baif, ICCO, Pradan
Other stakeholders	Partner organizations ICCO in India, farmers
Time	January 2009 – March 2012
Key take-aways	To have appropriate partners, so that each represents a different part of the value chain To create trust between partners through knowledge sharing and open attitude
Challenges	Ownership in DSM
More information	DSM-Magazine, 2008

Innovation process



Key lessons learned DSM Neev (Project leader: Manon Schuurmans, DSM innovation centre)

1. Collaboration building and cooperation:

Taking time to identify the right (local) partners, and take time to build trust and an open dialogue (without expecting any concrete results yet) might be highly beneficial for the rest of the project. Having clear selection criteria makes the selection easier.

“When selecting the NGOs we looked in detail to their capabilities and their track record and their professional attitude. From the start we have been open about our technology and knowledge and did not want to give them a feeling of wanting to have everything without giving something in return. That has helped in creating trust, though it did take some time.”

2. Co-creation, Participation and social embeddedness:

Participation and involvement of the community should be done by a partner that has experience and knowledge about the specificities of the (cultural) context.

“To involve the farmers, meetings were organized in villages in different states. Some 500 people would go to those meetings. These meetings were held by our partners, I have never been present at one.”

“Co-creation was very crucial in developing the educational and awareness programme. DSM didn't have any knowledge or insight in the living conditions of the farmer and the cow.”

3. Business models and financing:

Testing the value of the innovation, and whether or not you have the right value proposition, can be incorporated in the project by letting test participants pay for the product.

“Amul participated mostly in defining the proposition and the communication strategy of the product. For example it is not possible to sell it in same size packages as we do in Netherlands, as that is too big for the amount of cows a farmer has.”

“We never gave away our product for free. it would have caused serious disruption of the cash position if first you give free and then try to get payment. We asked the farmer to pay an amount found reasonable by our partners, especially in the poorest area. We put this fee in a special fund that is now provides microcredits. In this way the farmer is aware of the value of the product from the beginning.”

4. Scaling-up innovation:

Having the partners involved that will also be part of the future value chain, can be highly beneficial when one wants to scale.

“We ensured that the other partners were all in different parts of the value chain, hence we did not have competitive/conflicting interests.”

5. Institutes, policies and strategic alignment:

Both bottom-up and top-down strategies can foster the innovation process. Having a constant dialogue with the top can indirectly lead to things start moving in your direction on a local level.

“I was in India at least three times a year to talk to the stakeholders and farmers and to keep the relation going.” “Although we did not feel direct benefit in communicating with the ministry, it is relevant to talk to the governmental bodies. There is a big governmental system in India and the chance of things drizzle down to lower levels of governance is higher when involving the Ministry. This can make it easier to do what you want to do . The Indian government also has a focus on the improvement of milk production in rural India, and our project was fitting in to those plans very well.”

6. Focus on capabilities and evaluation:

The innovation might have high impact on the lives of people, this also means those people (and organizations) have a lot more to lose.

“Actually they have more to lose than we do. If our product would fail, or it was doing as we promised it would do, than they have more to lose. The farmers will forget DSM, but they will remember it was Amul that convinced them to participate in the trial and has now, for example, killed their cow. This didn't happen, but it is good to be aware of.”

Vitae

Jenny de Boer works as an expertise consultant at the Netherlands Organisation for Applied Scientific Research TNO – Organisational Innovation in Delft, the Netherlands. She has an academic background in Industrial Design engineering and Cultural Anthropology and Development Sociology. She has both research and practitioner experience in developing inclusive innovations, particularly in the field of information and communication technologies for development. She is focusing on organizing inclusive innovation projects for economic, social and technical sustainable innovation; creating ownership, developing a viable business model with innovative technologies. As a facilitator and designer she works in project teams with public, private and not-for-profit organisations, representing the voice of the end-users.

Marc Steen works as senior research scientist at TNO. He earned MSc, MTD and PhD degrees in Industrial Design Engineering at Delft University of Technology. He worked at Philips Electronics and KPN Research before joining TNO. His expertise is in human-centred design, co-design, open innovation, organization studies, service design, marketing strategy, philosophy of technology and ethics. He is currently interested in the ways in which innovation projects can realize sustainable impact and promote people's wellbeing.

Bineke Posthumus has been working as a technical consultant at the Strategic Business Analysis department of TNO since 2009. She is specialised in research and advisory with regard to stakeholder analysis and complex business modelling. Bineke has a special interest in research towards market-based innovations in emerging markets. Before her career at TNO, Bineke worked as a business analyst at Deloitte Corporate Finance where she performed company valuation and business analysis assignments in the Netherlands and abroad. Bineke has a bachelor degree in International Business, majoring Finance, which she obtained with distinction (2006). After her bachelor degree she obtained a master degree in Strategic Management at the London School of Economics (2007). (150 words)