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## Concept of Frugality and Informal Sector Innovations in the Context of Local Development

Birendra Singh<sup>1</sup>

### Abstract

*Frugal innovation discourse is a new entrant in the field of innovation studies. Impacts of frugal innovations on the global value chain, environment, labor conditions, technology up-gradation and formal-informal economy linkages are also not well understood. To understand development potential of frugal innovations the concept has to couple with socio-cultural factors. Local resources including knowledge, institutions, power relation, social capital, and community networks should be the part of analysis. Second, to inquire nature of frugal innovations the concept of "frugality" may be the entry point. Frugality is not a new concept, but its association with business models and innovation studies is the new welcoming trend. Perhaps, it is because of the emergence of new loci of knowledge creation in the global south. As a philosophy, the concept of frugality can be traced back in Indian philosophy since a long time. Buddhism to Gandhian thought emphasized "simple living with high thinking" way of life. Frugality is not merely a mean but an approach to accomplish a particular end. Incorporating intuitive learning and individual experiences to achieve maximum with whatever is available is the basic of the frugal process. Present paper emphasize that analysis of local development potential of frugal innovations should be examine at three important levels like viz. local resources, knowledge and institutions.*

**Keywords:** Frugality, Frugal Innovations, Informal Sector, Local Development, Technology

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### 1. Introduction

There is no contestation, at present, about the idea that technology is the major driver of economic development. It is changing the behavior of economic entities. Providing the different kinds of opportunities to diversified actors engaged in the process of economic development. But, the main issue is designing the technology that will be appropriate in local condition, able to minimize the conflict among the different actors, respectable in local socio-cultural traditions. These simple assertions become important from both perspectives; social construction of science (SCOT) or technological determinism. They are based on three fundamental ontological questions that are how to *make* technology, how to *use* technology and how to *study* technology (Bijker 2009). These are the questions traveling across the long period of time. First, we have a reflection of these in the appropriate technology movement in the 1970s and 80s. Then currently we are observing the more localized form of this movement that some scholars called as grassroots technology movement (Fressoli et al. 2014). Grassroots technology movement is largely based on the finding the solution of local problem with the help of the local recourses

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1. Doctoral Student, Center for Studies in Science Policy, School of Social Sciences, Jawaharlal Nehru University  
New Delhi -110067, India  
E-mail: singhbirendra959@gmail.com

and heuristics rather looking towards technology transfer or importing the model of solution from outside. When it comes to localized grassroots way of finding solutions, frugality becomes the main component of the whole process. Frugality is not about “what” but it is more related to “how” or in simplest words frugality can be regarded as an approach (Bhaduri 2015). This approach is based on de-facto way of doing things rather post-facto looking into the things. Production, conservation and responsible utilization of resources are another aspect of the frugality. Applications of idea of frugality in technological development are directly or indirectly related to the localized, affordable and accessible solutions available for the communities. Where, communities are not just the user of the technology. They are the part of knowledge production and utilizing process. Because technology is not merely the physical manifestation of knowledge it is also the tool of development including social empowerment and providing dignified employment.

To analyze the concept of frugality, different forms of frugal innovations and development potential of frugal innovation this paper is divided into different sections. The first part of the paper focuses on socio-cultural roots of the concept of frugality. The second part of the paper is devoted toward basic understanding of frugal innovations. The third part of the paper talks about informal sector from knowledge and innovation perspectives. The fourth section of paper precisely deals with the development potentials of the frugal innovations. Sixth part of the paper deals with the managerial and policy implications of frugal and informal sector innovations. And, finally last part of the paper discusses the way forward to harness frugal innovations as development tool.

## **2. The Concept of Frugality: Socio-Cultural Perspective**

From ancient times to the present, the notion of frugality very often has been run together and discussed as an entire package of virtues and values. “The philosophy of frugality,” or “the frugal tradition,” associates both frugality and simplicity with wisdom, virtue, and happiness. The oxford dictionary describes frugality as “The quality of being economical with money or food”. The quality of being economical is the gist of this definition. Frugality can be conceptualized as a way of living where self-reliance and conscious consumption of resources is the core of socio-economic life. Empathetic decision making and spiritual well-being can be the intrinsic motivation factors in to participate any frugal process. Philosophers, prophets, saints, poets, culture critics praise frugality in different ways. But while a few treat frugality as primarily a method for becoming rich, or at least for achieving financial independence, most are concerned with more than cutting coupons, balancing checkbooks, and making good use of overripe bananas. They are fundamentally about lifestyle choices and values. And although they are not works of philosophy, they are nonetheless connected to and even undergirded by a venerable philosophical tradition that in the West goes back at least as far as Socrates. This tradition constitutes a moral outlook or, perhaps more accurately, a family of overlapping moral perspectives that associates frugality and simplicity with virtue, wisdom, and happiness. Its representatives typically critique luxury, extravagance, materialism, consumerism, workaholism, competitiveness, and various other related features of the way many people live (Treanor 2016). And they offer alternative ideals connected to values such as moral purity, spiritual health, community, self-sufficiency, and the appreciation of nature. Many articles and books and articles about frugality and simple living are polemical: their aim is both to criticize materialistic beliefs, values, and practices and to advocate an alternative way of thinking and being. This article is not about to criticize any way of living but incorporation of the concept of frugality in science and technological advancement to secure more sustainable and inclusive local development.

Philosophers have been pushing the same message for millennia without it becoming the way of the world should give us pause. Even Socio-cultural philosophical traditions suggest frugality doesn't mean cheap or under-quality product and services. Simple strip downing cannot be confused with the concept of frugality. Frugality is something that brings maximum variables in designing process of product and services in a most cost effective manner. Use of local resources, knowledge and institutions can be basic pillars of frugal process. Frugality explores available resources (knowledge, material, entrepreneurship), by minimizing cost of affordability to solve local problems (Gupta 2012, Radjou and Prabhu 2013). But, these innovations are not just about the affordability as they must be inclusive (developed by local material and entrepreneurship) and sustainable (Gupta 2012) as well. Sustainability and inclusive development and conservation of natural resources are the important part of the frugal process.

The emergence and integration of the concept of frugality with innovation and technological studies are also an attempt to make the departure from the conventional conceptualization of innovations as acts of "great men" involving huge resources. Bhaduri (2015) underline the concept of frugality in the context of decision making. According to him, we must analyze both the person, who takes the decision, and the environment, in which the decision is taken, in order to understand frugality. Frugality should, therefore, underscore not only 'what is achieved' but also (perhaps more importantly), 'how it is achieved' (Lastovicka et al 1999). He further suggests that frugality in the context of innovation should entail:

- (i) A search process using simple hierarchical steps, and intuitive reasoning (rather than clearly defined rule based decisions)
- (ii) Efforts to adapt to the environmental challenges through demonstrated capacity of learning and imitation, and
- (iii) Emphasis on actual performance/ practicability/ effectiveness rather than logical/scientific validation.

We have noted that 'environment' is an important driver of frugality. The concept of frugality in innovation has to take into account not only the final outcome of the innovation process, but also the entire process of innovation itself. It has to rely on "heuristics" rather than "well designed rule" to solve a problem in "the actual environment", even at the cost of being "logically unsound", and demonstrate a "learning dynamics". The heterodox approach in economics of technical change, over the years, has expanded its scope to analyze these parameters, but have mostly remained confined to formal sector organizations (Bhaduri 2015).

### **3. Frugal Innovations**

Most of the previous business leaders viewed "Bottom of the economic pyramid" that estimated 40 billion people in developing world who live on less than \$2 per day as risky and unprofitable demography. This assumption was based on the belief that the bottom of the economic pyramid doesn't have the buying power to make investment worthwhile, the goods and services available to population are already inexpensive and leave little room for competition; and this population doesn't know how to use advance technologies and therefore doesn't appreciate innovation (Prahlad and Hammond 2002). These misconceptions dominate the business modeling since long time and have kept a large population underserved. In recent year because of many global as well as domestic factors, emergence of the polycentric systems of knowledge creation and recession of 2008 compel multinational as well domestic companies to recognize potential of bottom of economic pyramid. Trapping the need and aspiration of bottom of economic pyramid can be a way forward to enlarge global value chain. Question is not just capturing rents at bottom of economic pyramid but the way companies are going to do that is most crucial. The

nature of market at the bottom of economic pyramid is very much different from top of the pyramid. Lacks of basic infrastructure, value and price sensitivity are the important factors. In least developing countries where socio-cultural life is highly intertwined with economic life, frugality cannot be confused with the strip downing. However, developing countries have an enormous population of bottom of the economic pyramid that has a huge and latent demand “low price high quality” good and services. Frugal innovation is totally a different concept in this context that needs rethinking of assumptions and changes in whole business metrics (Banerjee and Leimer 2013).

Frugal innovations remodel businesses and some time a way to solve local problem in affordable way that is characterized by the use of limited resources to create low cost products and services. From \$35 tablet to \$3000 cars that is sustainable for the environment and individual communities may be the example of frugal innovation. most important characteristics of frugal innovations is that they challenge established innovation process. Frugal innovations can be radical as well as incremental also. For Radjou and Prabhu (2012), frugal innovation means, “doing more with less”. In their recent book titled “Frugal Innovation” they give many absorbing accounts of how leading multinational firms are nowadays spending billions of dollars to come up with innovations which are cheaper, environmentally sound, and scale neutral, all at the same time. These are usually dictated by changing norms of product standards, environmental concerns and consumer awareness. To introduce these innovations, firms must change their organizational structure, with a greater focus on consumer feedback and larger flexibilities in their R&D programs. However, to what extent these activities conform to the notion of frugality remains debatable. Insofar as frugality refers to “need satisfaction” (satisfying as opposed to maximizing) and “simple search rule” (as opposed to constraint optimization), it remains unclear how the above activities may be characterized as ‘frugal innovations’.

Frugal innovations and responsible entrepreneurship may come from both the ends; from bottom of the pyramid and top of the pyramid (Prabhu and Radjou 2012, Prahalad 2012). While frugal innovations from top of the pyramid aims to linkup relatively poor consumers to global value chain, innovations from BOP intent to solve local problems by the using local resources. Processes of frugal innovations are also embedded in behavioral and cultural aspects of local environment that make these technological/products activities more value sensitive (Prahalad 2012). Learning and imitation in adaptive environment rather than logical or scientific validation is a special characteristic of these innovations. Tacitness of knowledge and cultural packing of it is another key aspect of frugal innovations. On the basis of Indian experience, most of the frugal innovation failed in process of commercialization due to their re-optimization in an environment (laboratory or business) that is totally different from local socio-cultural environment where these innovations originally emerge and evolved (Bhaduri 2015). Cultural sensitivity and perception about technological artifacts is also a big issue in diffusion of frugal innovations.

#### **4. Informal Sector Innovations**

Informal sector innovations are the example of frugal innovations coming from bottom of the economic pyramid itself. Most of the time informal sector innovations, those is mainly frugal in nature, evolve as the response to gaps created by the market. Today, in countries like India, much of the kind of activities, including technological activities, observed outside the boundaries of formal sector. In the last few decades we have witnessed a significant rise in the share of informal economy in India, and other developing countries also. Concomitantly, interest has grown among academic scholars to recognize informal economic spheres as a reservoir of knowledge, skills and creativity (Daniels 2010), besides the traditional focus on the exploitative work conditions of this sphere. Sophistication has also come in defining informal economy in a

more nuanced manner, where occupations are segregated in terms of the degree of informality, measured in terms of parameters like temporariness of an activity, tax obligations, regulatory requirements, nature of competitors, scale of activity. Indeed, people seem to join this sector with multiple motives and capabilities, rather than the motivations to avoid tax or regulatory mechanism, which dominated the discussion in informal economy for a long time. However, this long neglect of informal sector by the scholars of innovation and technology has indeed created a vacuum of theoretical scholarship through which one would have liked to analyze the knowledge generating activities in this sector.

People engaged in informal sector innovations use diverse source of knowledge in their innovative activities those are mostly incremental in nature. Local knowledge (alternatively called people's knowledge or Loka-vidya), 'experience in the field' (apprenticeship, which can be for a reasonably long period), "traditional knowledge" (although less deployed in this context) in various forms have shaped these innovative acts (Basole 2014). Nowadays, due to the initiatives of the National Innovation Foundation (NIF) experts from the formal sector also get to engage with such efforts at various stages of innovation. These innovations can take forms of modifications of existing formal sector technologies to suit local conditions, or improvisations over traditional knowledge. There is also a tendency, in general, among people involved in these activities to undermine the knowledge they themselves hold and innovative efforts they undertake. They learn not only by 'doing', but also by merely 'being there' 'observing' others doing the thing, which is perhaps the reason why it is often difficult to decode their source of knowledge and precise mechanism of learning.

Frugal and grassroots innovation are just not artifacts for the local innovators or communities. These innovations are way to express their heuristics, asserting identity, resistance and intimacy to the local resources. It might be possible that economic values of these innovations are negligible in regular economy but we have to also consider other values of these innovation including social, cultural and psychological values. Recognizing these values give them a trust to participate in larger development process. It is also necessary to build up strategic collaboration with the local communities to establish mutual trust.

## **5. Development Potential of Frugal Innovations**

Stiglitz (2002) profoundly suggest that development should be conceptualized as "transformation of a society from traditional relations, traditional ways of thinking... to more modern ways." The modern ways in this context has to be more affordable, accessible and sustainable in nature. These ways has to be designed or modified according to the need of local conditions. Previous literature on economics of technology and innovation suggests that new technologies introduced from the outside have often fail to achieve the projected impacts of development. External force often fails to change existing behavior of a community, as they fail to provide adequate incentives to people "to develop their own capacities...using their own intelligence" (Hirschman 1958, Rizzello and Turvani 2002). In this context frugal, grassroots innovation and responsible entrepreneurship can play pivotal role in finding solutions of many local development related problems in more localized ways. In India there are plenty of empirical evidences of frugal innovation and responsible entrepreneurship that different scholars explained in various ways (Prahalad and Mashelkar 2010, Gupta 2012, Tiwari and Herstatt 2012, Radjou 2012). In India, low cost and portable sanitary napkin machines that produce quality napkins at only Rs 1-1.5 per pad by using local resources (wood pulp), developed by local entrepreneur, is an example that shows potential of local resource to generate responsible innovations and entrepreneurship. TATA SWACH a low cost water purifier that use locally available resources, rice husk and silver nano-particle filter, developed by TATA chemicals strategically harness cultural prestige of silver

in their advertisement and campaign for diffusion of device as silver in Indian society regarded as essential metal for better health. RFID technology based clean drinking water distribution system "Savarjal ATM" by Piramal foundation explore local franchisee based model to enhance communitarian feeling in process of technology acceptance. GE healthcare's high tech frugal innovation, MACi (low cost, portable ECG) and Lullaby warmer (Infant care system), uphold the fact that the idea of cost effectiveness must be complimented with local needs like working conditions of physician and medical practitioners.

In all the above mentioned examples understanding of local conditions is the basic of business model. Without incorporating local resources, knowledge and institutions it might be very difficult to design a responsible business model at the bottom of the economic pyramid. Facilitating the people to utilize their resources, empowering them to express their knowledge system according their local needs, recognizing their right to access at minimum affordable cost will be the way to development, even at its small size, that we can achieve with the help of frugal grassroots innovations.

## 6. Managerial and Policy Implications of Frugal Innovations

Frugal and informal innovations are gaining attention of academicians and policy makers. Huge size of informal economy, development potential of innovative activities taking place in informal sector and emergence of developing countries as new a market compelling policy makers and academicians to look into frugal and informal innovations from different perspectives. Several scholars (Prahalad and Hammond 2002, Govindarajan and Ramamurti 2011, Radjou and Prabhu 2014) profoundly discuss business and management implications of frugal and informal innovations to enlarge global value chain.

From the policy point of view, frugal and informal innovations can be powerful tool to empower local community. But it doesn't mean that these innovations cannot go global. Gupta (2012) clearly mentioned that grassroots innovation can travel from grassroots to global. Giving the space of these small and incremental innovations will boost the confidence of communities to participate in mainstream development process. Because community led frugal and informal innovations cannot be seen just merely as artifacts but these are the ways of expression of their knowledge for the communities. Considering community knowledge while making designing policies will help people to manage and utilize their resources including knowledge in a more efficient way.

## 7. Discussion and Conclusion

Frugal, informal and grassroots innovations can be come from both ends; from top of the economic pyramid or sometime from the bottom of the economic pyramid itself. Frugal innovation can be done by large formal multinational company or the small self-employed metal worker in Indian informal sector. In both the cases it may have development potential. In our understanding co-creation is the best way to harness development potentials of frugal innovations, where, firms can incorporate values and knowledge of the bottom of the economic pyramid in the initial stage of designing products and services. In reciprocating this Bottom of the pyramid can have the access of technology, skills and finance in a more affordable manner.

Now question is how multinational firms, global development agencies, formal institutions (domestic or non-domestic) and civil societies can play a role in promoting of frugal innovations to achieve affordable and accessible process of development. First step in order to give answer of this question is "recognizing each other". There are several bodies of knowledge scattered in different economic landscapes let it be formal or informal economy. The second step is "respecting each other" because informal economy has diverse set of community practices.

For them knowledge is the mixture of everything. And the third step should be “rebuilding trust”. Because every policy making process should start from the trust building process among various stake holders. It will minimize the post-facto conflict among different stakeholders of the development process.

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