



# What is innovation anyway? Youth perspectives from resource-constrained environments



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## ABSTRACT

Innovation manifests itself in myriad forms in developing communities. A better understanding of the meaning and rationale for innovation, as perceived by the rapidly-growing youth population in developing countries, is pivotal to the design of practical and sustainable technology innovations and entrepreneurial ecosystems. This article presents the findings of interviews conducted with 271 youth across the rural, semi-urban, and urban areas of Kenya, Tanzania, India and Nicaragua. These provisional narratives explain how the next generation perceives innovation, and illustrates how cultural mechanisms and communal context bias innovative solutions for individual or community needs. The dynamic interdependence between innovation and the socio-cultural context is brought to life by juxtaposing narratives of respondents from Kenya and Tanzania, neighboring countries with starkly different histories. Different perceptions of what constitutes innovation is critical as it varies from location to location and impacts the likelihood of success of different technologies and innovations. Such similarities and differences in the major themes of innovations, driving factors, and rationales can inform and inspire innovators seeking to meld western and indigenous innovation frameworks to foster self-determined improvement of lives and livelihoods.

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## 1. Introduction

Product innovation is usually a major driver of economic development, but the innovation process itself is transformative for all societal institutions. Hence, it is imperative to first define innovation and what it entails, before designing new approaches to foster innovation, drive economic development, and bring about social change (Lazonick, 2002). At a fundamental level, innovation is the process of generating and recombining ideas to establish a relationship between present efforts and past experiences to solve future problems (Bartel and Garud, 2009). It could also represent the process of doing something new or adding value to old things by changing the way they're done (Dawe and Guthrie, 2004) and lessons learned from one innovative activity can often be applied to improve other activities (Lazonick, 2004).

But this 'innovation' is mostly associated with technological feats and discoveries, especially in more technologically advanced economies. One must acknowledge that technological innovation has come to play a critical role in the economic wellbeing of the

world and resulted in unprecedented improvements in the world's standard of living. For instance, the United States concentrates its innovation strategies on three focal points related to science and technology:

1. Investments in research and development and facilitation of capital (human, physical and technological) needed to perform and transfer this research.
2. Promotion of competitive markets that encourage entrepreneurial spirit and help spread innovative ideas across borders.
3. Achievement of breakthroughs in fields such as alternative energy and health where private innovators might be unlikely to produce sustainable results (National Economic Council, 2011).

In developing countries, however, lack of proper business and political climate, insufficient education, focus on day-to-day survival, and limited investment in research and development make Western-style innovation processes harder to implement (Aubert, 2004). In this context, innovation is led simultaneously by formal development programs and a multitude of local entrepreneurs and communities innovating to eke out a living. Individuals in such societies often utilize their indigenous knowledge to address challenges and develop innovative ways to solve the problems in

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their own communities. For instance, the Kpelle artisans in Liberia have mastered the production of high strength, rust-resistant iron (Thomasson, 1991). Such innovations, or “traditiovations”, (Cannarella and Piccioni, 2011) develop from cultural and traditional origins and are often considered irrelevant by conventional scientific standards and current development programs often fail to incorporate such indigenous innovation frameworks into their positivist epistemologies, partially because they are designed and funded by people in Western countries.

When development experts rely solely on their Western backgrounds while creating programs to foster innovation in developing countries, they reinforce the Western conceptualization of innovation and ignore both local concepts and the cultural context under which such innovations are formulated and operationalized (Mehta et al., 2011). Furthermore, dependency theorists even argue that the global diffusion of ‘Western’ innovations has exacerbated the dependency, poverty, and inequality in these regions (Freeman, 1985). But individuals in these resource-constrained environments can be extraordinarily innovative. For instance, the *Maasai* women of East Africa know that the splinters of the wild olive (*oloirien*) tree can be burnt and the smoke used to sterilize milk (United Nations Convention to Combat Desertification, 2007). This practice has been used for generations, but the wild olive was neither tested nor analyzed for such preservative properties. This lack of scientific examination prevents many positivist thinkers from seeing these indigenous methods as innovations or acknowledging their value. Subsequently, such a bias towards positivist thinking could result in innovations stemming from cross-generational wisdom being considered backward or worse yet, not considered at all! This inhibits the multi-sectoral innovation that developing countries need in order to spur organic economic development. Incorporating both Western and indigenous perspectives simultaneously is imperative for the successful dissemination of innovations in resource-constrained and more traditional environments (Cannarella and Piccioni, 2011).

Furthermore, stimulation of organic growth requires innovative thinking in every sector of growth. In terms of assistance from the West, the onus falls on innovators and entrepreneurs to contextualize and operationalize innovation as the communities perceive it. Failure to do so can result in strained relationships between exogenous innovators and the communities and ultimately lead to failed projects and wasted resources. The failure of the communal treadle pumps in Zimbabwe illustrates this imperative.

Treadle pumps are human-powered pumps that draw groundwater for irrigation and are mainly used by women and children. In Zimbabwe, many farmers in garden cooperatives stopped using the pumps stating that the operation process was tiring. However, further investigation revealed that the farmers were actually uncomfortable with their wives operating the pumps! Standing on the elevated ground made the women vulnerable to the wind blowing their dresses away and resulting in inappropriate exposure of body parts. Another sensitive aspect was that the men thought that the pumps were tiring their wives out and negatively impacting their wives’ “performance in bed” (Kay and Brabben, 2000). An innovative technology that worked beautifully in other countries like Niger and Kenya did not work in Zimbabwe.

A dialog on development and innovation in such a community needs to begin with an understanding of their socio-cultural values, user preferences, and innovation frameworks. This article argues that defining innovation in the words of these communities, particularly the youth, is a first step towards understanding how creative and context-specific innovations are formulated and how they meet needs and can engage stakeholders in improving livelihoods and quality of life.

Several developing regions of the world - in Africa as well as

South Asia and the Middle East - have a burgeoning youth population owing to steady birth rate and decreased infant mortality (Jimmenez and Murthi, 2006). While it is true that youth in such resource-constrained environments are often victims of extreme poverty, disease and crime, they also have the potential to be a tremendous resource for growth. Youth in developing countries are often exposed to entrepreneurial activities early on in their lives, some as young as 5 years, in order to cope with economic duress and poverty (Torimiro and Dionco-Adetayo, 2005). Thus, understanding youth perspectives on innovation and development is a critical first step in a process to gradually promote developmental entrepreneurship. Furthermore, such insights into innovation and youth entrepreneurship can help formulate effective strategies and programs to assist youth with harnessing their potential, commercializing their innovations, and subsequently, breaking out of the vicious cycle of poverty while cross-pollinating innovations across cultures and countries. This article describes the rationale, methods, and findings from a study of youth perspectives on innovations in resource-constrained communities across four different countries. We hope that these findings on the perception and rationales for innovation can facilitate cross-cultural innovations, self-determined improvement of livelihoods, and improvements in the overall quality of life.

## 2. The Global Jugaad Commons

*Jugaad* is a colloquial Hindi word that captures the very spirit of innovation manifested by the *Maasai katambugas* (car-tire sandals). *Jugaad*, as a noun, refers to grassroots innovations (like refrigeration systems that run on charcoal, or a bicycle-driven washing machine). As a verb, it describes the strategy of utilizing constrained resources to develop innovative solutions to solve real problems. *Jugaad* embodies the process of lateral thinking – working within the boundaries of resource constraints to develop innovative solutions for pressing problems. From utilizing indigenous knowledge that bamboo should be peeled instead of cut in order to produce bamboo splint-making devices (National Innovation Foundation, 2009) to finding a new way to shred old billboards and refashion them into soccer balls (Hersman, 2011), people are inherently creative and often channel this creativity to serve individual or community needs. *Jugaad* also metaphorically refers to the mindset of creating value with minimal resources. It is recognized and practiced by many cultures - such as the concept of “bricolage” in France or a “hack” in the United States.

*Jugaad* is often practiced in the form of “frugal engineering” - a form of cost-effective engineering that helps in creating solutions to problems in emerging markets. This is done by following a very strict cost-effective design process that identifies and addresses needs of customers at the “base of the pyramid” who are often unaddressed by mature market products (Sehgal et al., 2010). Frugal engineering helps tap into the unexploited market opportunities of even the desperately poor and it has begun to establish a new trend in the design of products for emerging markets, like the development of the \$2000 Tata Nano car in India.

Subsequently, the process of Western countries adopting these frugally designed products and services from developing communities is referred to as “trickle-up innovation.” For instance, the Ushahidi Crisis Management Platform was developed in the aftermath of the post-election violence in Kenya in 2007. This web-based platform collected information about crisis situations reported through text messages and emails and placed them on a Google Map to spread information and direct aid efforts (Andjelkovic, 2010). The engine was later customized for crisis management during the earthquakes in Haiti and Chile and hurricanes in US Gulf Coast.

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