Satyajit Majumdar · Samapti Guha
Nadiya Marakkath *Editors*

Technology and Innovation for Social Change

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Foreword

In the last two decades, after adopting the liberalized economic policy, India has experienced lopsided growth. The growth has not adequately touched the poor and marginalized section of the Indian society. Application of technology and innovation can play an important role to bring positive social change in the lives of these people, and social entrepreneurship is emerging as a strong agent to bring this desired change. Tata Institute of Social Sciences, Mumbai (India), in 2007, under the aegis of its Centre for Social Entrepreneurship, took up this responsibility and launched an innovative master's programme in social entrepreneurship to train a cadre of professional social entrepreneurs. Since then, the Centre operates with dual responsibility of knowledge creation and dissemination while building a network of academicians, scholars and practitioners. It is satisfying to know that the Center created a forum and invited scholarly work from across the globe to deliberate on the theme of 'Technology, Innovation and Social Change'. This edited volume is a compilation of these research papers which also unfold many issues, innovations, theories and cases of social change with application of technology and innovative solutions.

This volume offers multiple perspectives on the subject of social change; there is no single theory emphasized or any attempt made in this volume to generalize any aspect of technology application. Readers are invited to understand the context and the related appropriate and specific role technology and innovation can play. The four themes offer them opportunity to conceptualize better. The first theme introduces the concepts of social innovation and provides critical analysis. Authors have considered social innovation as an essentially contested concept and argue that the scholars must raise above definitional debates; equally important is the empirical evidence to explain how social enterprises serve the marginal and micro-enterprises. The second theme discusses the role of institutions in adopting innovative strategies and technology solutions to bring the social change with specific focus on developing countries of Asia and Africa. The third theme is an attempt to deal with the process of transformation with adoption of technology; it uses many theoretical perspectives and frameworks to explain the processes. The last theme is about case studies in multiple contexts and perspectives.

While this volume provides answers to some research questions, I hope the readers will also find ways to raise many other relevant issues to pursue their work. Readers will also have strong basis for scholarly debate and discussion for further development of the field of social change with application of technology and innovation.

Mumbai, India
June 30, 2014

S. Parasuraman
Director, TISS, Mumbai

Abbreviations

AACSB	Association to Advance Collegiate Schools of Business
AMCCSAL	Annapurna Mahila Cooperative Credit Society Limited
ASTRA	Application of Science and Technology to Rural Areas
ATM	Automated teller machine
BPL	Below poverty line
Bt	*Bacillus thuringiensis*
CDI	National Commission for the Development of Indigenous People
CEIS	Craft Economics and Impact Study
CIC	Community Interest Corporations
CIS	Commonwealth of Independent States
CONANULTA	National Council for Culture and Art
CSO	Civil Society Organization
DICRC	Design Innovation and Craft Resource Centre
e.g.	exempli gratia (Latin): for example
EAP	East Asia and the Pacific
EAP	Economically active poor
ECA	Europe and Central Asia
ECHO	Extension for Community Healthcare Outcomes
EU	European Union
FAO	Food and Agricultural Organization
FBSSE	Forest based small scale enterprise
FE	Fixed effects
FGDs	Focus group discussions
FONART	National Fund for the Promotion of Handicrafts
GC	Gene Campaign
GEAC	Genetic Engineering Approval Committee
GM	Genetically modified
GMM	Generalised method of moments
GMOs	Genetically modified organisms
Hdev	Human capital development
HDI	Human Development Index

i.e.	it est (Latin): that is
ibid.	ibidem (Latin): same source as in the preceding citation
ICT	Information and communication technology
ICTs	Information Communication Technologies
IFC	International Finance Corporation
IGAS	Income generation activities
IIT	Indian Institute of Technology
INR	Indian rupee
Instq	Institutional quality
IPR	Intellectual property right
IT	Information technology
Itnet	Internet users per 100 inhabitants
ITU	International Telecommunication Union
IVR	Interactive voice response
L.G.A	Local government area
LAC	Latin America and the Caribbean
MA	Master of arts
MENA	Middle East and North Africa
MEs	Micro-enterprises
MFIs	Microfinance institutions
MNCs	Multinational corporations
MoU	Memorandum of understanding
MSME	Micro, small and medium enterprises
NABARD	National Bank for Agriculture and Rural Development
NBFCs	Non-banking finance companies
NGO	Non-governmental organization
NGOs	Non-governmental organisations
OASiS	Organisation for Awareness of Integrated Social Security
OCE	Cultural and Economic Observatory
OECD	Organisation for Economic Co-operation and Development
Pcom	Personal computer
PV	Photo voltaic
RBI	Reserve Bank of India
RE	Random effect
RL	Rule of Law
Rpgdp	Growth rate of the real per capita income
RQ	Regulatory quality
Rs	Indian rupees
SBLP	Self Help Group Bank Linkage Programme
SELCO	Solar Electric Light Company
SETUJAL	Jalisco's Tourism Ministry
SEWA	Self Employed Women Association
SHGs	Self-help groups
SHPL	Self-help promoting institution

SLS	Same language subtitles
SNEHA	Society for Nutrition Education and Health Action
SSA	Sub-Saharan Africa
T.V.	Television
TAM	Technology Acceptance Model
Tel	Telephone users per 100 inhabitants
TISS	Tata Institute of Social Sciences
TNCs	Transnational corporations
U.S.	United States
UK	United Kingdom
UN	United Nations
UN	United Nations
UNDP	Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNESCO	United Nations Educational, Scientific and Cultural Organization
US$	United States dollar
USA	United States of America
WDI	World Development Indicators
WHO	World Health Organization
WLL	Wireless local loop
WWW	World Wide Web

Contents

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Satyajit Majumdar is a Professor at the Center for Social Entrepreneurship in the School of Management and Labour Studies of Tata Institute of Social Sciences, Mumbai (India), and teaches entrepreneurship, growth and technology strategy, corporate social responsibility and service operations management. He has published research papers and case studies in the areas of entrepreneurship, social entrepreneurship, small business, growth strategy and corporate social responsibility. He also reviews research papers for international journals and evaluates research scholars for awarding doctoral degrees. Professor Majumdar advises organizations and young entrepreneurs, and mentors entrepreneurs and start-up organizations. He is member of expert panel of United Nations Conference on Trade and Development (UNCTAD), Geneva, Switzerland, on 'pro-poor investment'-related educational initiatives in higher education of the developing and developed countries, member of academic councils, board of studies of universities and editorial boards of scholarly journals, and member of advisory boards of educational, research and business organizations.

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Chapter 1
Technology and Innovation for Social Change: An Introduction

Satyajit Majumdar, Samapti Guha, and Nadiya Marakkath

Tension exists between technologists and social thinkers because of the impact technology and innovation has on social values and the norms which are often viewed as damaging the cultural fabric of a nation or society. Global business environment being the context in which implementation of technology and innovation takes place is widely accepted as the major reason for such conflicts. The current debate in India for and against the globalised and liberalised economic policies is the best case to cite. Social values and norms are the dynamic constructs of economic development and social entrepreneurs are the actors to drive such changes. Though the outlook of economic development is expected to be modern and contemporary, it should also address all-round growth and well-being in the society. Growth is expected to be inclusive in nature, without any bias towards particular socio-economic groups. However, data on the development and growth trajectories of many developing countries reveal undue favours to some specific groups, which have resulted into some kind of divide. The divide between rich and poor, rural and urban, educated and uneducated, upper and lower castes, indigenous and modern societies and technologically forward and backward societies are common in these countries. At times, high cost of technological innovation, access and ease of adoption of technologies are considered to be the chief reasons for such non-inclusion. Information Technology being the most adopted and accepted technologies is at the core of this debate which on other hand has also affected the major changes in social and political systems in many countries in the recent past. Also many other product and process technologies have affected favourably or otherwise the skill, livelihood and social norms in specific regions. This almost necessitates a fresh discourse, beyond anti-globalisation debates and bottom-of-pyramid market phenomenon. This Volume is one such first attempt to identify the

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relevant areas of new search, and research into them without labelling the social entrepreneurs - the social change agents, as heroic figures. In developing countries, social entrepreneurs have already established innovative and inclusive methods and systems such as micro-finance to impact social change. They are trained within the existing institutional set-up to practice social entrepreneurship processes; innovative educational models are also developed for such focused training. These social entrepreneurs design systems and processes for high social impact while adapting in countries, societies or communities, and adjusting to the specific local cultural norms or traditions or vocations. In this Volume, an attempt has been made to compile many independent research cases by the authors from across the globe. India, Mexico, Ethiopia, Nigeria, Thailand, Cambodia, Laos, Vietnam and other African countries are selected as contexts to report on multiple aspects of social change.

The snippet of the research discussed in this Volume which has themes at the interface of technology and social change is presented in this Chapter.

The first theme of the book discusses the *concepts of social innovation and critical analysis*. It begins with a paper by Nia Choi and Satyajit Majumdar, in which the authors formulated a model that can be used to analyse the existing social innovations. This Model is expected to enable readers to analyse an existing social innovation with regard to its formalised characteristics, actual changes in practice, and social structure that it induces and the social value that it effectively creates. With this analytical clarity at the backdrop, the next work by Samapti Guha and Nadiya Marakkath presents before the readers a case-based research, where the social innovation of microfinance is analysed with respect to two popular Indian models which are welfarist and minimalist in nature. Interesting variation in these Models is elucidated, based on which the need for design of demand-driven and client-centric social innovation models is called for.

Having discussed the relevance of such client-centric social innovative models, the second theme of the Volume discusses *the role of institutional systems*. Here, the work by José G. Vargas-Hernández, and Mónica Isabel García Mora gains relevance as in their research they argued that despite the nature of institutional innovation, the larger institutional dynamics in which it operates, comprising of stakeholders, is to play a vital role for the perceived change to materialize in the society. Political parties, businesses, families, universities, non-governmental organizations (NGOs) and civil organizations are portrayed as the key institutional players that contribute to the developmental potential of any social change initiative in a region. Notwithstanding this organizational dynamics and stakeholder analysis, an empirical research by Evans S. Osabuohien and Uchenna R. Efobi found that for institutional systems like technology to reap intended benefits in places like Africa, human capital development and resultant economic development should be an important predecessor. Therefore, they suggested improvements in educational system, as it will play a crucial role in human capital development. They argued that it will help to drive the essential technical know-how as well as assist in reduction of information asymmetry. Knowledge will be better transmitted when there is functional knowledge system in a society. In this context, a case research by Yaso Thiru,

Satyajit Majumdar and Samapti Guha refers to how in India, an innovation in education model, created a cadre of graduates in social entrepreneurship, instrumental in filling the gap left by the withdrawal of states from supporting social programmes and the failure of markets, to meet the needs of rural and urban India and marginalized communities. Thus, the power of education in social change is articulated by the authors by presenting the case of an innovative education model at the Tata Institute of Social Sciences, Mumbai, India.

Imbibing the learnings from this case, the next theme focuses on *transformation* which is seen in the society. The research by Archana Singh and Satyajit Majumdar portrays before the readers as to how technology and innovation play a transformational role in facilitating the individuals' social change process or how individuals deploy technology and use innovation to create social change. The chapter by Bharat Damani, Vishal Sardeshpande and A. W. Date adds to this discussion by stating that the best approach to social change would be to focus on the change that is intended, and then find innovative solutions which could use technology in an appropriate manner as against the conventional approach wherein technology and innovation are positioned as the initiators and drivers of social change. Gladys Idogo strengthens this observation by stating that sometimes what would be termed as innovation in places like Africa could be something simple as a technology-enabled communication system as this can strengthen information exchange among their families, the strongest pillar of any society.

Thus, after setting stage to understand what technology can mean to social change, three *case studies* are presented in the last theme of the Volume by Madhulika Kumari and Sambit Mallick, Smriti Saraswat, and Upasana Ray and Asoka Kumar Sen, respectively. These cases show that though society does not silently accept technologically enforced changes, sometimes technology is seen as a villain of inclusive growth, and for many, economic development is an anti-thesis of social change. The select cases on sector-specific technologies, such as genetically modified seeds in agriculture which has impacted the market and society, are critically analysed to develop insights on technology adoption and resultant impact while examining the policy-related issues, without any bias in favour or against a specific technology.

Part I
Concepts and Critical Analysis

Chapter 2
Social Innovation: Towards a Conceptualisation

Nia Choi and Satyajit Majumdar

2.1 Introduction

Social innovations are receiving increasing consideration by policy makers, scholars, and the citizen sector in recent years as a viable alternative for solving social problems. Social innovations hold the promise of offering solutions to a range of today's societal problems, which neither classic tools of government policy nor market solutions are able to solve (Murray et al. 2008: 3). Social innovations such as microfinance, fair trade, and emission trading have proven to be impactful instruments for social change. Hence, the topic of social innovation has increasingly become relevant in political agendas such as in the USA where the 'Office of Social Innovation and Civic Participation' and the 'Social Innovation Fund' have been established. Also, the European Union has initiated the 'Social innovation Europe' initiative. Centres for social innovation and social innovation labs have been established in universities worldwide such as the Centre for Social Innovation at the Stanford Graduate School of Business in the USA and the Social Innovation Lab at the Humboldt Viadrina School of Governance in Germany.

However, academic research on social innovation is still rare. Recent work on social innovation has been mostly practice-oriented and has been published in the form of research reports of various organisations and foundations as well as articles in journals such as the Stanford Social Innovation Review. The 'Social Innovation Europe' initiative of the European Commission has launched a major research project on social innovation conducted by a research collaboration of six European institutions called TEPSIE (theoretical, empirical, and policy foundations for social innovation in Europe). The Young Foundation, one of the participating institutions of TEPSIE, publishes regular reports on the topic of social innovation.

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Nevertheless, research articles in academic peer-reviewed journals remain sparse. Consequently, no clear definition of social innovation exists till date. Indeed, 'some analysts consider social innovation no more than a buzz word or a passing fad that is too imprecise to be usefully applied to academic scholarship.' (Pol and Ville 2009: 878). The lack of academic literature on social innovation is surprising since the study of social innovation may render valuable insights on social evolution, social change, social movements, and on a more practical level on how to solve pressing social problems. In recent years, the concept has been increasingly discussed in the context of social entrepreneurship but finds applications in much broader contexts as well (Huybrechts and Nicholls 2012). It is suspected that the lack of unanimity about the meaning of social innovation arises from the diverse contexts in which social innovation is practiced since social innovations look very differently in different sectors and locations (Caulier-Grice et al. 2012). Also, most of the understandings and definitions of social innovation have emerged from people actively involved in solving practical problems rather than from scholars who theorise on social innovation (Caulier-Grice et al. 2012). A look at the existing social innovation literature shows that it has been conceptualised in very different research fields. Caulier-Grice et al. (2012: 4) speak of social innovation 'literatures' since no distinct and unified body of knowledge exist to date. In can be concluded that social innovation cuts across sectors and is multi-disciplinary and has, therefore, led to a diversity of meanings and uses of the term (ibid.).

The purpose of this chapter is to provide an overview about the different uses and meanings of social innovation found in the literature and to propose a conceptual understanding based on the literature review which is relevant for the field of social entrepreneurship and other fields investigating processes and mechanisms of inducing positive social change in society. To this end, the next section explores the different meanings of social innovation across different literatures. Major uses of the concept are summarised in the third section. The conception of social innovation which views social innovation as innovations that explicitly aim at the creation of social value is presented and discussed in the fourth section. Within the same section, a conceptual understanding of the concept, which offers a more rigorous understanding of social innovation, is presented. This chapter aims to provide a comprehensive overview of the existing literature on social innovation, an overview about the different definitions of the concept, a delineation of major uses of the concept, and a basic conceptual understanding of social innovation which can be useful for future research on the concept.

2.2 Social Innovation in Different Streams of Literature

As already mentioned, literature on social innovation can be found in various disciplines and streams of literature. Even within a given stream of literature, researchers often hold different conceptions of the concept. Seven streams of literature which give rise to different perspectives on social innovation can be

identified: the sociological perspective, the creativity research perspective, the entrepreneurship perspective, the welfare economics perspective, the practice-led perspective, the community psychology perspective, and the territorial development perspective. Literature from each of these streams is presented and discussed in the following subsections.

2.2.1 The Sociological Perspective

Social innovation from the sociological perspective has been investigated with regard to its significance in changing social practices and structures and leading therefore to social evolution and social change. The term 'social change' from the sociological perspective does not inherently mean positive social change. Social change in the sociological context is understood as a process involving far-reaching changes in society, which may or may not be socially desirable, rather than the well-being and the improvement of quality of life of people[1] *per se*.

Zapf (1991) discussed social innovation in the context of development theory, specifically in the context of modernisation theory. As Zapf (1991: 83) notes, modernisation theory has been partly discredited as 'westernisation'. However, Zapf (1991) believes that the concept of social innovation is an important theoretical link that may bridge the gap between micro- and macro-processes and between structural and action-centred approaches to social change and social development. Zapf (1991: 89) defines social innovations as 'new ways of doing things, especially new organizational devices, new regulations, new living arrangements, *that change the direction of social change*, attain goals better than older practices, become institutionalized and prove to be worth imitating' (emphasis in the original). For Zapf (ibid.), examples of social innovations are incentive-reward systems in companies, new services, social technology, political innovations such as the Peace Corps, and new lifestyles (ibid.). At the core of the social innovation definition by Zapf (1991: 89) is the idea that social innovations are 'new ways of doing things'. These 'new ways of doing things' attain goals better than older practices. It is not specified in this definition whether these 'new ways of doing things' are intentionally implemented or not. It can be expected that a new incentive-reward system in a company is an intentionally designed and goal-oriented strategy, whereas a new lifestyle, understood as a new way of organising one's spending of resources (time, money, etc.), could be a result of complex social, technological, and cultural changes in society rather than a result of intentionally designed and goal-oriented strategies. For Zapf (1991), the purpose of establishing the idea of social innovation

[1] The Encyclopaedia Britannica defines social change in sociology as 'the alteration of mechanisms within the social structure, characterized by changes in cultural symbols, rules of behaviour, social organizations, or value systems' (http://www.britannica.com/EBchecked/topic/550924/social-change), accessed on October 1, 2012.

is that it functions as a theoretical means by which the macro-processes of social change and evolution can be explained.

Building on Zapf (1991), Gillwald (2000) examines six cases of social innovation belonging to different spheres: the environmental movement and extra-marital partnerships (private sphere), assembly-line work organisation and fast-food chains (economic sphere), and Bismarck's social security system and the Territorial Reform in Germany (government sphere). For Gillwald (2000), social innovations are 'in a nutshell, arrangements of activities and procedures that differ from previous accustomed patterns and that have far-reaching social consequences' (translated from German). On the question as to what extent newness is relevant to social innovation, Gillwald (2000) concludes that rather than absolute newness, the newness of the social innovation's implication and consequences is a relevant criterion for social innovation. These implications and consequences can be benefits and costs as well as adjustments in the societal environment. The author does not view the concept of social innovation as a normative concept. Social innovations are, therefore, not 'good' as such, but are 'social', since they have an impact on social relations and structures. Gillwald cites Salen by stating that 'an innovation does not become an innovation until there is a social impact and this may involve both positive and negative effects' (Salen 1984, cited in Gillwald 2000: 20).

Heiskala (2007) conceptualises social innovation within the broader context of a variant of the structuration perspective (Giddens 1984). Presuming the existence of multiple levels of social structures which enable and constrain people's actions, Heiskala goes on to enumerate seven types of such structures: (1) the structure of the natural environment, (2) demographic structure, (3) technological structure, (4) economic structure, (5) regulative structure, (6) normative structure, and (7) cultural structure. The last three classes of structure (i.e., regulative, normative, and cultural structures) form the sphere of social innovations (Heiskala 2007). Thus, Heiskala (2007: 74) defines social innovations as 'changes in the cultural, normative or regulative structures of the society which enhance its collective power resources and improve its economic and social performance'. Similar to Zapf (1991) and Gillwald (2000), Heiskala (2007) conceptualises the change of social practices and social structures as a crucial aspect of social innovation.

Kesselring and Leitner (2008) also follow the sociological view while studying the invention and implementation of social innovations in organisations. The authors (Kesselring and Leitner 2008: 28) define social innovation as 'elements of social change that create new social facts, i.e., influence the behaviour of individuals or specific social groups discernably and align it with accepted – not primarily economic rationality following – goals' (translated from German). The definition of Kesselring and Leitner (ibid.) stresses, in contrast to the definitions by the above-mentioned authors, the goal-oriented character of social innovations, i.e., emphasises the idea that social innovations are intentionally implemented and strategic to attain specific ends.

Howaldt and Schwarz (2010) argue in their study on social innovation that a paradigm shift is taking place in innovation research. The innovation paradigm of the industrial society perceives technical innovations such as products and

processes as the only avenue for societal development (ibid.). Howaldt and Schwarz (ibid.) foresee the rise of a social innovation paradigm with the transition from an industrial society to a service and knowledge-based society. The authors define social innovation as follows (Howaldt and Schwarz 2010: 21):

A social innovation is [a] new combination and/or new configuration of social practices in certain areas of action or social contexts prompted by certain actors or constellations of actors in an intentional targeted manner with the goal of better satisfying or answering needs and problems than is possible on the basis of established practices.

The definition shows that social innovations are perceived as intentionally designed tools that target specific goals. According to Howaldt and Schwarz (2010), a social idea or social invention turns into a social innovation only when it becomes widely accepted and is being used in a social system, or, put in other words, when it gets institutionalised or transformed into a social fact through planned and coordinated actions. According to the authors, social innovations are disseminated by the market, social networking, movements, governmental guidelines, support by foundations, and charismatic individuals or social entrepreneurs (ibid.). With regard to the role of the social sciences in researching and shaping social innovation, the authors (ibid.) state that the social sciences can contribute, specifically in its analytical function, to conceptually investigate the conditions for social innovation and the social character of innovation processes and their contextual circumstances.

To summarise, it can be concluded that the sociological view of social innovation emphasises the effect of social innovations on social practices and structures, and, therefore, on producing social change. At the same time, for some, the term social innovation designates these changes in social practices and structures themselves. Social innovations are generally considered to be desirable, although some researchers such as Gillwald (2000) state that undesirable innovations can also be considered as social innovations. Social innovations may implicitly refer to human welfare as the discussion in the context of modernisation theory by Zapf (1991) shows. However, the desirability of social innovations from the sociological perspective does not necessarily mean moral or ethical desirability but can also merely mean economic desirability.

2.2.2 The Creativity Research Perspective

Social innovation has been further investigated within the context of creativity research. Research in this domain investigates strategies and tactics that are used to generate and implement social innovations (Mumford 2002; Mumford and Moertl 2003), the factors that influence the development of ideas for social innovations, and the social settings which lead to the acceptance and diffusion of these ideas (Mumford and Moertl 2003). Social innovation in this context is defined by Mumford (2002: 253) as ‘the generation and implementation of new ideas of how

people should organize interpersonal activities, or social interactions, to meet one or more common goals'. In a later article, Mumford and Moertl (2003: 261) define social innovation by referring to Mumford's (2002) earlier definition as 'the generation and implementation of new ideas about people and their interactions within a social system'. The products of social innovation may vary with regard to their breadth and impact (ibid). Mumford (2002: 253) conceptualises different types of social innovation on a continuum. On one end of the continuum, new ideas about social organisation or social relationships are located which may involve the creation of new institutions, as well as the formation of new ideas of government or the development of new social movements. Examples of this kind of social innovation can be found, according to Mumford (2002), in the lives of Martin Luther, Henry Ford, and Karl Marx. At the other end of the continuum, social innovations have a less systemic character but may involve the creation of new processes and procedures for structuring collaborative work, the development of new business practices, or the introduction of new social practices in a group (Mumford 2002: 253). Examples for social innovation at this end of the continuum are, according to Mumford (2002), the establishment of the Boy Scouts, the creation of the International Monetary Fund, and the introduction of flexible work-schedules. Social innovations from the perspective of the creativity research perspective are, for instance, the police force, the subscription library (Mumford 2002), scientific management, and standardised tests for college admissions (Mumford and Moertl 2003).

As was the case in the sociological perspective, the creativity research perspective focuses on the effects of social innovation in changing social interactions within a social system. The creativity research perspective, however, emphasises the goal-oriented aspect of social innovations. As Mumford (2002: 253) states, social innovation is about new ideas 'to meet one or more common goals'. Hence, the creativity research perspective views social innovations as intentionally planned and implemented. Accordingly, creativity research is interested in the tactics and strategies applied to create innovations. The sociological view, in contrast, does not restrict the concept of social innovation to planned innovations, but also to emergent changes in social practices and structures such as new lifestyles, which can be intentionally planned and implemented only to a limited extent in society.

2.2.3 The Entrepreneurship Perspective

The field of entrepreneurship, especially social entrepreneurship, offers another perspective on social innovation. More specifically, the topic of social innovation from this perspective, is addressed by the so-called social innovation school of social entrepreneurship (Dees and Anderson 2006). Since the social innovation school builds heavily on Joseph Schumpeter's theory of entrepreneurship, which understands entrepreneurs as innovators, it views social entrepreneurship and social innovation as closely related concepts. Nevertheless, definitions of social

innovation from this stream of literature are rare and social innovation is mentioned only indirectly as something that social entrepreneurs do. The understanding of social innovation within this literature emphasises the positive *social change* that a social innovation brings about. Thus, social innovation from this perspective is about the whole complex process of bringing about social change within a specific setting. For example, Dees (1998) views social entrepreneurs as 'change agents' (p. 4), and Dees and Anderson (2006) refer to Jean Baptise Say and Joseph Schumpeter by stating that social entrepreneurs 'reform or revolutionize the patterns of producing social value, shifting resources into higher areas of higher yield for society' (p. 44). Also, Martin and Osberg (2007) stress the importance of social change by referring to the entrepreneur as someone who develops 'a new solution that dramatically breaks with the existing one' (p. 33).

A more concise examination of Schumpeter's model of entrepreneurship and its implications for social entrepreneurship has been conducted by Swedberg (2009). Swedberg explains that Schumpeter himself suggested in his early work (1911) that one could apply his theory of entrepreneurship also to non-economic activities. Building on the work of young Schumpeter, Swedberg (ibid.) formulates Schumpeter's full model of entrepreneurship which is also applicable to non-economic fields such as arts and politics. Applying Schumpeter's full model of entrepreneurship to social entrepreneurship, Swedberg (2009) mentions five key elements of the model: motivation, innovation, resistance, profit, and the link to macro-level change. The motivation of social entrepreneurs is complex and centred around a sense of mission to create social change (Swedberg 2009: 102). Swedberg (2009: 102) defines social innovations as 'new combinations that produce social change' (p. 102). According to Swedberg (2009: 102), such a combination consists of several elements, each of which can be an innovation in itself: (1) the conception of the way of doing things; (2) financing the venture; (3) its legal forms; (4) its organisation; (5) acquiring resources for its production; (6) method of production; and (7) to turn it into the accepted way of doing things. The resistance to social change includes habits, customs, tradition, norms, routines, and orders that may be anchored in interests such as economic interests or ideal interests (ibid.). Social innovations lead to creative destruction and contribute to society's evolution, and therefore, provide a link to macro-level change (ibid).

Building on Swedberg's (2009) work, Ziegler (2010) conceptualises social innovations as capability innovations. Ziegler (2010) uses the capability approach to explain the 'social' element in social entrepreneurship. The capability approach makes two core normative claims: The first is that the freedom to achieve well-being is of primary moral importance, and the second claim is that the freedom to achieve well-being is to be understood in terms of people's *capabilities*, i.e., their real opportunities to do and be what they value (Robeyns 2011). Accordingly, Ziegler (2010: 265) poses the hypothesis that 'social innovation is the carrying out of new combinations of capabilities'. The second hypothesis which he states is that 'social entrepreneurs act as social change agents who imagine and carry out new combinations of capabilities' (Ziegler 2010: 265). Thus, Ziegler (2010)

conceptualises social innovations as capability innovations, i.e., the carrying out of new combinations of people's real opportunities to do and be what they value.

Similar to the sociological view, the entrepreneurship perspective on social innovation views social innovation as driving social change and social evolution. Both the conceptualisations of Swedberg (2009) and Ziegler (2010) have a reference point to the notions of social evolution since both point out to Schumpeter's idea of creative destruction which, in turn, relates to macro-level societal changes. In contrast to the sociological view, however, it can be assessed that the entrepreneurship perspective views social innovations as intentionally planned and pushed through by entrepreneurs. Another difference is that Ziegler (2010) by using the capability approach as an evaluative framework, makes the goal of social innovation as targeting well-being very explicit, whereas the sociological view and the creativity research perspective view social innovations as desirable and having specific goals, which must not necessarily be social goals, but can be economic goals as well. Also, Swedberg (2009) and proponents of the social innovation school (e.g., Dees 1998; Martin and Osberg 2007) are moreover explicit about the goal of social innovation by stating that social entrepreneurs have a mission to create social value and social change.

2.2.4 The Welfare Economics Perspective

Acknowledging that social innovation has several overlapping meanings, Pol and Ville (2009: 881) suggest the following definition of social innovation: 'an innovation is termed a social innovation if the implied new idea has the potential to improve either the quality or the quantity of life'. The authors (Pol and Ville 2009) distinguish in their explanation of quality of life between micro- and macro-quality of life. Micro-quality of life refers to the quality of life of individuals, which is determined, according to Pol and Ville (2009), by two factors: personal characteristics and the set of valuable options a person has. Examples of personal characteristics which can determine one's quality of life are not only inborn talents but also education and skills. The second determinant of the micro-quality of life is the set of valuable options or things that a person can do and which is generally accepted by civilised society (ibid.). Macro-quality of life is defined by the set of valuable options that a group of people has the opportunity to select (ibid.).[2] The aggregate level of micro- and macro-quality of life includes aspects such as material well-being, education opportunities, health domain, job security, family life, community life, environment (climate and geography), political freedom and security, and gender equality (ibid.). The expression 'quantity of life' that the

[2] Pol and Ville (2009) build their conceptualisation of the quality of life heavily on the capability approach, which was pioneered by Amartya Sen in the field of welfare economics, although the authors do not explicitly mention this reference themselves.

authors use in their definition of social innovation means life expectancy at birth. Pol and Ville (2009) explain that quality of life in their definition of social innovation refers to the macro-quality of life and that the improvement of this means the increase of the number of valuable options that people can choose from. According to the authors, a vast majority of social innovations are at the same time business innovations, since many business innovations help increasing the set of valuable options that people can choose from (ibid.). Nevertheless, the authors note that not all business innovations (e.g., cigarettes) are social innovations. Hence, the authors distinguish between social innovations as such and 'desirable' social innovations, a concept that involves value judgements (ibid.).

Another category of social innovations exists which the authors call *pure social innovations*. These pure social innovations are not business innovations but, since they do not exhibit potential profits, address needs that are not satisfied by market innovations (ibid.). Pol and Ville (2009) state that these pure social innovations have the features of public goods: It is impossible to exclude others from the benefits of the new idea and the marginal cost of an additional person making use of the idea is zero. The authors further assert that in a free-market society there will be an under-investment in pure social innovations since they do not bear profit incentives for social innovators. As with other public goods, private markets will provide an under-supply of pure social innovations (ibid.). Hence, as the authors conclude, government support is justified in the case of pure social innovations (ibid.). Pol and Ville (ibid.) further suggest the creation of incentives such as prizes by the government or private interest groups to foster the development of social innovations. The contribution of the article by Pol and Ville (ibid.) is that they offer a classification of different social innovations in order to clarify the concept. Very broadly, social innovations are innovations that expand the set of options that people can choose from, whereas 'desirable' social innovations are those which expand the set of options that are normatively judged as good. Pure social innovations have the character of public goods and are not produced by businesses and are therefore often the responsibility of the welfare state.

2.2.5 *The Practice-Led Perspective: Reports and Other Non-Peer-Reviewed Contributions*

A number of reports and articles on social innovation in non-peer-reviewed journals, especially in the Stanford Social Innovation Review, have been published in recent years. In contrast to the above-mentioned literature on social innovation, this stream of literature is more interested in the practical applications of social innovation rather than in building theories on the topic. Hence, literature of this type often attempts to offer strategies and road maps for creating social innovations, rather than explaining social innovation within a theoretical context.

Geoff Mulgan (2007), director of the Young Foundation, provides in his report entitled 'Social innovation: what it is, why it matters and how it can be accelerated'

an overview about the actors who invent social innovations, the different kinds of resistance that social innovations face, and the different stages of social innovation which range from invention to scaling and to diffusion. Mulgan (ibid.) defines social innovations as 'innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly developed and diffused through organisations whose primary purposes are social' (Mulgan 2007: 8). According to Mulgan (2007), social innovations can be developed and implemented by different actors such as individuals, movements, and innovative organisations. Examples of individual persons, i.e., social innovators, are Michael Young and Muhammad Yunus (ibid.). Mulgan notes that social innovators often have very diverse backgrounds. Historic social innovators were, for instance, politicians, bureaucrats, intellectuals, business people, as well as activists in the citizen sector (ibid.). Another origin of social innovations can be found in the context of social movements such as environmentalism, feminism, and the disability rights movement (ibid.). These movements gave rise to many social change-inducing innovations. Another group which 'does' social innovation is, according to the author, the group of innovative organisations. Drawing to the larger context of social change, Mulgan enumerates barriers to social change such as a loss of efficiency in the short term, people's interests, mental models, and relationships. Mulgan (2007) further explains the stages of social innovation: (1) Generating ideas by understanding needs and identifying potential solutions – sometimes needs can be very obvious, for example, hunger or homelessness, but at other times they are not so obvious and have to be spotted through keen observation and ethnography or need to be defined through campaigns and movements; (2) Developing, prototyping, and piloting ideas – foundations and philanthropists often prove crucial in this phase by financing the development and prototyping of new ideas. Nevertheless, social innovations are often implemented early on without proper piloting, since social innovators are so motivated that they are too impatient to carry out the prototyping and piloting; (3) Scaling up and diffusion – scaling and diffusion of social innovations can happen through organic growth, replication, adaption, or franchising; (4) Learning and Evolving – innovations continue to change, and experience may show that the innovation has unintended consequences or unexpected applications and thus necessitates suitable adaptations (ibid.). Mulgan (2007) conceptualises social innovation in very broad terms as 'innovative activities and services that are motivated by the goal of meeting a social need' (Mulgan 2007: 8). From this perspective, social innovations can be, therefore, as diverse as kindergartens, microfinance, the Internet, the fair trade movement, Wikipedia, and cognitive behavioural therapy (Mulgan 2007).

Phills et al. (2008) offer in their article, titled 'Rediscovering social innovation', and published in the Stanford Social Innovation Review, a detailed and elaborate definition of social innovation. The authors argue that the concept of social innovation is more suitable to understand and induce social change than the concept of social entrepreneurship or social enterprise (ibid.). Giving the example of Muhammad Yunus and the Grameen Bank, the authors show that, while Yunus is the social entrepreneur and the Grameen Bank is the social enterprise, it is ultimately the social innovation of microfinance, which creates social value (Phills et al. 2008).

The authors assess that, since social entrepreneurship is about personal traits and the social enterprise about earned income, both are not able to grasp the mechanism of social change and social value creation as does the concept of social innovation. In addition to this, both social entrepreneurship and the social enterprise are located mainly in the non-profit sector, which inhibits the consideration of the government and the for-profit sector (ibid.). Hence, the authors suggest the construct of social innovation for investigating the mechanism of social change and social value creation since it transcends sectors and levels of analysis. Phills et al. (2008: 36) define social innovation as 'a novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals'.

The authors (ibid.) further argue that to be recognised as an innovation two criteria have to be met: novelty and improvement. Novelty in this context does not imply that the innovation has to be necessarily original. The implementation of an innovation in a new context or the employment of the innovation by a new group of users is a criterion for novelty as well (ibid.). The criterion of improvement signifies, according to the authors (ibid.), that the innovative solution is more effective or efficient than other alternatives, and more sustainable or more just (ibid.) than other alternatives. The authors further distinguish between four elements of innovation: process of innovation; innovation as an outcome; diffusion or adoption; and the value created by the innovation. Trying to find an answer to the question as to what 'social' is, the authors state that motivation cannot be considered as a basis to determine what social is and what it is not, since motivations cannot be directly observed and are moreover often mixed and, therefore, more complex (ibid.). Another way of determining if a social innovation is 'social' is to observe if the innovation addresses a social need or social problem (ibid.). However, the difficulty with this approach of the 'social' is that even obvious non-social innovations, for instance, deodorants address social needs and problems (ibid.). Hence, the authors contend that an innovation is a social innovation only if the value created is tilted towards social value (i.e., that it benefits society or the public) rather than towards private value, which would mean gains for entrepreneurs, investors, and ordinary, not disadvantaged consumers (ibid.). Phills et al. (2008) further assess that a social innovation can be a product, a production process, a new technology, a principle, an idea, a piece of legislation, a social movement, an intervention, or some combination of them (e.g., fair trade). Hence, the authors clearly state that even tangible products can be social innovations as long as they meet the criteria of being a solution to a social problem that is more effective than other solutions and for which the value created accrues primarily to society as a whole rather than to private individuals.

The *Open Book of Social Innovation*, authored by Murray et al. (2010), has been published in 2010 as a collaboration between NESTA (the National Endowment for Science, Technology and the Arts) and the Young Foundation. In this book, the goal of the authors is to present ways to 'design, develop and grow social innovation' (ibid.). The authors (Murray et al. 2010: 3) define social innovations as 'new ideas (products, services and models) that simultaneously meet social needs and create

new social relationships and collaborations. In other words, they are innovations that are both good for society *and* enhance society's capacity to act' (emphasis in the original). The process of social innovation consists, according to Murray et al. (2010), of six stages: (1) prompts, inspirations, and diagnoses, (2) proposals and ideas, (3) prototyping and pilots, (4) sustaining, (5) scaling and diffusion, and (6) systemic change. The first stage of social innovation involves the diagnosis of problems which identifies the root causes, rather than the symptoms of the problem (ibid.). Prompts or triggers to social innovation are, for example, a crisis, poor performance, or new evidence (ibid.). The second stage is the stage of idea generation. The authors (ibid.) suggest several formal methods such as user-led design, creative thinking methods, and quality circles. The third stage involves the testing of the social innovation in practice through different prototyping methods or more informal methods (ibid.). The fourth stage, the sustaining stage, is when the idea becomes an everyday practice. This involves identifying income streams for the firm, social enterprise or charity that carries the social innovation forward or, in the public sector, the identification of budgets and other resources such as legislation (ibid.). The fifth stage of social innovation, scaling and diffusion, involves different ways for growing and spreading innovations such as organisational growth or, in the public sector, the mobilisation of demand by policymakers. The sixth stage of social innovation is the stage of systemic change, which is the ultimate goal of social innovation (ibid.). Systemic changes often involve changes in the public sector, private sector, grant economy, and household sector (ibid.). The authors note that the process of innovation is not linear, and feedback loops and leaps between different stages and processes can occur (ibid.).

In their report entitled 'Defining social innovation', Caulier-Grice et al. (2012: 18) define social innovation as follows:

> Social innovations are new solutions (products, services, models, markets, processes etc.) that simultaneously meet a social need (more effectively than existing solutions) and lead to new or improved capabilities and relationships and better use of assets and resources. In other words, social innovations are both good for society and enhance society's capacity to act.

The definition mentions the five core elements of social innovation which are, according to the authors, (1) novelty, the (2) actual implementation of the social innovation (not just the idea), (3) effectiveness, (4) meeting of a social need, and (5) enhancing society's capacity to act. Novelty as a core element means that social innovations are new to the field, sector, user, region, market, or are applied in a new way (Caulier-Grice et al. 2012: 20). The second core element of social innovations is that the idea is actually implemented, and that, therefore, social innovation has to be distinguished from social inventions (ibid.). The third core element, namely, effectiveness, means that the social innovation is more effective than other alternative solutions (ibid.). The fourth core element of social innovation is that it is explicitly designed to meet a social need (ibid.). The fifth core element is that social innovations enhance society's capacity to act, which means that they empower beneficiaries by creating new roles, relationships, assets and capabilities, or make better use of assets and resources (Caulier-Grice 2012: 21). Caulier-Grice et al. (2012) further develop a

typology of social innovations depending on whether the social innovation is a new product, new service, new process, new market, new platform, new organisational form, or a new business model. In accordance with Murray et al. (2010), the authors propose six stages of the process of social innovation.

For authors of the practice-led literature, social innovation explicitly aims at meeting social goals and needs. In contrast to the sociological view and the creativity research perspective, social innovations from the practice-led perspective can also be tangible products (Phills et al. 2008). Hence, in this stream of literature, a critical aspect of what constitutes a social innovation is not its ability to change social practices and structures but rather its ability to meet social needs and solve social problems, and, therefore, to create social value. The conceptualisation of social innovation from the perspective of the practice-led literature is very broad. Social innovations can be new services, new technologies, new models, a principle, a piece of legislation, or a combination of all these (ibid.). The focus of the literature from this stream is on providing a road map for developing and growing social innovations, rather than theoretically explaining them as social phenomena. Thus, although it is clearly stated that the aim of social innovation is to address social needs and solve social problems, the focus is on the development of social innovation models and programmes which can be replicated (Mulgan 2007: 9), rather than on *how* social change occurs through these innovations.

2.2.6 The Community Psychology Perspective

The term 'social innovation' has been used in the context of community psychology, where it is also referred to as 'experimental social innovation' (ESI). In contrast to traditional psychology, the unit of analysis and intervention in community psychology is not the individual but the community. Thus, the goal of community psychology is to bring social change to communities and to improve the quality of life of the members through the introduction and dissemination of innovative solutions, i.e., social innovations.

Community psychologists address problems such as dysfunctional school systems, racial and gender discrimination, intergroup conflicts, and socio-economic disparities (Maton 2000). Community psychology and its ideas of social innovation are underpinned by humanitarian values such as compassion, caring, humility, and a deep sense of shared humanity (Maton 2000: 49; Seidman 2003). The idea of experimental social innovation has been pioneered by George W. Fairweather (1967). In his book *Methods for experimental social innovation*, Fairweather (1967) addresses the problem of societal marginalisation and proposes the experimental social innovation model as a tool to drive positive social change. Fairweather (1967: v) argues that the social scientist's 'traditional, verbally-oriented role' no longer meets pressing societal problems. Therefore, within the experimental social innovation model, the social scientist plays an active role in creating social innovations. ESI is a systematic methodology that entails the

following several steps. First, the scientist has to identify and define a significant social problem (Fairweather 1967: 20). Next, with the help of field observations, the parameters of the problem in its actual community setting have to be described. The next step is to create several different solutions (innovated social subsystems) to the social problem. The efficacy of the different innovated social subsystems in solving the social problem has to be compared by implanting them into the appropriate social settings. The innovated social subsystems have to be then evaluated over a period of several months or even years (ibid.). The experimental social innovation model further assumes the researcher's responsibility for the lives and welfare of the participants and necessitates a multidisciplinary approach, e.g., economic, political, sociological etc., in assessing the social problem (ibid.). It was due to the dissemination aspect that the ESI model was labelled later as 'experimental social innovation and dissemination' (ESID) model (Emshoff et al. 2003: 346). In Fairweather's (1967: vi) words, the purpose of ESI is experimental social innovation, 'to create a new social subsystem whose methods include innovating models as alternative solutions to social problems, experimentally evaluating them, and disseminating the information to those who can make the appropriate changes'. Moreover, from the perspective of community psychology, social innovations are created and 'managed' first and foremost by scientists. Examples of social innovations from the perspective of community psychology are, for example, anti-poverty programmes and rehabilitation programmes for long-term residents in mental hospitals. The experimental approach suggests that social innovations are tested and evaluated on a small-scale in a naturalistic setting (Hazel and Onaga 2003). The dissemination of the social innovation is a major part of the ESID model. Community psychologists have reported successful dissemination of social innovations as well as failures, sensitising the community of psychologists regarding the difficulties of social innovation adoption (ibid.). Social innovations, such as a new way of dealing with poverty, a new technique to treat schizophrenia, or an innovative kind of school are, compared to technological innovations, not easily introduced and adopted, since they often disrupt valued and complex roles and identities of the members of a community (Taylor 1970).

From the perspective of community psychology, social innovations are mechanisms to bring about positive social change to groups and communities. Social innovations are considered social, since they address social problems and provide solutions to these problems, rather than merely changing social practices. Similar to authors of the entrepreneurship perspective and the practice-led perspective, this stream of literature views social innovations as aiming primarily at social ends.

2.2.7 Territorial Development Perspective

Moulaert et al. (2005) conceptualise social innovation in the context of territorial development. This conceptualisation is linked with the 'mushrooming' of high-quality and innovative community development initiatives in European cities,

which the authors view as local social innovations (Moulaert et al. 2005: 1970). The social rationale of these social innovations is the inclusion of excluded groups into spheres of society such as the labour market, the education system, and socio-cultural life (ibid.). The political rationale is to give a 'voice' to groups which have been traditionally absent from politics (ibid.). Moulaert et al. (2005: 1978) define social innovation as follows:

> Social innovation is *path-dependent and contextual*. It refers to those changes in agendas, agencies, and institutions that lead to a better inclusion of excluded groups and individuals in various spheres of society at various spatial scales.
>
> Social innovation is very strongly a matter of *process innovation* – i.e. changes in the dynamics of social relations, including power relations.
>
> A social innovation is very much about *social inclusion*, it is also about countering or overcoming conservative forces that are eager to strengthen or preserve social exclusion situations.
>
> Social innovation, therefore, explicitly refers to an *ethical position* of social justice. The latter is of course subject to a variety of interpretations and will in practice often be the outcome of social construction (emphasis in the original).

The authors suggest that social innovations have three dimensions: (1) a content dimension, which means that the content or goal of social innovation is the satisfaction of human needs; (2) a process dimension, which means that social innovation involves the process of changing social relations; (3) and an empowerment dimension, which increases socio-political capability and access to resources.

Referring to the conceptualisation of social innovation by Moulaert et al. (2005) as consisting of three dimensions, Gerometta et al. (2005: 2007) state that social innovation is understood as both a normative and analytical concept for the study and development of solutions to the problem of social exclusion in European cities. Other authors who have examined social innovation in terms of territorial development are Novy and Leubolt (2005) and Christiaens et al. (2007).

An example of social innovation in the context of territorial development is a local mediating organisation in Germany that carries out project coordination, promotes the activation and participation of residents in the initiation of projects in the neighbourhood, and fosters especially the inclusion of German resettlers from the Soviet Union in the government structures of neighbourhood management (Moulaert et al. 2005). Another example is that of a psychiatric hospital in Milan which has started setting up economic activities and which is run and used by patients and neighbours and has therefore been integrated in the public, social, and economic space of the city and the metropolitan area (ibid.).

Thus, the focus of social innovation within the context of territorial development is on the local development of communities and neighbourhoods and the inclusion of excluded groups into different spheres of society. Similar to the community psychology perspective, the territorial development perspective of social innovations explicitly refers to an ethical position of social justice and values, as intentionally planned and implemented to solve problems of social exclusion.

Table 2.1 provides an overview about the definitions of social innovation found in the different streams of literature.

Table 2.1 Definitions of social innovation

Field	Author	Definition	Example
Sociology	Zapf (1991)	[S]ocial innovations, then, are new ways of doing things, especially new organizational devices, new regulations, new living arrangements, that change the direction of social change, attain goals better than older practices, become institutionalized and prove to be worth imitating. (p. 89, emphasis in the original)	Incentive-reward system in companies, new services, social technology, political innovation (Peace Corps), new lifestyles
Sociology	Gillwald (2000)	Social innovations are, in a nutshell, arrangements of activities and procedures that differ from previous accustomed patterns and that have far-reaching social consequences. (p. 1, translated from German)	Environmental movement, assembly line work, fast-food restaurants, extra-marital partnerships, social security system
Sociology	Heiskala (2007)	Social innovations are changes in the cultural, normative or regulative structures of the society which enhance its collective power resources and improve its economic and social performance. (p. 74)	Democracy
Sociology	Kesselring and Leitner (2008)	Social innovations are elements of social change that create new social facts, i.e. influence the behaviour of individuals or specific social groups discernably and align it with accepted – not primarily economic rationality following – goals. (p. 28)	Political reforms, new services, new forms of employee participation in corporations
Sociology	Howaldt and Schwarz (2010)	A social innovation is new combination and/or new configuration of social practices in certain areas of action or social contexts prompted by certain actors or constellations of actors in an intentional targeted manner with the goal of better satisfying or answering needs and problems than is possible on the basis of established practices. (p. 21)	New services, new business models, web-based social networking

(continued)

Table 2.1 (continued)

Field	Author	Definition	Example
Creativity research	Mumford (2002)	The term social innovation, as used here, refers to the generation and implementation of new ideas of how people should organize interpersonal activities, or social interactions, to meet one or more common goals. (p. 253)	Subscription library, police force, paper currency
Creativity research	Mumford and Moertl (2003)	Mumford (2002) defined social innovation as the generation and implementation of new ideas about people and their interactions within a social system. (p. 261)	Scientific management, standardised tests for college admission
Entrepreneurship	Swedberg (2009)	[Social] innovations are new combinations that produce social change. (p. 102)	Combination of microfinance and social group pressure
Entrepreneurship	Ziegler (2010)	[S]ocial innovation is the carrying out of new combinations of capabilities (p . 265)	The work of Gram Vikas forging capabilities of participation, health, and affiliation
Welfare economics	Pol and Ville (2009)	An innovation is termed a social innovation if the implied new idea has the potential to improve either the quality or the quantity of life. (p. 881)	Internet, Clean-up the world initiative
		These social innovations address needs that are not satisfied through the market mechanism (because they do not exhibit potential profits) may be called pure social innovations. (p. 883, emphasis in the original)	
Practice-led field	Mulgan (2007)	[social innovations are] innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly developed and diffused through organisations whose primary purpose are social. (p. 8)	Organic food, open source software, pedagogical models of childcare, microcredit, magazines sold for the homeless,

(continued)

Table 2.1 (continued)

Field	Author	Definition	Example
Practice-led field	Phills et al. (2008)	We redefine social innovation to mean 'A novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals'. (p. 36)	Microfinance, fair trade, community-centred planning, charter schools, socially responsible investing
Practice-led field	Murray et al. (2010)	Specifically, we define social innovations as new ideas (products, services and models) that simultaneously meet social needs and create new social relationships and collaborations. In other words, they are innovations that are both good for society and enhance societies capacity to act. (p. 3, emphasis in the original).	Innovative education model for slum children, organic farming school
Practice-led field	Caulier-Grice et al. (2012)	Social innovations are new solutions (products, services, models, markets, processes etc.) that simultaneously meet a social need (more effectively than existing solutions) and lead to new or improved capabilities and relationships and better use of assets and resources. In other words, social innovations are both good for society and enhance society's capacity to act. (p. 18)	Text messaging, crowd sourcing, information platform for disaster relief
Community psychology	Fairweather (1967)	. . .to create a new social subsystem whose methods include innovating models as alternative solutions to social problems, experimentally evaluating them, and disseminating the information to those who can make the appropriate changes. This is experimental social innovation. (p. vi)	Anti-poverty programmes, rehabilitation programmes for long-term residents in mental hospitals

(continued)

Table 2.1 (continued)

Field	Author	Definition	Example
Territorial development	Moulaert et al. (2005)	Social innovation is path-dependent and contextual. It refers to those changes in agendas, agency and institutions that lead to a better inclusion of excluded groups and individuals in various spheres of society at various spatial scales. Social innovation is very strongly a matter of process innovation – i.e. changes in the dynamics of social relations, including power relations. A social innovation is very much about social inclusion, it is also about countering or overcoming conservative forces that are eager to strengthen or preserve social exclusion situations. Social innovation therefore explicitly refers to an ethical position of social justice. The latter is of course subject to a variety of interpretations and will in practice often be the outcome of social construction. (p. 1978, emphasis in the original)	Neighbourhood development programmes against social exclusion

2.3 Uses of the Term

From the literature review, it is clear that different uses of the term 'social innovation' exist. It can be generally observed that some researchers view social innovation as a very broad concept, whereas others consider only very specific phenomena as social innovations. Nevertheless, congruencies between different uses of social innovation across different literatures exist as well. A close reading of the extant literature suggests that three major uses of the term 'social innovation' can be distinguished. Firstly, it is used to describe processes of social change. Secondly, it is used to describe innovations which are intangible and manifest only on the level of social practice, and, thirdly, it is used to describe innovations that explicitly aim at the creation of social value and at inducing positive social change. The different understandings of social innovation must not be necessarily mutually exclusive, but put different emphases on specific aspects of the concept. Each of the three major uses which can be delineated from the literature review is briefly described in the following subsections.

2.3.1 Social Innovation as Social Change

For some researchers, social innovation is synonymous to social change. In this case, the term social innovation does not point to specific novel products or services which induce social change, but to social change itself which manifests in changing social structures. As Nicholls and Murdock (2012) state, 'innovation' implies not only novelty but also a sense of *renewal*. It is this notion of renewal which gives rise to the use of social innovation for describing 'processes of social change and social transformation of society as a whole' (Caulier-Grice et al. 2012: 6). Social innovation signifies in this respect the establishment of new social structures rather than specific new models, products, or services that aim for social change. For example, Heiskala (2007: 74) defines social innovation as '*changes* in the cultural, normative or regulative structures of the society' (emphasis added). This understanding of social innovation as social change does not deny that new services, products, or technologies induce change in the social structure, but it views the resulting changes as social innovations rather than the change inducing innovations. This understanding of social innovation as social change and as the renewal of social structures is relevant to the field of sociology and to investigations regarding social and sociocultural evolution.

2.3.2 Social Innovation as Intangible Innovations

Franz et al. (2012: 4) argue that 'intentionality of social innovation is what distinguishes it from social change', since 'social change just happens'. The second conception of social innovation, therefore, views social innovations as intentionally designed means to achieve specific ends. The 'social' element in social innovation denotes in this conception that the innovation is not manifested as a material object, but occurs on the level of social interaction and social practice. Whereas the focus of the conception of social innovation as social change is on its far-reaching consequences for social practice and the social structure, this approach to social innovation emphasises social innovations as intentionally implemented new services, new modes of production, new political reforms etc. to achieve different goals which can be economic or social. Social innovations from this perspective are, for example, fast-food restaurants (Gillwald 2000; Franz et al. 2012), scientific management, the subscription library, standardised tests for college admissions (Mumford and Moertl 2003), and incentive-reward systems in companies (Zapf 1991). This understanding of social innovation stands in contrast to technological innovation, and some researchers such as Howaldt and Schwarz (2010: 15) foresee a paradigm shift from a technology-oriented innovation paradigm that has been historically influenced by the industrial society, to a new social innovation paradigm that is shaped by the growing service sector. This understanding of social innovation as intangible innovations is especially relevant for the social sciences

with regard to research on innovation (Howaldt and Schwarz 2010) as well as creativity (e.g., Mumford 2002; Mumford and Moertl 2003).

2.3.3 *Social Innovation as Innovations That Aim at Social Value Creation*

The third use of the concept views social innovations as explicitly aiming at the creation of social value and thus at positive social change. Hence, in this case, the 'social' denotes that the purpose of social innovation is to meet pressing social needs and to improve human and environmental well-being. A social innovation, perceived from this perspective, must not necessarily manifest only on the level of social interaction and social practice, but can be as tangible as a new product or a new technology. This understanding of social innovation is relevant for fields that investigate processes and mechanisms which are designed to induce positive social change and to create social value. It is thus relevant for the fields of social entrepreneurship, territorial development and community psychology.

Since the aim of this chapter is to investigate the concept of social innovation for the field of social entrepreneurship, the understanding of social innovation as innovations that aim at social value creation is discussed in the next section in more detail.

2.4 Proposing a Conceptual Model of Social Innovations that Aim at Social Value Creation

Based on the extant literature, a conceptual framework of social innovation for the field of social entrepreneurship is presented in this section. It is proposed that social innovations comprise of three dimensions: the dimension of formalisation, the dimension of change processes, and the dimension of social outcomes. Figure 2.1 illustrates the proposed model of social innovation.

2.4.1 *The Dimension of Formalisation*

The dimension of formalisation captures the variety of forms in which social innovations can manifest. Researchers from the practice-led literature especially acknowledge and point out the different forms of social innovations by stating that it can be a product, a production process, a technology, a service, a business model, an idea, a principle, a piece of legislation, a social movement, an intervention, or a

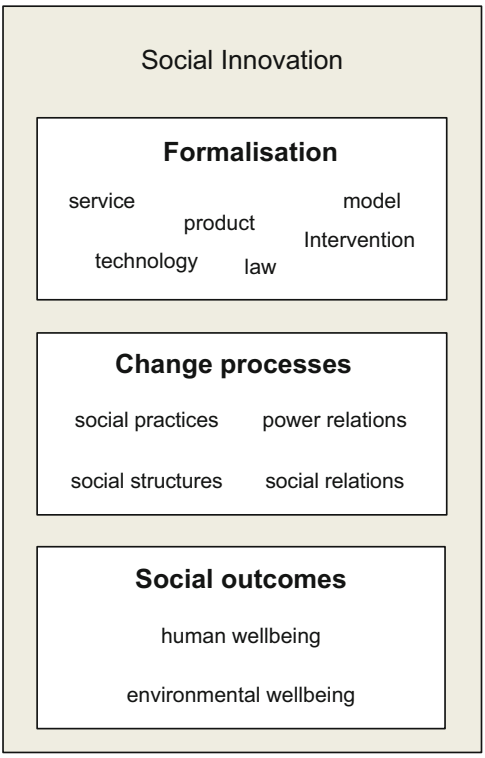

Fig. 2.1 Social innovation aiming at social value creation

combination of them (Caulier-Grice et al. 2012; Murray et al. 2010; Phills et al. 2008: 39).

It is indeed important to distinguish between these different forms since they differ respectively with regard to their antecedents and consequences. Acknowledging this fact, Caulier-Grice et al. (2012) develop a typology of social innovation on the basis of its different possible forms, which the authors identify as new products, new services, new processes, new markets, new platforms, new organisational forms, and new business models. The model of social innovation proposed in this chapter suggests that the different forms of social innovations can be conceptualised on a formalisation continuum (see Fig. 2.2).

The formalisation dimensions of social innovation imply that social innovations' own specific properties and characteristics can be more or less specified and, therefore, formalised. For example, a social innovative product such as a eco-friendly and health-friendly gas burner developed for Indian street vendors is highly specific and has well-defined properties such as a specified design, material etc. Hence, social innovative products, being highly formalised, are located on one end of the continuum. An intervention such as an empowerment program for women workers in the informal labour market, on the other hand, is less specified and consists of less well-defined properties. Such interventions, often consisting of a bundle of services and smaller interventions, are highly dependent on the

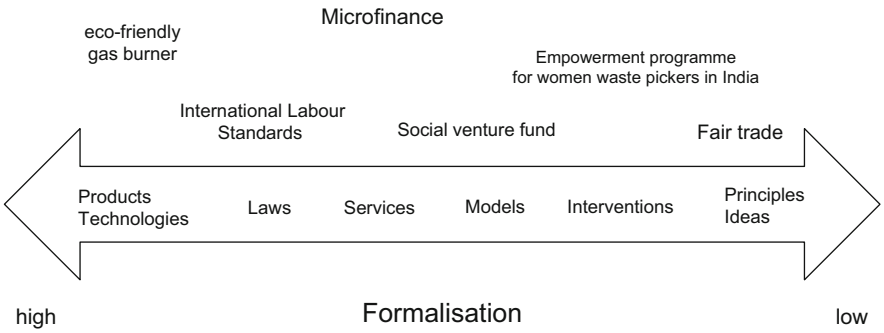

Fig. 2.2 Formalisation continuum

characteristics of the target group and the context and are, thus, often adjusted in an on-going process resulting in a less pre-determined and formalised character. Complex intervention programmes such as these are, therefore, located on the other end of the formalisation continuum. Microfinance as a social innovation is located in the middle of the formalisation continuum since it is specified with regard to its business model and main services, but still requires adjustments to the local context. Conceptualising social innovation along a continuum of formalisation emphasises the increasingly important role played by the specific contexts as the formalisation progressively decreases. Whereas highly formalised social innovations are less context dependent with regard to their properties, less formalised social innovations are highly dependent on the specific context. This recognition also elucidates the potential and possible difficulties of the replication and diffusion of social innovations. In fact, the diffusion of a social innovation is usually possible only if the social innovation is sufficiently well defined and formalised. Also, depending on where the social innovation is located in the formalisation continuum, the role of the beneficiaries of a social innovation as co-creators of value assumes progressively increasing significance as the formalisation reduces. As an example we note that the end user of a product plays a minimal role in the co-creation of value, whereas the customer of a new service such as microfinance plays an important role in co-creating the intended social value of the social innovation by utilising the loan as an investment for generating income.

2.4.2 The Dimension of Change Processes

The second dimension of social innovation is the dimension of change processes. This dimension captures the changes in social structures and practices that social innovations induce. With regard to this, Moulaert et al. (2005: 1978) state that social innovation is related to ‘changes in the dynamics of social relations, including power relations’. Also, Caulier-Grice et al. (2012: 20) argue that ‘the process of

social innovation will often entail changes in social relations', and that 'social innovation involves changes in power relations'. Howaldt and Schwarz (2010: 21) also locate the changes that social innovations induce in the 'social practices in certain areas of action or social contexts'.

It is suggested that literature from the sociological perspective emphasises the second dimension of social innovation and can, therefore, help to elucidate change processes in the social structures and social practices. A social invention becomes a social innovation only when it effectively changes routines and practices as well as social structures such as power relations and regulative, normative, and cultural structures (Heiskala 2007). The notion of creative destruction with regard to innovation, as proposed by Schumpeter, therefore applies in this sense to the creative destruction of established routines, practices and social structures. The dimension of change processes points not only to sustainable and long-lasting, systemic changes induced by social innovations, but also to the contexts, settings, and their specific structures in which social innovations are embedded. Hence, with regard to the diffusion and replication of social innovations, the dimension of change processes draws attention towards impediments for replication due to different existing structures and relations in different systems. This dimension further draws attention towards resistance, towards social innovations facing structural inertia of organisations, resistance due to vested interests and existing power relations, or rigid mental models and the disruption of roles (Taylor 1970), to name just a few.

2.4.3 The Dimension of Social Outcomes

Moulaert et al. (2005) refer to the third dimension of social innovation as 'content dimension' which explicates the specific needs that the social innovation addresses and the social goals that it aims for. This dimension of social innovation captures the social value that is created through the changes in routines, practices, and structures (dimension 2) which are in turn induced by different forms of social innovation (dimension 1). Pol and Ville (2009: 881) have specified the desired outcome of social innovation as the improvement of 'either the quality or the quantity of life'. Others describe the outcome dimension of social innovation as meeting social needs (Caulier-Grice et al. 2012: 18; Mulgan 2007: 8; Murray et al. 2010: 3), or as solving a social problem (Fairweather 1967; Phills et al. 2008). Moulaert et al. (2005: 1978) view that social innovation aims at social inclusion and that it refers to an ethical position of social justice. In general terms, the desired social outcomes of a social innovation can be stated as the improvement of human well-being and environmental well-being. In more specific terms, social innovations can aim for and result in outcomes such as better access to health care services, improved opportunity for income generation, education etc. It is suggested that existing approaches such as the capability approach, pioneered by Amartya Sen and Martha Nussbaum, can serve as a normative framework to explicate the social

value that social innovations create (Caulier-Grice et al. 2012; Mulgan 2012; Yujuico 2008; Ziegler 2010). In summary, the dimension of social outcomes explicates the purpose and ends of social innovations, which is the improvement of human and environmental well-being.

The three dimensions of social innovation discussed in this section, namely, formalisation, change processes, and social outcomes, are suggested to represent the constituent aspects of social innovations that aim at social value creation. Such an understanding implies that for an innovation to be identified as a social innovation, each of the three dimensions must be present. For instance, an innovation such as a new law to prevent child labour is not a successful innovation until and unless it effectively induces changes in social practices, i.e., is being practiced (dimension of change processes) and, therefore, results in the genuine improvement of children's well-being (dimension of social outcomes).

Conclusion and Future Research

In this chapter, different conceptions of social innovation as found in different streams of literature were presented. Three major uses of the concept were identified: social innovation as social change, social innovation as intangible innovations, and social innovation that aims at social value creation. The third use of the concept has been identified as relevant for the field of social entrepreneurship and has, therefore, been discussed in more detail in this chapter. A conceptual model of social innovation based on the extant literature and comprising of three dimensions was proposed. In this model, the formalisation implied by the social innovation, which forms the first dimension, serves as a continuum basis according to which social innovations can be classified. The level of formalisation of a social innovation further sheds light on the replicability of the innovation and the role of beneficiaries as co-creators of social value. The second dimension of the model is the dimension of change processes, which sheds light on the changes in practices and social structures brought about by the implementation of a social innovation. The third dimension of the model is the dimension of social outcomes. This dimension sheds light on how the consequences resulting from change processes (second dimension) relate to the desired outcome of the social innovation, which is, broadly speaking, human and/or environmental well-being.

The proposed model can be used to analyse existing social innovations. An existing social innovation, for example, could be analysed with regard to its formalised characteristics, actual changes in practice and social structure that it induces, and the social value that it effectively creates.

The model proposed here can, moreover, serve as a convenient starting point for further research on social innovation. Various aspects of social innovation can be analysed within the framework of the proposed model.

(continued)

Also, various existing theories can be applied to the different aspects of social innovation in conjunction with the model. As examples, the diffusion and replicability of social innovations, which is linked to the dimension of formalisation, could be investigated from the perspective of diffusion theory (Rogers 1962; Wejnert 2002), while the service-dominant logic of marketing (Vargo and Lush 2004) could help to elucidate the role and implications of the beneficiary as a co-creator of social value in social innovation processes. The second dimension, namely, the dimension of change processes, could be elucidated by sociological theories such as structuration theory (Giddens 1984) and the Punctuated Equilibrium Paradigm (Gersick 1991), while the dimension of social outcomes could be analysed using, for example, Rawl's theory of justice (Rawls 1999) or the capability approach (Sen 1979; Nussbaum 2003). Such research can yield valuable insights into social evolution, social change, social movements, and on a more practical level on how to solve pressing social problems.

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Chapter 3
Relevance of Social Enterprises for Micro-entrepreneurial Growth: A Case-Based Discussion on Indian Microfinance Models

Samapti Guha and Nadiya Marakkath

3.1 Introduction

Social entrepreneurship[1] has emerged as a tool for social change[2] in terms of creating new livelihoods, enterprises and socio-economic empowerment of the marginalized communities across the world. In India, microfinance institutions as a section of social enterprises have been providing financial services to the micro-enterprises for four decades. Microfinance[3] refers to the provision of financial services to low-income clients (Otero 2000). By providing financial access to the poor clients, microfinance plays a decisive role in economically empowering the poor and integrating them to the mainstreams of the economy. One of the prime target groups of microfinance in this initiative is to aim at the economic empowerment of a segment of poor people called the economically active poor (EAP). EAP denotes that section of poor at the base of the pyramid, who are indulging themselves in some productive income generation activity but are struggling for financial support to sustain their activities.

A major chunk of this EAP segment comprises of micro-entrepreneurs. Micro-enterprises (MEs) can be defined as very small-scale, informally organized business

[1] Social Entrepreneurship is an approach to work on existing social problems in an innovative way to bring the positive social change (Nicholls 2006; Dees 1998).

[2] Social change is a social construct of changing negative social norms for the betterment of the society (May 2011).

[3] In India, formal banking sector which consists of commercial banks, cooperative banks and development banks does not cater to the marginalised section due to asymmetric information problems (Stiglitz 1990). Microfinance addresses the financial needs of this section.

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activity undertaken by poor people (Schreiner and Leon 2001; Schreiner and Woller 2003) and MSME (2011).

According to Pitelis (2009), *Theory of the Growth of the Firm*, MEs have a *Competitive Handicap* compared to their large and mainstream entrepreneur counterparts. This 'competitive handicap' is not limited to mere monopolistic advantages enjoyed by the larger firms vis-à-vis MEs. It also is a corollary of size, experience, successful track record, impressive credit history and collateral backing advantages. Sans these competitive advantages experienced by larger firms, the information asymmetry associated with MEs is humongous. Together these disadvantages, it makes unable the MEs to 'Access Finance' from banks and other formal financial institutions.

Even if the micro-entrepreneurs have managed their initial start-up capital on their own (from internal sources and family and friend circles), subsequent external financial support imperative at their 'Growth Stage' becomes an impediment to move ahead (Kuzilwa 2005). Access to external finance from banks and financial institutions becomes a formidable task for micro-entrepreneurs as the high information asymmetry associated with them categorizes them as their 'high-risk category clientele' for the financiers. Authors like Akerlof (1970), Stiglitz and Weiss (1981), and Scholtens and Wensveen (2003) regard this information asymmetry at base of the pyramid markets to have culminated in a 'market failure' for the poor.

This market failure had crucial implications for the MEs, because it meant lack of external financial support for the growth and sustainability of their ventures. Devoid of 'capital' at a crucial juncture – 'Growth Stage of their Venture's Life Cycle' – most MEs eventually had to embrace failure and therefore premature death. This is schematically denoted by Fig. 3.1.

It was against the backdrop of this market failure that the concept of microfinance has emerged as a new paradigm in the annals of inclusive financial reforms.

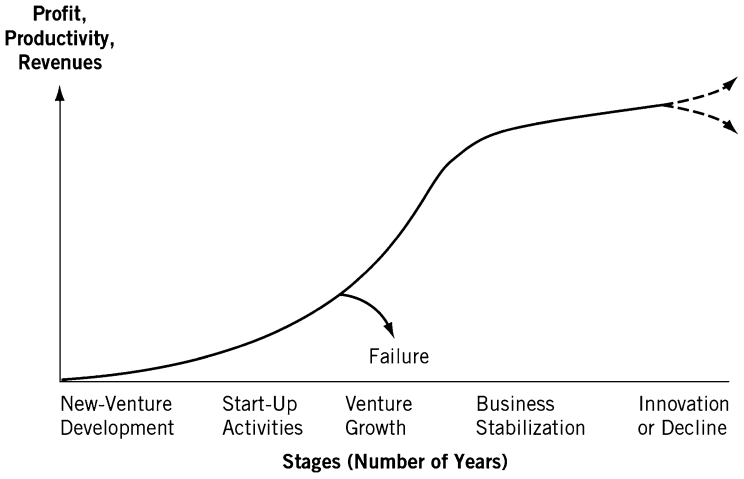

Fig. 3.1 Venture life cycle (Source: Donald 2009)

According to Ghatak and Guinnane (1999) and Ghatak (2000), the concept of microfinance is innovative and novel in its approach to address the information asymmetry prevailing at the market of the marginalised. It effectively provides financial intermediation services in this market because it uses unconventional group lending models that work on joint liability principle, without collaterals, to reduce the information asymmetric problems. The group lending model mitigates asymmetric risk in the following manner:

1. Adverse selection by affecting group formation
2. Moral hazard by inducing group members to influence the way other members select their projects
3. Costly monitoring by helping the lender avoid external audits
4. Enforcement problems by encouraging borrowers to repay their loans without the lender having to impose sanctions (Aghion and Mordoch 2005)

Thus, the ability of microfinance to operate sans collaterals in an environment where there is a dearth of information about the credit history of the poor was seen a welcome relief for the MEs. This was perceived as a major breakthrough by researchers who believed credit to be the vital missing link for the growth of MEs (Jain 1996; Hashemi et al. 1996; Otero and Rhyne 1994; Harper 1998).

International Finance Corporation (IFC) also reiterated the importance of micro-credit by reporting the views of more than 500 million poor profitable micro-entrepreneurs across the world, who cited access to credit to be the primary constraint for their venture's growth (IFC 2004).

With this consensus view prevailing at global level about the pertinence of credit for entrepreneurial growth, the need for microfinance for MEs was felt in India too.

> In India, the need for microfinance is higher as the demand for credit to start micro-enterprises by the poor people could not be met by the institutional initiatives of rural finance up to large scale. Due to the failure of percolation theory of social development, poor people are highly dependent on non institutional sources of credit. Growth of micro-finance in India has been in response to the failure of institutional initiatives of rural credit and exploitation attached with informal system of credit (Singh 2002).

In India the advent of microfinance took two forms – the formal route and informal route. The philosophy of players in these two forms of microfinance was radically different.

The formal route began with India's celebrated 'SHG (Self Help Groups)-Bank Linkage Programme'. SHG-Bank Linkage Programme was initiated by National Bank for Agriculture and Rural Development (NABARD) and later approved by the Reserve Bank of India (RBI) Circular in the year 1991. This circular marked an announcement for linkage of informal SHGs,[4] with the existing banking system. Banks were permitted to classify microfinance lending to SHGs under its advances to weaker sections under the priority sector lending norms. Thus, with the linkage

[4] SHGs are affinity groups of around 15–20 poor individuals, mostly women with a homogeneous socio-economic background, sharing the willingness to improve their living conditions.

route, formal banks were able to reach out to the base of the pyramid. Later, under the formal route, there were also Non-Banking Finance Companies (NBFCs) acting as private microfinance institutions (MFIs) which provide microfinance services on their own or through bank on-lending models. These NBFCs are formal financial intermediaries governed by RBI. These two formal players believe in providing minimalist microfinance services to poor and MEs. They also provide some minimum welfare services but their main focus is on providing financial services like loans and savings.

In contrast to this minimalist view, the semi-formal microfinance players in India believe in integrated welfare service approach. They provide not just microfinance but also several other welfare services that invested in the capacity building of the micro-entrepreneur per se. These semi-formal players were the Indian NGOs registered under Societies and Trusts Act, Section 25 Companies and Cooperative Societies. These players in their diverse legal forms began to transform themselves into specialized financial intermediaries called MFIs, which caters not just to the credit needs of the MEs but also to their welfare needs.

Until 2010, both these formal and semi-formal players peacefully coexisted catering to the growing financial needs of the poor MEs. But in September 2010, the country witnessed a spate of suicides among the microfinance clients in the district of Andhra Pradesh. This resulted a crisis in Indian microfinance industry. The crisis was allegedly due to commercial attitude and approach adopted by the microfinance players in their dealings with the clients.

This episode began to inculcate doubts on the sanctity of the once impressive and celebrated concept of microfinance and its relevance for ME's growth. This research work addresses this skepticism using two case studies – one each conducted on a formal player and semi-formal player.

In this chapter, through in-depth interviews and case study methods, we understand the philosophical and approach diversities that exist among the different forms of Indian MFIs and its influence on the entrepreneurial growth of MEs. The rest of the chapter will present the case-based discussion on this matter and will be structured as follows.

The next section covers a brief literature review on the theoretical underpinnings, which demarcates the two approaches and the underlying philosophies governing the activities of the microfinance service providers. The ensuing section explains the methodology used in this research work. Thereafter Case Study I and Case Study II are presented. Finally, the chapter presents a summarised discussion on the insights drawn from the two case studies, along with the concluding remarks.

3.2 Literature Review: Theoretical Underpinning for Microfinance Classification

This section covers the theoretical underpinning for the MFI classification adopted in this study. A survey of microfinance literature depicts that there are two different schools of thoughts prevailing in the domain (Brau and Woller 2004). Microfinance literature classifies MFIs to these two broad schools of thought – 'Welfarist MFIs belonging to Poverty Lending School of Microfinance' and 'Institutionalist MFIs belonging to Financial System School of Microfinance' (Bhatt and Tang 2001; Woller et al. 1999; Annapurna 2008). In literature, this classification is popularly used to demarcate MFIs which believe in 'financial depth' vs. 'financial breadth'. Financial depth denotes reaching out to poor with integrated financial and welfare services to empower them to move out of poverty. Financial breadth denotes reaching out to the poor in a scalable manner, so that maximum number of poor is financially included.

In this study, we extend the connotation of this theoretical underpinning, by understanding how an MFI's services to micro-entrepreneurial growth can be viewed with the lens of 'financial depth' vs. 'financial breadth'. We use these lenses as categorical constructs capturing the model, approach, and philosophy guiding the MFIs in product design and delivery for MEs. With this lens, we categorize the semi-formal MFIs that we discussed in Sect. 3.1 as 'Welfarist MFIs' for they believe in depth of outreach. We use this categorisation for semi-formal MFIs because they have a welfare orientation governing them in their approach to the poor MEs. They provide both financial and non-financial welfare services in an integrated manner. Their approach is thus to combine both financial and non-financial components in their service and thus provide 'Integrated Welfare Services'.

The formal MFIs which we discussed earlier in Sect. 3.1 are categorized as 'Institutionalist MFIs', as these providers believe in breadth of outreach. These MFIs believe in reaching out to maximum number of economically active clientele, in a scalable manner (Woller and Woodworth 2001; Olivares–Polanco 2005). We use this categorisation for formal MFIs, because the orientation of these MFIs is more towards financial scalability and the approach is to provide only 'Minimalist Financial and Welfare Services'.

In this study, we investigate which of these theoretical classifications which demarcates formal and semi-formal Indian MFIs is relevant for growth of MEs. Is mere minimalist microfinance enough to foster micro-entrepreneurial growth or is there a need for integrated welfare micro-financial services?

3.3 Methodology

For this study, we have adopted qualitative methods for data collection and data analysis. Primary and secondary sources are used for data collection. For primary data collection, we have adopted multistages sampling method as different stakeholders are the respondents for this study such as microfinance institutions, banks, and customers. In the first stage, we have purposively chosen two Institutions: Annapurna Mahila Cooperative Credit Society Limited (AMCCSL), semi-formal MFI[5] and NABARD[6]-promoted SHG Bank Linkage Programme (SBLP), formal MF model as our cases. The purpose of this choice is both of these organisations have been implementing microfinance programme from 1990s though they have different methods of operation. While under SBLP commercial banks are following the group lending process, AMCCSL is following the individual lending with joint liability process.

In the second stage, in-depth interview method and focus group discussion method were used to collect the data from the staff of two institutions and their clients as we need to collect qualitative information from them to understand the process of delivering the services and the benefits of the customers.[7] Secondary sources are reports, documents collected from the MFI and NABARD which are available in the public domain. Case studies were developed to understand the operation of two different forms of financial institutions (Yin 1994).

For data analysis, content analysis was adopted to understand the perception of the customers about the impact of microfinancial services on their entrepreneurial development.

3.4 Case Study I: Semi-formal Microfinance Institution

As we have discussed in the previous section, the popular semi-formal microfinance institutions are Cooperative society, NGOs and Section 25 Companies. In this case study, we have chosen Annapurna Mahila Mandal, Pune to understand the role of semi-formal microfinance institutions in the growth of microenterprises in the urban slums of Pune and Mumbai, Maharashtra.

[5] This is registered under Cooperative Societies Act, Government of India.

[6] This is the apex body of formal microfinance institutions. Under this nodal agency, commercial banks, cooperative banks are providing microfinancial services.

[7] Total 5 in-depth interviews and 20 FGDs were conducted.

3.4.1 Genesis

Annapurna Mahila Mandal was started by Padmashree Prematai Samant in Mumbai in the 1970s. After 20 years, her daughter Dr. Medha Purav Samant started micro-finance activities supported by this organisation in Pune to help the marginalised micro-entrepreneurs in the urban slums of Pune. From 1981 to 1993, Dr. Samant was working with a nationalised bank as a banker. During her service, she found there was a huge gap between demand for and supply of microloans. She also found that there was information gap among the poor people and the institutions. Customers did not have access to information about the financial products exclusively designed for them. On the other hand, bankers were not willing to share this information with the potential customers as they had a fear of possible default committed by those customers.

In Pune, where she was working, she found that the city was largely dormant. This gave her lots of time to interact with people at the margin like vegetable vendors. In addition to this, her Marxist background and knowledge in banking kept her motivated to spend more time with these people, so as to enable them to be part of the mainstream financial circle.

Being a banker, she was aware of the myriad credit direct policies issued by Government of India aiming at the financial inclusion of the poor. The formation of Regional Rural Banks as early as in 1975 was a major step in this direction but still she found that this has not reaped the intended benefits to the poor. She found that poor micro-entrepreneurs were still taking loans from the private moneylenders at usurious rates of interest. However, she found these micro-entrepreneurs were not just prompt in repaying their loans but also had the habit of saving in meagre amounts. She realized that a pro-poor banking system was imperative to be set up among them.

Before creating such a system, she reviewed the faults of the existing banking system. She found that under Twenty Points Programme launched by the Government of India in the year 1975, banks usually would send their security guards at the year end to the neighbouring slums to identify the people for loan disbursement. Most of the time these people either did not have the loan demand or their loan capacity was not checked and this adversely affected the repayment rate. As a banker, she saw that these ways of loan disbursement led to the stereotypical view that poor are un-bankable. These biased views of a faulty credit delivery system made her dissatisfied with her banking job. As a result, she left bank in 1993 and started operations with the support of Annapurna Mahila Mandal, Mumbai. After 7 years of working with the people from the urban slums in Pune, Annapurna Mahila Mandal, Pune was registered under Trust Act in 2000. In 2003, it was registered under Section 25 Companies Act, 1956. In 2009, Annapurna Credit Cooperative Society was re-registered under Cooperative Societies Act. This Cooperative Society was set up by Prema Tai Samant long back in Pune.

3.4.2 Strategy of Selecting Microfinance Customers

Dr. Samant observed that the vegetable vendors, from whom she purchased vegetables, were in the habit of taking loans at the rate of 15–20 % per month from the informal moneylenders. She wanted to take the responsibility of freeing them from the clutches of the informal moneylenders, as the formal financial system had failed in doing this. She started visiting these women vendors on every Saturday after her office. She also visited the slums where they were staying. Initially, family members of these women vendors did not like her approach. Therefore, to check her legitimacy and credibility, they first visited Annapurna Mahila Mandal in Mumbai and the bank where she was working. When they were convinced, they agreed that she could help them for getting the loans from the bank. But banks with their stereotypical beliefs about the poor were reluctant to deliver the money. She explored several possibilities to make the traditional banks work for the poor. But since all were in vain, after 2 years, she formed a group of nine members among the poor. She started an exercise with them. She gave INR 1,000 per member from her pocket just like 'Anna'.[8] They repaid daily a sum of INR 25 to her. They suggested she should collect the money everyday like Anna. Therefore she followed the route of Anna. She knew that following their route was essential. This would help to build a social bonding before getting into financial dealing. At the end of a year, the entire borrowed sum was repaid and this group had INR 250 savings. They also had a share capital per member of INR 50. One of the member shouted with joy, "your money shows magic". She told them that this pro-poor MFI would be their own institution.

Thereafter, she chose all vegetable vendors and grocery owners in the slums as the customers of this pro-poor MFI. This constituted the micro-entrepreneur population of that region. These micro-entrepreneurs had already started their ventures and were in the growth phase, where financial support was crucial for their venture sustenance. This MFI operated with the concept of individual lending within a joint liability model. The best marketing for this institution was the 'word of mouth' marketing done by its group members. This positive vibe rapidly resulted in scalability for their activities. As on January 2013, it has total 30,000 members.

3.4.3 Designing Microfinance Products and Welfare Services

Through the social bonding done prior to financial intermediation, this organization got to know different non-financial problems of its women members. Each of these problems gave Dr. Samant the idea of the different financial products and welfare services needed by the micro-entrepreneurs. She found that since these MEs were in their growth stage they did not need any hand holding in business development

[8] Anna is the name used by poor for the informal money lender.

services like skill training. There were very adept in their respective vocation and had good knowledge about their markets. But there was a need for some non-financial support, when their enterprise grew and demanded more of their time. Dr. Samant tried to design financial and welfare services based on these needs.

For example, though the institution's objective was to make poor free from the clutches of the informal moneylenders through microfinance, soon the vicissitudes in their family life made Dr. Samant aware of the financial insecurity faced by them in diverse occasions. Death of a family member of a woman micro-entrepreneur gave an idea of the need for Life Insurance and Health Insurance products. It was found that micro-entrepreneurs who were mothers did not have any place to keep their children, while their growing venture demanded most of their time. An incidence of rape of a girl child in the slum gave an idea of starting Day Care Centre by this MFI. This helped the women micro-entrepreneur to work peacefully. Some of their micro-entrepreneur clients were single mothers; they needed fellowship to support their children's education. This led to the idea of starting educational fellowship for children.

Presently this Cooperative Society is also about to launch pension product for their members. This is based on the observation that some of the women micro-entrepreneurs are aging and they would need pension, at a time when they lose their capacity to work hard in their MEs. Thus, the product design strategy for both financial and non-financial welfare services shows that all the products are demand-driven. This was a contrast to what the formal financial sector was doing earlier for the poor. Even the micro-entrepreneur members have access to different savings products like term deposits and recurring deposits with Annapurna Mahila Mandal.

In a nutshell, this organisation has a holistic view of empowering micro-entrepreneurs in their growth stage through financial and non-financial welfare support.

3.4.4 Delivery Process of Microfinance Products to the Customers

The staff of the Annapurna oriented the micro-entrepreneurs in the community about the relevance of microfinance in their entrepreneurial growth. They also facilitated group formation. Each of these groups consists of five members. Three groups form a centre in the community and eight to ten centres are under one branch office. The MFI has eight branch offices in Pune and seven branch offices in Mumbai. All Branch offices are linked to Pune head office. After group formation, within 7 days first loan is disbursed to each of these individual members at the Centre. It is mandatory that at the time of loan disbursement, they bring either their husband or anybody from their family. The credit delivery model followed is joint liability lending. The uniqueness of this joint liability lending model is that each of these centres distributes the total loan products based on a ratio of 3:70:9:9:9.

Around 3 % of loans are distributed for repayment of past debt, 70 % of loans are distributed for micro-enterprises-related activities, 9 % of loans are distributed for housing, 9 % of loans are distributed for asset creation and rest of the 9 % loan is distributed for education. The size of the loan varies between INR 7,000 to INR 1,00,000. For loan size ranges from INR 7,000 to INR 25,000, the interest rate is 15 % per annum on reducing balance. From INR 30,000 to INR 1,00,000, it is 12 % per annum on reducing balance. The logic behind this differential rate is that for small loan size, the write-off rate is high and therefore its pricing stands higher.

During the loan disbursement, 10 % of the sanctioned loan is kept as savings in this Cooperative. So, first instalment comprises of 10 % savings + amount due towards loan principal repayment + interest payment. Members earn 6 % interest rate on this savings. For each instalment, 8 % of the remaining capital is deposited to a savings account with the Cooperative Society. The reasons for savings component in the loan is as follows – (a). it acts as collateral, (b) the stake of the members will increase, and (c) members will get the interest on their savings. Presently, loan portfolio is INR 25 crores. Around INR 8 crores of the total capital has been raised from members' savings and INR 12 crore is the borrowed capital. In this process, Annapurna is gradually reducing its dependency on outside borrowing.

3.4.5 Role of Annapurna in Entrepreneurial Growth of the Micro-enterprises: The Crucial Role Played by Non-financial Welfare Services

Re-visiting the entire case discussion on Annapurna, we can see that this MFI is different in its approach to clients as it assists them with financial and non-financial welfare services in their growth stage. As discussed, the target customers of this MFI are micro-entrepreneurs. In their initial start-up stage, most of these MEs have managed their funds on their own. But later they have joined Annapurna. Through their association with this co-operative, micro-entrepreneurs have accessed loan products for various purposes, ranging from repayment of past debts to business expansion and asset creation.

Apart from this, other non-financial supports are also given to the members, which have smoothened their entrepreneurial journey at its growth stage. The MFI also has a system of continuous capacity building and relationship building among their staff and customers. Every month, Centre staff meets the client members for savings, lending and repayment. Members have to attend one community meeting in a year after 10th or 11th instalments. Apart from this, Health Service Executives meet the members thrice a year for client's health education. All the members go through three modules of health education in a year (scheduled as follows: 1st to 4th instalment of their loan: one training module; 5th to 8th instalment: second training module and 9th to 12th instalment: third module). Such a system was devised because it was found that due to health-related problems women entrepreneurs have

lost their working hours, which in turn has negative impact on their entrepreneurial growth, resulting in financial hardships. The emphasis of this health training is to mitigate the occurrence of health issues and malnutrition problems among women members and their family members. This also serves as an orientation for them about the importance of health insurance, in case they face any medical exigencies.

Apart from health literacy, there are also training programmes on financial literacy for the customers conducted at branch level by experts. For loan size range between INR 35,000 to INR 1,00,000, the MFI conducts special formal financial literacy programme. This helps the MEs to adhere to financial discipline and make prudent use of the money that they receive.

In addition to this, as discussed earlier, to create a caring and empowering ecosystem, this MFI has devised novel support systems like Day Care Centre for the children of the women entrepreneurs and sessions for dissemination of knowledge on asset creation practices for women. It is a unique way of transforming the societal norm of patriarchy where women are able to own the assets through their enterprising activities. These support systems and knowledge-creating mechanisms result in a positive social change in women MEs.

3.4.6 Perceptions of the Member Micro-entrepreneurs

During our discussion with the clients, most of the MEs stated that their association with Annapurna Mahila Mandal have changed their lives. In their words:-

> Before Annapurna's intervention, we did not have any idea of the impact of health hazards on our entrepreneurial growth. Other support mechanisms like day care centres and information about financial literacy helps us to concentrate on our business. This focus helps us to concentrate on our entrepreneurial activities as primary source of income. It is not the finance but other supports mechanisms of Annapurna that have proved to be very important for our growth in business.
>
> We feel that it is our own organisation, we get the dividend. We feel empowered as we can deal with the issues related to our business and family in an efficient way than before. Without this organisation's help, we could not have increased the scale of our business and it would not have been possible to reduce our informal debts. We want many such pro- poor institutions which can pull the marginalised people from the debt trap.

3.5 Case II: Formal Microfinance Institutions

In the 1990s, formal banking institutions entered in the microfinance space, after observing the success of the pilot project of NABARD, in linking groups of the poor with banks. These groups constitute the financially excluded and underserved poor who were hitherto cut off from mainstream financial system. The programme that linked them to the banks is popularly called the SHG Bank Linkage programme (SBLP). Presently, the NABARD-promoted SBLP is one of the largest

microfinance programmes in the world. This programme is based on Joint Liability Lending and Peer Monitoring Principles which mitigate the problems of asymmetric information among the poor (NABARD 2010). In this case study, we will look at this microfinance programme and their contribution in the growth of the micro-enterprises in Mumbai slums.

3.5.1 Genesis

Like in many developing countries, microfinance movement in India also started in 1970s. The first microfinance institution in India is SEWA[9] Bank. The success of SEWA in India, BancoSol in Bolivia, and Bank de Rakayat in Indonesia inspired NABARD to take up a pilot project on SBLP in 1992. Under this initiative, NABARD implements a linkage programme with the help of Self Help Promoting Agencies like NGOs, Commercial Banks, Cooperative Banks, Regional Rural Banks and MFIs. The pilot project was very successful and achieved a high recovery with low transaction cost for banks. These positive outcomes led to large number of both public and private banks replicate the programme since 1995. These banks delivered financial services like savings and credit to the poor through implementation of SBLP. Apart from benefitting from financial products, the SHG members also helped themselves in taking up income-generation activities. But the focus of the service provider, be it bank or NABARD, was mainly to provide financial linkages with mainstream formal financial institutions. This was so because the philosophy behind the linkage approach was to scale up and broaden the reach of banks to the maximum number of financially excluded and underserved poor. Financial breadth was the aim and the programme did achieve massive scale in no time. According to NABARD Report 2009–2010, the total number of SHGs savings linked with banks is 69.53 lakhs. Through this programme, 53.10 lakh exclusive women SHGs are linked to the formal financial system. Around 15.87 SHGs are credit-linked under this formal microfinance route. Thus the scale and breadth of outreach for this programme was very impressive.

3.5.2 Strategies for Selecting Self-Help Groups

As discussed in earlier section, scaling up was the governing strategy in the SBLP and therefore efforts were always in the direction of maximising the number of SHGs. The strategy was to reach out to the poor falling below the 'Below Poverty Line' (BPL).

[9] Self-Employed Women Association.

To reach out the BPL segment, most of the time bankers involved in the SBLP inform about the linkage programme to their existing poor clients and prospective BPL clients. Apart from this initiative by the bank, interested groups also come to the banks on their own to open the group savings account. Sometimes, bankers visit the villages and semi-urban areas to orient the people about group lending programme and facilitate group formation and savings linkages. At times bankers, choose the MFIs and on-lend them to microfinance activities.

3.5.3 Delivery Models and Product Design for Self-Help Group Members

The banks participating in this model saw SBPL as a means to fulfil the mandatory priority sector lending limits to be adhered to by them as part of the RBI directive. Under SBLP there are two models of delivery for the banks to reach out to the poor. Under model I, branches of an implementing bank facilitate the group formation among the poor. After the group formation, they inculcate savings habits among the SHGs. After 6 months, these SHGs are linked to the bank for credit. Branches of bank act as a self help promoting institution (SHPI). Under model II, branches of bank lend to MFIs and they on-lend to SHGs.

Two financial products are delivered under this programme: savings and loans. There was no need and demand assessment or bottom-up clientele participation involved in designing these products. The premise was that credit and savings are needed by the financially excluded poor and so the role of the bank is just to act as a supplier of finance. Therefore, the banks did not spend much thought on designing their loan and savings products. They offered loans with a rate of interest that varies between 8 and 12 % and savings with interest on savings of about 4 %.

With this approach of acting as a supplier, NABARD achieved huge scale and breadth in its outreach. In Maharashtra, as on March 31, 2010, a total of 770695 SHGs were having savings accounts with the formal banks, with an outstanding savings of INR 56828.02 lakhs. With respect to credit of Maharashtra state, there were around 110287 SHGs linked for credit, with a total outstanding credit amount of INR 51284.24 lakhs.

3.5.4 Promotional Role of NABARD

The above case discussion shows that under SBLP, NABARD's role is that of a promoter of finance, who supplies financial products to the poor through a linkage approach. By this linkage it promotes financial inclusion by providing support to banks, MFIs, and SHG members. SHG members get linked with formal sector banks through this programme and thereby become part of mainstream finance.

For banks, refinance supports are given by NABARD for smoothening the operation of the bank branches. For MFIs, revolving assistances have been provided to scale up their operation.

Apart from acting as a financial inclusion promoter, NABARD also provides training and capacity building to SHG members, with the help of banks, Government Department of Enterprise Development and MFIs. As a part of training programme, awareness on SHG bank linkage, marketing assistance etc. are conducted regularly. However, it is found that none of the programmes are need-based. It is very much supply-driven.

There were also several other supply-driven initiatives. For instance, for the graduation of SHG members from borrowers to micro-entrepreneurs, micro-enterprise development programmes are conducted. Similarly, if any SHG takes up group-enterprising activity, there is a provision of getting activity-based support from NABARD. However, it was observed that most of these studied SHGs do not know about the schemes. It is grossly focused on skill building. The time period for training ranges between 3 and 13 days. Most of the time, same training is given to different entrepreneurs who are on different paths of growth. Members informed us that this training did not help them much.

3.5.5 Perception of the Micro-entrepreneurs

Focus Group Discussions (FGDs) were conducted among the micro-entrepreneurs to know their views about SBLP. During the FGDs, some micro-entrepreneurs mentioned that with the assistance of the bank-promoted credit linkages they took up the group enterprises. They operated in activities like cooked food supply to the school children, papad[10]-rolling business, handicrafts etc. However, they did not consider these activities as primary sources of income. While they were asked about their training, they replied,

> We do not know that a training component exists. Bankers suggested us to take up income generation activities (IGAs) and we thought that we might lose the opportunity of getting loans at a lesser rate of interest if we would not take up IGAs. As a result we started some activities. Apart from loan and savings facilities, we have not got any training facility from the bank. If it is not mandatory for us to start any enterprise, we would not have taken up these entrepreneurial activities. We do not have knowledge about how to run an enterprise. Nobody has given us information and training. We are very confused about the future of these enterprises. We are not motivated to spend full time for these activities. If educated people like you come to train us, may be, we can take it seriously. After credit linkage, we meet the bankers only during the loan repayment and savings deposit. Even if we ask them anything related to our enterprises, we have not got any proper answer.

The SHG members were also asked about whether they are getting any other facility apart from credit. They mentioned,

[10] It is an Indian snack.

> We did not get any other facility. Two-three times bank conducted awareness programme and training programme. Though the awareness programme was initially good, training programme did not meet our needs. We found that training programmes did not contribute much in our entrepreneurial journey. All the programmes are designed according to bankers' choices. They never asked us what kind of training we need. These days we do not attend these training programmes.

3.6 Discussion and Recommendations

In India, micro-enterprises[11] play a pivotal role in economic growth. Around 94.94 % enterprises are micro-enterprises among all of the Micro, Small and Medium Enterprises (MSME final report, 2006–2007). The gross output contribution of the micro-enterprises is about 44.24 % of total output produced by MSMEs in India. If we consider the employment scenario, micro-enterprises employ around 70 % of total employment created by MSME sector. Each of the enterprise on an average employs four people. Overall, the contribution of micro-enterprises in the economy is very significant. However, for entrepreneurial growth of these enterprises, financial support and access was felt imperative. With the high information asymmetry associated with MEs, very few avenues for financial access were open for them. Against this backdrop, the concept of microfinance took its advent, with an unconventional group lending model that could address asymmetric risks and act as a financial intermediary for MEs. In India, microfinance was implemented by formal and semi-formal institutions and they acted as financial intermediaries for the poor micro-entrepreneurs of the nation. But the potential and relevance of these two forms of institutions in facilitating entrepreneurial growth for MEs was seldom researched. It was widely believed that provision of finance would solve the problem of micro-entrepreneurial growth. But in 2010, with a crisis that hit the growing microfinance industry in India, there was widespread scepticism in this belief.

In this chapter, we address this concern by discussing two case studies from among the formal and semi-formal categorisation of microfinance institutions in India, to understand whether microfinance services are relevant for micro-entrepreneurial growth. Based on the in-depth interviews conducted and the case-based discussions presented in this chapter, we conclude that microfinance still has relevance for the growth of MEs, but the approach and philosophy governing the microfinance service provider will play a crucial differentiating role in this. A mere minimalist approach of providing credit and meagre welfare services as adopted by the formal players (like that done by SBLP) may not be sufficient to help a

[11] According to the Government of India, in a micro-enterprise, the limit of investment in plant and machinery is INR 25 lakhs, and the investment in equipment does not exceed INR 10 lakh rupees (Final Report, Fourth All India Census of Micro, Small and Medium Enterprises, 2006–2007. This is the latest report with data on micro-enterprises in India).

micro-entrepreneur to address his/her venture's diverse growth needs. A more demand-driven and integrated service, which is a mix of both financial and non-financial welfare services, as adopted by the semi-formal players (like Annapurna) will be needed to assist and nurture them at their growing period.

These case studies may be limited in its ability to provide generalisation. But it definitely provides contextual indication of some stylized factors that have come to the limelight and thereby warrants attention in a discourse that tries to understand the relevance of microfinance for MEs. This section discusses these facts and concludes with the recommendations which emerged.

3.6.1 Model: Supply Driven vs. Demand Driven

From the case studies, it is evident that member micro-entrepreneurs of semi-formal institutions have perceived most of the products availed form the MFI to be addressing their enterprise's growth needs. This is so because the design of most of these products have emanated from the clients themselves. Products were designed by taking cue from the financial and non-financial support needed for an entrepreneur and his/her growing venture. Thus, with this bottom-up demand-driven model adopted by the MFI for product design and delivery, the microfinance services had relevance for the clients. The member micro-entrepreneurs remained satisfied with the services and products they availed from the semi-formal MFI. In the view of the micro-entrepreneurs, their satisfactory association with the MFI had impact on their venture growth. It got translated into better venture performance, resulting in positive entrepreneurial growth. While the semi-formal, community-based cooperative microfinance model has addressed this factor of having a demand-driven approach for its products, the formal banking model has failed to identify this aspect. Under the formal model, all processes, right from group formation to product design and development, are supply-driven. Most of the time, the problem of such a supply-driven model, which only aims at scalability and breath of outreach is that it is unable to identify the needs of the clients. This happens because the clients are not at the centre of the model. Thus, most often the entrepreneur clients of these MFI perceive that though they have access to financial products through their association with the MFI, the products availed most often do not address their needs. Therefore, in the clients' view, the usage of such microfinance products had only limited positive impact on their entrepreneurship growth.

Based on the clients' perceptions, it is recommended that demand-driven product development is required to create positive impact on the entrepreneurial development of the customers.

3.6.2 Philosophy and Approach: Minimalist vs. Welfarist

The case discussion on the semi-formal and formal MFI reflects that the philosophy and approach governing the microfinance service provider has an influence on how relevant the microfinance services are to their ME clients. The case depicts how the founder of the semi-formal MFI observed and studied her client's life in detail before designing products for them. The founder observed a close relationship between her client's life per se and their entrepreneurial venture's growth. Therefore, based on this observation, the philosophy of the MFI was that integrated services should be provided to the micro-entrepreneur clients. The belief was that if there are no such integrated services – financial and non-financial products to support the entrepreneur in scenarios of health, family and household exigencies – he/she will never be able to effectively devote time to entrepreneurial growth.

But contrary to this belief, the philosophy of the formal MFI is that provision of finance – mainly credit and savings options, with or without some meagre welfare services – will solve the needs of micro-entrepreneur clients. Therefore, their focus remained mainly in provision of finance, with scalability of their services in mind. The approach of this MFI was to use a top-down supply-driven model for their product design.

But the perceptions of the clients in the respective case studies show that micro-entrepreneurs valued the integrated services more and attributed such services to have played a crucial role in their venture's growth. Hence, integrated services approach is highly recommended in the context of microfinancial product development.

3.6.3 Concepts: Financial Depth vs. Financial Breadth

The case studies contrasting the services of two MFI forms show that the minimalist approach used by formal MFIs could result in 'broadening of outreach' and thereby financial inclusion of the poor to mainstream finance system. But it had less relevance in creating a positive effect on entrepreneurial growth. This was so because there was no proper relationship building, need-based training or information dissemination happening between the formal MFI and the micro-entrepreneurs. This made the entrepreneurs lose their focus in entrepreneurship. Very soon they began to avail loan only for the sake of getting funds, with less interest in their venture's growth. A welfare-oriented and integrated service approach, which understands the 'needs of the micro-entrepreneurs in depth' and accordingly designs and delivers products for them is seen more relevant for micro-entrepreneurial growth. The satisfied clients of the semi-formal MFI who avail such integrated services reiterates that 'financial depth of the services matters more than the financial breadth', if microfinance is to be made meaningful for micro-entrepreneurial growth.

These dual concepts of 'Financial Depth' and 'Financial Breadth' were hitherto used in microfinance literature, to distinguish between MFIs falling into different schools of thoughts, namely, the 'Poverty Lending School' and 'Financial Systems School'. Opening up the contrasting views that exists at the interface of microfinance and micro-entrepreneurial growth, this study adds to the connotation of these two theoretical concepts, by depicting which among these concepts have the potential to make microfinance services relevant to micro-entrepreneurs. The micro-entrepreneur client perceptions captured in the case studies vividly depicts that a welfare-oriented demand-driven microfinance model can foster entrepreneurial growth than a mere minimalist supply-driven microfinance model.

Conclusions

This study focuses on the debate on 'Financial Depth' and Financial Breadth' in the social enterprises like microfinance institutions. As these institutions have emerged to serve the marginalised section of the society, it is required for them to work on 'financial depth' with demand-driven and welfarist approach. The present study shows that this approach has more potential to foster entrepreneurial growth than a mere minimalist supply-driven microfinance model.

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Part II
Institutional Systems

Chapter 4
Development Strategy in the Northern State of Jalisco from the Institutional Perspective

José G. Vargas-Hernández and Mónica Isabel García Mora

4.1 Introduction

The development of regions has become a very important topic in recent years. The talk about development involves bringing about improvements in the quality of life and greater social welfare of a country or region. Formally, regional development was defined as a process of growth and structural change, using existing development potential in the area, leading to improvement of the welfare of the population in a locality or region (Diez 2004).

It is well known that for historical background development in Mexico has not been performing in accordance with the expectations and needs of the country. Coupled with this, there are disparities in development between regions. For example, data released by the National Institute of Statistics and Geography (INEGI 2010, INEGI 2012), Jalisco is the fourth state with more participation in the Gross Domestic Product (GDP), i.e. the fourth most productive in Mexico, only after the Federal District (DF), Estado de Mexico and Nuevo Leon. However, if this is a good economic indicator, in contrast is the Human Development Index (IDH 2009), which places Jalisco in the 14th place in relation to income ratio compared to other states of the country.

The HDI Jalisco also evaluated the 12 regions that make up the State of Jalisco. This is where it is noted that development occurs in a very heterogeneous form in Jalisco and where it can be seen the disparities in development, especially in the Northern region of Jalisco which the Jalisco HDI assessment puts this region in the

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last. For this reason, interest has in this work to analyze disparities in the development of the Northern Zone of Jalisco, viewed from the influence of institutions on the development of the region.

4.2 Regionalization in Jalisco

In the mid-1990s, political changes in the State of Jalisco brought a new way of organizing economic development plans, starting with the segmentation of neighbouring regions with similar characteristics called regions (Martínez 2007).

In 1997, it began a process of regionalization in the State of Jalisco. This process of regionalization was a result of the opening of the country to look to take advantage of globalization and addressing regional inequalities. The regionalization strategy in Jalisco led to the concentration of the 124 municipalities that make up the State into 12 administrative regions in order to promote decentralization and devolution to the regions, and promote the social planning process, comprehensive, participatory and strategic to develop regions within a framework of State Development Plan (PED 2030, 16–17).

However, even though since 1995 it has implemented the State Development Plans in Jalisco to reduce disparities in development between regions, there are still regions with visible signs of backwardness. While national inequality could be reduced to 15 % between 2000 and 2005, in Jalisco it increased to 62 % in the same period (IDH 2009). A clear example, when talking about regional disparities, is the case of the Northern Region of the State of Jalisco.

4.3 Overview of the Northern Region of Jalisco

The Northern Region of the State of Jalisco is located on the northern tip of the state of Jalisco (ZNEJ). Its territory is equivalent to 10,305.46 km^2, which corresponds to 12.86 % of the total area of the State of Jalisco. Jalisco is bordered on the North by the states of Nayarit and Zacatecas, to the East by the State of Zacatecas, on the West by the State of Nayarit and South the state of Zacatecas and Municipalities of Jalisco Tequila and Hostotipaquillo. The region includes ten municipalities: Bolaños, Chimaltitán, Colotlán, Huejúcar, Huejuquilla high, Mezquitic, San Martin de Bolaños, Santa Maria de los Ángeles, Totatiche and Villa Guerrero.

The Northern Region of Jalisco is one of the regions of Jalisco with more potential and yet the most backward (Romero 2009). On a very general overview, it is mentioned that the population of the region represents only 1.04 % of the state population. The 60 % of municipalities in Jalisco are classified as rural and semi-urban 40 %. The Northern Region of the State of Jalisco (ZNEJ) has a strong presence of indigenous cultures. According to a report by INEGI (2010) it was revealed that 4 of the 10 municipalities of the ZNEJ have the highest percentage of

indigenous-speaking population of the state, Mezquitic with 75.9 % and Bolaños with 64.4 %. It follows them the municipalities of Huejuquilla el Alto with 6.5 % and Villa Guerrero with 5.5, prevailing culture of the Huichol people in Mezquitic and Bolaños mainly.

As indices of marginalization, the North Zone of Jalisco (ZNEJ) is the most marginalized of the entity and has a very high degree of marginalization. The marginalization index allows differentiating the shortcomings faced by the people, considering the lack of access to education, residence in inadequate housing, the perception of insufficient monetary income and residence in small towns (CONAPO 2010). Although these figures are not very encouraging, the North Zone of Jalisco has large potential resources, mainly natural resources, which can be considered as a strategy to promote endogenous development of the zone.

This area has water resources, provided by the rivers Bolaños, passing from North to South and West of the centre, the river Camotlán, which plays the same direction west of the municipal area. There are also small springs. Among the main hills and mountains are La Palma, Violeta, El Caimán, El Aguacate, Pitacho of Patoles, The Sabines, The Link, Tapaiste, La Campana and Guajolotes.

The main tourist and cultural attractions in the Northern Zone of Jalisco are shown in Table 4.1.

These are just some of the many tourist attractions, cultural sites that can be found. This area is rich in natural resources, privileged for its scenery, is an ideal area to promote ecotourism.

4.4 Importance of Institutions in Development

The big problem that plagues the current orthodox literature on institutions and development is their inability to distinguish clearly between the forms and functions of institutions (Chang 2006). However, for this work, it is taken the definition of North (1990) who defines institutions as humanly planned restrictions that structure the interaction of people and are known informally as rules. Institutions are the key to ensuring that development efforts are sustainable. The institutions regulate and manage the way of carrying out the actions that contribute to the development of a region.

Acemoglu (2003, p. 27) found that the major factor that explains the root causes of the differences in the prosperity of the country are the institutions. The three key features of good institutions are the application of property rights to a broad segment of society, so that several people have incentives to invest and engage in economic activity, limits on the actions of elites, politicians, and other powerful groups, to avoid expropriation of income and investment of others or create conditions that favour them, and some degree of equal opportunities for broad segments of society so that people can invest, especially in human capital, and engage in productive economic activities.

In respect of property rights, North and Thomas (1973, p. 8) indicate that the creation, specification and implementation of property rights are costly, and these

Table 4.1 Tourist and cultural attractions in the Northern Zone of Jalisco

Municipality	Touristic attraction	Description
Bolaños	La Casa de la Condesa	Baroque Mansion of late eighteenth century, located on 16th Street, #39. Facade of two levels with engravings with scenes of daily life in their borders and fitomorfas figures in their cenefas and graffito decoration in their original enjarres
Chimaltitán	Archeológical zone "Los Cerritos"	On this site are found quarry stones embossed with some signs and drawings
	Piedras Largas	Mountainous pine and oak with whimsical figures formed by nature in different sizes, in an area of approximately 2 ha
	Long stones	
Colotlán	Cueva de la Novia	It is a cave that is 8 m high and 12 m wide; from this site you can admire the Colotlán Township, St. Mary of the Angels, Huejúcar, Tlaltenango Momax and also the road, Colotlán, San Nicolas, El Carrizal and the nozzle dam Perez
	Cave Colotlán Bride	
Huejuquilla el alto	Archaeological zone "Cerrito de Hiztle"	In the place are the remains of pre-Columbian cultures
Mezquitic	Mirador Mezquitic	It is located approximately 5 miles away from the county seat of Mezquitic, intended as a lookout site, overlooks a large canyon and valley Mezquitic part, just as seen from Bolaños River. Ideal to develop landscaping and meditation
San Martín de Bolaños	Mining plant "El Pilón"	It is a silver processing plant, which could be found through guided tours showing the process is subjected to this beautiful metal, with hours from 8:00 to 17:00 pm Tuesday through Friday
Santa María de los Ángeles	Presa "Boquilla de Zaragoza"	It is located north of the centre; it can be fished for bass, carp and catfish throughout the year. On this site one can watch silly duck, Papello. Also the landscape of rolling hills is covered with tropical forest. It features some camping areas in the North and West of the reservoir
	Dam "Nozzle Zaragoza"	
Totatiche	La Cueva de las Patas	It is a mysterious and ancient place nestled in the canyon of the community of El Canjilon, still preserved petroglyphs dating 8,000 years old
	Totatiche The Cave of the legs	
Villa Guerrero	Waterfalls "La Pila del Diablo"	It is located in the town of Patahua at 8 km dirt. They are natural pools formed by the rocks that they surround your sabino vegetation, and in the rainy season there are small waterfalls

Source: SEIJAL (2012)

costs depend on the state of technology and organization, and the governments take the protection and enforcement of property rights because they can do so at lower costs than private groups could organize voluntarily.

As noted Bandeira (2009), after the appearance of the famous book of North on institutions and economic development in 1990, the failure of structural adjustment policies of the 1980s and 1990s, and contrasting the North thesis with empirical

evidence, the new paradigm is that institutions are the key to the economic development of nations. Although the state is who is at the front of institutions, it is important that the actors within it do not abuse the power they have. In this sense, the institutions involved in the development, mainly the government, should be able to establish and implement the actions aimed at developing the sole purpose of promoting social welfare, without deviating from it.

Equal opportunities between members of society generate a proactive attitude towards the development of their community. This support is important as a basis for development policies in which it is essential to involve members of society. Finally, it must be emphasized that the strategic importance of institutions in development processes is that it allows reducing transaction and production costs, increase trust between economic actors, encourages entrepreneurship, promotes the strengthening of networks and cooperation between actors and stimulates learning mechanisms and interaction (Rodríguez-Pose 1998).

4.5 The Relationship of Institutions in the Development of the Northern Region of Jalisco

From the theoretical framework proposed earlier, it seems appropriate to make a brief analysis of the institutions of the Northern Region of Jalisco. To perform this analysis, the institutions are classified as economic, political and social.

4.6 Economic Institutions

According to Jose Antonio Ramirez (quoted in Spiller 2010) in the North of Jalisco, there is a very negative perception of institutions. Programs to improve the economic status are not supported by the population, and are not driven by the government. A dynamic economic growth must be accompanied by satisfactory margins of equity, equal opportunities and social protection. For this is important citizen participation in decisions through public consultations by the institutions. Not only must prepare a development plan based on figures and numbers but must include the assessed needs from the point of view of society to engage in the process and get better results.

To mention one case, one of the main problems of the North Zone (80 % of municipalities) is excessive logging and second loss of vegetation by wildfires. Knowing that natural resources of the North Zone are potential resources to promote development, the loss of these is a major challenge for the authorities who lack more strongly authority to regulate this situation. The figures do not lie. The municipalities of Colotlán, Bolaños, Huejúcar, Huejuquilla, Mezquitic, San Martin de Bolaños, Totatiche and Villa Guerrero are the most affected (PED 2030, p. 95). It is important that the competent authorities consider the use of natural

resources, as they may give rise to an endogenous development. That is, if the local community is able to lead the process of structural change, a local endogenous development process is possible (Vázquez Barquero 2000).

A proposal to promote economic growth from the perspective of endogenous development would be to promote ecotourism as a strategy for the promotion of natural and cultural tourism resources of the region. However, if the authorities are not strong to ensure the preservation of natural resources and vegetation will continue logging the forest, the ecotourist option would not be viable. In addition to natural resources, another alternative is to look after the cultural attractions such as the activities of the Huichol, mainly handmade crafts which are distinctive to their culture and customs.

The authorities should support the Huichol culture to harness the development and marketing of handicrafts from the perspective of the frame (VRIO) which is a resource-based view that focuses on aspects of value, rarity, imitation and organization resources and capabilities (Peng 2010). In this sense, the crafts have a competitive advantage because they are handmade products and rare by the fact that the presence of indigenous cultures is becoming less everyday in cities. Here the authorities must act to ensure that these products have a decent payment because it is an activity that creates jobs and is the livelihood of many Huichol families.

4.7 Political Institutions

For many years, the academic field of economic theory that studies political systems is the social choice theory which argues that in democracies politicians tend to choose those policies that will bring greater electoral benefits and those that are pressured to take by interest groups with political power (Bandeira 2009).

The literature indicates that there could be two reasons for inefficiency in meeting development objectives. The first is that the holding of elections every few years leads politicians to give priority to short-term results to the detriment of policy and institutional reforms necessary for economic development, which only produce results in the long term. The second is that stakeholders and interest groups have long-term goals. They seek to ensure their future income, but also they seek very specific objectives, i.e. that do not benefit the whole society, to reduce costs and increase the benefits of their political action (Olson 1965).

The governance of a region depends on the actors involved in this process, political parties, government (at all three levels, local, state and federal). So it is important to constantly evaluate the role played by these institutions in the development based on the political system's ability to negotiate stable coalitions, strong policies or the strength of public institutions, the ability of government and social sectors to combine development policies adequately.

According to INEGI (2010) 4 of the 10 municipalities of the ZNEJ, have the highest percentage of indigenous-speaking population of the state, Mezquitic with 75.9 % out of the total population in this municipality and Bolaños with 64.4 % out

of the total population in this municipality. The two municipalities, Mezquitic and Bolaños have the prevailing culture of the Huichol people mainly. It follows them the municipalities of Huejuquilla el Alto with 6.5 % and Villa Guerrero with 5.5 % out of the total population per each municipality.

For example, in the past, political election was an important policy to encourage indigenous people living in the Northern Zone to join the political process. The Daily Reporter (2012) revealed that during the elections of 2012 locals voted using an electronic ballot box rather than the traditional way, but with an electronic ballot box, or at least that's what was intended to do the Electoral Institute and Citizen Participation (IEPC).

A community benefited was the San Andreas Cohamiata, or Tateikie, in Wixarica language, which is in the North of the State and the municipality of Mezquitic. To access the community, it takes about 10 h from Guadalajara. However, the IEPC will enable residents of this community and some others from the North Zone to be trained in the use of electronic devices for election on July 1. This is a major effort of the IEPC to help the people of the North, which has a high percentage of indigenous population that could elect their rulers and would have the feeling that they are taken into account and also actively involve themselves in the development process.

Finally, note that in the Northern Zone of Jalisco, 9 of the 10 municipalities that make up this area are governed by the National Action Party (PAN). This would imply homogeneity in the ideology of political thought, which should be a reason for the promotion of development within a new efficient administrative framework. It would also be important that the political institutions of the Northern Zone take advantage of shared political ideology and make intergovernmental relations between the municipalities of the region to ensure joint development of the area.

4.8 Social Institutions

Institutions and society behave dynamically, but at the same time must work in harmony to achieve development goals. As already mentioned, it is important that society is actively involved in development issues. An important form of participation is the evaluation of public policies and programs that are implemented in the Northern Zone with the aim of promoting the development of the region.

However, in the Northern Region, there are low levels of education among the population of 15 years. It is known that the population of the Northern Region is one that has less competition for not having completed primary school. Twenty-eight percent of the population aged 15 and older, double the proportion in the state (which is 14.7 %), did not complete primary. Furthermore, four of the municipalities are above the proportion of the region: Santa María de Los Angeles, with 39.9 %; Chimaltitán with 35.1 %; Totatiche and Huejúcar with 32.5 and 31.3 %, respectively (PED 2030, p. 53). These data give a slight overview of the situation in the Northern Zone of Jalisco. It is a high percentage of the population that did not

complete primary even so it is unlikely that this proportion of the population with low education can engage actively in development issues in their communities.

However, the development of the Northern region of Jalisco is not of isolated interest. There are already organizations and academics who are constantly concerned about the development of this region. In fact, there is already a social movement that seeks and procures development in this area. On june 9, the Citizens Movement North of Jalisco was created by 54 people signing a constitutive document. The citizens who signed this document came from different social, economic, cultural and political backgrounds. This movement was created before the difficulties on economic growth and with further concern in regional development. Also they were concerned for nominate candidates to local and federal representatives and municipalities' majors to generate commitment to the region (Romero 2009).

The creation of this movement is of vital importance for the development of the region where the NGOs can access the state program development and, in some cases, interact with the public in the development and implementation of policy (Arroyo 2010).

Conclusion

It is important that in the Northern State of Jalisco an institutional change takes place, i.e. an interaction between institutions and organizations to meet the challenges of development in the region. Institutions understood as the rules of the game are an essential factor in the development process. However, it must be complemented by the organizations. These organizations are political parties, businesses, families, universities, nongovernmental organizations (NGOs), civil organizations, among other actors that can contribute to the development of the region.

The institutions are not created for the sole purpose of promoting the development of society. Organizations also serve the purpose of distributing or consolidating political and economic power. However, the key for development is that institutions and economic policies promote the welfare of the citizens and not the satisfaction of particular political and economic interests (Bandeira 2009).

It is important to strengthen the institutions and the main objective that seeks the interests and welfare must be procured. To achieve this, the effectiveness of institutions, programs and policies proposed by the government must be evaluated.

Society must be part of this process by actively participating in the evaluation and proposed development plans in the Northern Zone of the State, as it is the same society that meets the basic needs of their own region.

Political organizations such as political parties and governments in the region should strive for the interests of the region and not just issue proposals in the short term that will guarantee votes and gain power.

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Chapter 5
Technological Utilization in Africa: How Do Institutions Matter?

Uchenna R. Efobi and Evans S. Osabuohien

5.1 Introduction

In recent times, there is an increased research effort and conclusion on the role of technology, especially Information and Communication Technology (ICT), on economic growth across countries. However, little empirical work has focused on how the level of institutional development in a particular country (institutional quality) and the level of economic development in countries can improve or impair the level of ICT utilisation. This is even more disturbing for African countries that have experienced low ICT utilisation in the phase of institutional 'palavers'. Needless to say that the nature and extent of institutional quality and level of economic development can influence the rate of diffusion and utilisation of a given form of technology given that institutional quality creates a platform for improved economic interactions that protect economic agents from potential losses. Consequently, the expected outcome from such a system is improved trust for the particular technology, which will result to better ICT diffusion. This is the main argument that informed this study with the main objective to empirically explore the nexus between institutions, economic development and ICT utilisation in Africa.

The growth of ICT utilisation can be seen from the improved use of ICT infrastructures such as electronic payments in the financial sector, the operations of the government and administrative procedures, in education, improved business activities and transportation, among others (Mukoyama 2003; Osabuohien and Efobi 2012). Despite this upsurge of ICT utilisation across the world, in many

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African countries, the level of ICT utilisation is low. This is evidenced by the value of some indicators of ICT utilisation, with African region scoring lower than those of other regions of the world. For example, the average Internet usage per 100 persons in Sub-Saharan Africa (SSA) was 3.97 between 2005 and 2008 compared to other developing regions like Latin America and the Caribbean (LAC) and the global average that had the values of 16.37 and 20.58, respectively (World Bank 2011).

Following the low level of ICT utilisation in Africa, some studies have traced this performance to a number of factors. They include low level of educational attainment/low literacy rate, low per capita income, poor infrastructural development, outbreak of diseases, weak institutional quality, among others (Dimitrios and Ourania 2003; Musa et al. 2005; Osabuohien and Efobi 2012). Despite the appreciable effort of these studies, the interconnectedness between institutional quality and human development in informing ICT utilisation has inadvertently been avoided. The interconnectedness between these variables and its effect on ICT utilisation in Africa requires attention due to the fact that African countries are beginning to echo on developmental policies that encourages human development (United Nations Economic Commission for Africa-UNECA, 2010). Likewise, the role of institutional development has been emphasised and it is accountable for the reason why the region lags behind in many respect. The implication of these on ICT utilisation is not clear. This in itself presents a worrisome situation because institutions are supposed to govern human behaviour and enhance the attainment of human development for economic outcomes including ICT utilisation (North 1994; Williamson 2000; Rodrik 2008; Acemoglu 2010; Osabuohien and Efobi 2011, 2013); therefore, neglecting this nexus accentuates a lopsided discussion on the factors that enhance ICT utilisation in Africa.

In a view to empirically situate the focus of this study, an econometric model was formulated and analysed using a panel data for 45 African countries across the five subregions (Central, East, North, Southern and West Africa) for the period 1995-2010. The main variables of interest include institutional quality and human development and ICT utilisation. The Generalised Method of Moments (GMM) technique was employed in estimating the model in order to handle the issue of endogeneity and to handle the possibility of spurious regressions. The chapter is structured into six sections. The second section presents some stylised facts on the indicators of ICT utilisation, which is followed by the literature review in the third section. Methods of analysis comprising of empirical model and estimation technique were discussed in the fourth section. The fifth section presents and discusses the results, while the last section concludes with some policy recommendations.

5.2 Some Stylised Facts

In general terms, ICT utilisation connotes the ability of ICT to have a broad influence in a country as it relates to ICT usage by economic actor such as households, firms and the government. This has been noted to be one of the distinguishing factors between economies (Mukoyama 2003; Osabuohien and Efobi 2012). This section appraises the level of ICT utilisation in Africa in comparison to other regions of the world. The comparison also cuts across the five subregions in Africa.

Table 5.1 presents the Internet users per 100 persons, fixed (wired) broadband subscriptions per 100 persons and active mobile broadband subscriptions per 100 persons, which are basic indicators of ICT utilisation (International Telecommunication Union 2010; World Bank 2011). As can be seen in Table 2.1, the number of Internet users per 100 persons was lowest in Africa compared to the other regions of the world, all through the period 2006–2010. Similar trend was observed using another indicator of ICT utilisation, namely, the fixed (wired) broadband subscriptions per 100 persons where the value for Africa ranged between 0.1 and 0.2 from 2006 to 2010. This was also lower than other regions. For instance, in 2010, the average values for Asia and the Pacific and Commonwealth of Independent States (CIS) were 5.5 and 8.3, respectively. These were more than 27 and 41 times greater than that of Africa's value of 0.2 within the same period.

Another indicator reported in Table 5.1 is the active mobile broadband subscription per 100 persons, which measures the extent of usage of mobile Internet facility. The values from the table reveal that Africa performed lower than other regions except for CIS in 2008. In 2010, the value for Africa was not only the lowest but many times lower than other regions. In effect, it was about three times lower than those of Asia and Pacific; four times lower than those of Arab States; more than

Table 5.1 Indicator of ICT utilisation (Internet) across regions of the world

			Internet users per 100 persons		Fixed (wired) broadband subscriptions per 100 persons		Active mobile broadband subscriptions per 100 persons		
Region	2006	2008	2010	2006	2008	2010	2006	2008	2010
Africa	3.3	6.3	10.8	0.1	0.1	0.2	Na	1.0	2.5
Arab States	10.9	17.3	24.1	0.5	1.3	1.9	Na	2.4	10.2
Asia and Pacific	10.6	16.5	22.5	2.8	4.0	5.5	Na	4.3	7.5
Commonwealth of Independent States (CIS)	12.6	19.5	34.0	1.3	4.5	8.3	Na	0.8	11.2
Europe	49.8	60.3	67.0	14.8	20.7	23.8	Na	24.2	41.3
The Americas	38.8	44.2	50.7	9.1	12.4	14.1	Na	10.3	24.1

Source: Authors' compilation from International Telecommunication Union (2010)

Table 5.2 Indicator of ICT utilisation (telephony) across regions of the world

	Fixed telephone lines per 100 persons			Mobile cellular subscriptions per 100 persons		
Regions	2006	2008	2010	2006	2008	2010
Africa	1.5	1.5	1.5	17.9	32.4	45.2
Arab States	9.6	10.3	9.8	39.3	63.4	87.9
Asia and Pacific	15.5	14.9	13.6	28.8	46.6	69.2
Commonwealth of Independent States	24.7	26.1	26.2	81.8	112.5	134.8
Europe	45.3	42.9	40.7	101.2	117.7	117.7
The Americas	31.9	31.5	29.5	62.0	81.5	94.5

Source: Same as in Table 5.1

Table 5.3 Indicators of ICT utilisation across the subregions in Africa

Indicators	Africa	Central	East	North	Southern	West
Internet users per 100 persons	2.42	1.64	3.11	5.25	2.36	1.44
Telephone (Mobile + Fixed) users per 100 persons	12.96	6.11	14.29	28.87	14.54	9.04

Source: Authors' computation using data from World Bank (2011)
Note: The values are presented using the averages for the period 1995–2008. All African countries were used in the computation except Liberia and Somalia due to data availability

nine times lower than Americas; and more than 16 times lower than those of Europe. Likewise, fixed telephone lines per 100 persons and mobile cellular subscriptions per 100 persons are reported in Table 5.2 and the extent of ICT utilisation using these indicators was also lowest in Africa compared to other regions of the world. The average number of fixed telephone lines per 100 persons in Africa in 2010 is about seven times lower than the Arab States, nine times lower than Asia and pacific region, 17 times lower than CIS, 20 times lower than the Americas and 27 times lower than Europe. A similar pattern can be underscored using mobile cellular subscriptions per 100 persons, where the values for Africa was many times lower than other regions as well.

Some of the indicators of ICT utilisation are presented in Table 5.3 across the five subregions in Africa, namely, Central, East, North, Southern and West Africa. From the table, the average value of Internet users and telephone (mobile + fixed) users per 100 persons was 2.42 and 12.96, respectively. However, across the subregions, a disparity was observed. For instance, Internet users per 100 persons in Central and West Africa are as low as 1.64 and 1.44, respectively. The highest value (5.25) was observed for North Africa, which is more than three times above the value of Central and West Africa.

Similarly, the value of telephone users per 100 persons is also lowest in Central Africa (6.11), followed by West Africa with a value of 9.04. The highest telephone usage is in North Africa with a value of 28.87, which is distantly followed by Southern Africa (14.54) and East Africa (14.29). In fact, the values for Central and West Africa are 4.73 and 3.19 times lower than that of North Africa, while those of

East and Southern Africa are about 100 % lower than North Africa. The basic observation from the above discuss is that the Central and West Africa had the lowest extent of ICT utilisation, while the highest was in North Africa.

The main issue to be summed in this section is that Africa has witnessed low level of ICT utilisation compared to other regions. Thus, investigating on the factors that can matter for the improvement of this trend will be worthwhile.

5.3 Literature Review

The extent to which ICT utilisation occur in a country has received empirical attention. This has resulted into the development of some models that explains the factors that enhance this process. They include the innovation-diffusion model, economic constraints model, adoption perception model, the epidemic model, the rank-order model and the stock model. Among these models, the innovation diffusion model stands out, especially when considering the ICT utilisation framework of African countries.

The innovation diffusion model is premixed on the position of Rogers (1995) that the extent of technology utilisation is based on the amount of information about the technology that are accessible per time to the potential adopters of the technology. Rogers proposes that the process of technology adoption follow a five-step process: knowledge about the technology, persuasion to use the technology, decision to adopt the technology, implementation (actual usage of the technology) and confirmation (assertion that the technology is worth using). This implies that technology utilisation is not an end in itself, but a systemic process, which is only feasible among members of a social system.

Any technology can be accepted in any system based on the systemic framework and the information asymmetry within such system. As Mudzonga (2012) observed, technology is devoid of cultural meaning and the extent of its penetration is based on effective communication and persuasion. Similarly, Uaiene et al. (2009) observed that technology is culturally and technically appropriate, but the extent of information asymmetry can usurp its adoption process. Apart from the extent of information flow within the economic system, some other heterogeneous traits of members that constitute the economic system also affect the extent of technology utilisation.

Mudzonga (2012) classified members in the economic system as innovators, early adopters, early majority, late majority and laggards. The members adopt technology based on their innovative capacity. This heterogeneity among the members of the economic system will account for the s-shaped trend in technology diffusion process. Thus, the technology utilisation process follow a period of slow utilisation, then gradual increase in utilisation, after which a rapid utilisation will occur when the technology has been accepted by the members of the system, then a gradual decline begins to occur. The gradual decline is caused by introduction of new technologies in the economic system. This flow is illustrated in Fig. 5.1,

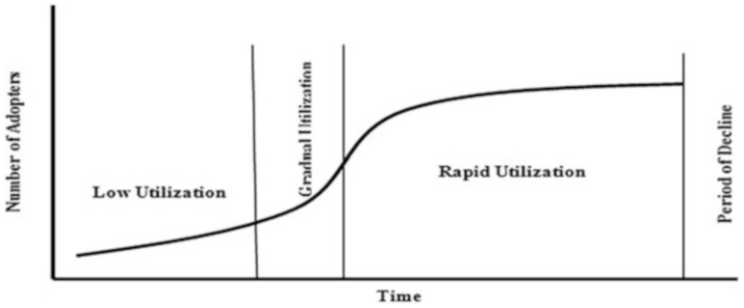

Fig. 5.1 S-curve illustrating technology utilisation process (Source: Adapted from Rogers (1995), Osabuohien and Efobi (2012))

From this model, the extent of education of members of the economic system matter in determining the extent of ICT utilisation. This can be observed from the fact that the heterogeneous diversities among the members of the economic system are based on their innovative capacities and without gainsay; the innovative capacity of individuals cannot be disassociated from their level of education (Mudzonga 2012). Furthermore, the reduction of information asymmetry within the economic system is directly linked to the strength of institutions, prevalent in the country. Developing economies have hitherto experienced poor institutional framework to facilitate information access. This was further confirmed in Columbus (2012) who ascertained that the common feature of developing countries is information poverty as a result of information inaccessibility, which can be enhanced by the development of institutions. Need to say, the decisions of economic agents are largely influenced by the available institutions. This is based on the fact that institutions shape the behaviour of economic agents and create incentive for economic relationships that reduces the risk of economic losses and moral hazard (North 1991; Williamson 2000; Greif 2006; Acemoglu and Robinson 2008). For agents to strive towards accepting a technology and ultimately utilising the technology, the institutional paradigm can go a long way to ensure the suitability of any technology inflow to the country. This relieves the agents of the pressure of finding out about the suitability of such technology and thus encouraging the utilisation process.

There are avenues through which technology can be introduced into an economic system. Some of these avenues include trade, such as import of technologies into a country. Some others include FDI flow such as technology transfers (e.g. Carr et al. 2001, Dirk 2006); however, this study is not concerned about the source of inflow but on eventual utilisation of the technology. Before the technology can be eventually utilised, some intermediaries that fashion the belief system of users are predominant. This includes the formal institutions in the form of government policies and regulations; the level of human development of the users such as their educational attainment and level of income; and the informal institutions.

The formal institutions matter in the technology utilisation process. As observed by North (1991) and Rodrik (2008), sound institutions protect economic agents (users) from possible moral hazards that can occur from economic relationships. An economic system with better institutions will act by defending the interest of economic agents and ensure that technology inflow does not have possible adverse effect on users. This may not be entirely ensured, since the ultimate decision to use a technology lies on the agent. However, the role of institution in protecting the rights of economic agents and ensuring a fair hearing in the case of moral hazard can build confidence in the users. This confidence will be translated to the trust that economic agents have for any technology that has been certified by the government, based on certain standards. This will further translate to the acceptance of the technology and then utilisation.

When institutions are weak, economic agents loose trust in technology inflow. This is based on the fact that they do not trust that the government certification of the technology is based on quality and reduction of moral hazard, but on rent seeking and private gains. Fosu and O'Connell (2006) and Fosu (2011) observed that this has remained the bane of African country as political elite make national policies for private gains instead of public interest. In this case, the economic agents become sceptical about adopting a technology and in cases where they have to adopt; they require extreme caution in making the decision to adopt.

In a similar fashion, the level of development of potential adopters, in the form of education, can explain the extent of ICT utilisation. Guerrieri et al. (2011) opine that high human capital development can expedite the rate of technology utilisation because potential adopters are able to understand and utilise the new technology. Kiiski and Pohjola (2002) also observe, from the study of mix samples that comprise of countries from both developing and the Organisation for Economic Co-operation and Development (OECD), that tertiary education had a positive significant influence on the utilisation of ICT. Some other studies note that the level of human capital does not have a significant impact on ICT utilisation. Baliamoune-Lutz (2003) using sample from 47 developing countries, points out that the level of education is not associated with the ICT utilisation. Similar observation has been made for industrialised countries (Kiiski and Pohjola 2002). Norris (2000) also underscores that human capital (education) does not have a significant influence on the extent of ICT utilisation from a sample of both developed and developing countries.

From the general standpoint, studies on the determinants of ICT utilisation are in twofold: micro- and macro-analyses. Studies focusing on the micro-analysis have ascertained that ICT utilisation is influenced by the human capital capacity, the income of the individual adopter, the nature of the new technology to be adopted, firms characteristics (such as the size of the firm, performance of the firm), among others (Jensen 1982; Chari and Hopenhayn 1991; Haller and Traistaru-Siedschlag 2007). Studies on the macro perspective have concentrated on the *digital divide* which is the divergence existing in the rate of technology utilisation between developed and developing countries (Guerrieri et al. 2011). The *digital divide* has been attributed to the difference in economic wealth of countries (Guerrieri

et al. 2011). Baliamoune-Lutz (2003) asserts that a country with higher income level will spend more on research and development, which will in turn boost ICT utilisation. Contrasting view has been observed, as some studies noted that the wealth of the countries may not be a significant factor for explaining the extent of ICT utilisation (Hargittai 1999; Beilock and Dimitrova 2003).

In the light of the earlier discussions, it is important to note that there has been an inadvertent exclusion of conclusions for the factors that inform ICT utilisation in African countries. This is particularly considering that the region is faced with poor human capital development as well as an increasing proportion of the world's poorest people, with low standard of living (Cohen 2002; Mills 2010; United Nations Economic Commission for Africa-UNECA 2010). In a similar fashion, African countries are characterised by poor institutional quality (Fosu 2011; Osabouhien and Efobi 2013, 2014). Therefore, applying the conclusions of other studies that have concentrated on ICT utilisation of other regions may not be sufficient for policy implications for African countries.

5.4 Methods of Analysis

The study engaged two main methods of analysis to achieve its objectives, which include descriptive and econometric analyses. The former involves the use of summary statistics on the indicators of ICT utilisation, human capital development and institutional quality. The second aspect of the analysis used the Generalised Method of Moments (GMM) econometric technique to capture the relationship between the indicators of ICT utilisation, economic performance and institutional quality.

5.4.1 Econometric Model

The extent of ICT utilisation has been measured in extant literature using different approaches such as Internet users per capita, mobile phone subscribers per capita (Baliamoune-Lutz 2003; Beilock and Dimitrova 2003), expenditure on information technology (Luciani and Padoan 2007), personal computer per capita (Haller and Traistaru-Siedschlag 2007), among others. Some others have used the extent of utilisation of ICT for economic activities like purchasing, email account per person, email users (Bayo-Moriones and Lera-Lopez 2007) and the price of ICT services (Kiiski and Pohjola 2002). Some of these measures are not accessible, for instance, reliable data for price of ICT services and expenditure on information technology are not available for African countries. Also, email account per person, utilisation of ICT for economic activities can be accessed for micro-studies but are not available for macro-studies such as this. Thus, similar measure of ICT utilisation used by Baliamoune-Lutz (2003) is most preferable for this study.

The econometric model formulated for this study gleans on Baliamoune-Lutz (2003) determinants of equilibrium level of ICT utilisation. The model examines the relationship between technology utilisation-*T*, income and a vector *Z*, which includes other variables like institutions, openness of the economy and level of education. This is expressed in Eq. (5.1) as:

$$\mathrm{Ln}T*_I = \beta_0 + \beta_1 \ln \mathrm{INCOME}_i + \lambda^i Zi \tag{5.1}$$

Equation (5.1) can be extended by considering the possibility of institutional quality influencing human capital and income level of a country (Fosu 2011). This is expressed in an interaction form that includes the multiplicative between institutional quality (*Instq*) and the economic performance variables (*human capital development-Hdev* and *income-Rpgdp*). These are denoted as *Instq*Hdev and Instq*Rpgdp*.

Therefore, the empirical model for the study is stated as:

$$\begin{aligned} ICTuti_{it} = \beta_0 + \ & \beta_1 Instq^n{}_{it} + \beta_2 Hdev_{it} + \beta_3 Rpgdp_{it} + \beta_4 Instq * Hdev_{it} \\ & + \beta_5 Instq * Rpgdp_{it} + U_{it} \end{aligned} \tag{5.2}$$

where:

ICTuti: Indicator of ICT utilisation measured as the simple average of three main indicators of ICT, namely, telephone and mobile phone utilisation (*Tel)*, Internet utilisation (*Itnet*) and personal computer usage (*Pcom*) per 100 persons.

Instq: Indicator of institutional quality derived from the simple average of rule of law (*Rl*) and regulatory quality (*Rq*). This approach has been used recently by Fosu (2011), who compared the terms of trade between Nigeria and Botswana by focusing on their institutional quality. The measures *Rl* and *Rq* are essential indicators of institutional quality because the rule of law *(Rl)* explains the extent by which economic agents have confidence in and abide by the rules in a country, thus translating to the protection of property rights. It includes the effectiveness of the judiciary system, the incidence of crime and the enforceability of contract. Likewise, the regulatory quality *(Rq)* measures the incidence of market friendly policies in the country. Thus, reflects the ability of the government to formulate and implement sound policy that will enhance the private sector development, thus translating to ICT utilisation. The values of *Rl* and *Rq* as computed by Kaufmann et al. (2009) range from −2.5 to +2.5; the higher, the stronger the institutional quality.

Hdev: Human capital development was measured using the Human Development Index (HDI). The HDI shows the extent of human capital in the country taking into consideration the health,

education and income status of the population in a given country. The index is ranged between 0 and 1, with the higher value signifying better human development. A country with HDI value above 0.80 is regarded as high; those between 0.50 and 0.80 are regarded as medium; while below 0.50 is regarded as low human developed country (UNDP 2010).

Rpgdp: Growth rate of the real per capita income of the country measures the growth rate of the real gross domestic products (GDP) at 1990 constant prices.

*Instq*Hdev*: The interaction between the institutional quality and the level of human development in the country.

*Instq*Rpgdp:* The interaction between the institutional quality and the growth rate of real per capita GDP.

U_{it}: The error term that captures other factors influencing ICT utilisation not included in the model. They are assumed to be identically and independently distributed (*iid*) with zero mean and constant variance.

it: Country's and time identifiers.

The *apriori* expectation is such that: $\beta_i(i = 1 - 3) > 0$. This implies that an improvement of institutional quality, human capital development and real per capita income growth rate will lead to better level of ICT utilisation. The signs of β_4 and β_5 can be negative or positive (−/+) depending on the nature of interactions between institutional quality and the indicators of economic performance. When the coefficient of *Instq*Hdev* is positive, it suggests that institutional quality enhances ICT utilisation in a country where human capital is developed. Thus, better institutional quality is complementing human capital development to improve ICT utilisation, vice versa. Similarly, when the coefficient of *Instq*Rpgdp* is positive, it implies that better institutional quality is congruent with per capita income growth to enhance ICT utilisation, the converse holds if the coefficient is negative.

5.4.2 Estimation Technique

The model formulated in Eq. (5.2) was estimated using econometric technique, using static and dynamic panel data estimators. The static panel analysis was done with Fixed Effects (FE) estimator. The choice of FE over the Random Effects (RE) was based on Hausman test. The dynamic panel data estimator was carried out using the Generalised Method of Moments (GMM). The GMM is similar to the Two Stage Least Squares (2SLS) for 'just identified' models. However, the GMM gives precise estimates with 'over-identified' models. The GMM estimation is considered appropriate for this study because it internally generates the instruments

used in the estimation process unlike the 2SLS method where the researcher has to look for valid external instrumental variables. In addition, innovations in current technology usage can affect future utilisation. This is represented in the model as lagged dependent variable [*ICTuti (-1)*]. This introduces the issue of autocorrelation and endogeneity in the model, which can be handled by the GMM estimator compared to the 2SLS (Arellano and Bond 1991; Grubler 1991; Jovanovic and Lach 1997).

In view of the above, Eq. (5.2) can be modified to include the lagged dependent variable and stating it in GMM model format as:

$$ICTuti_{it} = \beta_0 + \beta_1 \Delta ICTuti(-1) + \beta_2 \Delta Instq_{it}^{n} + {}_3\Delta Hdev_{it} + \beta_4 \Delta Rpgdp_{it} + \beta_5 \Delta Instq * Hdev_{it} + \beta_6 \Delta Instq * Rpgdp_{it} + \Delta\mu_{it} \quad (5.3)$$

The sign 'Δ' is the change coefficient that represents the dynamic mechanism in the model.

The data engaged were sourced from the World Development Indicators (WDI) of the World Bank (2011) and the Human Development Indicators (HDI) of the UNDP (2010) for the period 1995–2010. The analysis was carried out using STATA 11.1 software. Forty-five countries in Africa were selected based on data availability.[1] The sampled countries represent over 80 % of the countries in Africa covering the five subregions, namely, Central, East, North, Southern and West Africa.

5.5 Results and Discussions

The descriptive analysis of the variables, especially, the indicators of ICT utilisation and institutional quality was carried out using their respective indicators instead of the average with a view to observing their nature as reported in Table 5.4. From Table 5.4, the selected African countries had low values in the indicators of ICT utilisation with respect to Internet usage (*Itnet*) and personal computer usage (*Pcom*) per 100 persons. The average utilisation rate was 2.09 for personal computer usage per 100 persons and 2.40 Internet users per 100 persons. The telephone usage (*Tel*) had the mean value of 13.29 users per 100 persons, which equally appeared low. Using the minimum and maximum values, it could be inferred that the difference between the country with the ICT utilisation rate and that of the least

[1] The countries include: Algeria, Angola, Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Central Africa Republic, Chad, Comoros, Congo Republic, Cote d'Ivoire, Democratic Republic of Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea Bissau, Guinea, and Kenya. Others are: Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Senegal, South Africa, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, and Zimbabwe.

Table 5.4 Descriptive statistics of variables

Variable	Mean	Std. deviation	Minimum	Maximum	Observations
Rpgdp	2.74	7.14	−29.63	65.77	626
Hdev	0.51	0.13	0.27	0.85	542
Rl	−0.62	0.63	−1.88	1.00	449
Rq	−0.49	0.71	−2.37	1.75	448
Pcom	2.09	3.73	0.02	24.04	471
Tel	13.29	21.73	0.07	125.72	601
Itnet	2.40	4.77	0	38.98	601

Source: Authors' computation

was as much as 24, 39 and 125 for personal computer, Internet and telephone usage per 100 persons. This implies the existence of disparity in ICT utilisation in Africa.

Indicators of institutional quality as reported in Table 5.4 had the mean values of −0.63 and −0.49 for regulatory quality (*Rq*) and rule of law (*Rl*) for the sampled countries. The minimum value for the selected countries was as low as −1.88 for rule of law and even lower for regulatory quality with the value of −2.37. The implication of the above is that, on the average, the strength of institutional quality of the sampled countries is relatively weak. This observation is similar to the submission of Sanjeev and Ourvashi (2006) who noted that the strength of African institutions may be one of the reasons for the low growth in investment as investors (inclusive of ICT devices) can be encouraged to invest in countries with reliable institutional quality.

The indicators of human capital development *(Hdev)* and the growth rate of the real per capita GDP *(Rpgdg)* show that the sampled African countries have mean value of 0.51 and 2.74 % for *Hdev* and *Rpgdg*. The range between the country with the highest GDP per capita growth rate and that of the lowest is as much as 95.40 %. Similarly, the country with highest value in *Hdev* and the lowest was as much 0.58. This reflects the huge difference among African countries with regard to the indicators of economic performance.

The study observes from the descriptive analysis that in the selected African countries there is a prevalence of low value indicators of ICT utilisation, economic performance and institutional quality. Thus, the level of impact of economic performance and institutional quality on ICT utilisation is reported in the next subsection using econometric technique.

The results from the econometric analysis using Fixed Effects (FE) and Generalised Method of Moments (GMM) are reported in Table 5.5. The choice of FE over Random Effect (RE) was based on the Hausman test as the estimates from the FE was observed to be more efficient that RE. However, only the results of FE are reported in columns 1–3 in Table 5.5 for sake of brevity. As noted in the preceding subsection, there was huge difference in the range of values of the respective variables, which suggest the existence of country fixed effect, thus making a case

Table 5.5 Econometric results using FE and GMM (1995-2010)

	Dependent variable: ICT utilisation (ICTuti)					
	FE			GMM		
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Cons	−41.4716[a]	−40.3222[a]	−42.1045[a]	−0.2977[a]	−0.2428[a]	−0.2821[a]
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0001)
Hdev	90.9007[a]	89.6643[a]	91.9470[a]	1.2181[a]	1.0729[a]	1.2013[a]
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0001)
Rpgdp	0.0217	0.0273		0.0023[a]	0.0014[a]	0.0199 [a]
	(0.6468)	(0.5604)		(0.0000)	(0.0076)	(0.0000)
Instq	2.3558[c]		2.6324[b]	0.2750[a]		
	(0.0821)		(0.0410)	(0.0000)		
Instq*Hdev		3.0337			0.6918[a]	
		(0.3416)			(0.0000)	
Instq*Rpgdp			0.0712			0.0243[a]
			(0.1530)			(0.0030)
ICTuti (-1)				1.1726[a]	1.1741[a]	1.1727a
				(0.0000)	(0.0000)	(0.0000)
R-squared	0.8234	0.8219	0.8240			
F-Stat.	20.3321	20.1320	20.4149			
	(0.0000)	(0.0000)	(0.0000)			
Breuch Pagan	53.1592	44.4885	52.2964			
	(0.0000)	(0.0000)	(0.0000)			
Hausman test	12.5963	13.5694	13.1559			
	(0.0056)	(0.0036)	(0.0000)			
AR (1)				−1.2833	−1.2885	−1.2832
				(0.1994)	(0.1976)	(0.1994)
AR (2)				−0.1422	−0.1658	−0.1418
				(0.8869)	(0.8683)	(0.8872)
Sargan test				42.3883	42.4138	42.5136
				(0.9786)	(0.9784)	(0.9778)
Number of countries	45	45	45	45	45	45

Source: Authors' computation
Note: Values in bracket are the probability values. Superscripts [a], [b] and [c] represent significant at 1, 5 and 10 %, respectively

for the use of FE.[2] From the table, the coefficients of institutional quality and human capital development significantly influenced ICT utilisation. However, there may be the issue of endogeneity using FE. Thus, the GMM results, which help to resolve the issue of endogeneity, are reported in columns 4–6 of Table 5.5. Based on the above, the study focuses discussion on the estimates from GMM technique.

[2] The respective country fixed effect was not reported as it was not the main focus of the study and for sake of brevity.

To evaluate whether the problem of endogeneity was handled as well as test the validity of the instruments, the Sargan/Hansen[3] test for over-identifying restrictions and the second-order serial correlation test *AR (2)* test were carried out. From Table 5.5, it can be observed that the instruments were valid given the fact that the probability values for the Sagan/Hansen test and the *AR(2)* test were not significant at 5 %. There was no first-order serial correlation-*AR(1)* from the results; however, *AR(2)* and the validity from the Sargan/Hansen test shows that the instruments were not over-identified.

An examination of the coefficients of the explanatory variables in columns 4, 5 and 6 of Table 5.2 shows that the significant level of institutional quality changed from 10 % and 5 % to 1 %, which is an indicator of improvement of the results using the GMM estimator. The result helps to establish the fact that a unit improvement in the quality of institutional quality in Africa will help to boost the rate of ICT utilisation by 0.28 units. The implication of the above is that for African countries to advance in ICT utilisation, there is a need to improve the quality of their institutional quality especially adherence to rule of law and improvement of regulatory quality. This submission is crucial given the fact that most of the 'stimulants' of ICT utilisation such as property rights and innovations are to be protected by law in order to give the needed incentive for idea generation that are imperative for ICT utilisation.

The results in Table 5.5 indicate that human capital development has positive impact on ICT utilisation, which is statistically significant at 1 %. The coefficient denotes that a unit increase in the rate of human capital development will result in about 1.22 units of improvement in ICT utilisation. The main implication of this finding is that there is need to enhance the quality of human capital in Africa with a view to improving the level of ICT utilisation. This can be driven by improvement in functional educational system, continuous relevant on-the-job training, which will help boost innovation and technical know-how. This is because technical skills are essential for enhancing ICT utilisation.

The growth rate of real per capita income (*Rpgdp*) was found to significantly exert positive influence on ICT utilisation. This tends to support the fact that the income level in the country can affect the rate of ICT utilisation. The above observation is in line with the rank order model of ICT utilisation, where wealth of the individuals in a country can influence the rate of ICT usage (Caselli and Coleman 2001). Another observation from columns 4, 5 and 6 is that the previous level of ICT utilisation can influence its current value. This implies that ICT utilisation is time dependent. Thus, current level of ICT utilisation can be used to predict its future level. The connotation of this is that immediate efforts geared

[3] The Sargan/Hansen test is asymptotically distributed as a chi-square with degree of freedom equal to the number of instruments less the number of parameters. For the model to be correctly specified, the variables in the instrument set should be uncorrelated with the idiosyncratic component of the error term.

towards improving ICT utilisation will have long-run effect on the level of ICT utilisation in Africa; *the earlier the better*.

Other findings that can be made from the study are based on the two interacting variables presented in columns 5 and 6 of Table 5.2. The result from Column 5 reveals that the coefficient of the interaction between institutional quality and human capital development had significant and positive influence on ICT utilisation. The implication of this finding is that institutional quality will enhance ICT utilisation in a country given the *complementarity* of human capital development. Thus, in Africa, improving institutional quality in the light of developing human capital is essential for ICT utilisation. This may be interpreted based on the relevance of human capital development process such as education and health built on strong institutional quality for improving ICT utilisation, which cannot be overemphasised.

Similar result was observed for the interaction between ICT utilisation and the growth rate of real per capita income, which came out with a positive sign and significant at 10 %. The result reveals that institutional quality can complement real growth of per capita income in enhancing ICT utilisation in the selected African countries. Thus, the growth rate of per capita income in a country has important influence on ICT utilisation especially where the institutional quality is relatively strong.

Conclusion

Information and Communication Technology (ICT) utilisation, like most other forms of technology, can be influenced by the institutional quality as well as level of economic performance in country, which this study set out to examine. This is with the main objective of investigating the extent to which institutional quality and economic performance exert impact on ICT utilisation in Africa. The study used descriptive and econometric analyses to achieve its objective. Some of the major findings of the study are summarised here.

Based on some indicators of ICT utilisation, the study found that the level of ICT utilisation in Africa was far lower than other regions of the world. This is similar to the findings that the strength of institutional quality of the sampled African countries was rather weak. This study found that institutional quality positively and significantly influences the level of ICT utilisation in Africa. This implies that for African countries to advance technologically with respect to ICT utilisation, as often aspired, there is the need to frantically strengthen the level of institutional quality especially the rule of law and regulatory quality. This is essential as the adherence to the tenets of the rule of law and enhancement in quality of regulation can affect some of the key issues of ICT utilisation such as protection of property rights, innovations and creativity.

(continued)

The study also established that human capital development, one of the indicators of economic performance, exhibit positive and significant influence on the level of ICT utilisation. The implication of this finding is the need to urgently improve the quality of human capital in Africa, which will significantly improve the level of ICT utilisation. One of the ways this can be achieved is through improvement of the educational system, which will help to drive the essential technical know-how as well reduction of information asymmetry as knowledge will be better transmitted when there is functional knowledge system in a society. An improvement in the level of economic performance in a country will significantly lead to the enhancement in the level of ICT utilisation. This suggests that one of the ways to improve the level of ICT utilisation in Africa is to enhance the growth of the economies. This is not far-fetched as a high performing economy will have the wherewithal to innovate, diffuse as well as utilise the required form of technology including ICT.

In précis, institutional quality matters a great deal in explaining the rate of ICT utilisation in Africa just as the indicators of economic performance: growth rate of per capita income and human capital development are also essential. Thus, strengthening the institutional quality, harnessing human capital and increase in per capita income will help in the quest of African countries to improve their level of ICT utilisation. Thus, this concludes that efforts that will strengthen institutional quality, on one hand, improve level of human capital development and the growth rate of real per capita income, on the other, will play important role in enhancing the level of ICT utilisation in Africa. In this perspective, regulatory bodies charged with responsibility of formulation of technical innovations through broad-based consultation is also recommended. This is built on the understanding that institutional quality will enhance ICT utilisation in a country, when it is complimented with human capital development. In other words, the relevance of human capital development process such as education and health as well as growth rate of per capita income built on strong institutional quality for improving ICT utilisation are fundamental.

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Chapter 6
Creating Social Change Through Entrepreneurship Education: An Effectuation Model at Tata Institute of Social Sciences (TISS), Mumbai, India

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6.1 Introduction

Globally, social entrepreneurship is touted as a mechanism for a socially conscious and inclusive model for economic growth. Inclusive economics bridges the gap between those at the bottom of the pyramid and others; it brings social responsibility to the forefront and enables non-profits and NGOs to enhance earnings potential through earned income. The social entrepreneurship movement started out as an approach to socially responsible entrepreneurial solutions centred around innovation to solve social or institutional problems.

Depending on the region of the world where it is prevalent, social entrepreneurship practices takes on three fundamentally different characteristics. In Asia, Africa, and Latin America, where economic empowerment, redistribution of resources and development are acute needs, social entrepreneurship has emerged as a way to address these societal needs which help the people who are marginalized to lift themselves up socio-economically and politically. In Europe and the UK, governments are increasingly looking for alternate ways to provide social services. The creation of community interest corporations (CIC) enables the UK government to privatize some of the social services that the state would otherwise provide to the public. This approach to entrepreneurial social services is reflected in their focus on the creation of legal structures such as the CICs. In North America, social entrepreneurship is embraced by two major groups: non-profits and foundations. Non-profits or charitable organizations use social enterprise activities to enhance

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their earned income. Examples include Delancy Street Project (human services), J. B. Schramm (education). Foundations in general are moving towards making funds more sustainable by moving from *granting* to *lending*. The second group is made up of the innovative entrepreneurs who see opportunity in the otherwise ignored sector of the market – the bottom of the pyramid. Made famous by C.K Prahalad's (2006) book *The Fortune at the Bottom of the Pyramid* the economically disadvantaged market has opened up an opportunity that entrepreneurs had previously ignored. Using a capital market mechanism to bring microfinance to the poor segment of the population in Egypt, Madagascar, Ghana etc in Africa; Bolivia, Chilli, Peru etc in Latin America and Indonesia, Bangladesh, India etc. in Asia is an example.

For these reasons, social entrepreneurship education is increasingly finding its way into the business education and research agendas of universities and colleges. Tata Institute of Social Sciences in Mumbai is one of the early pioneers of social enterprise education. Their program is designed after Sarasvathy's (2003, 2008) effectuation theory of entrepreneurship. This chapter addresses the concept and design of the program and discusses the effectuation model's relevance to educating social entrepreneurs. The focus of social entrepreneurship education at TISS is development, *inclusive* economic growth, wealth creation, and social change.

In the last two decades in India, there has been a fundamental change in the way development strategies are approached. In the present phase of the globalized environment in India, development is not perceived as the outcome of state-led initiatives or donor-driven programs, but developmental outcomes are now closely linked to industrialization, which is solely based upon the functioning of the market economy (Bhaduri 2007). Making people capable of participating in the market as consumers and as producers by building their capacities, by facilitating linkages with the market, and by providing timely resources like credit, information etc. seem to be the approach for development. Under industrialization-led development, funding is increasingly seen as social investment leading to achieving objectives of social mission, social change, and financial viability/sustainability. Thus, financial return on social investments is an important indicator of sustainable development. In India, the field of social entrepreneurship has emerged to manage the financial and social aspects of investment to bring social change. It hopes to bridge the gaps created by market-led developmental mechanisms. For this purpose, a cadre of professionally trained social entrepreneurs is required in India to address the problem of inequality in terms of distribution of wealth and assets.

Beginning after the 1990s, national and international donor agencies have changed their views towards developmental initiatives. They have been moving away from grants and aids to lending for development work. In this context, the major determining factor for successful development and social change from development initiatives is the *sustainability* of the development funding. Social entrepreneurs are stepping up to this challenge and are increasingly making this possible. Social entrepreneurship as a field of practice provides a framework for creating financially viable and socially sustainable change across all segments of society. In recent years, like other developing countries, India too has experienced

positive social changes brought about by social entrepreneurs and social enterprises. Aravind Eye Care, Dignity Foundation, Kuthambakkam – The model Village of India, Self Employed Women Association (SEWA), Annapoorna Mahila Mandal etc. are some examples of such initiatives. Though social entrepreneurship has been practiced in India for last four decades, only recently has it emerged as an area of research.

The Tata Institute of Social Sciences in Mumbai, India pioneered an innovative Masters Programme in Social Entrepreneurship in 2007. This design uses a hands-on and fieldwork-rich pedagogy and theoretically relevant (to social entrepreneurship) effectuation principle in their programme. Its students build competency in entrepreneurship for the purpose of addressing the most pressing social issues in their communities. The main objective of this programme is to train a cadre of entrepreneurs who can create employment, assets, and wealth for the poor in creative ways. They are expected to take the responsibility to address problems in innovative ways, fill the gaps created by the withdrawal of states, and market failures to meet the needs of rural India and its marginalized communities.

6.2 Effectuation and TISS Model

6.2.1 Effectuation

Entrepreneurship activities result in the creation, enhancement, realization, and renewal of values, not only for owners, but for all participants and stakeholders. The concept of social entrepreneurship is a combination of two derivative concepts: entrepreneurship and social. The social aspect is explained as a process of creation of new and sustainable social values[1] by combining resources in new ways. The primary reason for resource combination is to explore and exploit opportunities for social value creation by stimulating social change or for meeting social needs (Neck et al. 2008). Further, because of the aspect of value creation in the social change context, social entrepreneurship is a multidimensional and dynamic construct moving across various intersecting points between the public, private, and social sectors (Nicholls 2008). This necessitates an entirely new way of thinking about social entrepreneurship and social entrepreneurship education.

Saras D. Sarasvathy's (2001, 2003, 2005, 2008) effectuation theory based on principles of entrepreneurial expertise explains that entrepreneurs use both causal and effectual logic in their actions. She defines the causation process as selecting between means to create an effect with that particular effect as a given. In contrast, effectuation process uses a certain means to select between possible effects that may be created with the given means. Effectuation theory thus helps us understand how entrepreneurs think and act. She points out that entrepreneurial thinking and

[1] Social value is defined as a change in the existing negative social norms.

decision-making processes are substantially different from the thinking used in our traditional approach to teaching entrepreneurship. Traditional teaching approaches are centred on making decisions. This decision-making approach to teaching assumes existing markets, firms, and economies within which these enterprises would operate. She calls this the *causal* logic. This type of thinking does not assume the creation of markets or economies. The entrepreneurial logic that leads to creation of firms, markets, and economies within which the social entrepreneur will act is *effectual*. Because social entrepreneurs are concerned with solutions to social problems, their focus is on creating a reality or effects using given means. Often these means are not only given but are scarce. Gundry et al. (2011) argue that because social entrepreneurs often operate in resource-constrained environments, their innovation depends on how creatively they are able to combine and apply these scarce resources to solve problems. This takes imagination and creativity among other entrepreneurial skills. While social entrepreneurs create the possible reality and solve problems using effectual logic, they organize and manage the entrepreneurial domains using causal logic. The effectuation theory, therefore, provides a more appropriate framework for developing teaching models for social entrepreneurship. TISS's Program approach clearly demonstrates a major focus on 'effectual logic' during the initial period when students begin to build a case and test the idea for their enterprise and gradually exposes the students to 'causal logic' at a later stage when they develop their thinking on how to organize and manage the enterprise.

Sarasvathy (2005, p. 5) explains, '. . .. the best entrepreneurs are capable of both and do use both modes well. But they prefer effectual reasoning over causal reasoning in the early stages of a new venture, and arguably, most entrepreneurs do not transit well into latter stages requiring more causal reasoning. While causal reasoning may or may not involve in creative thinking, effectual reasoning is inherently creative . . . While both causal and effectual reasoning call for domain-specific skills and training, effectual reasoning demands something more – imagination, spontaneity, risk-taking, and salesmanship. . . Entrepreneurs are entrepreneurial, as differentiated from managerial or strategic, because they think effectually; they believe in a yet-to-be-made future that can substantially be shaped by human action; and they realize that to the extent that this human action can control the future, they need not expend energies trying to predict it. In fact, to the extent that the future is shaped by human action, it is not much use trying to predict it – it is much more useful to understand and work with the people who are engaged in the decisions and actions that bring it into existence'.

6.3 Master of Arts in Social Entrepreneurship at TISS

The Master of Arts in Social Entrepreneurship at TISS is a full-time 2-year post graduate programme. Each cohort begins in the month of June every year. The selection process adopted by TISS imparts recruiting students with the right kind of

talents with passion, energy, and enthusiasm to do something meaningful for the society. Candidates for the programme are selected through an All India Entrance Test, which includes a written aptitude test and a personal interview. The interview screens individuals by their aptitude for creativity and enthusiasm, idea generation, and energy. The popularity of the programme can be assessed from the growing number of applications received for admission. In the year 2009, 1,300 students applied for 25 seats, in the year 2010 the number of application went up to 2,500 for 25 seats and presently in 2014, the number of applications were 3,000 plus for 30 seats. TISS selects a mix of male and female applicants, with and without prior work-experience, and from varied academic disciplines – engineering, medicine, agriculture, science, humanities, social science and computer applications.

The uniqueness of this MA programme is found in its approach to classroom teaching and fieldwork. Fieldwork involves executing the ideas created and discussed in the classroom. As a part of the programme, students test their pilot ventures for 3 months through a summer internship after their first year. Testing and piloting the venture involves a deeper understanding of the problems from various dimensions. This understanding is essential for making social changes. The programme provides courses and field experiences to create and finalize venture plans and launch them at full scale, immediately after graduation. The venture ideas primarily address one or more social problems and attempt to solve related deeply rooted social issues. Ventures can be for-profit, not-for-profit or non-profit, depending on the specific social issue, target audience, beneficiaries, target market, and financial plans. Piloting the ventures also provides students with the opportunity to change and revise ideas as needed and to innovate as well as practice their managerial and decision-making skills. For example, during pilot testing, Arun Agrawal found that the village craftsmen were not receptive to his/her idea to be trained and supported for a handmade bamboo products enterprise to enhance their livelihood. Instead, the villagers wanted their children to be better educated so that they would not face hardships such as their parents. Arun contemplated the issue and later decided to start working on an initiative to educate children from poor families. The venture picked up with community participation. Pilot testing is a part of the ideation process, which helps the potential entrepreneurs to look into possibilities with critical thinking and hope. This is what Sarasvathy calls 'co-creation' or building corridors to see how the problems manifest with participation and what the society's own understanding about the needs and options of solutions are.

Since the programme launched in 2007, three classes have graduated in 2009, 2010 and 2011 with 14, 21, and 23 students, respectively. Sixteen graduates have launched 6 group-ventures, with financial support from their family members, relatives, and friends. Up until now (till 2013), venture funding for the student projects from outside investors was unavailable. However, TISS has signed an MOU with DBS Bank as a part of the Bank's Corporate Social Responsibility Programme to launch 'DBS-TISS Social Entrepreneurship Programme' in which a seed fund and support capital are provided to the ventures launched by the graduates who agree to pursue a career in social entrepreneurship.

This financial support is available for 3 years after graduation. This is a broad-based initiative to support the social entrepreneurs and social entrepreneurship knowledge domain while the budding social entrepreneurs work in the real-life environment and hence experience both financial and emotional hardship. The programme not only provides the initial capital when the venture ideas are in their formative stage but also the expert guidance to consolidate venture ideas and the plans. This also prepares students to face investors with confidence after 3 years, to pitch for funding for a start-up and for the sustainability of their ventures. Ventures are typically in the areas of agriculture services, rural health care, education, sustainable development, and consulting for capacity building. (Refer Appendix 1 for an example.)

6.4 The Program Design

6.4.1 Structure of Coursework

Program design is based on the 'life cycle approach' of entrepreneurial process, i.e. problem identification, testing and design, and start-up. The structure of the programme was designed in such a way that the students recognise the opportunity to solve a social problem chosen by themselves individually or collectively. This is a meaningful approach for students because they feel that the problem is important in a larger social context (McKenzie and Sud 2009). Hence, the stages of the life cycle include: understanding the context and problem ideation, designing and experimenting a solution to the problem, consolidating the ideas and lessons learned in the experiment stage, planning, and venture creation (See Table 6.1). The coursework is designed with this entrepreneurial idea life cycle in mind.

The program has three major dimensions: context (social), skills (entrepreneurial), and tools (management). The curriculum is designed to include all three components (social context, entrepreneurial skills, and management tools) in each semester to meet the overall objectives of the programme. Any entrepreneurial idea begins with a cause or purpose and this provides the context for the activity. The entrepreneur, using her skills, transforms this idea into action. In order to sustain the action, the entrepreneur needs certain management tools. Finally, long-term sustainability means growth. Table 6.1 shows how the three dimensions are distributed and their degree of focus throughout the four semesters of study. In between each semester, students engage in fieldwork and practice-oriented internships, piloting, and field research, in that order, to create and develop their venture plan. The final phase in the program moves students into an incubation stage. Each semester's course uses the effectual and causal logic in different degrees as shown in Table 6.2. Causal logic teaches students to make structured decisions, such as the methods used in risk management. Teaching effectual logic is practice-oriented, includes situational analysis and is focused on application.

Table 6.1 TISS social entrepreneurship teaching model

Venture life cycle stage	Semester and field work stage	Programme content focus			Decision focus	
		Social context	Entrepreneurship process and method	Management tools	Effectuation	Causal
Understanding context and ideation on problem	Semester 1 (in class)	High	High	Low	High	Low
	Rural visit for 1 month	High	High	Low	High	Low
Designing experiment for social problem solving	Semester 2 (in class)	Moderate	High	Moderate	High	Moderate
	Pilot testing of ventures for 3 months	Moderate	High	Moderate	High	Moderate
Consolidation	Semester 3 (in class)	Moderate	High	High	Moderate	High
	Field visit for venture-related research	Moderate	High	High	Moderate	High
Venture planning	Semester 4 (in class)	High	High	High	High	High
Venture start-up	Enter into the incubation centre and financial and non-financial support under the 'DBS-TISS Social Entrepreneurship Programme'					

Table 6.2 Courses offered under the teaching model

	Social context focus	Entrepreneurial skill focus	Management tools focus
Semester 1	High	High	Low
	Understanding society and social dimensions	Social entrepreneurship as innovative approach to social problem solving	
	Courses:	*Courses:*	*Courses:*
	1. Understanding society	1. Entrepreneurship	1. Basic accounting
	2. Introduction to basic economics	2. Social entrepreneurship	2. Computer-aided applied statistics
	3. India's development trajectory	3. Venture plan I	
	4. State, democracy, and social movements		
			Non-credit compulsory workshops:
			1. Innovation
			2. Communication
Semester 2	Moderate	High	Moderate
	Framework of social problem study		Social venture management tool kit
	Courses:	*Course:*	*Courses:*
	1. Social sector: Perspectives and interventions	Venture plan II	1. Qualitative research methodology
	2. Social network analysis		2. Marketing for social ventures and marketing research
			3. Financial management
			4. Project management
			Non-credit compulsory workshop:
			Group dynamics
Semester 3	Moderate	High	High
		Framework for innovative problem solving	
	Course:	*Courses:*	*Courses:*
	Evidence-based	1. Legal framework for the social enterprises	1. Social marketing
	Intervention advocacy and policy making	2. Fundraising	2. Social enterprise management
			Non-credit compulsory workshops and courses:
		Social venture planning	Role of training and development in social enterprises

(continued)

Table 6.2 (continued)

	Social context focus	Entrepreneurial skill focus	Management tools focus
Semester 4	High	High	High
		Social venture management, operational problem solving	Social venture growth planning and management
	Courses:	*Courses:*	*Courses:*
	1. Social impact assessment and policy evaluation	1. Entrepreneurial leadership and motivation	1. Business ethics
	2. Corporate social responsibility	2. Venture plan III	2. Risk management
	3. Microfinance		3. Performance management
			4. Research project
			Non-credit compulsory workshops and courses:
			Strategic management

The 'Entrepreneurial Skills' and 'Management Tools' can often be at odds with each other. Entrepreneurs explore, experiment, innovate, and learn by making mistakes. On the other hand, managers plan, budget, and evaluate options and then take the decision with least amount of risk. Hence, most of the managerial tools are designed to support a good decision with clearly defined risks and assumptions. Though these approaches contradict each other, entrepreneurs learn to toggle between the two. The teaching approach ensures that the contradictions are made clear to the students at every stage while allowing students to make choices about their preferences through a creative learning process.

The total number of credit hours for the programme is 77 (one credit hour is equivalent to 15 h of in-class teaching) with 24 credits for course work in the class and remaining allocated to fieldwork and research. Classroom activities include limited lecture sessions. In the classroom, students engage in individual and group learning including problem solving, reflective, and participative learning. Pedagogy depends on the focus: content or delivery. Content-focused pedagogy includes theoretical frameworks, concepts, and methods that are used in and are at work in the entrepreneurial domain. Because each student works on a problem in context, delivery of the pedagogy is application oriented. In other words, each student is guided to develop a case creating social value in the context of their chosen problem or issue, and to propose solutions. This case study culminates in a master thesis at the conclusion of the program. Multiple evaluation methods are used to assess learning. They include mid and end of the semester examinations, report writing and presentations, case development, business plan development, etc.

Program objectives include developing individuals as entrepreneurs with a focus on social entrepreneurship; enabling budding and practicing social entrepreneurs with knowledge of concepts and practice to solve social problems; creating an environment for dialogue and discussion; creating a research base for developing a domain of knowledge in social entrepreneurship; and sharing this knowledge among interest groups to enable practitioners enhance effectiveness of their operations.

6.4.2 *Fieldwork and Practice-Oriented Internship and Learning*

Fieldwork and internships are important and integral components of the program. Each semester's work builds on the previous and advances toward readiness for incubation as they reach the fourth and final semester of work. After the second semester, it is mandatory for all students to launch a pilot project in their native place. Sometimes students participate in launching group ventures. The nature and orientation of the fieldwork as students progress through the semesters is described below.

Semester 1 The first session of fieldwork is devoted to *rural visits*. It starts immediately after the completion of the coursework of the first semester. The Institute identifies a few locations where students are allowed to observe, interact, and experiment in real-life environment and learn. The institute supports the field visits financially. After the rural visits, students are advised to submit a report and to make the presentation in the presence of the faculty. The rationale is that entrepreneurs experiment and learn in their own ways. Experiments designed by them need not follow the conventional process. This is also the process of discovering the potential of their ideas, their own strengths and weaknesses, and validation of their own ideas. This learning is important without attaching any stigma of failure. With this in mind, the field visit focuses on actions related to experimentation, understanding of market and people, and management of experiments. Analysis of experiments is central to learning.

Objectives of this exercise include conceptualisation of rural societal problems, removal of the fear of failure and the development of self confidence; skills development for planning and implementation at a small scale; experience of the principle of 'affordable loss'; and the analysis of the process of experimentation, in order to develop ideas for a venture. Under the Reservation policy of the Government of India, students who belong to backward classes or scheduled castes and tribes get the financial support for the field work. Students may change ideas any time. After the fieldwork, students submit their field journal and make presentations to the faculty about their findings.

At this stage in the learning process, use of causal logic and management tools is low. Idea generation is highly contextual, effectual logic plays a central role in imagining solutions to problems, and the innovative entrepreneurial process is highlighted.

Semester 2 Opportunities to create and launch enterprises for innovative products, services, and processes to solve social problems are on the rise. These increased entrepreneurial opportunities are a result of market failures, problems in implementation of government's social service programs, etc. Entrepreneurs, in general, and social entrepreneurs, specifically, see problems and look for ways to solve these problems to achieve economic prosperity or financial sustainability while adding social value. The Venture Plan is about this entrepreneurial action that details steps to be taken for sustainable solutions. Venture Plan is used for fundraising. In addition, it provides a systematic framework for laying out the thinking behind the entrepreneur's ideas for connecting the target market and beneficiaries, the actions required for problem solution, and the resources needed to accomplish the tasks.

Venture Plan formulation is a gradual process. Entrepreneurs develop deeper understanding about their own ventures and decide on a future course of action. The venture planning process demands deeper understanding about externalities, with adequate data support. The second semester fieldwork focuses on the launching of pilot projects based on the ideation and the experimentation that took place during the first semester. Immediately after second semester, students are in the field to run the pilot project for 3 months. Students are required to develop a feasible plan for implementation as a trial case. The objectives include the development of skills and capabilities to formulate a plan for new venture with a focus on entrepreneurial process; the identification of opportunities and to formulate a tentative plan to address the market gaps and needs; the implementation of the plan, learning to collect data related to social issues and to carry out critical analysis; and to explore and innovate on various options to address the issues with the help of research tools. The Center for Social Entrepreneurship has developed this technique with a name 'problem mapping' to support deeper understanding of the complexities of social problems, and exploring the feasible way to address that. For the pilot project, students get 50 % of their *ex ante* cost of the project as a financial support from the institute. After the pilot testing, students need to frame their venture idea and make a presentation at the institute. This presentation is used to assess the students' learning outcome. As in Semester I, students are required to turn in fieldwork journals to their faculty. During their pilot run, faculty supervise the students and provide needed guidance. Before leaving the field, they usually make an arrangement with their friends and relatives to continue the venture activities in future. Sometimes, they change their project after learning from the pilot project.

At this phase, the entrepreneurial methods and effectuation are highly important for the students to test the ideas. Piloting involves imagining the effects of intervention or solution, and using appropriate methods to test the outcome. Since the piloting continues to be in context and local, management tools and causal logic are moderately relevant.

Semester 3 Immediately after completion of coursework in the third semester, students go into the field to follow up on the progress of their pilot venture, if the project had not failed to take off. If students choose to change their venture plan after the pilot, they begin work on the new project immediately. They also collect the data on social phenomena and problems related to their venture. Those who have already successfully run the pilot start the process of registration of their venture and to develop networks for venture activities in the future. As they did in the previous semesters, students submit the fieldwork journal and present their findings to the faculty.

At this stage all components of the program (content and decision focus) take on moderate to high importance. Because the pilot is testing the cause and effect relationships at this stage, entrepreneurial methods, management tools, and causal logic are high.

Semester 4 Venture plan matures as they gain more experience. The students get a clearer picture about products and/or services, market needs and opportunities, and the skills and competencies required to fulfil these needs. They continue during the third semester to work to finalize their venture plans and are ready to enter the incubation phase at the end of the fourth semester. The objectives of this semester's work are to improve the venture plans, seek help and support from mentors, acquire skills to raise funds from various sources, and mobilize team and other resources to start the ventures.

6.5 Discussion

6.5.1 Innovations in Program Design and Delivery

6.5.1.1 Pedagogy

In academia, the movement toward competency-based outcomes assessment has gained momentum mainly due to the requirements imposed by accrediting agencies such as the Association to Advance Collegiate Schools of Business (AACSB). TISS's programme lends itself well to this kind of assessment requirement by measuring programme outcomes by articulating the following: Were the graduates able to succeed in solving social problems? Did the program's pedagogy succeed in developing among students both the entrepreneurial and managerial skills? The program is designed to monitor and report these measures. These outcome indicators provide input for programme improvements.

The programme design has evolved over time since its inception through a collaborative faculty group process. As a pioneer of this new approach to social enterprise education, TISS did not have a model to follow. Hence the participatory and experimental nature of program structure was necessary. The programme design involved consultation and participation from multiple stakeholders and

individuals. Since its initial implementation in 2007, the programme structure has undergone many changes as a result of continuous review and improvements. Many experiments were also carried out to make the programme more effective. While many such experiments succeeded, there were failures, too. Networking efforts to work with social organizations and philanthropists worked well. The faculty found that using business plans to screen candidates was not helpful for selection. Further, the applicant group discussion as part of the selection process did not indicate who the suitable candidates were. Based on what was learned in the first 3 years of the programme, a major revision in the design was made in 2010. As part of this revision, fieldwork was restructured to focus on venture formation. The current unique structure emerged through the above learning process.

Once the programme got under way, the faculty realised that many popular tools and techniques used were traditional entrepreneurship teaching methods developed in the USA. By now, the faculty group was also convinced that many of those toolkit (Business Plan is the most popular) based approaches were not appropriate for venture start-ups. Many small and big experiments were carried out to devise the appropriate pedagogy. One such innovative method was 'problem mapping'. In problem mapping, students are asked to select social problems and find out the social, economic and political dimensions of the problem. They are asked to engage in individual and group thinking to explain the complexities of the problem as much as they can. It is the reverse of the scientific problem solving method in which the students are asked to break a problem in small and manageable parts so as to simplify and then solve the problem. In problem mapping approach, students are pushed to think about and understand the complexities and are gradually asked about which part of the problem they think they can approach to solve. This is effectual thinking. However, before the students are asked to think effectually about the problem and the solution, they are required to understand the problem in its totality and also to appreciate the various perspectives attributing to the problem. In this way, they can use their creative thinking to find a manageable way to solve the problem. This pedagogical approach of problem mapping has become a universal practice in TISS's social entrepreneurship classes.

While knowledge and ability are essential parts of the learning process, they, in themselves, aren't sufficient for performance accomplishments (Bandura 1986). It is critical, therefore, to use a pedagogy that builds confidence in the students to develop solutions to real-world problems. As the students progress through the program to advanced levels, in-class teaching was gradually reduced to make room for more experiential fieldwork. Credit load for in-class learning was reduced to provide equal academic weight and credit to the fieldwork. This created deep engagement of the students with the practitioners and stakeholders and provided significant hands-on learning opportunities for them. The idea of enhancing learning outcomes using experiential learning is supported by the work of Segal et al. (2007). In an exploratory study to understand what classroom activities enhanced entrepreneurial self-efficacy and learning outcomes, they surveyed entrepreneurship professors and found that a number of pedagogical techniques are useful. Highly rated effective classroom activities included those that took the

students outside the classroom and connected them to the entrepreneurial environment, such as starting a venture or working closely with an entrepreneur.

The programme outcome focus also was changed from job placements to venture creation. Though the idea was simple, given the financial background of students who had either taken bank loans for their education or come from poor families, asking them to take the riskier route of starting a venture, instead of receiving job placement was challenging. Familial circumstances and financial security are some reasons why students prefer job placement to venture creation. As the program progressed, many students chose to take the venture creation route that they would otherwise have not preferred earlier. This was result of the change in the ecosystem of the programme that made venture creation less risky for these students by introducing the idea early and providing financial support. Feedback from alumni supported this move. TISS faculty found that students who graduated before this change now indicated a preference for ventures over job placements but were unable to do so due to financial, social, and other reasons. The programme staff learned that the earlier the students are guided to take the risk of venture creation, the easier they transitioned to thinking about venture creation as a viable option for their entrepreneurial careers. The redefined program objectives of focusing on venture creation necessitated the modification of the method of selecting students for the programme (discussed below).

The programme design involved numerous small experiments and trials on new contents and methods. The results of such experiments had mixed results. But they resulted in valuable learning for the faculty and provided a sound basis to revise the program. More experiential and fieldwork for students demands additional resources beyond what TISS faculty could provide and were in many occasions, not available on demand. For example, the use of increased fieldwork and experiential learning meant a need for an increased number of partners to provide the students with opportunities for practical experiences. Networking became a useful way to mobilise resources through formal and informal channels. This in itself was an entrepreneurial innovation process by TISS to manage resources. In this way many network partners were created, and the members of these organisations agreed to guide and mentor students and graduates of the program.

The programme also redefined its objectives to reach out to Indian youth who had the willingness and desire to become social entrepreneurs but could not get into TISS system for formal education. As a public institution, TISS is limited by how many students they could admit into the program. For this reason, TISS's experiences, knowledge, and resources were shared with many network partners to either start new programs at their end and / or train teachers at other institutions. Such collaborations were also made with social organisations working on entrepreneurial capacity building among the youth and also with universities abroad. This approach to increase network partners helped scale up the teaching model TISS had developed.

6.5.2 Student Selection

Another related innovation was in redesigning the selection method of students. On one hand, the urgency and desire to make changes in the programme was felt by the faculty team, while, on the other hand, need was also felt to change the perception about the program and attract the right kind of (entrepreneurial) talent. There was also a need to spot the youth who were ready to take responsibility for encountering social challenges, to innovate the solutions and to not hesitate to experiment and learn without worrying much about success or failure. The faculty team redesigned the questions for selecting such talents, using effectuation principles. Network with members of Ashoka Office also helped. Ashoka, when selecting individuals for a fellowship award, looks for 'something different,' which was similar to what the faculty group at the Centre for Social Entrepreneurship was trying to find among the candidates aspiring to become social entrepreneurs.

While working on this agenda in 2010, the faculty group also communicated with the then existing students and alumni of first two classes to find out what motivated them to join the programme. The responses were mixed. There were many who wanted a relevant graduate degree from TISS to get a good job. The Centre for Social Entrepreneurship at the School of Management and Labour Studies offers another graduate program on Human Resource Management which attracts good job offers from corporations. Students expected that with a degree in social entrepreneurship they could expect the same: good jobs with attractive salaries. However, there were some students who were willing to spend time exploring something different and they were open to try entrepreneurship. Very few were committed to become social entrepreneurs. This observation was supported by what was found in the literature regarding career choices in entrepreneurship. Using Image Theory, Kuehn (2009) explains why so few people chose entrepreneurial careers. He argues that entrepreneurship is not even an option in their decision pool when considering career options. According to Beach (1997) individuals make choices using certain images from their memory to help them frame their decisions. Kuehn suggests two possible avenues for solutions for promoting entrepreneurship as a decision choice: socialization of entrepreneur experiences that lead to positive images of entrepreneurial career choices and influencing decision frames that lead to decision making.

Given the circumstances, it became evident that the contents of the selection test had to be revised in order to identify candidates from the pool who had the propensity to make entrepreneurial career choices. Many questions were added to test the social sensitivity and awareness about socio-economic and political problems as well as the probable approach to solve those problems. Major emphasis was placed on knowing whether the candidate concerned would be willing to take responsibility for solving these problems. Once admitted into the program, students were exposed to the curriculum and pedagogy discussed earlier that helped them frame decisions through their 2-year study and well into the post graduation incubation period.

Gradually the perception of the programme changed and the number of applications from those who were keen to pursue entrepreneurship as career increased. The programme attracted students from various socioeconomic and cultural backgrounds, with varied education at the undergraduate level and with and without work experiences. On one hand, it attracted students like Vineeta Soni, a 30 year-old with rural and socially deprived background and challenging family life with limited opportunity to go to college or university for a degree (she had obtained undergraduate degree through distance learning mode) and who had a passion to work for improving the condition of rural women. Sarvesh Tewari, on the other hand, was an IT engineer with an urban background and had never faced deprivation but desired to work towards improving lives for slum children. The critical part of the selection especially during the personal interview was to select potential candidates on their pro-activeness (Prieto 2011). Since the focus of the programme was to ensure that the graduates launched social ventures, it was important to know how much responsibility they would take and demonstrate when confronted with a social problem; would they leave the problem to be attended to by the government or would they feel that at least they can try and see if a solution is possible?

6.5.2.1 Support After Graduation

At the Institute, an incubation centre is established with the help of the University Grant Commission. Other financial supports are also raised by the institutes. For promoting social enterprises, students' projects are incubated in this centre for three years after their graduation. Currently, the Centre is incubating nine social entrepreneurship projects started by alumni. In August 2012, DBS Bank signed an MOU with the Centre for Social Entrepreneurship and launched the 'DBS-TISS Social Entrepreneurship Programme' to support alumni in promoting their social ventures. Every student is chosen based on the selected criteria. Selected students are granted a fellowship, start-up capital for their ventures for three years. These supports are need-based. Alumni continue to get mentoring support and office space in the incubation centre. The Centre for Social Entrepreneurship has taken the responsibility of monitoring all these enterprises. Under this programme, for example, social entrepreneur Arun Agarwal received support capital for his venture, Project Lalsa on Education for marginalised children in Jharkhand.

6.5.2.2 Social Entrepreneurship Teaching and Research at TISS

The area of social entrepreneurship is very new to Indian academia. Social entrepreneurs from all over India are contributing to the practice significantly. However, Indian academic research and teaching on social entrepreneurship is only slowly developing. The Centre for Social Entrepreneurship at TISS is playing a pivotal role in strengthening academic research and teaching practices on social entrepreneurship in two ways: by arranging national and international conferences and by organising teaching workshops. From its inception, the Centre has organised

workshops/conferences along with nonprofit organizations such as UnLtd India and Creative Handicrafts. TISS enables academics and field practitioners to initiate and engage in discussions on best practices for social entrepreneurs to bring about large-scale social change.

6.5.2.3 Promotional Activities

Recently, TISS organised workshops for the teachers of India who are either engaged in social entrepreneurship teaching or are interested in introducing a new course on social entrepreneurship at their institutions. In 2012, along with Dell Social Innovation Centre at the University of Texas at Austin, the Centre for Social Entrepreneurship ran a workshop on pedagogy development. The major objective of this workshop was to train the teachers in three areas: how to develop innovative pedagogy; how to incorporate this pedagogy into their existing curriculum in institutions where a social entrepreneurship programme is nonexistent; and how to develop networks of teaching communities to strengthen research on social entrepreneurship.

In 2013, faculties of TISS also helped the other social entrepreneurs and social enterprises to develop their enterprise models for the bigger social change. For example, OASIS, a social enterprise took the help of TISS faculties to develop their Amar Gaon Project, Agranee took the help for improving the implementation strategy and fundraising capacity. In 2014, Anandwan was helped to launch a pilot project, Parivartan, for training mid-career managers about the social entrepreneurship. The objective of all promotional activities is to create a bigger impact in the society.

6.5.2.4 The Road Ahead

The twenty-first century is the century of globalisation with technology application, seamless integration of people and culture, and managing diversity. This is an era of inclusive growth and sharing of resources. The new curriculum for the Graduate Program (Master of Arts) in Social Entrepreneurship at TISS is designed to address the needs of the times by using formal education to scale up socially entrepreneurial thinking for dealing with issues faced by communities in need, thus bringing hope for the millions of people from around the world. The curriculum framework based on the *Five Minds of the Future* (Gardner 2008) provides an approach to mapping content category against five cognitive capacities. This mapping allows curriculum designers to not be limited by the domain-specific disciplinary thinking and consider more educationally relevant curriculum structure for the study (Levit and Piro 2012). Using the spirit of this mapping approach, TISS's programme design went beyond the traditional approaches to entrepreneurial education by using context-relevant, hands-on, and venture-focused curriculum. Sarasvathy's effectuation theory provided the conceptual framework as described in this chapter. TISS's pedagogy provides enormous scope for the faculty to engage, innovate, and co-create a learning environment within and outside the class. The goal of the programme is to

facilitate social venture creation, which is seemingly simple yet challenging to execute.

TISS faces many other challenges moving forward. The first challenge is to form a larger team of faculty and administrators passionate about the goal of the programme. While faculty bring multi-disciplinary expertise on common principles of social entrepreneurship, their talent must be harnessed to influence and challenge the students to think beyond the book knowledge, use creativity and imagination to solve social problems, and instil the desired ethics and value systems in their venture practices. See Prieto et al (2012) for example. The administrators manage the systems and procedures to ensure the desired efficiency.

The second challenge is in institutionalising learning, in consolidating the initiatives and synthesizing the experiences gained by the faculty and students. This involves establishing systems and processes so that the programme gradually becomes less dependent on a select few individuals. The programme must look beyond the TISS Campus to make larger impact on society. With this goal in mind, TISS is beginning to institutionalise the creative efforts of the faculty by sharing the experience with other institutions and organisations for replication, adaptation, and scaling.

The last challenge is developing metrics for measuring the outcome and impact of the Program. At TISS, this is a work in progress in its initial stages. Wholey's (1979) Logic Model (resource → activity → output → outcome → impact) may be used to explain the framework for impact measurement of the programme. Clark and Brennan (2012) used this framework along with other concepts including a proposed Balanced Value Matrix in which they include typical deliverables such as goods and services, satisfaction of the beneficiaries, financial performance and wastage as outputs. Outcomes are the short-term benefits (human conditions, infrastructure development), learning and growth (spread or market share) and continued support of sponsors and beneficiaries. However, TISS recognizes that impact measurements must also include long-term social, economical, environmental conditions, policies, and sustainability and scalability of ventures.

Appendices

Appendix 1

Case Study on 'Harsha Dental Clinics: Rural Dental Clinic'
Dr Mohit Sukhija, BDS, MA in Social Entrepreneurship (TISS)[2]

India today boasts an annual economic growth rate of over 8 %. Look closely, and one realizes that one of the basic needs – accessible and affordable health care is largely unattended, especially in the villages. The problem is serious as over 60 %

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of India's population is still living in villages and health care is booming in Indian market for urban rich.

Dental health has been ignored since long. The national health programs on dental care seem to be largely muted. Also private practitioners do not prefer setting up clinics in villages and areas away from cities as it is generally profitable. This ultimately leads to lack of awareness about importance of maintaining good oral hygiene among the rural mass. It was with this idea of providing accessible, quality and affordable dental health services that *Harsha Dental Health Services* was launched under guidance of Tata Institute of Social Sciences, Mumbai. Harsha Dental Health Services aims to open 105 dental clinics across Haryana so as to cater to as many people as possible in the State. The focus of the initiative is to enable people access to quality health care and to reach out to as many as possible with quality health care.

The pilot project of the organization has started with the launch of three clinics in and around the city of Rohtak. Two of them in Rohtak and the third clinic in a village called Bhalaut, 10 km off from Rohtak. Pamphlets were distributed prior to launch of each clinic so as to attract as many people as possible. The main purpose was to generate 'a subtle movement' for oral hygiene among the rural and poor people.

The first clinic was launched on the April 14, 2010, at the main market of Rohtak. The purpose of this location is to attract the maximum clientele. Also the clinic is very close to the main bus stand where buses to and from different rural places of Haryana connect Rohtak. A large village crowd was attended in the Clinic. The clinic provided dental services to four patients per day during initial days; the number has crossed 20 per day as on today. It is said that to start any journey, we need to take the first step.

The second clinic is set up and inaugurated on April 17, 2010, at Bhalaut, a village about 10 km off Rohtak city. The location of this clinic is important as the village connects six neighbouring villages to Rohtak city. Help of a local dentist was taken to set up the clinic. He also extends support and monitors the day-to-day work of the clinic. Free dental camps are conducted by the clinic to spread awareness about oral health care among the villagers. Tooth extractions are performed under local anaesthesia and medications are also distributed to the patients, free of cost.

The third clinic was inaugurated on April 18, 2010, in collaboration with a NGO – Hari Om Seva Dal in Rohtak city. The NGO is dedicated to providing quality, affordable health care to the masses for over a decade. They run an eye clinic, homeopathic clinic and now Harsha Dental Health Services has started providing dental health services in their premises. Both have organized camps to provide dental care to many poor and needy people in the area. Tooth extractions under local anaesthesia were also performed and medications were provided for free.

In every clinic, continuous dental health education is provided. It is to note that patients can avail follow-up treatment from any Harsha Clinic as per their convenience, with the similar cost of treatment as paid at the time of their first visit. Thus, if a patient started his/her treatment at the Bhalaut village and continues at any other clinic the cost of treatment would be the same as decided at the Bhalaut clinic with no compromise on the quality of services.

Working environment in the clinics is patient-friendly. The organization is flexible and tries to adhere to as many needs of its employees as possible; employees also give their best performance to the patients.

Overall investment in all the three clinics is about Rs. 5,00,000, about 70 % of this amount has been raised as informal loans from family and friends, balance 30 % is funded out the personal savings of the entrepreneur. In general, patients pay 30 % of market price of dental services. Free services are also provided if donations are received.

This is just a beginning. As the organization grows, new initiatives will be taken up and appropriate changes will be brought about. However, the basic aim of providing accessible, affordable, quality dental care to the mass will always remain the purpose of the initiative.

Harsha Dental Health Services hopes to attract talented manpower from different sections of the society, including dentists, businessmen, and corporate houses to support this movement.

Appendix 2

Pilot Testing: Education Services

Narendar Garidi and Vamsi Krishna Nukala (both worked as engineers with a reputed IT Services company) have noticed serious gap in career guidance and counselling services for students in rural and semi-urban areas. They tried a lot of time to understand the then existing services education counselling and found that the decision on individual's career is considered to be incidental. Also, students did not have relevant information about educational choices available to them. Only 10–15 % students from urban India and 0.1 % from rural India were getting proper career information and guidance. As a small experiment they began an initiative called 'Guideline Education Services' to help school students informed decision on their careers. They developed guides focusing on personality development, study skills, stress management and communication skills and later offered career counselling. They used tests and one-to-one sessions with the parents. The first major task for them was to prepare 'the career guide' for which they spent a lot of time collecting information from various sources including internet. They ensured that the content was interactive and easy to understand by the students. Then they visited schools to meet the school management seeking permission to allow them test their idea. After a lot of persuasion the head of Krishnaveni Talent School agreed. They conducted a session for the children and received very encouraging response from them. They continued experimentation and trials with other services to know the best way to reach the maximum number of students. They offered awareness programs on career choices, career planning, etc. Post sessions they used to conduct tests to report the students about their strengths and weaknesses, and interests and personality traits. In this way, they developed the service delivery

model using experiences from multiple experiences from small pilot tests and subsequent feedbacks.

Appendix 3

Pilot Testing: Learning from the Field

Pradeep Hial belongs to the Kalahandi District of Odisha State in East Coast of India. Kalahandi is known for many wrong reasons. Print and electronic media often report the problems of hunger deaths, drought, unemployment and poverty. The women do not have much voice to assert their presence within and outside the families. Pradeep felt this as a problem. He knew women are capable to be independent and can earn money to support their families but they did not have necessary skills to engage in a productive work which could also be economically rewarding. He saw an opportunity in this problem and decided to explore more with the help of an experiment with a small group of women. He decided to organise training sessions on tailoring for them for which he selected three villages – Kikia, Chicharla and Bahadur Padar. His first experiment was in Kikia where he chose a group of women between the age bracket of 15–30 years. Earlier, he met several women in the village to understand their needs, challenges and social realities. Also he visited the vocational training centre near Kalahandi. He was aware that he had to form a good team to help him running the training school to study the system and also to recruit the trainers. He spent a lot of time in selecting by conducting interviews. He also used his social network to spot the right talent. Then he purchased one sewing machine and rented another from the fund received from TISS for pilot testing. He rented a small room for training the women. Sixteen women candidates signed up on the very first day. He never expected this kind of success. He divided them into two groups of eight each. For many of them this was a unique experience as they had never used sewing machine for teaching. Hence, initially, they faced a lot of difficulty. Many took about 10–15 days to familiarize themselves with the machine. Trainers used old newspapers to teach them cutting. Old and soiled clothes were used for practicing stitching. Gradually the women learnt to make bags, blouses and petticoats. Mid-way during the training the trainer left and Pradeep's venture almost came to stand-still. He could never imagined such problem and did not make provision of a stand-by trainer. The women lost patience and almost stopped coming to the training centre. This was a testing period for Pradeep. He has to have patience. He was determined to do something immediately to revive the activities. He asked those women to report for an urgent and assured them continuity of the training sessions. He took charge of the situation and himself got involved to continue their training. In this way he also learnt some skills of tailoring, though he continued the search for another trainer. After about a month, he found another trainer who stayed with him till the training batch ended. He paid the trainer well as he could not afford to lose him.

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Part III
Transformation

Chapter 7
Technology and Innovation for Creating Social Change: Concepts and Theories

Archana Singh and Satyajit Majumdar

7.1 Introduction

Technology and innovation play significant role in economic growth of countries. It is evident that with books, newspaper and telephone, the greatest force of change is technology. Technology, especially Internet, has changed the face of commerce. It has changed the lives of those who engage in charity and also the intended recipients or beneficiaries. It has changed the fundamental methods in which social change happens and made easy to the social change as never before. Many people have created or inherited wealth because of technology, for example, employees and founders of Microsoft, eBay. On the other hand, people from low-income groups also have access to technology to make their lives better. The five transformational functionalities of the Internet: aggregation, dissemination, customization, collaboration, and vocalization, have changed fundamentally the way many sectors carry out their businesses (Hecht 2008). There are enough evidences (Katz 2009) to claim that technology is not only playing an important role in economic development but also contributed enough creating social impact in the society.

For inclusive growth in poor countries, growth in social sector is equally important (Ianchovichina and Lundstrom 2009) because 'development' includes economic growth, social progress and human individual improvement (Lundstrom and Zhou 2011). With this mindset, many individuals, entrepreneurs or social entrepreneurs have started using technology and innovation in combination to bring social change for larger social impact. Munshi (2010) has how social innovation and new social value creation are the underpinnings of social entrepreneurship. But, social change is not limited to social entrepreneurship; many business entrepreneurs have also brought social change through their business enterprises.

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Though, the available literature has adequately considered entrepreneurs as change agents, and has also acknowledged the importance of innovation and technology, little attention has been paid to find out how technology and innovation facilitate in bringing social change, or how individuals, entrepreneurs or social entrepreneurs, deploy technology or apply innovation to create social change. This chapter is an attempt to address this gap and also a step towards theory building with the help of live data collected from Ashoka Fellows working in various parts of India. So, drawing on a variety of literature, personal observations and experiences, the Chapter also develops a conceptual framework for creating social change. Incorporating Bandura's 'Social Cognitive Theory' and Davis' 'Technology Acceptance Model (TAM)', we propose a typology with five different ways in which individuals combine technology and innovation to bring the intentional and desired positive social change in the society. The framework we present also shows two-way relationship between technology and innovation associated with this process of social change. We conclude that on one hand individuals deploy existing technology innovatively to create social change or social impact but on the other hand we also observe that innovators engage in developing new technologies for the same purpose. Finally, we have made a set of propositions to this effect, thus providing a wide canvass for future research and open up opportunities for theory building on this phenomenon of social change.

7.2 Building Theory

As mentioned earlier, there has been little clarity on the role that technology and innovation play in guiding the social change process. There is a major gap in theoretical explanations as to how individuals deploy technology and use innovation to create social change. Thus, Eisenhardt's (1989) building approach is adopted for building theory from case studies. Case study is acknowledged as a research strategy that involves using one or more cases to create theoretical constructs, propositions and/or midrange theory from case-based empirical evidence (ibid). Multiple cases are used in this study because multiple-case studies provide a strong base for theory building (Yin 1994). Theoretical sampling helps to replicate previous cases or extend emergent theory or to fill theoretical categories and provide examples of polar types (ibid). Data are collected from multiple sources (Yin 1994), such as interview, observation, and secondary sources like websites, brochure, published articles etc. Prior availability of constructs helped us to shape the initial design of theory building (Eisenhardt 1989).

7.3 Theoretical Underpinning

7.3.1 Social Cognitive Theory

Social learning (1986) and self-efficacy (1997) are two most important contributions from Bandura in social cognitive theory. Individuals are capable of learning not just from their own experiences but also from the experiences of others around them (Bandura 1986). 'The ability for a human to learn vicariously (by observation of others rather than by their own experience) is one of the foundational concepts of social cognitive theory' (Straub 2009, p. 629). Bandura (1997) defined 'self-efficacy' as 'beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments' (p. 3). Development of self-efficacy is dependent on factors like mastery experiences, vicarious experiences, verbal persuasion, and psychological and affective states. In this context, it is important to note that 'self-efficacy' and 'self-confidence' are different but related concepts (Straub 2009). Self-confidence deals with a holistic view of one's capabilities, whereas perceived self-efficacy is individual's belief that he or she can complete a specific task in a set of circumstances. Self-efficacy is a judgment based on beliefs about the personal capabilities of an individual.

7.3.2 Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) was developed by Davis (1989). He introduced two new concepts: 'perceived usefulness' (person's belief that using a particular system would enhance his or her job performance) and 'perceived ease of use' (person's belief that using a particular system would be free of effort). Perceived ease of use is basically a judgment about the qualities of a technology (Straub 2009). It influences future usage of technology by an individual. TAM has been widely used in context of studies of information management (Chen et al. 2011).

7.4 Social Change

The concept of social change involves divergent views (Mann 1987). Wilbert Moore, defined social change as the 'significant alterations of social structures', wherein structure includes norms, values and cultural phenomena (mentioned in Lauer 1991). For, Lauer (1991), 'Social Change' refers to alterations in social phenomena at various levels of human life from the individual to the global. It is concerned with the formation and destruction of social system (Martindale 1976); often a society is described as a social system (LaPiere 1965). In this chapter, we

have used the concept of social change in terms of 'social impact' or 'social outcomes'. In this sense, social change includes a range of social impact or social outcomes starting from increased awareness, understanding, attitudinal and behavioural changes to creating benefits for the beneficiaries and impacting their lives. These changes can happen at broader institutional, group or community level. Also, 'society may change at varying rates, in various respects, and in a variety of ways' (LaPiere 1965, p. 40). However, the changes that are critical at one level are not necessarily significant at other levels. Social changes are reported to be of two types 'haphazard', caused by the unplanned sources and forces; and 'intended' or 'purposed', intentionally generated from within as well as from outside to meet particular ends or to bring about desired change, and challenges posed to the community (Mann 1987). Social entrepreneurs are the change agents (Dees 1998; Dees et al. 2001; Nicholls 2006; Elkington and Hartigan 2008) in social sector, because they work tirelessly to bring intentional, planned and desired social change in the society. The potential of social entrepreneurs to bring about desired and positive social change has been recognized globally by the scholars (Leadbeater 1997; Mort et al. 2003; Bornstein 2005; Dees 2007; Martin and Osberg 2007). However, social change is not limited to social entrepreneurs and business entrepreneurs can also create social changes through their efforts.

7.5 Innovation and Technology

'Innovation' refers to implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations (Organization of Economic Cooperation and Development OECD 2005). Following Schumpeter's distinction between introduction of 'a new good or a new quality of good' and the introduction of 'a new method of production' for producing goods, most of the scholars agree that product and process innovations are two primary types of technological change, central to economic growth and firms' competitiveness (Damanpour and Aravind 2012).

Several innovation models are reported in scholarly literature. Berkhout, Hartmann, and Tro (2010) reviewed these models and explained that the linear models are based on the assumption that there is a well-defined set of stages that innovations pass through. These models view innovation in isolation and hence they missed the point of human involvement in general and particularly the dynamic roles the entrepreneurs play. A new socio-technical framework replaced these linear models with cyclic alternatives to understand the interactive nature of the innovation process. This proposes that for disruptive innovations an environment must be created where people with a range of backgrounds can freely interact, discuss ideas and exchange information. The proposed model portrays a system of dynamic processes – circle of change – with four 'nodes of change': scientific exploration, technological research, product creation and market transitions with entrepreneur at the centre as an enhancer of the innovation process. Entrepreneurs manage simultaneous execution of the dynamic processes in the four cycles. This

framework also connects experts from different organizations (science and business) and different disciplines (technical and social).

On 'technology' despite years of investigative effort, there is little agreement on its definition (Orlikowski 1992). They are definitions in a spectrum of narrower to broader definitions. In a narrow sense, technology refers to a class of knowledge about specific product or production technique and sometimes includes the technical skills necessary to use a product or a production technique. Thus, technology is largely identified with the hardware of production or technical artefacts. In broader sense, technology includes all skills, knowledge and procedures required for making, using and doing useful things. In other words, it includes the *software* of production – managerial and marketing skills, and also the services – administration, health, education and finance. However, despite these differences most of the experts recognize that the concept of technology implies a subtle mix of know-how, techniques and tools. Technology is vested in people – their knowledge, skills and routines – just as much as in the machine they use. Machines and tools are only the physical manifestation of a particular technology or technologies (Chandra and Zulkieflimansyah 2003).

'Technological innovation' includes all innovation activities of firms which relate to introduction of a technologically new or substantially changed good or service or to the use of a technologically new or substantially changed process (OECD 2005).

All those innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly developed and diffused through organizations with primarily social purposes are 'social innovation' (Mulgan 2007). The concept of social innovation reflects social entrepreneurship. Social innovation can take place within government, within companies or within the nonprofit sector (Lundstrom and Zhou 2011). The social innovations that lead to create social change are novel not only in the product or service offering but also in how they are implemented (Austin et al. 2006b). Hecht (2008) has listed many common characteristics of organizations which are engaged in creating social change by using technology and innovation: (1) intent to impact the masses; (2) marginal, incremental cost to serve the next customer; (3) borderless service delivery; (4) grants plus business model; (5) redefining fundamental power relationships; (6) engage markets and market-driven solutions; (7) redirect ongoing flows of public or private sector funds to institutionalize desired change; and (8) use technology itself to provide innovative solutions.

All technological, business and social innovation are referred in general literature on innovation (Lundstrom and Zhou 2011).

7.6 Conceptual Framework

Technology provides opportunity to do things differently. Technology has changed the way social change can happen and made it easier to effectuate wholesale social change. As a result, with similar levels of efforts, today organizations can impact

substantial social change or develop programs that almost overnight touch millions of people, difficult to imagine even 15 years ago, because of Internet (Hecht 2008). Individuals, who intend to create social change, are now combining technology and innovation for larger social impact and showing the world a way forward to create social change. These business and social entrepreneurs are playing significant role in this process of creating social change with demonstrated leadership capabilities.

Rosenbloom (2000) explained that despite strong capabilities in new technologies and other organizational capabilities, the role of leadership is significant to move to a new direction. The central role of leadership is both to make new commitments and to break old one and take risks. Technology and innovation, combined as innovative technology or technological innovation, are producing social change in every fields: environment, human rights, health, education, livelihood, economic development, agriculture. Many times, they also result in negative impact, unintentional or intentional.

Figure 7.1 presents a set of typologies with five different ways of combining innovation and technology to create social change. Individuals business or social entrepreneur who leads the process of creation of social change is the most

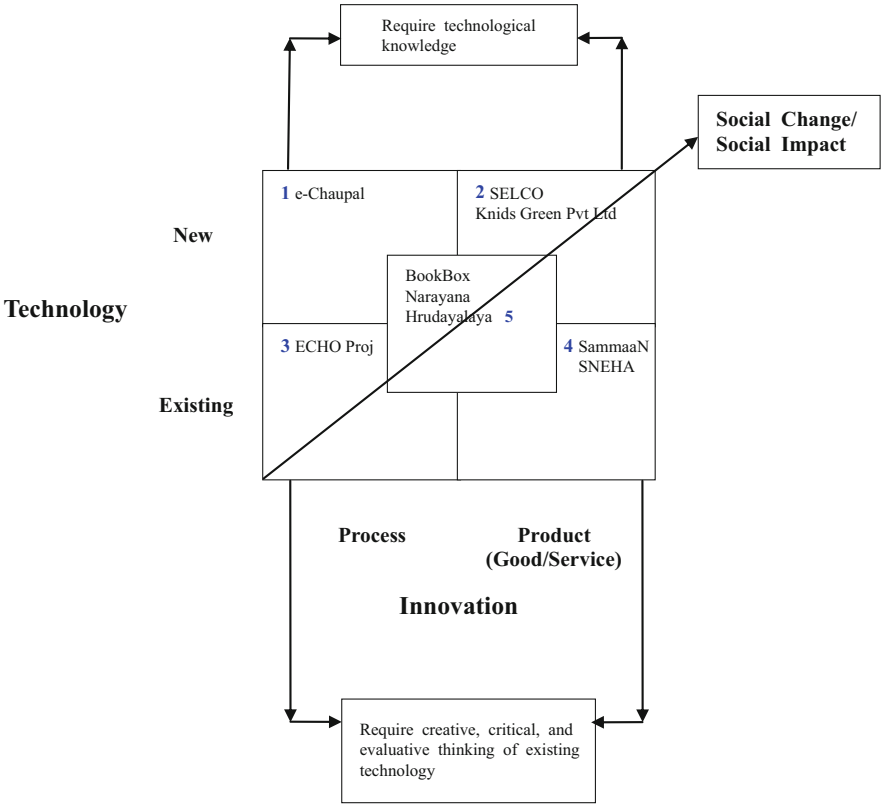

Fig. 7.1 Conceptual framework

important element of this framework. We propose two-way relationship between technology and innovation. On one hand, entrepreneurs both business and social entrepreneurs make innovative use of existing technology to create social change, on the other hand, in some cases they innovate new technologies to create social change for social impact. The five proposed typologies of innovation and technology are:

7.7 Type 1: New Technology to Innovate Process

There are evidences that entrepreneurs foster the process of social change; an example is S. Shivakumar's (CEO, International Business Division, ITC Limited) innovative model 'e-Choupal'. The model has been specifically designed to deal with the challenges of Indian agriculture, characterized by fragmented farms, weak infrastructure and the involvement of intermediaries, among others. Consistent with the concept of self-efficacy based on the huge range of mastery experiences, 'e-Choupal' is unique web-based initiative of ITC's Agri Business Division. It offers the farmers (of India) all information, products and services they need to enhance their farm productivity, improve farm-gate price realization and cut transaction costs. Now, farmers can access latest local and global information on weather, scientific farming practices as well as the market prices on its web portal, in regional languages. It also facilitates supply of high-quality farm inputs as well as purchase of commodities at their doorstep. In this way, ITC has improved the process by innovating new technology to create social change. Discussing its change-effect, Prahalad (2005) mentioned, 'One of the most exciting aspects about the e-Choupal model is that it profitably provides an inaccessible village with a window to the world. The e-Choupal computer is the first and only PC in most of these villages. This, coupled with higher remuneration, is causing several shifts in the social fabric. These changes can be categorized into the following broad areas: Improved agriculture; Better Lifestyle; Brighter Futures' (p. 345). Most probably this is the reason behind Austin et al. (2006a) belief that social entrepreneurship is not just for the social sector, but corporations could also be social entrepreneurs (called 'corporate social entrepreneurship' – CSE). It is a win-win situation for all the stakeholders. Entrepreneurs interact with other people and form a network of stakeholders with commitment to particular transformation of extant realities into components of the new markets (Sarasvathy and Dew 2005).

Proposition 1 Entrepreneurs combine technology and innovation and create network of stakeholders; align interests of their own as well as that of the stakeholders to create social change.

7.8 Type 2: New Technology to Innovate Products

Entrepreneurs also innovate new technological product for social change, e.g. Harish Hande, Kaushalendra Kumar, Dr. Devi Shetty, Dr. Brij Kothari and Amol Goje. Harish Hande, an undergraduate from Indian Institute of Technology (IIT) is uplifting underserved populations by selling, servicing and financing clean and sustainable energy that improves their quality of life while running a commercial venture Solar Electric Light Company (SELCO) with strong social objectives. Kaushalendra Kumar, an agriculture engineer from Gujarat Agriculture University and MBA from Indian Institute of Management Ahmedabad (India), has created system and process to free the farmers from price and market risk and to provide better life to vegetable sellers who migrate from rural India to earn livelihood in a city. Through his organization 'KnidsGreen Pvt Ltd', he brings together small, marginal and landless vegetables growers, value adding intermediaries, vendors and consumers to one platform. He invented a range of products. He designed '*Samriddhii*[1] Green AC Cart', unique innovative support for vegetable vending. The cart helps them keep the vegetables fresh and hygienic. He also created 'Pusa Zero Energy Cool Chambers', a small storage space made up of bricks and sand for storing vegetables,. He has used simple technology without any need of electricity. Third, he also innovated 'Poly Houses' for farmers while using technology like drip irrigation or vermin compost. As a result, farmers grow vegetables with no consideration to season and earn more. Dr. Devi Shetty is a heart specialist. Dr. Brij Kothari has obtained masters in Physics from Indian Institute of Technology, Kanpur (India). He has created many innovative products, such as digital books for children, products for I-Pad, I-Pod, Androids application etc, to enhance the learning and reading ability of the children and other people. Amol Goje, an electrical engineer and master's degree holder in computer science, is enabling rural communities in India to participate effectively in the new economy, driven by computers and information technology. He educates and supports rural entrepreneurs with user-friendly tools to access market and crop information to enhance their businesses and simultaneously provides the rural schools with IT education and training. Amol's strategy is to develop low-cost innovative technological services that are easy to use. He selects people from rural areas with entrepreneurial potential and trains them. He also provides them business and technical guidance to set up their own service delivery enterprises. His important innovations are Interactive Voice Response (IVR) System, Smart Card for rural producers, and usage of Wireless Local Loop (WLL) technology for Village Information Kiosks in remote areas. He uses information technology to promote computer literacy and IT-enabled entrepreneurship.

It is evident from these cases that the social entrepreneurs possess prior knowledge on technology on account of their formal training which help them innovate for creating social change. The entrepreneurs are confident about their capabilities

[1] 'Samriddhii' is a word in Hindi. It means prosperity in English.

to take actions and complete technology-related tasks to create social change. It is their self-efficacy (Bandura 1997) which in turn is dependent on their technological knowledge, experiences, verbal persuasion, and psychological and affective states, social network etc. Scholarly research in entrepreneurship has already established the importance of prior knowledge, social network and identity for entrepreneurs (Dew and Sarasvathy 2007).

Proposition 2 Social entrepreneurs with technological background are more likely to engage in new technology for product or service innovation.

In addition, they earn profit out of their investment while serving the respective social missions. They align self and collective interests which remain critical for social and financial sustainability of the organizations. Most of them registered their organizations/social enterprises as for-profit, e.g. KnidsGreen Pvt Ltd. Co., SELCO, Narayana Hrudayalaya, BookBox.

Dr. Devi Shetty, Founder of Narayana Hrudayalaya explains,

> We want to clarify everyone that charity is not scalable. If we are going to do it free forever, we are going to die. It has to be based on very good business fundamentals. We are, perhaps the only organization in the world, which has a balance sheet on a daily basis. We get a profit and loss account everyday. . . .. So we respect money.

He further says,

> If any enterprise doesn't create profit, it is going to die, irrespective of what your motive is. If you are running on donations, it's a matter of time; donation will come to an end. If you want to build a sustainable organization, run it like a company. Right. And with the constant efforts, to reduce the cost of your services.

Similarly, BookBox's social mission of increasing literacy and reading among hundreds of millions of people in India, and Founder Dr. Brij Kothari, says,

> There were potential to actually generate revenue from the contents we created. So, rather than depend on the grants for BookBox, we decided that we would start a company, because it would depend much less on grants. . . .. . . To build sustainable company, you have to generate revenue from somewhere." He also said, "Social mission is our primary mission, but profit generation is not the secondary mission. However, sustainability is definitely the second mission.

Proposition 3 Social entrepreneurs who invest in innovation tend to operate in for-profit mode.

7.9 Type 3: Existing Technology to Innovate Process

To achieve their mission of creating social change, social entrepreneurs try their best to reach as many people as possible. They use the existing technology to improve the process. The perceived usefulness of the available technologies (Davis 1989) influences the future usage of that technology. Hence, individual's perception of a technology innovation affect the usage and application of the technology

concerned (Straub 2009). For example, Dr. Sanjeev Arora (www.ashoka.org) treats complex chronic diseases in rural and underserved areas of USA, especially to those who do not have direct access to health care specialists. He connects the urban health care specialists to them using communication technology. His project ECHO (Extension for Community Healthcare Outcomes) creates a one-to-many knowledge network of specialists. It connects up to 40 rural health care specialists who meet through videoconferencing to co-manage patients with support from the field staff of ECHO working in remote clinics. The knowledge networks of clinics, specialists co-manage patients and teach rural medical professionals to take up the role of mini-specialists. In this way, technology application becomes as important as technology innovation for social change. Mobile phone, telephone, television, computer, and Internet-based tools provide cost-effective means to the social entrepreneurs for wider and deeper reach for the larger population.

Proposition 4 Social entrepreneurs use existing technology to extend their reach to impact masses.

7.10 Type 4: Existing Technology to Innovate Product

Business and social entrepreneurs constantly search for the available and existing technologies and continuously think about their application to innovate products (service or good). If they believe that usage of a particular technology would enhance their performance (perceived usefulness), they make tireless effort to establish the same. Entrepreneurs always look for opportunity for creative, innovative, critical and evaluative application of technologies. They even adapt technologies from the other unrelated domains, test trial, learn and modify to fit to their own contexts. Entrepreneurs learn from their experiences (Sarasvathy 2001). However, individuals learn not only from their own experiences but also from the experiences of others around them and by observing them as proposed (Bandura 1986). In this way, the social capital expands learning of entrepreneurs. There are evidences of social capital facilitating the intentional social change (Smith 2006). For example, Irfan Alam, Founder of SammaaN Foundation, working for upliftment of rickshaw pullers in Patna and other cities of India, felt that battery-operated rickshaw could be more efficient like mopeds. He developed a prototype and pilot-tested in Patna (Bihar). With feedbacks from the rickshaw pullers, he has been making constant modifications and overall better performance. Context and concerns play important role in technology adoption. 'Contextual characteristics make up the environment and surroundings of an individual during the adoption process – frequently this is the work-based organization, but it also may be the mass media or individuals acting as facilitators of change' (Straub 2009, p. 628).

Proposition 5 Social entrepreneurs adapt existing technologies from other domains and create a fit in their own contexts after the desired modifications.

It has also been reported that resource scarcity forces social entrepreneurs to innovate and use existing and available technologies to fulfil their social mission. Entrepreneurs engage in problem solving with innovative methods because of their self-efficacies. Dr. Armida Fernandez (www.sneha.org), founder of 'Society for Nutrition, Education and Health Action (SNEHA)' working in the slums of Mumbai to improve health of women and children mentioned that non-availability of proper incubator for babies (suffering from jaundice) in the government hospital forced her to think about an alternative. Then, she started using table lamp as incubators. Similarly, her experience with the mothers from slums led her to think about alternatives to mother's milk for the newborn babies. She found that due to lack of nutrition many mothers fail to provide breast milk to their babies. The situation forced her to think another alternative and hence she started the first breast-milk bank in Mumbai.

Proposition 6 Resource constraint forces social entrepreneurs to find innovative ways to use existing technologies (for products and service).

As discussed above, resource limitation creates conditions for the social entrepreneurs to search for existing and available technologies and apply innovative or modifications to suit their own contexts. Here, critical, rigorous and creative thinking plays important role. We quote Irfan Alam:

> I think, the best think about me is, as I mentioned, self-confidence is my asset. And I am not just passionate about my ideas, but I am obsessed. I am crazy for ideas. I have a special quality. . .. . .and I am thankful to God that I am very patient and I can wait until I succeed. So if I do something, I will ensure that it will click. I mean, there may be some need of changes. . .. . . Entrepreneurs need to be innovative. You may run a business, a traditional business like selling cloths sitting in a garment shop; it may not require much of innovation, it will also require, but it may not require much of innovation, but an entrepreneur needs to be innovative always because. . ... You need to come up with a new solution, a new thing. . . no copy cat. It may exist, but you need to identify. You may call it innovation or invention-whatever it is, I don't know. I will not argue on that, but ultimately you need to come up with something new, fresh.

Hence, entrepreneurs always think about new ideas, and also look at the existing technologies critically to find new ways out by making modifications as appropriate.

Proposition 7 Social entrepreneurs are creative, evaluative and critical thinkers who make use of the existing technologies to develop innovative products and process.

7.11 Type 5: New Technology and/or Innovative Usage of Existing Technology to Innovate Products and Processes

We see cases where social entrepreneurs not only apply the existing technology innovatively to innovate processes, but also to innovate products. Dr. Devi Shetty's Narayana Hrudayalaya Hospital, a model for accessible and affordable health care, is an example of this kind – combining technology and innovation for social change. In order to provide affordable cardiac care, Narayana Hrudayalaya follows hybrid strategy while attracting paid patients by virtue of its reputation high-quality healthcare it also combines this appeal with a relentless focus on lowering costs of operation wherever possible, so that a large number of people can afford the same. The surplus gained from paid patients is used to subsidize the cost of non-paying patients who cannot afford them. Narayana Hrudayalaya uses video conferencing for telemedicine (technology tool to enhance its reach, not only in India, but also to other countries) and hence improving the process of consulting the patients. The specialist doctors of Narayana Hrudayalaya see patients from various remote locations. The patients are called to the hospital only if they require admission for surgeries. In this way, technology tool (communication technology) has improved the process of connecting with the patients and treating them. Simultaneously, Narayana Hrudayalaya has also improved its services. The enterprise uses communication technology to enhance the capabilities and knowledge of specialist doctors of the Hospital. It has developed network with specialist medical professionals from other countries for exchanging knowledge through video conferencing. In this way, Indian doctors (from Narayana Hrudayalaya) can learn new advanced techniques of surgery and from different countries, hence, significantly improving the quality of services to the patients.

Social entrepreneurs also go beyond the deployment of available technology. Dr. Brij Kothari's social venture 'BookBox Pvt Ltd' works on the social mission 'creating a book for every child in his/her language'. Here book is a reading experience that can travel through any audio-visual media platform, including print. BookBox not only uses existing technology (such as television, Internet and mobile innovatively) to enhance the learning ability of the children, but also innovates newer technology to bring innovation in the process and the product. It uses the latest digital distribution channel for reading. They make available their contents on YouTube, web, etc. so that anyone can access it. It has also innovated 'AniBook' (animated book), to support early reading and language skills. AniBooks are animated stories for children, with narration appearing on-screen as Same Language Subtitles (SLS), in which every word is highlighted in perfect timing with the audio narration, thus strengthening reading skills, automatically and subconsciously. Further it has innovated bilingual languages digital form of books where one can record the stories in his/her own language and voice. Currently, BookBox developed a model for providing tools to convert stories in the languages of the readers. Innovation in using a variety of Indian and foreign languages in their products (books, games) enhance the reach to other countries.

At present, BookBox's AniBooks are available in 25 languages. While supporting TV broadcast, DVD/VCD, mobile phones, handhelds, iPads, tablets, Internet, they have also innovated new products such as games suitable for androids.

Proposition 8 For deeper and larger social impact, social entrepreneurs develop different models while combining two or more typologies described above.

The cases discussed above reflect combination of Bandura's 'Social Cognitive Theory' (social learning and self-efficacy) and Davis' 'Technology Acceptance Model' (TAM) (perceived usefulness and perceives ease of use). However, TAM seems to help us better to theorise the cases where entrepreneurs deploy existing technology to innovate the process or the product.

Conclusion

Based on review of scholarly literature, several cases of application of technology and innovation for social change, and experiences of the authors, the chapter presents a conceptual framework consisting of five different typologies with combinations of innovation and technology, to create social change. The five typologies are: new technology to innovate process; new technology to innovate product; use of existing technology to innovate process; use of existing technology to innovate product; and, new technology and/or innovative use of existing technology to innovate process and product. The framework recognizes the importance of the individuals (business or social entrepreneurs) who engage in creative thinking and also initiate action to combine technology and innovation for bringing social change. Several propositions were made by us to support each typology. Bandura's 'Social Cognitive Theory' (self-efficacy and social learning) and Davis' 'Technology Acceptance Model (TAM) (perceived usefulness and perceived ease of use)' are used in our framework. We propose that combining technology and innovation for intentional social change is a process influenced by individuals' self-efficacies, social learning, perceived usefulness of a particular technology, belief of using a particular system and the contextual differences. However, TAM provides additional insight to understand innovative application of existing technology initiated by the entrepreneurs. Contexts influence the entrepreneur differently to act as an agent of social change by combining technology and innovation. Social change is a developmental, social and contextual process because the entrepreneurs learn from their own experiences, others' experiences and also from the environment.

The cited cases reveal that entrepreneurs use technology for better impact, i.e. to provide more or improved services to help the poor or underserved communities. However, it is also noteworthy here to that technology and innovation together, i.e. technological innovation or innovative technology, contribute to social impact and for creating positive social change in variety of sectors: health, education, livelihood etc. But we must also remember that

(continued)

the same input can negatively impact the beneficiaries leading to high risks. Technological innovation must be handled carefully to produce only positive social change. Constant monitoring is essential for this purpose. It also depends a lot on the culture and the country which contribute to ethnicity, religion, gender and socialization.

To conclude, in this chapter, we aimed to initiate theory building with making propositions. For establishing the theory, we suggest these propositions be tested with appropriate case studies. Considering the role of technology and innovation in social entrepreneurship change, efforts may open new avenues for inquiry for researchers and for further exploration in future research. This will also provide insight to the practitioners keen to work for making social change.

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Chapter 8
Social Change Using Innovation and Technology

Bharat Damani and Vishal Sardeshpande

8.1 Introduction

Truman (1949), President of USA in his inaugural address on January 20, 1949, was possibly the first to introduce technology as a driver for social change. He set the tone for developed nations to make innovations due to their need for modernization and to transfer the existing technology to the underdeveloped nations for their social and economic growth.

Jawaharlal Nehru, Prime Minister of India, believed that science alone could solve the problems of hunger, poverty, insanitation, illiteracy, superstition, deadening custom, tradition, vast resources running to waste and of a rich country inhabited by starving people (Zachariah 2001; Roy 2007).

Development and social change was seen to be an outcome of technology and its applications and sought to create industrialization, technological innovation, acceptance of scientific rationality and resource distribution with social change happening by the trickle-down process (Sylvester 1999).

Technology has indeed contributed to social change with the industrial revolution, the green revolution, the computer age, the digital revolution and now the Internet innovatively creating disruptive technologies irreversibly impacting the way people do things in developed or urban areas, creating a different way of life for those who can afford and use it.

According to the World Bank (2010), about one billion people globally live on less than US$1 a day; and 2.6 billion, or 40 % of the world's population, live on less than US$2 a day. Rural areas account for three in every four people living on less than US$1 a day. The poor are deprived of essential services like health care,

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education, social protection and access to urban infrastructure of roads, water and electricity.

In India, pursuant to the vision of Truman and Nehru, the 1950s saw the US Model of home economics for women pushing technology in rural areas by promoting the use of latest home appliances, values in home decoration, clothing and scientific housewifery for driving but what women really wanted was social change of a different nature – change created by learning skills of collective action for demanding access to clean water, roads and health care, for protesting against wife abuse, for closing liquor shops and helping women leaders become elected members of the *panchayats*, to be recognized as a members of society like farmers, labourers and active agents of social change (Berry 2003). Consequently, the technological initiatives were shelved and social change, as intended or required, did not happen.

Sen (2000) recognized the urban–rural divide and advocated development as a process of expanding the real freedom people enjoy including the ability to avoid starvation, under-nourishment, escapable morbidity and premature mortality, the freedoms associated with being literate and numerate, enjoying political participation and uncensored speech. These could be achieved with innovative solutions deployed with or without use of technology.

The focus of this chapter is on the process of creating social change in the rural areas, areas that are often insulated from the benefits of technology due to lack of basic infrastructure. Social entrepreneurs use innovation to drive these desired social changes. The chapter covers four case studies highlighting how innovation was used to create the desired social change, with or without use of technology. The cases where technology was used was adapted and made appropriate for the local requirements.

8.2 Literature Review

Technology can be defined as the skills, knowledge and procedures for making, using and doing things (Date 1981c). Technology is a commodity, catering to the demands of those who can purchase it and ignoring those who cannot afford it (Reddy 1988a). Technology often becomes a tool for entertainment and social gratification, not for the desired social change (Toyama 2010). Technology, no matter how well designed, is only a magnifier of human intent and capacity; it is not a substitute.

The limitation of technology is that if it is stretched or forced to fit the needs of current, mainstream customers, it is almost sure to fail. The more successful approach is to find a new market that values the current characteristics of the technology (Christensen 1997). Technology is not only about installing devices, but should be instrumental in transforming society and its value systems (Sagasti 2004).

Schumacher (1975) stated that technology has taken four wrong directions of ever-bigger size, complexity, capital intensity and violence. The primary task of technology is to lighten the burden of work man has to carry in order to stay alive and develop his potential. He quoted Mahatma Gandhi, 'every machine that helps every individual has a place', but that 'there should be no place for machines that concentrate power in a few hands and turn the masses into mere machine minders, if indeed they do not make them unemployed'. Schumacher suggested that there must be intermediate or appropriate technology, a technology which promotes the satisfaction of basic human needs, facilitates social participation and control and is ecologically sound, use of which can make small people productive and relatively independent.

Technology does not determine socio-economic change, but should be the co-evolution between technical change and social adjustment (UN Millennium Project 2005). The transformation of traditional social structures implies major or basic technological innovations, not just incremental change and minor modifications of existing methods (Huber 2000). We must adapt innovation ambitions and strategies to the country's technological and institutional capabilities by building on their strengths and specificities (Aubert 2005).

The World Bank (2006) stated that the best way for science and technology to foster innovation is the 'transfer of technology' model or alternately, an interactive process between individuals and organizations within a particular social, political, policy, economic and institutional context which promotes social change by using technology and innovation.

Innovation is a social process, in which the social factors, needs and wants determine technological development. Innovation must be adapted to the region's natural endowments, trade positioning, cost of labour and indigenous knowledge, which would later facilitate diffusion and adoption of the new technology by the local community (World Bank 2010).

Innovative use of technology using locally available resources for local applications or appropriate technology is technology which promotes satisfaction of basic human needs, starting from the needs; facilitates social participation and control and is ecologically sound (Reddy 1988a).

Social change can also happen in the natural course of evolution. Social change in a desired direction and at a desired rate leads to development and is often perceived as being achieved using technology in an innovative way (Date 1981c).

Technology, innovation and social change at first impression creates the presumption of a forward linkage among the keywords. Quite often technology is identified for implementation in rural areas and then introduced using innovative adaptation to induce social change. Social enterprises follow this approach. The ASTRA (Application of Science and Technology to Rural Areas) programme is one such initiative in India. Reddy (1988b) documented the lessons of 14 years from the ASTRA programme wherein technology was sought to drive social change. The main lessons were:

- Start with the people, and end with the people! Understand what people want and provide it to them.
- Because people are poor, we must not ignore their likes, tastes, preferences and needs.
- We must curb our marked tendency to develop technologies in response to imaginary and imagined needs identified in remote and alien settings.
- The ultimate choice of technology must be made by the people, because technology choice is too important to be left to technologists and other 'experts'.
- Technology alone cannot remove poverty, redress injustices, provide a panacea and solve development problems. Technology is only a sub-system of society, and the development of society hinges, not only on technology, but also on the other crucial subsystems.

8.3 Approach for Creating Social Change

Creating social change has become the forte of social enterprises and social entrepreneurs. Social entrepreneurs play the role of change agents (Dees 2001), pursue social innovations with the aim of developing and implementing new ideas (products, services and models) to meet social needs (Mulgan et al. 2007) using innovation at different stages of the process (Spear 2006). They have impatience with the status quo and traditional thinking (Morino 2007) and focus on social value creation by applying practical solutions to social problems, combining innovation, resourcefulness and opportunity (Elkington and Hartigan 2008).

Social entrepreneurship is not simply about creating an enterprise; it is about finding innovative solutions to social problems (Bornstein 2004) and pursuit of opportunities for transformative social change (Roberts and Woods 2005). It is characterized by innovation and the creation of something new (Austin et al. 2006) and about creating new methods and models for providing products and services that cater to the unsatisfied basic human needs (Seelos and Mair 2005). It creates better social value by being proactive and innovative (Mort et al. 2003).

Literature review shows that technology alone does not create the desired social change, especially in the rural areas. Technology needs to be adapted or made appropriate for the local rural ecosystem to create the desired social change. Disruptive technology must be created which captures the requirement of the market or potential beneficiaries (Christensen 1997). In other words, innovation is required on the technology to make it an effective means of creating the desired social change. Field experiences like ASTRA have shown that a better approach is to identify the social problem, involve the potential beneficiaries and use innovation to create solutions which are acceptable and implementable. These solutions could be backed by the adaptive use of technology.

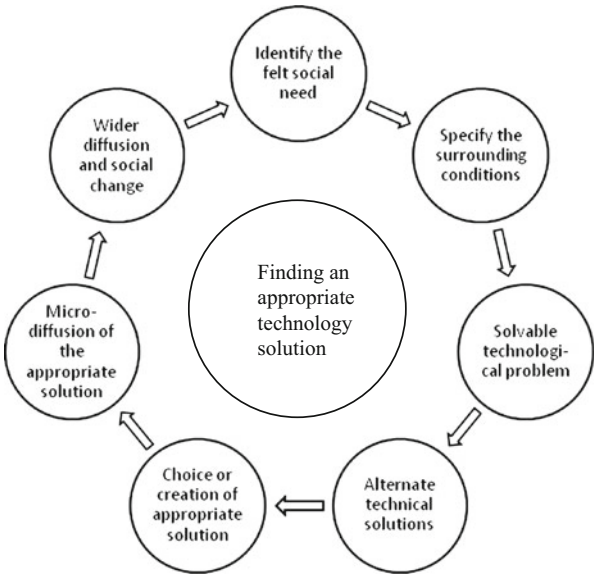

Fig. 8.1 Finding appropriate technology solutions for social change

The conventional thinking placing social enterprises or civil society organizations at the end of the innovation chain for dissemination of an already worked-out idea needs a serious rethink and has implications for innovation policy. Innovations are actively shaped by the actors in the system and this includes the poor. Trickle-down theories are inadequate for ensuring the poverty relevance of innovation (Prasad 2007).

Date (1981b) summarized the methodology for appropriate technology solutions as a series of steps as depicted in Fig. 8.1. It is a solution created from the ground level by the people for their own benefit, using the instrument of technology and the innovation process as a tool to achieve the objective.

There are unmet needs in healthcare, education, housing, waste management, energy, water, infrastructure whose problems deal with core needs for which people will pay entrepreneurs who deliver effective solutions (Parkin 2011). Social innovation occurs to satisfy unmet human and societal needs, whereas business innovation is market- and consumer-driven (Elliot 2006). Social needs – how to educate children, how rural people can be empowered, how livelihoods can be created, how lighting and energy can be provided to the rural areas, how class and gender bias can be reduced, how poverty can be reduced, how better hygiene can be promoted, how sanitation can be provided, how technology can be accessed equally, how pollution can be controlled, etc can be addressed by finding innovative solutions, often backed by technology to create and implement appropriate solutions.

We will now look at four cases to study how the approach to social change was initiated and implemented to address some pressing and unmet social needs.

8.4 Case Studies

We selected four successful cases to understand the interplay of technology, innovation and social change. In the first case, sanitary napkins – a technology product for the urban people were not accepted by the rural people, essentially due to the high cost. However, the intense desire to create social change drove the innovation of technology to create a low-cost machine which would produce the same product at a much lower cost. The second case of Sulabh Shauchalaya is that of a fundamental biological need that is neglected, creating social problems. This is overcome with the use of simple technology and innovation in execution. In the third case, solar lighting – a technology product created as a substitute to high-cost electricity, was not successful in the urban areas due to its high capital cost and was not considered an option for the rural people. However, with a drive for social change, the high-cost product was innovatively made affordable for the rural people, providing the breakthrough for the desired social change. The fourth case of Lijjat papad shows how social change can be brought about even without the use of technology, by adopting innovation in thinking and management.

8.4.1 Sanitary Napkins Making Machine

Excerpted from Sandhana (2012).

8.4.1.1 Background

Arunachalam Muruganantham had to drop out of high school at age 14 when his father, a handloom weaver, died. His mother was a farm worker earning a meagre amount. To supplement these wages, Muruganantham took the entrepreneurial route looking for low-cost business opportunities that addressed a need. Cooking and delivering breakfast to factory workers was his first successful venture. At age 15, working in a workshop making gates and windows, he adapted decorative *rangoli*[1] patterns to the metalwork and became so popular for his craftsmanship that he started his own workshop.

In 1998, Muruganantham was a workshop helper who lived below the poverty line in Coimbatore, Tamil Nadu. His research into sanitary towels began when he caught his wife, Shanti, trying to slip away with some filthy rags. When questioned, she said the choice was between buying towels for herself or buying milk for the family. Faced with a challenge, Muruganantham decided to create a low-cost towel for his wife.

[1] Design – (rangoli - artistic design normally created during festivals in India using coloured powder as a form of decoration to bring good luck).

8.4.1.2 Strategy

Muruganantham started the sanitary napkins journey by purchasing the best quality cotton to make a few samples. He presented them to his wife requesting for immediate test results. But his wife and sisters refused to discuss his creations with him and soon started avoiding him. Undaunted, he approached female medical students and, when they refused to enter into discussion, gave them feedback forms. His wife did not approve of this approach and left him a year and half after he started his research. He then decided to distribute the towels free and asked women to return the used ones. His mother stumbled upon his storeroom full of used sanitary towels and left him too.

Muruganantham figured out that towels could be made of pine wood cellulose derived from the bark of the tree. He procured raw material samples from American manufacturers which he tore in half to reveal compressed fibres. Reclaiming the fibres into usable cellulose required a machine costing more than Rs 2 million. He decided to make a simple version of this machine by re-engineering it. This took him more than 4 years of trial and error. The towel-making machine transforms cellulose into sterilized towels in a four-part process. In the first stage, it chops up wood using a powerful motor. The operator compresses the pulp manually into a towel shape by controlling a core-forming unit with a foot pedal. Each towel is wrapped with a non-woven fabric and sealed with another pedal unit. Finally, the towels are sterilized by exposing them to ultraviolet light, trimming the end product and affixing strips before packing.

Two years later, in 2006, his machine won the award for the best innovation for the betterment of society from the Indian Institute of Technology, Madras. And he was finally able to persuade his family to come back.

His company Jayaashree Industries now has more than 600 machines installed across 23 states in India. Compared to the conventional large-scale machine requiring an investment of Rs 35 million, a basic machine costs about Rs 65,000 producing 1,000 sanitary towels a day generating employment for 10 women; the pneumatic version churns out 3,000 towels a day. Women pack around six to eight towels in a packet and sell them for as little as Rs 13. On an average, each woman earns the equivalent of Rs 2,100–5,000 a month. An operator can learn the entire towel-making process in 3 h and then employ three others to help with processing and distribution. The entire system operates on a woman-to-woman basis, the women making the towels spread awareness of the product locally, eventually helping others shift to this more hygienic method.

The machine helps build a viable and sustainable enterprise that can be run efficiently by the grass-root stakeholders. The business model reduces the players in the supply chain facilitating the product to be made available to poor women at affordable rates without compromising on the quality. The raw material used is different from the one used by the large companies, creating a breakthrough in positive social engineering. The technology used is simple and non-chemical using

mechanical processes such as grinding and de-fibration, pressing and sealing to convert the pine wood pulp into a napkin.

8.4.1.3 Social Change

Muruganantham is creating a revolution on a socially taboo topic. His objective is to set up 100,000 units to generate employment for one million women. He says, 'No one is bothered about uneducated and illiterate people. Through this model, they can live with dignity'. It provides a hygienic alternate, creates local employment and provides dignity, livelihood and empowerment to women using a sustainable business framework.

Muruganantham has obtained a patent for his innovation but does not want to make it a commercial affair. He refuses to sell his innovation to the corporate world who would exploit it for making money. Passionate about social change, he presents his deeply held convictions without inhibition, which makes him a novelty in the conservative society that surrounds him. He drives his own car, doesn't have a secretary and lives a quiet life – all of which confuses people who are used to seeing more obvious signs of wealth or fame.

8.4.2 Sulabh Shauchalaya

Excerpted from Date (1981a) and Bansal (2011).

8.4.2.1 Background

Bindeshwar Pathak hailed from a Brahmin family, living in a sprawling house with a large compound but no toilet. Every morning at 4.00 am he heard the chaos of women who had to attend to the call of nature in the open areas before sunrise. During the day or when women were not well, attending this call was a nightmare. As a young boy when he happened to touch an 'untouchable', his grandmother forcefully cleansed him by making him swallow cow dung, cow urine, *gangajal*[2] and sand. Bindeshwar was disturbed by the plight of women who did not have access to a toilet and had to defecate in the open and the plight of the 'untouchables' in the social system.

[2] Holy water from river Ganges.

8.4.2.2 Strategy

Bindeshwar was influenced by Mahatma Gandhi and his dreams. He decided to live with the 'untouchables' and experience their difficulties. He happened to receive two books: one authored by a member of the Sarvodaya Movement on what a better toilet system should be like and the other, a WHO book on excreta disposal in rural areas and small communities. The WHO book mentioned that the pit privy (Indian style of toilet) is the most practical and universally applicable type of toilet. This struck Bindeshwar who then researched and adopted an existing design of pit-type latrines, innovated on it using simple technology to create the Sulabh design of a twin pit, pour-flush compost toilet which did not require sewer lines or septic tanks. A deeply sloping toilet pan connected to two pits by a Y shaped channel enabled effective flushing with just a mug of water. It requires very little water and converts the excreta into valuable fertilizer in the pit during the rest period, has no odour or pathogens.

Social acceptance was the biggest obstacle – be it from the family, the government or society in general. Ridicule and government non-cooperation were the obstacles all through, perseverance was the key to achieving the objective. Getting someone to accept the concept was a challenge, till an opportunity presented for constructing a public toilet. Funding also became an issue till a senior government official advised not to depend on grants and subsidies; instead the user should be charged for the facility. This converted Sulabh into a self-sustaining enterprise, no longer dependent on grants, subsidies, loans or donations.

8.4.2.3 Social Change

Bindeshwar had a mission to fulfil Mahatma Gandhi's dream of making India scavenger-free, to educate the scavengers, provide them new occupations and integrate them in the mainstream. Sulabh has impacted the lives of scavengers, provided them with a source of livelihood and a business opportunity. It has also provided toilets to villages and in public places. Sulabh has two-pit latrines installed in more than 1.2 million homes, has more than 7,500 public toilets and annual revenue in excess of INR 1.20 billion.

8.4.3 Solar Lighting

Excerpted from Hande (2011).

8.4.3.1 Background

Harish Hande, while a graduate student in the USA visited the Dominican Republic where he was inspired with the idea that a decentralized approach in the spread of solar application – using small-scale, stand-alone installations instead of large, centralized thermal stations – is best for reaching poor, remote villages where the technology is most needed. Returning to India, he decided to live with villagers to understand their situation first hand. This convinced him that, in diffusing a technology, it is not just the product that matters but also the social realities which technology seeks to change.

8.4.3.2 Strategy

Putting this belief into practice, he established Solar Electric Light Company India (SELCO) in 1995. SELCO's principal product offerings were solar PV lighting systems, water heating systems and cook stoves to meet the needs of the rural poor. SELCO adopts a triple strategy for reaching the poor; a strategy of customized products, doorstep financing and doorstep service. It designs and installs solar technology applications based on each customer's specific needs, whether a two or four-light system for the home, head lamps for night workers like midwives and rose pickers, or electricity for sewing machines. To enable the poor to access the technology, SELCO has pioneered in linking the sale of solar technologies with credit institutions, like rural banks, cooperatives and self-help groups. Taking the service to the 'doorstep' it trains customers in maintenance and provides prompt, personalized help through its wide network of service centres.

SELCO is more than just a technology provider dispelling three myths: that the poor cannot afford sustainable technologies; that they cannot maintain sustainable technologies; and that social ventures cannot be commercial entities. The catch-word is customization. Wants can be standardized; needs have to be customized. In practice, that means SELCO's products can be adapted to address what a customer needs from their lighting. Treating the poor as partners instead of mere consumers, SELCO builds their confidence as it assists them in accessing and using technology to better their lives. Poverty reduction is central to its goal.

After five difficult years of operation, the company started to net a profit. When it did, pressure from investors forced the company – against Hande's wishes – to expand through a franchised dealer network. This expansion, combined with rising world prices in solar gear, seriously hurt the Company's finances and diverted it from its social mission of helping the poor. Facing collapse, he repositioned the Company, separated from his business partners and with the help of the International Finance Corporation and new, socially minded investors restructured the company to refocus on its social mission. While SELCO remains a for-profit business, it strengthened its purpose as a social enterprise, measuring performance by how it creates social capital instead of simple financial profit. SELCO has

demonstrated that the poor can afford sustainable technologies and maintain them and that social ventures can be run as successful commercial entities.

8.4.3.3 Social Change

A persistent myth is that the poor cannot afford the best technology, nor are they able to maintain and use it productively. In India, where nearly half of all households do not have electricity, this myth has stood in the way of spreading solar technology and its benefits of cost-efficiency, clean energy, mitigation of climate change, improvements in the quality of life and livelihood among the poor.

SELCO has reached more than half-a-million people by installing solar lights in 120,000 households, microenterprises, and community facilities. Modest and unassuming but intensely determined about his work, Hande says, 'India has a fantastic opportunity to solve two huge problems – reduce poverty and combat climate change. This is India's chance to combine and address both issues in a holistic way. Until the poor become asset creators, we are not empowering them'.

Hande does not want to sacrifice the development process for numbers; or his social mission for rates of return. His passion and pragmatic efforts help build a social enterprise that brings customized, affordable and sustainable electricity to India's vast rural population, encouraging the poor to become asset creators.

8.4.4 Lijjat Papad

Excerpted from Bhatnagar et al. (2003).

8.4.4.1 Background

Shri Mahila Griha Udyog Lijjat Papad or Lijjat, was started by seven women in 1959 to provide a source of self-employment and livelihood for women without seeking financial assistance. Its membership is open to any woman, irrespective of her religion, caste, or class, after signing a pledge of devotion, which is her assurance for earning an honest income through cooperative work. Men cannot become members, but they can be salaried employees. Lijjat follows Mahatma Gandhi's principles of self-reliance and trusteeship, and all of its members have equal rights.

The product, *papad*, is a thin, round, savoury snack; papad rolling is the major activity of the members (called 'sisters'). The sisters are free to choose their activities, such as making the *masala* (blend of multiple spices), pounding the flour, weighing the flour, preparing the dough, rolling papads, receiving papads after weighing, checking the *papads*, packing the *papads*, distributing wages, and

handling the accounts. Each activity is given equal importance, and sisters perform these activities with mutual cooperation and consent.

8.4.4.2 Strategy

The central office purchases and distributes all ingredients to maintain the quality of the final product. For example, the *urad dal* (a popular Indian variety of lentil) is imported from Myanmar, asafoetida is imported from Iran, and black pepper comes from Kerala. Because of Lijjat's main motive of generating self-employment for women, no machinery is used at the production level, and everything is done manually. However, computers are now being used in some of the Mumbai branches for accounts and administration.

Remuneration is paid equally to all on a piece rate system on the number of *papads* rolled. The rate is the same for everyone and profits and losses are shared equally among the members of a given branch. In the initial days of Lijjat, the profits of the first 6 months were shared equally among all sisters in the form of gold. There is no credit period with every payment done on a daily basis, except for the outside supply of raw material.

Lijjat follows its own financial accountability principle; for instance, the margin is only 50 paise[3] between the production cost and selling price of a 200 g *papad* pack. Account books are easily accessible to all members, ensuring transparency in working.

The central office of Lijjat in Mumbai previously coordinated the activities of all the branches, but with the increasing number of outlying branches, authority was decentralized in terms of routine work and sharing of profits at the branch level. However, branches and *sanchalikas*[4] still need the managing committee's approval prior to undertaking any new project or activity, and they all must follow the same set of instructions and have similar accounting systems. On successive failures of a branch to abide by the organization's philosophy of consistent quality and production of *papads*, the Central Committee reduces the daily wages of its members by Rs 1. The Committee often makes surprise visits to various branches to assure that production conditions are hygienic.

Lijjat has grown to more than 40,000 members in 62 branches across 17 Indian states. The branch managers, or *sanchalikas*, form a central managing committee of 21 members, including a president, a vice president, two secretaries and two treasurers, elected every 3 years. The Managing Committee members are selected from the member on the basis of common consent. Any member can express her interest to be a managing-committee member and be selected after due procedure. The discussions are held openly, and decision powers lie in the hands of the

[3] One paise is one-hundredth of Indian Rupee (INR).

[4] Branch heads or coordinators.

members who are present on that day. A single member's objection can nullify the decision of the whole group.

A member can ask an employee to quit without specifying the reason, but no employee can ask a member to quit. However, a member can ask another member to quit if found to be involved in false practices or misconduct. No member sister can be asked to leave unless or until she goes against the organizational principles. However, voluntary leaving is permitted.

Lijjat refuses to accept donations, but instead provides donations to the needy. The seven founding women were determined not to expect donations or help from anyone to run the organization, even if they suffered losses. This practice has been strictly followed. Any sister can apply for a loan from the organization without specifying the reasons. As well as acquiring some financial independence, women have also realized the importance of social independence. Because women own the organization, lower-middle-class women find it very comfortable to work in such an environment.

8.4.4.3 Social Change

The sisters who were deprived of education during childhood now have a source of livelihood, become self-sufficient and attain literacy while working. They are no longer dependent on others for a host of tasks such as writing a letter, maintaining a bank account, or teaching their children. In most families of Lijjat members, the monthly earnings are a valuable addition to the total family income. This has enhanced their status and power within the family.

A number of people, including officials from countries such as Israel, the United Kingdom, Sri Lanka, Sudan, Iran, and Uganda, have visited India to see Lijjat's methods of operation. They occasionally promote similar organizations in their own countries.

8.5 Case Discussion

The cases are summarized in Table 8.1 below on a list of common parameters. The parameters included key drivers, nature of social impact created, major obstacles faced, solution emphasis and reliance on technology and innovation, usage of the solution, alternatives available to beneficiaries without this solution and the relative success rank among the four cases based on social change created.

Each of the cases started with the objective of addressing a social need and faced situations and findings similar to the ASTRA experience. They followed the process depicted by Date, captured in Fig. 8.1. Consequently, all cases met with success.

Success is highest where the desire to solve the social problem was most pervasive (case of Lijjat papad) followed by the requirement to solve a pressing

Table 8.1 Case summary

No.	Parameter	Sanitary napkins making machine	Sulabh Shauchalaya	Solar products	Lijjat papad
1.	Key drivers	Embarrassment of women, social taboo	Providing toilets, dignity for users and untouchables	Provide light and energy at affordable cost to the poor and needy	Women's empowerment
2.	Social impact	Hygiene at affordable cost, local employment generation, empowerment, dignity	Clean public and domestic toilets, peace of mind for women, dignity	Energy security, livelihood, safety, empowerment	Women's empowerment, livelihood, dignity
3.	Major obstacles	Social taboo	Social acceptance, funding	Funding	Replication in branches
4.	Solution	Low–cost, small-scale napkin making machine using locally available raw material	Low-cost, low water usage toilet with no odour, converts excreta to fertilizer	Small-scale stand-alone customized applications for domestic and commercial use	Business model and management to utilize skills of women
5.	Technology and innovation input	Innovation to create appropriate technology for the machine	Innovation to create appropriate technology solution	Innovation in providing affordable customized solutions	No technology used, innovation in business model and management
6.	Widespread use	Yes	Yes	Yes	Yes
7.	Alternatives	Unhygienic methods	Open defecation	Kerosene lamps	Machine made
8.	Success (ranking)	4	2	3	1

need (Sulabh Shauchalaya). Lijjat papad did not use technology for its solution; it focused on innovation. It innovated on using the skills of women (the beneficiaries) and management techniques to manage the enterprise. It continues its emphasis on women's empowerment and the entire business is managed and monitored by the women members. Sulabh Shauchalaya used innovation and simple technology to overcome the social problem. Creating social acceptance was the biggest challenge and the need to create low cost, odour free toilets and dignity was the driving force. Both these cases had a strong case for creating social change through innovative solutions, resourcefulness and opportunity, supporting the findings of Bornstein, Roberts & Woods, Austin, Stevenson & Wei-Skillern, Seelos & Mair, Morino and Elkington & Hartigan.

Solar lighting systems face stiff resistance in urban areas, as identified by Christensen (1997) and Prasad (2007), where technology is being pushed in the market. However, in the case of solar products, while the need for lighting was evident, the challenge was to innovate a solution to address the problem of

affordability due to its high cost. Harish Hande had found a market for the technology and innovatively adapted the technology to provide affordable solutions to satisfy local requirements, proving Christensen's finding. The sanitary napkins machine addressed a felt social need and a social taboo resulting in stiff resistance to the solution. The challenge was to convert the felt need into a socially acceptable requirement. It used innovation to create an appropriate technology affordable solution for the problem. This again corroborates the process depicted by Date and the findings of ASTRA.

The cases show that technology targeted to the urban people may not necessarily be received the same way by the rural people; the trickle-down effect may not always work (Prasad 2007). On the one hand, low cost or affordability is important, sometime absence of effective alternative forces people to willingly to pay more. This substantiates the findings of Parkin, Elliot, Mort, Weerawardena & Carnegie, Mulgan, Tucker, Ali & Sanders. In most cases, high technology is not required. It is often the simple technology, made appropriate for use by a particular segment of people that is more effective in achieving the desired results. It is the social need with innovative application which determines acceptance and usage of the technology.

Conclusion

Technology is often introduced and thrust upon the local or rural people with an expectation that they would use it (Christensen 1997) to achieve the objective of say, removing poverty or introducing social change. This seldom happens as it is not provided as a solution for a need or problem expressed by the people (Prasad 2007). Technology can only provide a solution or means of addressing situations or problems (Toyama 2010). How to derive maximum benefit from the technology is dependent on the user and the ability to understand, absorb and apply the technology for social benefit, Hence, the technology solution must be created with respect to the local situation (Aubert 2005).

In case of technology, latest need not be the best, appropriate technology that is acceptable to the people is what creates social development and change (Schumacher 1975). The four cases show how social change is achieved innovatively, with or without technology. The focus should be on the identifying an unmet social need, conceptualizing the desired social change, to understand it, to involve all stakeholders in defining the limiting conditions, in finding an acceptable and appropriate solution using available resources and then implementing the solution to achieve social change in a local area, later diffusing it for wider social change (Date 1981b).

Innovation plays the key role bridging the gap between the desired social change and achieving it. The commonly understood theme that technology and innovation will result in social change should be modified to state that social change can be achieved using innovation and appropriate technology.

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Chapter 9
Impact of Technology and Social Change on the Family in Nigeria

Gladys Idogo

9.1 Introduction and Conceptual Framework

Technology has revolutionised the way we live with the advancement in information and communication technology (ICT). Technology in this jet age has greatly improved the quality of life, reaching millions of people efficiently and easily (Ohiagu 2010). The unprecedented rapid growth in ICTs including the global communications technologies facilitated by the emerging sophisticated globally based electronic messaging and networking technologies ushered in tremendous social change in Nigeria. Nigeria has the largest population of any African country, some 162.5 million people. With an estimated population of 162.5 million in 2011 (UNFPA 2011: 119), Nigeria is easily the most populous country in sub-Saharan Africa. One in every four people in sub-Saharan Africa lives in Nigeria. Africa's development prospects are tied into what happens here. With more than 160 m inhabitants, Nigeria accounts for 47 % of West Africa's total population and is the eighth most populous country in the world.

Given its size and rate of growth, Nigeria is one of the most attractive markets in the Africa. In 2008, the country became the biggest mobile market in Africa in terms of subscriptions, which in 2008 exceeded 63 m, surpassing South Africa, and reached 73 m in 2009. Thus, Nigeria is recognized as a major market for telecommunications equipment and services on the African continent, and has pursued an aggressive market liberalization policy that has made it perhaps the most liberalized telecom market in Africa. The attention of the world subsequently returned to Nigeria as the market with the highest potential for ICT investment on the continent and more than US$18bn had been invested by December 2009 (Pyramid research in Nigeria 2010).

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It is therefore not surprising that the emerging technological advances such as radio, television, cellular phones, computers, Internet and modems are rapidly removing the traditional barriers of time and distance that until now hinders the transfer of information, skill and expertise from one place to another. Its revolutionary impact is seen in the social change that has taken place in the third world countries and Nigeria is one of them. Information and communication technology (ICT) offers the promise of fundamentally changing how individuals live, work and interact, and the quality of the natural and built environment.

While 'information technology' is comprehensively defined as a set of activities that facilitate by electronic means the capturing, storage, processing, transmission and display of information (Yusuf and Yusuf 2009), 'social change' on the other hand refers to any significant alteration over time in behaviour patterns and cultural values and norms (Nwoke and Chukwuorji 2011). Invariably it is change in social relations that cause a change in a society or transformation of its social structure. And in this aspect the family is the foundation of the social structure of the society. A Dictionary of the Social Sciences defines social change as the significant alteration of social structures (that is, patterns of action and interaction) including consequences and manifestations of such structures embodied in norms, values, cultural products and symbols. It occurs in communities, families, nations and in all social institutions (Cliff 2012).

Technology and social change has transformed the concept of family values and its functions (Erin 2012; Kling 2000). As early as 1956, Reuben Hill (cited in Johnson 2010) posited that there are ten specific areas around which changes in the family structure rotates – they include age of marriage, interracial, interfaith and international marriages, economic factor, absence or presence of children, roles of fathers, mothers, relations and family social class. The question now is to what extent technology has impacted such changes in family structure, roles and traditionally designated functions. While much progress has been made in measuring the impact of ICT infrastructure and use on education, economic and human capital development, and their relationships explored, in the context of their place in the social, economic and environmental realms, measurement of the impacts of ICT on the family set-up and functions is rare (Levi et al. 2008). This is a serious omission seeing that the family as a united group is the bedrock of the African society. It is against this background that this paper intends to find out the impact of technology and social change on the family values and its underlying functions in Nigeria.

9.2 Statement of the Problem

Communication technological advances has ushered in various degrees of social change which inevitably transformed the family. This chapter intends to find out the impact technology and social change has made on the family in Nigeria and how the changes are reflected in urban, semi-urban and rural communities of Ethiope East Local Government of Delta State Nigeria.

9.3 Research Questions

Four research questions guides this study:

- What Information Communication Technology facilities are available to families in urban, semi-urban and rural communities of Ethiope East Local Government, Delta State, Nigeria?
- To what extent has Nigeria's concept of family and its functions changed?
- What are the changes that have taken place in interpersonal family relationship and ways of communicating?
- Are there changes in family identity?

9.4 Methodology

9.4.1 Research Design

The study made use of triangulation (multi-methods) to gather data through questionnaire, interview and personal observation. Triangulation is an attempt to map out or explain more fully the richness and complexity of human behaviour by studying it from more than one standpoint. It is an analytical approach that is applied in social science to strengthen conclusions about observations and to reduce the risk of false interpretations by drawing upon multiple independent sources of information.

9.4.2 The Population

The population of the study is made up of the households in Ethiope East Local Government Area of Delta State. The local government was delineated into urban, semi-urban and rural communities.

9.4.3 Sample and Sampling Technique

Stratified random sampling was used to select 150 families – 50 families from urban, semi-urban and rural areas, respectively. The entire population was stratified into urban, semi-urban and rural communities following the delineation as stated in Nigeria Bureau of Statistics (2010). The stratified random sampling technique is used for the selection to ensure that the sample represents a good population.

9.4.4 Instrument

The research instrument used for this study is a questionnaire. It is made up of 40 items constructed to guide the study as depicted in the research questions raised. The responses to the items in the questionnaire are structured on a simple 'yes or no' format. This is for the convenience of everyone in the community both literate and illiterate.

9.4.5 Method of Data Analysis

The study made use of descriptive statistics tool of simple percentages for the analysis of data.

9.5 Theoretical Framework

The theoretical framework of the study is Bowen's Family System Theory (1988) which proposes that family as a closely knit unit has a strong influence on any of its members. Families are considered systems because they are made up of interrelated elements, they exhibit coherent behaviours, they have regular interactions, and they are interdependent on one another. Families are expected to fulfil a variety of functions for each member, both collectively and individually. The family systems theory was introduced by Dr. Murray Bowen that suggests that individuals cannot be understood in isolation from one another, but rather as a part of their family, as the family is an emotional unit. Families are systems of interconnected and interdependent individuals, none of whom can be understood in isolation from the system. According to Bowen, a family is a system in which each member had a role to play and rules to respect. Members of the system are expected to respond to each other in a certain way according to their role, which is determined by relationship agreements. Within the boundaries of the system, patterns develop as certain family member's behaviour is caused by and causes other family member's behaviours in predictable ways. Maintaining the same pattern of behaviors within a system may lead to balance in the family system, but also to dysfunction. For example, if a husband is depressive and cannot pull himself together, the wife may need to take up more responsibilities to pick up the slack. The change in roles may maintain the stability in the relationship, but it may also push the family towards a different equilibrium. This new equilibrium may lead to dysfunction as the wife may not be able to maintain this overachieving role over a long period of time.

9.6 Literature Review

Family structure in Nigeria is basically two types: the nuclear family and the extended family. You become a member of a family through marriage or through blood relationship. A nuclear family is made up of legally and/or traditionally married father and mother and their children or a single, possibly widowed, parent and his/her children. The extended family is usually made up of a series of nuclear families of three or more generations living together with both vertical and lateral extensions, with a single line of authority, either patrilineal or matrilineal (Kudirat et al. 2010).

Nigeria families are patriarchal culturally. Family descendants are calculated from the father's lineage. Fathers' responsibilities are traditionally entrenched in all family issues; he takes all family decisions in the lives of all members of the family. He occupies prominent position and his authority is exercised during marriage, birth, naming, burial and initiation ceremonies. Every member of the family seeks his permission for almost anything you want to do including choice of career and marriage. His blessings on such ventures are accepted to be a good omen while his disapproval may indicate bad omen.

Although the fathers' position is autocratic, the obligation to mother is strongest. This is both cultural and religious. In the semi-urban and rural communities, the father is polygamous having more than one wife. Each wife has the day-to-day responsibilities of taking care of her children's needs with or without the assistance of the father (Sokari 2010).

Norms are strongly adhered to in Nigerian families. One of such norms is value of children in the family. Children are valued and couples still have large families. A man takes a second wife if the first wife is barren or if she bears only female children or have only one boy amongst female children. Male children are preferred to female children. The birth of only or mostly female children often lead to divorce. Children are very important because parents believe that their children will provide support for them in their old age. The children are socialized with this arrangement in mind, and even from a tender age of about ten years, the children both boys and girls assist in the family business – farming or trading – to bring in more income to the family. 'Child labour' is given different meaning in most communities in Nigeria. It is traditionally and culturally accepted that children at any age should help their father or mother in any capacity as demanded by the parents or even senior siblings. Refusal to assist attracts stringent discipline (Felicia and Leonard 2010).

Hierarchy is also important in Nigeria. Relationships within the family are rigidly established according to a hierarchy based on rules defining roles and functions. Criteria are age, sex, kinship ties, degree of alliance and marital status (e.g. marriage rank of wives). Vertical relationships require that younger children respect older ones, young people the elderly, and children their parents, while the older groups assist and protect the younger ones. The oldest child in the family has the greatest responsibility and has more obligations. Adult siblings must respect

each other, and if one has a better life, economically, then they should help each other. Younger brothers must respect older brothers who must respect parent's advice and decision and female children are consciously socialized to serve and be subordinate to males.

Family relationships are mostly gender based in Nigeria. The husband is the head of the family and takes all decisions without the wife's consent. The wife needs the husband's approval before undertaking any venture, more so when the age disparity between husband and wife in the rural communities is wide. In some communities you have up to 20 years age difference. Most girls marry very young (FG/British Council, 2012). Nevertheless, family solidarity remains strong. In urban areas, for example, relatives are always given shelter; the successful older man pays for his younger siblings' schooling, sends food and supports his parents financially. Families group together in family, ethnic, cultural or local associations. Attendance at or support for baptisms, weddings and funerals is compulsory (Uche 2010 reports that the goal for many Nigerians is to build up a large network of dependants that will help them in diverse ways whenever they need it. If your father is married to more than one woman (either at the same time or in a series) one has to regard all the wives as mothers. Traditionally, and out of respect or duty to father, one has to regard them the same, as they are the mothers of one's brothers and sisters.

9.7 Change in Family Structure

The value of traditional nuclear family structure of man, woman and children is fast eroding, resulting in alternative family forms such as single motherhood among others. Significant changes in family structures have occurred. Its form is diversifying with the increase in one parent families and non-marital unions as well as extended family arrangements. According to the modern family evolved in concert with industrialization, science, and technology. The modern nuclear family was shaped by three sentiments – romantic love between spouses rather than marriage arranged for reasons of property and social status; maternal love, or the idea that women have a maternal instinct and a need to care for young children; and domesticity, or the belief that relationships within the family are always more binding than are those outside it (Ohiagu 2010). The emphasis on emotional bonds between husband and wife set the modern family off from its predecessors (Morire 2005). The modern family is expected to be emotionally self-sufficient. Other relatives become peripheral, while the bonds among nuclear family members grow more intense and emotional (Susan and Gray 2000).

9.8 Changes in Family Networks

Some families take advantage of modern technology like telephone, family websites and email contact and exchange videos as well as visits to strengthen a sense of family and cultural identity and keep family networks intact. Some use advances in the banking system and send ATM cards to family members living in large cities abroad. *The Internet*, the world's largest computer network, has revolutionized electronic networking. Few homes in urban areas can purchase World Wide Web (www) service. Net-surfers can telecommute, read articles, check stock prices, conduct research, compare price, shop from home, meet others in chat rooms or on bulletin boards, take college courses, and even earn an accredited degree. The Internet has certainly provided exciting new possibilities for electronic communication, yet critics argue that a dark side exists to this informational tool. One area of special concern, especially for families with young children, is the ability to access and download pornographic materials.

9.9 Government ICT Policy

The Federal Government vision statement in the ICT policy is to make Nigeria an IT-capable country in Africa and a key player in the Information Society by the year 2005, using IT as the engine for sustainable development and global competitiveness. To this end, the mission statement is to 'USE IT' for education, creation of wealth, poverty eradication, job creation and global competitiveness. To achieve the above goals, 31 general objectives were stated some of which are: to ensure that information technology resources are readily available to promote efficient national development; to re-engineer and improve urban and rural development schemes; to empower children, women and the disabled by providing special programs for the acquisition of IT skills; to develop human capital with emphasis on creating and supporting a knowledge-based society (FG: ICT Policy 2009).

However, in spite of the widely publicised successes, Nigeria, as highlighted in this RIA Sector Performance Review (SPR), lags behind many other African countries with respect to a number of market indicators. Using nationally representative household survey samples, RIA's 2012 ICT Access and Usage Surveys in 12 African countries focussed on household, individual and informal business ICT access and usage. Among RIA ICT Survey countries, Nigeria ranks fifth with respect to mobile penetration and fifth in terms of industry perception of the effectiveness of domestic telecommunications regulation (Blessing et al. 2012). In terms of RIA's broader Pricing Transparency Index: Prepaid Mobile for 2012, Nigeria ranks 17th out of 46 countries in terms of the affordability of the cheapest prepaid mobile product from a dominant operator, and 13th out of 46 for affordability of the cheapest mobile prepaid product from any operator.

The policy is now more than 9 years old and the RIA Nigeria ICT Survey of 2012 and Policy Paper 6 (2012) found that only 3.4 % of households, or 747,025, have a fixed Internet connection, and 62 % of Internet users go online primarily via their mobile phone. It is also reported that 58.1 % of Nigerian web traffic was via mobile handsets and other mobile devices in November (UNCTAD 2011).

9.10 Results of the Study

9.10.1 The Availability of ICT Facilities

Research Question 1 What Information Communication Technology facilities are available to families in urban, semi-urban and rural communities of Ethiope East Local Government, Delta State, Nigeria?

Table 9.1 shows that

1. 101 respondents from urban, semi-urban and rural representing 67.3 % in item 1, agreed that radios are available.

Table 9.1 Percentage analysis of Information Communication Technology facilities available to families in urban, semi-Urban and rural communities of Ethiope East L.G.A. Delta State

		Urban		Semi-Urban		Rural	
S/N	Items	Yes	No	Yes	No	Yes	No
1	Radio	42	8	36	14	23	27
		28 %	5.3 %	24 %	9.3 %	15.3 %	18 %
2	T. V.	50	–	45	5	20	30
		33.3 %	–	30 %	3.3 %	13.3 %	20 %
3	Constant electricity	–	50	–	50	–	50
		–	33.3 %	–	33.3 %	–	33.3 %
4	Cable network	5	45	3	47	–	50
		3.3 %	30 %	2 %	31.3 %	–	33.3 %
5	Computer/modem	35	15	22	28	–	50
		23.3 %	10 %	14.7 %	18.7 %	–	33.3 %
6	Source websites	3	47	2	48	–	50
		2 %	31.3 %	1.3 %	32 %	–	33.3 %
7	Use social media	8	42	5	45	2	48
		5.3 %	28 %	3.3 %	30 %	1.3 %	32 %
8	Use mobile phone	50	–	44	6	35	15
		33.3 %	–	29.3 %	4 %	23.3 %	10 %
9	Spouse use mobile phone	38	12	22	28	10	40
		25.3 %	8 %	14 %	18.7 %	6.7 %	26.7 %
10	Children use mobile phone	43	7	30	20	5	45
		28.7 %	4.7 %	20 %	13.3 %	3.3 %	30 %

2. 115 respondents from both urban, semi-urban and rural representing 76.6 % in item 2 agreed that TVs are available.
3. 8 respondents from urban and semi-urban, representing 5.3 % in item 4 agreed that cable networks are available.
4. 57 respondents from urban and semi-urban representing 38 % in item 5 agreed that computer/modems are available.
5. 5 respondents from urban and semi-urban representing 3.3 % in item 6 agreed that source websites are available.
6. 15 respondents from urban, semi-urban and rural representing 9.9 % in item 7 agreed that use social media are available.
7. 129 respondents from urban, semi-urban and rural representing 85.9 % in item 8 agreed that use of mobile phone are available.
8. 70 respondents from urban, semi-urban and rural representing 46.7 % in item 9 agreed that spouse use mobile phone.
9. 78 respondents from urban, semi-urban and rural representing 52 % in item 10 agreed that children use mobile phone in Ethiope East L.G.A. Delta State.

The above findings indicate that the Federal Government policy on ICT is not being implemented since most of the ICT facilities are not available for urban, semi-urban and rural dwellers. Positive social change depends on accessibility to information through ICT facilities.

9.10.2 Concept of Family and Its Functions

Research Question 2 To what extent has Nigeria's concept of family and its functions changed?

Table 9.2 shows the extent of change in Nigeria's concept of family and its functions.

(a) 85 respondents in urban, semi-urban and rural communities representing 56.7 % in item 1 agreed that dowry payment is necessary before living together as couple.
(b) 150 respondents in urban, semi-urban and rural representing 100 % agreed to item 2 and 3 that traditional marriage ceremonies are more important than court/church and husband is the head of the home.
(c) 97 respondents in urban, semi-urban and rural representing 64.6 % in item 4 agreed that husband is the sole provider for the home.
(d) 70 respondents from urban, semi-urban and rural representing 45.6 % in item 5 agreed that couple must be legally married before having children.
(e) 80 respondents from urban, semi-urban and rural representing 53.3 % in item 6 agreed that polygamy is good for the family.
(f) 50 respondents from urban, semi-urban and rural representing 33.3 % in item 7 agreed that children are expected to care for parents till death.
(g) 75 respondents from urban, semi-urban and rural representing 50 % in item 8 agreed that forced marriages are accepted.

Table 9.2 Percentage analysis of the changes in Nigeria concept of family and its functions

S/N	ITEMS	URBAN		SEMI-URBAN		RURAL	
		Yes	No	Yes	No	Yes	No
1	Dowry payment necessary before living together as couple	42	8	40	10	3	47
		28 %	5.3 %	26.7 %	6.7 %	2 %	31.3 %
2	Traditional marriage ceremony more important than court/church	50	–	50	–	50	–
		33.3 %	–	33.3 %	–	33.3 %	–
3	Husband head of the home	50	–	50	–	50	–
		33.3 %	–	33.3 %	–	33.3 %	–
4	Husband sole provider for the home	32	18	45	5	20	30
		21.3 %	12 %	30 %	33 %	13.3 %	20 %
5	Must be legally married before having children	50	–	20	30	–	50
		33.3 %	–	13.3 %	20 %	–	33.3 %
6	Polygamy good for the family	12	38	20	30	48	2
		8 %	25.3 %	13.3 %	20 %	32 %	1.3 %
7	Children expected to care for parents till death	5	45	10	40	35	15
		3.3 %	30 %	6.7 %	26.7 %	23.3 %	3.3 %
8	Forced marriage accepted	–	50	25	25	50	–
		–	33.3 %	16.7 %	16.7 %	33.3 %	–
9	First son inherits father's authority and property	36	14	40	10	50	–
		24 %	9.3 %	26.7 %	6.7 %	33.3 %	–
10	Not bothered with only female children	50	–	30	20	50	–
		33.3 %	–	20 %	13.3 %	33.3 %	–

(h) 126 respondents from urban, semi-urban and rural representing 84 % in item 9 agreed that first son inherits father's authority and property.
(i) 130 respondents from urban, semi-urban and rural representing 86.6 % in item 10 agree that they are not bothered with only female children.

In this section there are some cultural norms that are detrimental to healthy social change and development of the individual, especially women and the girl child. This is continually promulgated through ignorance. Access to information through the Internet and World Wide Web would reduce such practices to minimal.

9.10.3 The Extent of Change in Interpersonal Family Relationship

Research Question 3 What are the changes that have taken place in interpersonal family relationship and ways of communicating?

Table 9.3 above indicates how Information Communication Technology influences interpersonal family relationship and ways of communicating,

Table 9.3 Percentage analysis of the changes in interpersonal family relationship and ways of communicating

S/N	Items	Urban		Semi-Urban		Rural	
		Yes	No	Yes	No	Yes	No
1	Wife must obey husband	50	–	50	–	50	–
		33.3 %	–	33.3 %	–	33.3 %	–
2	Spouses take decision together	50	–	50	–	50	–
		33.3 %	–	33.3 %	–	33.3 %	–
3	Family operate open/joint account	48	2	38	12	30	20
		32 %	1.3 %	25.3 %	8 %	20 %	13.3 %
4	Caters only for the nuclear family	22	28	30	20	32	18
		14.7 %	18.7 %	20 %	13.3 %	21.3 %	12 %
5	Living with spouse relations	18	32	40	10	–	50
		12 %	21.3 %	26.7 %	6.7 %	–	33.3 %
6	Communicates regularly with spouse/children through mobile phone	50	–	50	–	50	–
		33.3 %	–	33.3 %	–	33.3 %	–
7	Wife works in another city	25	25	30	21	–	50
		16.7 %	16.6 %	20 %	13.31 %	–	33.3 %
8	Husband works in another city	30	20	18	32	–	50
		20 %	13.3 %	12 %	21.3 %	–	33.3 %
9	Wife is solely responsible for the daily care of the children	28	22	30	20	50	–
		18.7 %	14.7 %	20 %	13.3 %	33.3 %	–
10	The family have dinner together	50	–	50	–	50	–
		33.3 %	–	33.3 %	–	33.3 %	–

1. 150 respondents from urban, semi-urban and rural communities representing 100 % in item 1, 2, 6 and 10 agreed that wife must obey husband; spouses take decision together; communicates regularly with spouse/children through mobile phone; the family have dinner together.
2. 116 respondents from urban, semi-urban and rural representing 77.3 % in item 3 agreed that family operate open/joint account.
3. 84 respondents in urban, semi-urban and rural representing 56 % in item 4 agreed that they cater only for the nuclear family.
4. 58 respondents from urban, semi-urban and rural representing 38.7 % in item 5 agreed that living with spouse relation is accepted.
5. 75 respondents from urban, semi-urban and rural representing 50 % in item 7 agreed that wife can work in another city.
6. 48 respondents from urban, semi-urban and rural representing 32 % in item 8 agreed that husband can work in another city.
7. 108 respondents from urban, semi-urban and rural representing 72 % in item 9 agreed that wife is solely responsible for the daily care of children.

It could be inferred that the root cause of broken family relationship is poverty which is entrenched by unemployment. People are willing to go anywhere they can find job to provide for their family. ICT tools can be used to provide economic empowerment for urban and rural dwellers.

9.10.4 Changes in Family Identity

Research Question 4 Are there changes in family identity?

Table 9.4 shows how technology has shaped family identity and daily life,

1. 6 respondents from urban, semi-urban and rural representing 4 % in item 1 agreed that daughters have share in father's property.
2. 150 respondents from urban, semi-urban and rural representing 100 % in item 2, 3, 4, 6 and 7 agreed that education of girls is essential; support hierarchy of seniority in participation in family decision-making process; support gender

Table 9.4 Percentage analysis on how technology shapes family identity and daily life

S/N	Items	Urban		Semi-Urban		Rural	
		Yes	No	Yes	No	Yes	No
1	Daughters have share in father's property	4	46	2	48	–	50
		2.7 %	30.7 %	1.3 %	32 %	–	33.3 %
2	Education for girls essential	50	–	50	–	50	–
		33.3 %	–	33.3 %	–	33.3 %	–
3	Support hierarchy of seniority in participation in family decision-making process	50	–	50	–	20	30
		33.3 %	–	33.3 %	–	13.3 %	20 %
4	Support gender priority in participation in family decision-making process	50	–	50	–	50	–
		33.3 %	–	33.3 %	–	33.3 %	–
5	Married daughters no longer part of the family	48	2	40	10	30	20
		32 %	1.3 %	26.7 %	6.7 %	20 %	13.3 %
6	Maiden name dropped after marriage	50	–	50	–	50	–
		33.3 %	–	33.3 %	–	33.3 %	–
7	Single parent (women) have same rights and privileges	50	–	50	–	50	–
		33.3 %	–	33.3 %	–	33.3 %	–
8	Children from unmarried mothers accorded recognition, same rights and privileges as other children	35	15	30	20	28	22
		23.3 %	3.3 %	20 %	13.3 %	18.7 %	14.7 %
9	Women have right to own/inherit husband property	20	30	15	35	5	45
		13.3 %	20 %	10 %	23.3 %	3.3 %	30 %
10	Women have right to decide when to start family	–	50	–	50	–	50
		–	33.3 %	–	33.3 %	–	33.3 %

priority in participation in family decision-making process; maiden name should be dropped after marriage and single parent (women) have same right and privileges.
3. 118 respondents from urban, semi-urban and rural representing 78.7 % in item 5 agreed that married daughters no longer part of the family.
4. 93 respondents from urban, semi-urban and rural representing 62 % in item 8 agreed that children from unmarried mothers be accorded recognition, same right and privileges as other children.
5. 40 respondents from urban, semi-urban and rural representing 26.6 % in item 9 agreed that women have right to decide when to start family.

These findings show that there are social issues that need to change for the development of the individual and the community.

9.11 Discussion

The findings from the first research question show that mobile phones are the commonest ICT facility available in urban (33.3 %), semi-urban (30 %) and rural (23.3 %). areas of Ethiope East L.G.A of Delta State. This is further confirmed by the extensive study undertaken by Pyramid research in Nigeria (2010). The study, sponsored by the Nigerian Communications Commission (NCC), the regulatory body in charge of Telecommunications Technology in Nigeria, affirms that modern telecommunication services particularly mobile phones, are within the reach of more than 90 % of the people who live in Nigeria. This study emphasizes the positive impacts of mobile phone usage in all spheres of national and individual development. It is evident in this study that Information Communication Technology facilities have not permeated the semi-urban and rural communities of Nigeria, and statistics suggest that 65 % of Nigerians live in rural areas (NBS 2010).

The second research question verifies the extent of change in African concept of family and its functions since the introduction of ICT in Nigeria. This section identified eight strands of Nigerian's concept of family and its attending functions: dowry payment, traditional marriage versus legal, the head of the home and his duties, polygamy versus monogamy, children's responsibilities, preference of male children, and first born son's authority and ownership of the father's property. All these issues raised above are still prevalent in Nigeria's society except not being bothered with only female children. During the interview, most of the respondents agreed the culture of the area of study took care of that – some families allow their girls to have children and raise them as single mothers in the family.

In this regard, there has been no shift from traditional African concept of the family and its functions. The only change in the family set-up and functions is that most couples are not bothered with only female children yet the oppressive culture towards women are maintained. For instance only 4 % agreed that daughters have share in father's property; there is a general consensus in the culture of hierarchy of

seniority in participation in family decision-making process; massive support of gender priority in participation in family decision making process; maiden name should be dropped after marriage; that married daughters no longer part of the family; only 26.6 % agreed that women have right to decide when to start family and that wife is solely responsible for the daily care of children. The findings of this study is a confirmation that technology and social change has not affected the basic traditional tenets of Nigerian family especially the identity, rights and privileges of women and girls. This corresponds with the findings of the study 'Gender in Nigeria Report' conducted by British Council (2012). Their key findings stated that *women and girls have significantly worse life chances than men;* there is pronounced gender disparity and that men are the decision makers in the family.

The third research question dealt with changes in interpersonal family relationship and ways of communication, thanks to mobile phone services. Distance is no barrier to effective communication; couples can work and reside in different states. The emergence of mobile phone, the Internet and cable networks has eased the pain of separation. Husbands and wives live continent apart so as to raise money for the upkeep of the family. The close union amongst nucleus family is no longer the vogue. The woman is left alone to take care of the children and most homes are broken as a result of long separation of spouses. These have given rise to single-parent families without any government intervention in the form of welfare grants to single mothers. Labeodan 2005; Anthonia and Agapetus (2009) identified this as a new trend of 'feminine poverty' that are found in urban, semi-urban and rural communities as a result of split in families.

As Trojin (2013) noted that technology is an advancement, but at what expense to social interactions? He affirms that there are problems when technological services replace face-to-face contact as his study have shown that greater use of the Internet was associated with declines in participants' communication with family members in the household, declines in the size of their social circle and increases in their depression and loneliness. Distance and break in physical contact as the forth research question suggest erodes family identity and daily life. Physical interaction is essential for the human race. This interaction promotes bonding in any relationship dynamic. Societies are built on the bonds of relationships. When these bonds are not present, it is feared by some that virtual societies will over encompass physical contact thereby causing a disabling effect in the routine of human interaction.

9.12 Recommendation

1. Energy poverty that prevails in the rural community is a barrier to the extension of Information Communication Technology facilities. The government should make the issue of electricity provision to all and sundry in Nigeria a priority.
2. Extension of ICTs to states and local governments should be borne by the Federal Government due to the high cost involved.

3. Nigeria is bereft of social policies that will hasten the erosion of harmful family tradition. This is a democratic era and most of the outdated and unproductive norms should be expunged from our society.
4. The schools should be equipped with computers and cheap Internet facilities so that students can be able to source the web, be exposed to other cultures and participate in social media. Our interviews and observation show that most people in semi-urban and rural communities do not even have e-mail address nor conversant with computer operations.
5. One of the objectives of the ICT policy is to 'USE IT' to eliminate poverty. More than 70 % of Nigerians are still very poor and this may be linked to non-usage and non-availability of ICT to most Nigerian. Financial structures that could make this possible should be in place.

Conclusion

Families are the bedrock of societies and informed families make up informed nation. Information refers to facts, ideas, feelings that are being shared. Without information, communication and development may not take place. Communication itself is a process through which message in terms of information, knowledge, ideas, thoughts and values are transmitted from a sender through appropriate channel to a receiver to elicit the required response and feedback. ICTs have become major source of sharing knowledge and information using electronic or digital equipment and the primary place to share knowledge is in the family. Where these are not available, negative social change may occur as we have in Nigeria and some outdated norms will continue to thrive. For the sake of the family therefore, Information Communication Technology facilities should be extended to the families in semi-urban and rural communities in Nigeria.

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Part IV
Case Studies

Chapter 10
Bacillus thuringiensis Cotton in India: Debates Surrounding Agricultural Biotechnology

Madhulika Kumari and Sambit Mallick

10.1 Bt cotton in India: Debates Surrounding Agricultural Biotechnology

Genetically modified (GM) nonfood crops were grown by farmers on 134 million hectares in 25 countries in 2009 (Government of India 2012). In India, *Bacillus thuringiensis* (Bt) seed was introduced in agriculture in 2002, and the first experimentation started with Bt cotton. India grows transgenic Bt cotton on 8.4 million hectares (Ramani 2008). Bt is a naturally occurring soil bacterium used by farmers to control toxins produced by lepidopteran insects. Genetic engineering helped scientists introduce the gene responsible for making this toxin in a number of crops, including cotton. Cotton crops are highly susceptible to pest attacks, and they use up to 5 % of the world's pesticides and over 25 % of insecticides. In India, 55 % of all pesticides are used for cotton grown on 5 % of the total crop area. Over time, pests became resistant to insecticides, which led to increasing chemical costs; falling cotton prices have pushed thousands of cotton farmers in India into debt (Menon 2001; Krishnakumar 2003). Bt cotton is the only commercialized crop that remains highly controversial in India. Biotech companies were willing to make inflated claims about the technology's ability to tackle problems of poverty and food insecurity, which prompted a backlash from the civil society organizations (Falkner 2006) (CSOs).

Science and technology play an important role in bringing agricultural change. According to Merton (1973), 'The social structure of modern science and technology is highly dependent upon the social, economic and political organization of society and extremely sensitive to changes in this environment'. Bt cotton was introduced to farmers in the developing world without sufficient knowledge, testing

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and use; this was mainly for the interests and profits of multinational corporations (MNCs) such as Mahyco and Monsanto. For the present study, Mahyco and Monsanto were selected because Bt cotton was promoted by a joint venture between them: the local seed house Mahyco and the USA-based MNC Monsanto, and was formally released in 2002 following a drawn-out regulatory approval process. Moreover, Monsanto is the major player; Dr P. M. Bhargava, founder and director of the Centre for Cellular and Molecular Biology, Hyderabad, and currently supreme court nominee on the Genetic Engineering Approval Committee (GEAC), said 'In India we largely [deal] with Monsanto', which indicates that Monsanto is the major player in India.

The objectives of this study are to understand the responses of CSOs to Bt cotton in agriculture and critically examine the implications of Bt cotton on farming community and debates surrounding agricultural biotechnology in India. The challenge is to understand the dynamics and debate and develop ways to deal with these drawbacks.

The present study examines the responses of two CSOs, namely, Gene Campaign and Navdanya, to proprietary technology in agriculture in India. Navdanya and Gene Campaign are the CSOs that work actively on intellectual property rights (IPRs), GM crops, policy issues and international trade. These CSOs have different views regarding the use and impact of Bt cotton; some view it as an essentially beneficial technology that can increase agricultural productivity, and others see it as potentially harmful to human beings and the environment. Thus, the ethical, social, legal, economic, cultural and performance-related controversies surrounding transgenic organisms in agriculture in India cannot be ignored. The study comprises both primary and secondary data. The primary data include in-depth personal interviews with the officials of the Gene Campaign and Navdanya. The secondary data include reports on the activities of the two CSOs as far as Bt cotton in agriculture in India is concerned, including government policies, books, articles, web sources, and so on.

10.2 Civil Society Organizations in India

In the era of globalization when the state is withdrawing to fulfil its duty to certain sectors of society, the civil society plays an important role in voicing their needs/rights and thus brings a paradigmatic transition in the society (Leach 2007). There is a gap between promise and practice, and this is where civil society plays an important role. A CSO is an organization that expresses 'the interests and values of their members or others, based on ethical, cultural, political, scientific, religious or philanthropic considerations'.

Gramsci depicted civil society as a private or nonstate sphere, including economic interests. According to Gramsci, the state cannot be understood without an understanding of civil society. Gramsci's civil society consists of an organization that has the potential of rational self-regulation and freedom and not just a sphere of individual needs. 'For Gramsci, Civil society is the primary political realm, the

realm in which all of the dynamics of identity formation, ideological struggle, the activities of intellectuals and the construction of hegemony takes place' (Gramsci 1992). Thus, civil society is a part of the political realm and acts as an instrument to continue or maintain this hegemony (Gill 1994). Gramsci emphasized a strong relationship between state and civil society and argued that civil society exists between economic structure and the state with its legislation and coercion (Fink 2010).

The Parliamentary Standing Committee on Agriculture states that the objection raised by CSOs against Bt cotton have been 'speculative, confusing and without any reasonable assessment of technological strength'. So, in case of Bt cotton in India real problem is not technological but lies in not being able to ensure institutional and actor cooperation to preserve environmental security to assure sustainable agriculture. The civil society organizations have opposed on the grounds that bio-safety assessment of Bt cotton before its introduction and post release monitoring of it were not adequate. Secondly, Bt cotton was not suitable for cultivation for rainfed areas. Lastly, cattle death and farmers' suicides were attributed to introduction of Bt cotton in some regions countries (Government of India 2012).

Although supporters of Bt cotton claim that during the post–Bt cotton era, the area under cotton cultivation and productivity have increased significantly because of the use of Bt seeds for effective control of bollworms. So, this creates a conflict of interest of opponents such as CSOs and supporters such as seed companies. Thus, in this situation of speculative and confusing interests, there is a need for strong political will, and clarity of purpose is required to voice the interest of the farmers. CSOs clearly differ in their views as they have different roles. There is an obvious difference between CSOs established at the local level and at the national level as local organizations are given roles in organizing and commenting at the local level and vice versa. Most commonly, CSOs work toward sustainable agriculture, which is common to all CSOs, but a common view has not materialized; because of this, the views of CSOs differ, causing the actions of these CSOs to differ.

10.3 Conflicting Interests and Ideologies

10.3.1 Navdanya, New Delhi

Navdanya, a participatory research initiative started as a programme of the Research Foundation for Science, Technology and Ecology, was founded by Dr. Vandana Shiva. Navdanya is responsible for nonviolent farming, which protects biodiversity, Earth, and small farmers. Navdanya means nine crops that represent India's collective source of food security. The main aim of the Navdanya biodiversity conservation programme is to support local farmers, rescue and conserve crops and plants that are being pushed to extinction and make these crops available through direct marketing. Navdanya is actively involved in the rejuvenation of

indigenous knowledge and culture. It has created awareness of the hazards of genetic engineering, defended people's knowledge from biopiracy and promoted food rights in the face of globalization.

Navdanya's mission focuses on improving the well-being of small and marginalized rural producers through nonviolent biodiverse organic farming and fair trade. Biodiverse organic farming produces more food and nutrition and brings higher incomes to farmers than monocultures and chemical farming. While avoiding environmental harm, biodiverse organic farming is also insurance in times of climate change.

10.3.2 Gene Campaign, New Delhi

Gene Campaign was founded by Dr. Suman Sahai in 1993; it works for nutrition, food and livelihood for all. Gene Campaign mission is to work for a just and equitable policy framework and research incorporating traditional and modern science to enable sustainable agriculture, self-reliant farmers and food for all.

Gene Campaign is a research and advocacy grassroots-level organization committed to achieving food security and sovereignty. Started in 1993, the focus of Gene Campaign's work is the food, nutrition and livelihood security of rural and tribal communities. To achieve this, Gene Campaign works to conserve the genetic diversity of important crop plants, making small-farm agriculture sustainable and adapting it to climate change. Also, it is trying to fight malnutrition by increasing dietary diversity using underutilized crops and reviving forgotten traditional cereals, fruits and vegetables.

Gene Campaign led the national campaign on seed patents and worked with the government to ensure that the country frames a law on farmers' rights, the only country in the world to have done so. It continues to be active in the field of IPRs and legal protection of indigenous knowledge to ensure that the rights of rural and tribal communities are protected. It is active in advocacy on laws and policies related to biodiversity, research and education and to food, agriculture and livelihoods. Gene Campaign's field research in dry land areas such as Jharkhand and Uttarakhand provides a model for improving food production and protecting farmers against the worst impacts of global warming and climate change.

The benefits and risks associated with the commercialisation of GM crops are a matter of concern at both national and international levels and continue to be debated by CSOs. The expected benefits comprise an increase in crop yields, reduction in the use of pesticides and herbicides and corresponding decrease in environmental pollution, and improvement in the nutritional content of some crops (Pinstrupp Anderson 2000). The expected risks consist of risks to human and animal health because of the appearance of allergens, toxins and carcinogens in GM food and feed and ecological and other environmental risks that could arise from cross-pollination between indigenous wild relatives and GM crops, leading to loss of biodiversity. Further, the income of farmers may decrease because of the

trade consequences of GM crops. As mentioned by Navdanya, 'Costs of production, which includes hybrid and genetically engineered seeds, chemicals and irrigation etc., are increasing with every season pushing farmers into the debt trap and also to suicides' (Interview by the senior officials of Navdanya and Gene Campaign). One drawback of GM crop technologies created by private companies is that they restrict technology transfer to poor farmers because of the privately held property rights. As far as cotton cultivation in India is concerned, it has been plagued with rising costs of cultivation, ineffective pesticides and adulterated seeds. This has led to consecutive crop failures and heavy indebtedness, causing farmer suicides in India.

10.4 Introduction of Bt Cotton in India

The present stagnation on the agricultural front is primarily caused by the technical backwardness of our agriculture; the adoption of science and technology could transform agriculture from predominantly a traditional way of life to an industry. Bt cotton is genetically engineered cotton that contains genes taken from a soil bacterium (*Bacillus thuringiensis*) (Shiva 2009). Bt cotton has promoters that create high doses of toxins, which are released in all parts of a plant during the entire life span of the crop. The principal aim of these toxins is to control bollworms, widespread cotton pests. Since 1998, Monsanto-Mahyco has been engaged in Bt cotton field trials in India (Sahai 2012a).

In 2002, the GEAC of the government of India gave clearance for the commercial planting of three Bt cotton varieties in seven states. In 2002, the government allowed Bt cotton to be grown commercially (Raghuram 2002). Bt cotton was the first GM crop in India; it was cleared for use on the ground that it would not require pesticides, which would help to increase yields and thereby farmers' income. But, none of these promises was fulfilled, as shown by a study undertaken by the Research Foundation for Science, Technology and Ecology (Shiva 2001).

Bt cotton is based on technology that will work with reasonable success in many countries, but it will not work in India (Sahai 2002). Its irrelevance to our small farmers is the crux of resistance to its introduction here. Another reason why many have opposed the introduction of Bt cotton here in India is that it belongs to Monsanto. Monsanto has a record of prosecuting farmers for technology infringement and harassing them with lawsuits (Scoones 2005). Using the proprietary technology of Monsanto will have significant implications in the field of IPRs because their policies are in conflict with Indian law. Thus, Bt cotton was never developed for agriculture in the tropics. It was developed for countries such as the United States, where pests are limited — chiefly one kind of bollworm, the green bollworm, against which the Bt toxin works. Bt toxin has no effect on the other bollworm, the pink bollworm, which is a major cotton pest in India.

Let us examine the differing views on the introduction of Bt cotton in agriculture in India by the two CSOs selected for the present study: the Campaign and Navdanya. According to a senior official of the Gene Campaign,

> Bt. Cotton was introduced in agriculture in India to control the harmful effects of pest. But, this was not a sound reason. As biologically pest cannot be controlled through single pest. Pressure was from the Monsanto to bring Bt. Cotton in agriculture in India. Countries like India that have food security concerns and have small and marginal farmers practicing an integrated type of agriculture have specific problems for which they seek solutions. GM technology has been developed for the large landholding, mechanized agriculture of industrialized countries (Interview by the senior officials of Navdanya and Gene Campaign).

According to a senior official of Navdanya,

> For some it was hardly justified the introduction of Bt. Cotton in India other than the profit motives by Monsanto and Mahyco. There are other easier solutions to crop loss or productivity decline than the introduction of gene technology like sustainable agriculture techniques, for example, natural pesticides, better water management, multi-cropping.

The United States has been engaged in spinning millions of dollars of profits by freely taking advantage of the biological adversity of the Third World. At the centre of the patent and IPRs issues is profit, but at the centre of the protection of rights to life is human rights, which are threatened by the new biotechnologies. The economics of Bt cotton cannot work in India as farmers have to set aside 20 % of landholdings as an insect refugium. Also, spraying of pesticides will continue as there are many other cotton pests besides bollworm; the pest attacks are far more intense and the number of insects per acre will be far higher in tropical countries than in colder countries.

Monsanto suggests farmers spray pesticides on their farms if they exceed a certain limit. The GEAC has stated that Bt cotton is not recommended for small farmers but in the past few years scientific establishments have argued that Bt cotton was crucially needed to provide a good cotton variety to small farmers to stop the tragedy of suicides resulting from the farming of cotton. So, if GM technology is not useful for small farmers, then the sociologically significant question is who the people are who are supporting this technology. It is necessary to have regulation and monitoring of GM crops for maintaining transparency, but Indian officials have decided not to have even a pretence of objectivity or transparency. It was found that Monsanto itself will be monitoring its performance, but whether it is realistic that the company itself will indicate failure is questionable; for example, the company probably will never report that the insects have developed resistance or that their variety of cotton has failed.

10.4.1 The Case of Monsanto and Mahyco

Patents are supposed to reward creativity (Cahoon 2007). However, MNCs such as Monsanto are using patents to create a corporate police state. As mentioned, Bt cotton was promoted by a joint venture between a local seed house, Mahyco, and a US-based MNC, Monsanto, and was formally released in 2002, following a drawn-out regulatory approval process. Permission for commercial cultivation of Bt cotton was given for six states: Gujarat, Maharashtra, Madhya Pradesh, Andhra

Pradesh, Karnataka and Tamil Nadu. A field study conducted by Gene Campaign in Andhra Pradesh and Maharashtra regarding the performance of Bt cotton found that it had performed poorly. Common complaints were that the bolls dropped off before maturing and the bolls were smaller in size, which resulted in lower yields. The study conducted by the Gene Campaign (Sahai and Rehman 2004) found that farmers also suffered losses because of the poor quality of Bt cotton.

Indeed, local hybrids, which were not Bt, usually performed better than Bt cotton as these non-Bt cotton varieties yielded about 15–17 % more than Bt cotton. 'Demand in the market was higher for non-Bt. Cotton than for Bt. Cotton because of better quality. Consequently non Bt. cotton fetched a higher price, ranging from Rs. 2,200 per quintal to Rs. 2,350 per quintal whereas Bt. cotton fetched only Rs. 2,000 to Rs. 2,100 per quintal' (Sahai and Rehman 2004:3). It became clear that the economics of cultivating Bt cotton were not in favour of farmers, primarily because the Bt seed is about four times more expensive than the good local cotton hybrids available to farmers. The first GM cotton harvest clearly showed that Bt cotton did not protect against the main cotton pests as promised by Monsanto. There was no great saving in pesticide use as Monsanto claimed as Bt cotton varieties grown in all six states mentioned were attacked by a variety of pests; the farmer had to keep spraying pesticides to control these pests. Let us examine the causes of Monsanto's failure. A number of factors are responsible for the failure of Monsanto's Bt cotton. The first is the poor quality of the cotton varieties used. It is known that MECH 162 and MECH 184, which were transformed to Bt 162 and Bt 184, respectively, are poor-to-modest performers (Ramanna 2005). The economics of Bt cotton are unfavourable for the farmer because of the expensive seeds and modest pesticide savings. Further, the fact that Bt cotton must be grown with refugia makes it increasingly nonviable, especially for small farmers. A further problem is the fact that Bt cotton does not protect against the pink bollworm, which is a significant cotton pest in India. If this is indeed the case as the study demonstrated, then the Bt strategy for cotton is likely to fail because if the Bt toxin protects only against the green bollworm and not against the pink bollworm, then farmers will have to continue pesticide spraying. In addition, the way Bt cotton was approved by the GEAC requires critical examination.

The MNCs (e.g., Monsanto) enforce their patents through technology agreements. Monsanto prevents farmers from selling or supplying the seed or material derived from their crop to any other person or entity and prohibit saving the seed. According to the agreement, a 'technology fee' over and above the price of seed and royalties is charged. If any clause is violated, the grower has to pay 100 times the damages, and this is not deemed to limit the amount of damages. Monsanto has a right to visit the fields of the farmer any time for 3 years after the agreement, even without the farmer being present or receiving the farmer's permission. Thus, even the farmer's property right is not respected. This clause has made farmers extremely outraged. The agreement is binding even on heirs and personal representatives or successors of growers, but the grower's right cannot be transferred without Monsanto's permission. Thus, Monsanto's rights exist above others related to the

farmer, but the farmer is denied his or her right to transfer the agreement. In addition, the agreement has no liability clause.

The agreement has no reference to the performance of the seed, and Monsanto has no responsibility in case the seed fails to perform as promised or for the ecological damage caused by it. Lastly, the Roundup-Ready Gene Agreement is the latest step in the seed industry's claim for far-reaching monopoly rights over seeds and farmers and bearing no ecological or social responsibility associated with the introduction of herbicide-resistant or pest-resistant genes into crops. It clearly illustrates a lack of rights for farmers. Thus, this can neither protect biodiversity nor provide food security. The worst aspect of GM seed patents is that farmers who are victims of contamination are sued for theft instead of being paid for the consequences of pollution. According to a senior official of the Gene Campaign, New Delhi,

> The technology creates only private goods that can be accessed only at significant cost (a bag of Mahyco-Monsanto's Bt. Cotton seeds in India costs Rs. 1,600 as compared to between Rs. 300 to Rs. 400 for superior varieties produced locally). Despite its faults, the Green Revolution addressed farmers' needs and India's food production showed an upward curve. There was huge amount of spread of Bt. Cotton in India. In 2003-04, Bt. Cotton was doing badly but after that it did well. So, it created craze among the cotton growers in India but farmers did not realize the aspect of the cost of Bt. Cotton. Cotton production has gone up due to the introduction of new varieties of cotton in the market but as far as Bt. Cotton is concerned, it increases the cost of growing cotton as every time new seeds should be purchased by the farmer, i.e. they cannot use the seeds for the next time besides the cost of growing refuge. So, there is a big dispute (Interview by the senior officials of Navdanya and Gene Campaign).

The MNCs such as Monsanto genetically manipulate seeds to obtain control over the seed sector, not to help farmers (Shiva 2002). Prior to the agreement, in November 2001, Monsanto had used the same GEAC to order the burning and destruction of 11,000 ha of cotton planted in Gujarat under the Navbharat, with 151 varieties found by Monsanto to have the Bt gene. The GEAC recommended the destruction through burning of the standing cotton crop on the ground because of its potential to cause an irreversible change in the environmental structure of the soil and a danger to the environment and human health and to obviate any possibility of cross-pollination; also the precautionary principles would require that no product with unknown effects be put in the market stream. Specifically, on the issue of commercialisation, the GEAC (cited in Sahai and Rehman 2004) stated that the cotton, which appears no different from any other cotton, would intermingle with ordinary cotton, and it will become impossible to contain its adverse effect.

The only remedy was to destroy the cotton and the seeds produced and harvested in this manner. So, if the destruction of the Gujarat cotton was performed on grounds of biosafety, then it was related to intellectual property monopolies of destroying seeds sold by a competitor. Monsanto used the GEAC to destroy the crop on the grounds of biosafety. It also used GEAC to obtain its own biosafety clearance for Bt cotton. However, if Monsanto's Bt cotton was now deemed to be safe, then Navbharat's Bt cotton would have to be declared safe, and hundreds of Navbharats would multiply and sell Bt cotton seeds, undercutting Monsanto's

market monopoly. To prevent competitors from selling seeds and to prevent farmers from saving seeds, Monsanto now turned to patent laws to obtain monopoly rights. The Monsanto amendments to India's patent laws are a logical consequence of the clearance for the commercial planting of genetically modified organisms (GMOs) in Indian agriculture. Also, the emergence of resistance in pests like the bollworm and creation of superpests are other inevitable consequences of Bt cotton because superpests spread through wind or pollinators, and farmers will be forced to turn to Monsanto for a seed supply, hence trapping them in Monsanto's patent monopoly. So, these issues should be raised so that India's farming community and cotton industry will not be enslaved by Monsanto.

10.4.2 Reduction in Pest Attacks and Low Input Costs

Bt cotton was the first GM crop in India. Bt cotton was cleared on the ground that it would not require pesticides, which would help to increase yields and thereby farmers' income by reducing input costs. But, the literature suggests that Bt toxin targets only the bollworm complex, comprising the American bollworm, the spotted bollworm, the spiny bollworm, and the pink bollworm (Sahai 2012c). The Bt toxin Cry1Ac, approved for commercialisation, is particularly specific to American bollworm, which attacks the plant after 60 days of sowing. The pink bollworm attacks the plant after 130 days of sowing, the time of the first picking. Although Cry1Ac has only a moderate effect on the pink bollworm, none of the Mahyco hybrids has any impact on pests such as thrips, aphids and jassids, which attack the plant during its early phase. Thus, while the number of sprays against the bollworm could decrease, there may not be a reduction in the use of pesticides against the other pests.

For Gene Campaign, it was not introduced to increase farmers' income by reducing input costs through minimizing pest attacks; rather, it was introduced by Monsanto and Mahyco for a different motive as Indian agriculture provides a huge market and is of significant interest to these companies. Because a major portion of seeds come from farmers, if Monsanto provides a portion of the seed, then it can control Indian agriculture to derive a profit in the form of royalties. Organizations such as Navdanya believed that it was just to make a profit, not to feed the world through sustainable agriculture. Monsanto claimed that because of the use of Bt cotton, pests are more controlled in comparison to the indigenous variety. But, Gene Campaign's view was that Bt cotton was not introduced in Indian agriculture to increase farmers' income. Rather, it was introduced for the profit of Monsanto and Mahyco, which control a large portion of the Indian seed market so they are likely to influence the government for their interest. Similarly, Navdanya viewed Bt cotton as not introduced in Indian agriculture to increase farmers' income but to serve the profit motive of Monsanto and Mahyco. In the report 'Cultivation of Genetically Modified Food Crops — Prospects and Effects' (Government of India 2012), Monsanto claims that its share in the seed market is just 6 % in the case of

Bt cotton and that the largest player in India is Naziveedu seeds, which has a 20 % market share. There are also other players, such as Namdhari, Vibha, Ankur, Mahyco, Rasi seeds, Krishi Dhan and others. In the report, Monsanto claims it is not a major player. But, as mentioned previously, Dr. P. M. Bhargava, indicated that India largely deals with Monsanto, indicating that Monsanto is a major player in India. Bhargava added if a list of unethical companies in all the areas of industry around the world were made, then Monsanto would be number one on the list. Plus, he said, 'It is known for bribing, for example, in Indonesia and also Monsanto is also known for hiding data, falsifying data and presenting wrong data'. He suggested not putting a permanent ban on the release of all GM organisms but rather adequately testing them (Government of India 2012).

10.4.3 Resistant Pests and Refugia

The GEAC put forth certain conditions for the cultivation of these Bt varieties that are supposed to protect against the pest bollworm, but these conditions are often misguided in favour of the MNCs. The most important condition is that Bt cotton must be grown with an 'insect refuge' of 20 % non-Bt cotton, which implies that fields of Bt cotton have to be surrounded by non-Bt cotton (Sahai 2012b). This is essential so that the bollworm can feed partly on nonpoisonous, normal cotton and remain susceptible to Bt toxin. Otherwise, similar to the way mosquitoes developed resistance to DDT, the bollworm will quickly become resistant to Bt toxin and crops will fail. The refugia created by farmers were not monitored by any regulatory authority, and Mahyco and Monsanto completely abdicated their responsibility in this regard. Bt cotton pollens can transfer themselves to cotton in adjacent fields, raising serious concerns about the possibility of genetic pollution.

10.4.4 Farming Community and Debates on Agricultural Biotechnology in India

The claim is that Bt cotton will double cotton production in India, thus increasing farmers' income; the reality is far different. Bt cotton is increasingly a risky investment for small farmers because of the high-input requirements, particularly in rain-fed areas, which constitute a majority of the cotton-growing area in India. The depletion of nutrients and soil health are also related problems (Chakrabarty 2011). Because of repeated cultivation of Bt cotton hybrids, which draw more nutrients and water from the soil, there has been depletion of nutrients in the soil. There is no sustained reduction in pesticide usage; the experience of farmers clearly showed that although fewer pesticide sprays were required in the first 2 years of Bt cotton adoption, thereafter the pesticide requirement increased. Now, the number

of pesticide sprays required is equal to or more than that in the pre–Bt cotton period. Officials of Gene Campaign also stated that Bt cotton is an expensive technology because pests become resistant to the toxin, as was the case for mosquitoes and DDT. So, before introducing it in the fields there must be a socioeconomic analysis of the impact of GM seeds. This introduction also undermines the history of agriculture, which is based on the exchange of seeds. Similarly, Navdanya also does not support Bt cotton and views that it has caused more harm to agriculture than it has produced good, such as a decrease in farmers' suicides (Shiva 2006).

It is important to note that Indian farmers have no idea what Bt cotton is or what GM crops are. Bt cotton is not economically viable under Indian conditions as farmers, because of heavy pest attacks, had to resort to frequent spraying of their fields. Even Monsanto itself has sprayed several times in its experimental plot, which clearly shows that the cotton fails to fulfil its own promise to provide a solution for heavy pest attacks. Therefore, it has a negative effect on the farming community in India because the farmers' rights are not protected, as Gene Campaign rightly pointed out regarding undermining the history of seed exchange and genetic selection. Moreover, it has brought more harm to the farming community in India, such as farmer suicide, as mentioned by the officials of Navdanya.

Also, if we want to increase the production of cotton, then the import of cotton should not be promoted; instead, the government should provide a subsidy to promote export of cotton from India. In addition, importing anything is not right as it causes hazardous through CO_2 emissions and does not support sustainable economic growth. Officials of Gene Campaign view that importing should not occur if we want to promote cotton production in our country. Instead, government should provide a subsidy to promote the export of cotton through minimizing the economies of scale of cotton production.

10.4.5 Public Policy and Bt Cotton in India

Agriculture in developing countries is rural based with a majority of poor people dependent on it. Hence, any technology that would result in a decrease in cost or improvement in crop yield will be highly valuable. Note that biotechnology innovation has several useful applications in agriculture, but when these innovations are protected by IPRs, then their implications are different. Traditionally, technical change has occurred on the farm, but these changes were omitted from intellectual property protection. During the Green Revolution (GR) period in India, many hybrid and high-yielding seed varieties were introduced, but these were the types of seed varieties that can be replanted each year; these seeds were not protected by any IPR measures, which made the GR successful. It was only after the Uruguay round of talks in 1994 that IPRs were extended to agriculture, mostly because of the insistence of developed countries, although some form of protection already existed in number of developed countries (see Qaim 2001; Lalitha 2004).

The New Agriculture policy of the government is promoting export-oriented agriculture, and food-producing crops are now being brought under cultivation of flowers and vegetables for export purposes (Shiva 2008). Thus, there are changes in agricultural policies that cause a shift in land use patterns, cropping patterns from food to flowers, and promotion of the importation of crops as indicated by Shiva in talking about globalization and the destruction of food security.

Trade liberalization and globalization lead to the entry of several private seed companies in proprietary seed production based on modern biotechnology (Shiva 2004). These seed companies promise to increase crop yield, but they have failed to overcome the undesirable consequences for the environment caused by GR technology. As a result of globalization, farmers have lost their rights to seed controls, and MNCs such as Monsanto and Mahyco have gained them. This has resulted in a huge agrarian crisis and farmers' suicides due to indebtedness caused by crop failure, and the most prosperous state, also called the breadbasket of India, Punjab, has ahead of Andhra Pradesh in the notorious distinction of farmers' suicides (Shiva 1993). The proposal is to replace the small peasant- and farmer-based agricultural economy of India with agribusiness-controlled industrial agriculture (Mallick et al. 2011; Dogra 2012). This shift is associated with a transformation of farmers as breeders and reproducers of their own seed supply to farmers as consumers of propriety seed from the seed industry. It is also a shift from a food economy based on million of farmers as autonomous producers to a food system controlled by a handful of transnational corporations (TNCs) that control both inputs and output. Farmers' rights in the context of a monopolistic control of the food system become relevant not only for farming communities but also for consumers. They are necessary for survival of the people and for survival of the country.

Conclusion

Thus, it is important to recollect the roles and agendas of CSOs at both national and international levels in a new way to identify a shared perspective between CSOs through collaboration. The European Union and many developing countries are of view that before GMO products are approved, they must be subject to rigorous scientific risk assessment (Kloppenburg 2004). Many developing countries lack a regulatory structure to approve agricultural biotechnology products; for this reason, they have tended to favour the EU approach that applies precaution in the face of scientific uncertainty. European Union and many developing countries approach towards the potential risk of GMOs are much more precautionary as it views the potential risks such as weeds and allergens, greater than the potential benefits. They also suggest that full potential risks associated with gm products should be evaluated prior to their approval. It is sad that the politics of biotechnology in developing countries are played out through food aid, whereas many developing countries (e.g., Africa, Zimbabwe, etc.) have rejected aid. For example, the Zambian president expressed his concern that GM food aid was 'poison', stating: 'If it is safe, then we will give it to our people. But if it is not,

(continued)

then we would rather starve than get something toxic' (quoted in Dynes 2002:12). That the United States continues to insist on giving its food aid in kind rather than in the form of cash suggests that an inability to find export markets for its GM grain. So, the possible risks that may arise because of the cultivation of a hybrid variety compared to the traditional variety are lack of information and incomplete knowledge about new technology, weather and agro-climate-specific shocks, water-level fluctuation, certain pest attacks and, lastly, HYV seeds involve greater use of fertilizers and other purchased inputs (Saha 2001). The negative impacts of Bt cotton are being clearly articulated, such as nutrient depletion, negative impact on soil health, pest resistance or emergence of new pests; these are showing serious impacts on the cotton crop and the farmers.

According to Navdanya, Bt cotton was introduced in India for a profit motive by Monsanto and Mahyco, and Navdanya firmly rejects introduction of Bt cotton and supports sustainable agriculture instead of gene technology. Bt cotton does not help to increase cotton production compared to local varieties because it increases the cost of growing cotton as farmers have to purchase seeds every time they plant in addition to the cost of refugia. Organizations such as Gene Campaign claim members are scientists as they take evidence from the field and claim that Bt cotton should be introduced only after proper scientific testing so it can bring good to small farmers. Thus, we cannot make a permanent ban on Bt cotton, but it should be adequately tested. It has to be emphasized that we cannot neglect the use of biotechnology to meet the need of a growing population. Farmers need to be trained for seed production of GMO varieties so that seed does not become the monopoly of multinational corporations, but such seeds should be introduced only after proper testing.

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Chapter 11
Revival of Crafts and Social Change: Case Study on Dholka

Smriti Saraswat

11.1 Introduction

Innovation is the impetus for social change. But, the challenge lies in meshing new ideas with the established beliefs and practices and introducing innovations that are embedded in the ethos of the end users. It is crucial to establish the meaning(s) of or an understanding for the words – 'craft'; 'craftsperson'; 'craft revival'; 'social change'; and 'innovation', before taking up this research. In the context of this chapter, the term 'craft' refers to the 'making' of something and the 'process (es)' involved in it. It could be any activity which requires particular sets of skills; rested in knowledge systems practiced from generations together; employs good craftsmanship while aims at unique product. Wood craft, glass-blowing craft, stone craft, inlay craft, metal craft are to name a few. 'Craftspersons' are the people who have the skills for varied kinds of crafts. They are also referred as 'craftsmen' and 'craftswomen'. Nowadays, such people are also addressed as 'artisans'. 'Craft revival' refers to revitalization or rebirth of a craft which may be in the state of decay or extinction because of varied reasons – lack of technology; not meeting contemporary market demands; constant up-gradation missing in the product range; method and process involved not improved; and, lack of awareness for policy incentives and government schemes (Designers meet Artisans: A practical Guide 2005). 'Innovation' deals with up-gradation of tools and machines; enhancement in the methods and processes of working; and value addition in the existing products (Arthur et al. 1997; Mckeown 2008; Johnson 2001; Janszen 2000; Schumpeter). Social change in this context implies sustenance of the craft cluster; better work efficiency; increased production; better income; and improved standards of living

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for the craftspersons (Kuhn; Heraclitus – Everything flows; Veenhoven 1988a, b; European Commission 2011).

This research is primarily motivated by the observations that the vast repository of craft forms has constantly faced annihilation (especially, in India), and the countless craftspersons have been finding it difficult to earn basic living (Ruskin; Morris; Chattopadhyaya; Coomaraswamy; Jaitly; Dhamija). The chapter tries to substantiate that 'innovation' has the potential of being a powerful tool or medium that can pivot reviving these crafts to bring social change. Further, the chapter emphasises on the fact that innovation is not simply about science and technology but it also impacts the culture and the way of life (Ogburn 1922). Many innovations fail because either they are not accepted by a community or a society (Chan 2011). Hence, it is important to recognize the needs and aspirations of the end users, and ensure that the innovation reaches them.

According to Schumpeter, as cited in Janszen (2000), 'Innovation is defined as the commercialization of all new combinations based on the application of: new materials and components; introduction of new processes; the opening of new markets; and the introduction of new organizational forms'. Janszen has also explained that 'Innovation Arena' consists of four key aspects – technology, applications, market and organization combinations.

11.1.1 Craft Revival: Need and Importance

Crafts had been endowed with an extraordinary focus on visual arts whereas crucial part of discourse during the Arts and Crafts Movement was centred at many socially driven initiatives associating with traditional knowledge, skills, repository of materials, workmanship, modes of production, sustainability and livelihood. As several craft forms are on the verge of decay, their revival has always been a critical agenda. Craft, especially in India, is not only about mechanical processes or an end-product; it has deeper meanings and associations influenced by narratives of spirituality, religion and everyday life. Every craft is a panorama, depicting a 56 historical background, story of evolution, growth and spread, skills being transferred from one generation to another, variations with the passage of time, tools and techniques, environment and people (Sennett 2008). It is not an object for museums or exhibitions. It has a soul to it. 'Crafts that are viewed in museums have lifelessness about them and those sold at exhibitions are part of a stimulated exercise. Being made and used in their unique context provides them relevance, and the faces and hands of those who craft them are, for me, far more important than any inanimate pedestal on which they may be placed'. (Jaitly 1990)

Crafts play important roles in creating unique identity and culture of a country. Craftspersons have profound understanding of local materials and indigenous styles, which contribute to define the sense of a place. 'Craftspeople contribute their knowledge of local materials, giving form to human experience. Their visual and tactile connections with the land and with cultural ideas help to define the sense

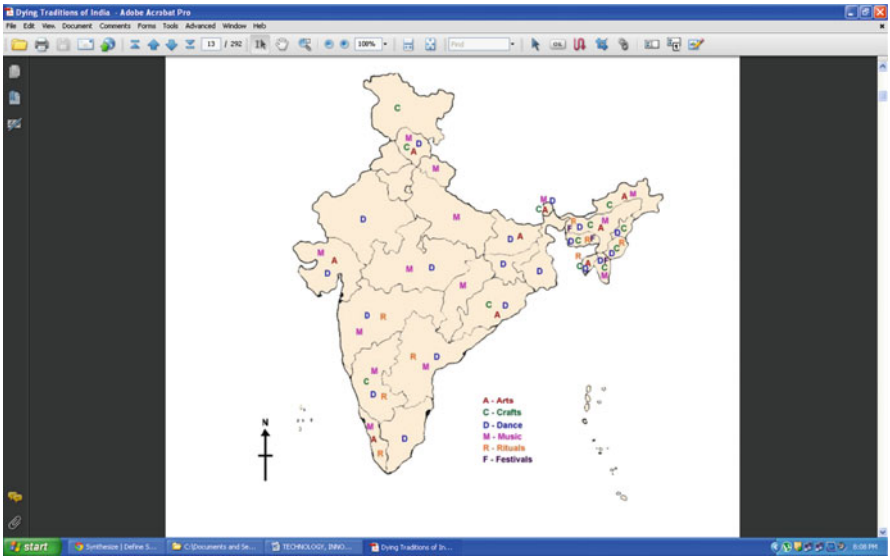
of place. The role of craftpersons in reviving cultural integrity and stimulating development and independence among small groups and communities throughout the world is profound'. (Inglis et al. 1999)

Crafts come under the category of creative or cultural industries (Howkins 2001; Florida 2002; Nielsén 2006; UNESCO 2009). They are among the most dynamic emerging sectors in world trade, and it is important to know how craftspersons and communities operate and constantly revive their craft; adopt innovation; and become catalysts of social change. Creative and cultural industries are increasingly playing significant role in our regional and national policy making. They have not only become the driving forces for technology and innovation but they are also impacting our lives. According to European Commission's Green Paper on unlocking the potential of cultural and creative industries, creativity and innovation have a strong and distinctive regional dimension (European Council 2010). Policies and support instruments need to be determined locally, building on local specificities and assets and tapping into local resources ('place-based development approach'). Creating an impetus for innovation, the crafts-based dialogue are instrumental in bringing forth the designs that are innovative while maintaining the characteristics of the original concepts of making with local resources, employment opportunity for others, while improving the standard of living of craftspersons.

The Report of the Indira Gandhi National Centre for Arts made under UNESCO'S Programme on Cultural and Copyright Policies and Partnerships stresses on the fact that it is an extremely difficult and challenging task to understand the needs of 16,900,000 Indian craftspersons, and that there is an acute need of involvement of people from diverse fields to nurture and flourish crafts (Indira Gandhi National Centre for the Arts, date not available).

There is also an urgent need to amalgamate technical expertise and innovative ideas for the survival of these crafts (Singh et al. 2009). 'If we are to advance from our present sorry state, we need to clarify the role of all our cultural forms, including the crafts. . .helping us to integrate (machines) into our way of making and thinking'. (Greenhaigh 1997 cited in Alfondy 2007).

According to Yair et al. (2001), 'Crafts knowledge may constitute a powerful strategic design tool when, it is managed appropriately and recognized as a unique amalgamation of cognitive, social and technical skills rather than a purely aesthetic resource'. Therefore, crafts should be understood beyond the production of aesthetic objects. There are several layers to them. By integrating appropriate technology and innovation, significant changes can be brought in them which can finally lead to Sustainability and important social changes (Sabadie 2013).



Note: Cultural Mapping of India as represented by Indira Gandhi National Centre for Arts

The craft cluster is a successful example where craft revival through innovations may be looked as an important measure for social change. It provides useful perceptions and means to understand how innovation influences in social change.

11.1.2 Policies of Government of India for Revival of Crafts

The Craft Economics and Impact Study (CEIS) of the Crafts Council of India (Chatterjee 2012) highlights the importance of crafts to achieve social and political stability, the role of women in key processes (also discussed in Hasalkar and Jadhav (2004)), hereditary patterns as well as new mobility, considerable dynamism in adapting to change (also discussed in Lall 2000), and changing patterns of remuneration (despite dominance of piece-rate payment), entrepreneurship and skill within the craft communities.

The Government of India in 2007 has explained its vision to provide wider base for design development, design promotion and partnerships across many sectors, states, and regions for integrating design with traditional and technological resources (Press Information Bureau, Government of India 2007).

It not only proposes to emphasize exports but also on retaining the rich craft traditions, cultural heritage, embedded in the ethos of the communities, craftsperson. Similar importance was also given in the approach paper to the Twelfth Five Year Plan (2012–17) to faster, sustainable and inclusive growth with various arts and craft traditions (Government of India, Planning Commission (2011)).

11.2 Woodturning and Lacquer Craft of Dholka in Gujarat

11.2.1 Dholka Cluster[1]

This study is based on the filed exposure gained while working with Design Innovation and Craft Resource Centre (DICRC) at CEPT University, Ahmedabad. Dholka or Dholaka is about 40 km at the southwest of Ahmedabad city of Gujarat State of India. Agriculture, production of cotton textiles, cotton ginning and pressing are the major occupation of the residents of this place. The craft of woodturning and lacquer work is also dominant in this region. The cluster has about 27 workshops. The chapter focuses on the three oldest workshops owned by Kannubhai Mistry-Mannubhai Mistry, Viren Vinod Mistry-Anilkumar Himmatlal Mistry, and Neeravbhai Mistry engaged in wood turning and lacquer workshops[2] (illustration showing the workshop on the next page) and make products on large scale. These craftsperson belong to the *Wada* community. About 30 persons are directly employed in these workshops including women. Women are generally involved in the process of decorative painting on the objects.

11.2.2 The Craft

Woodturning and Lacquer Craft is a traditional craft of India which dates back to antiquity. According to Mahdihassan (1986), 'Wooden objects on a turnery can receive a coating of lac as lacquer. This art must have been known even in ancient India, for Panini (500 B.C.) uses the word Jatu = lac (the resin) and Jatusa = lacquer (lac applied to wooden objects in a turnery)' (188–189).

This craft is practiced in many parts of India though the history or evolution would be different in each location. . In Dholka, this craft has evolved out of ritualistic connotations. Craftspeople here are majorly involved in the making of *ghodiyo* as a principal product along with some seasonal items such as *Dandiya* sticks and small drums. A *ghodiyo* or *ghodiyu*, as it is popularly known in Gujarat, is a traditional crib frame or a cradle for the babies made of *Bavla or Babool* (teak wood) sourced from Kheda district, near Ahmedabad. Wood is first turned on a lathe, and after a series of subsequent steps, a coating of lacquer is applied on it. Mahdihassan (1986) explained, 'Lac, which is called *laksa* in Sanskrit, first appeared in Atharvaveda (around 1500 B.C.). Panini refers to call lac *Jatu*, a

[1] Source: Unpublished monograph of DICRC.

[2] Richard Sennett in The Craftsman explained "The workshop is the craftsman's home. Workshops present and past have glued people together through work rituals, whether these be a shared cup of tea or the urban parade; through mentoring, whether the formal surrogate parenting of medieval times or informal advising on the worksite; through face-to-face sharing of information. In theory the well-run workshop should balance tacit and explicit knowledge."

genuine Sanskrit word signifying an adhesive. Lac applied to an object in turnery would be lacquer and was called *Jatusa*' (187).

The entire process of woodturning and lacquer craft is divided into 11 stages:

1. Storing
2. Cutting
3. Turning and Shaping
4. Sand-Papering
5. Lacquering
6. Polishing
7. Painting
8. Varnishing
9. Assembly of Elements
10. Packaging/Storing
11. Transporting

The wood procured for this purpose generally contains moisture which is unsuitable for turning. Hence it is seasoned and stored for few days and subsequently cut into logs. The square section logs are then chiselled to octagonal section to make suitable for turning on lathe. Various cutting tools are used for turning to achieve desirable curves and shapes. Later, sand paper is applied to smoothen the surface. At this stage, the wood is ready for application of lacquer. Lacquer preparation also takes some time. Lac, available in compact discs form is mixed with the desired colour adhesive (resin) and chemicals to make it thick and opaque. The mixture is heated till it becomes viscous. This is later converted into dough and then long sticks. The lac sticks are pressed to the turning wood which melts due to friction hence leaving its colour on the wood. The next step is polishing to provide lustre using leather and paraffin oil. This is followed by painting and varnishing usually done by the women.

Different components are made, assembled and checked for mismatch and flaws. The last step is packaging. They follow unique method of stacking at each stage to make optimum utilization of the available space.

11.2.3 Craft Revival and Need for Innovation

Though woodturning and lacquer craft is an indigenous craft practiced in and around Dholka, it no more remained a popular vocation.

11.2.4 Social Change

Most of the work in Dholka is done by hand-machine coordination. The craftsperson understand the significance of tools; machines; their coordination; and above

all, the need for innovations to respond to changing needs and times (Kim and Nelson 2000). Small innovations adopted by this community have resulted in the tremendous improvements in their craft forms and products and hence resulted in higher revenue and better life.

11.2.4.1 Knowledge Systems

Craftsperson possess the skill and knowledge about selection of wood and tools and all the operations. Few prefer blackish raw wood while the others prefer reddish and slightly processed wood. They prefer *sheesham and saghvan* though they are all expensive. As cheaper substitute, they use *babool*.

Hand Tools and Small Innovations –Variety of hand tools are used to cut and shape wood; they include chisels, gouges, hammers, awl and snappers. Hand saws and axes are used to prepare wood for turning. In addition, sand paper and leather are used in the final finishing. These tools have evolved over a period of time, from one generation to the other. (Please refer Appendix 1). Also few power tools are also introduced by them. This has resulted in higher productivity and better finish.

11.2.4.2 Machines

Traditional lathe (*patri*) – The most important machine for wood turning and lacquer work is the lathe. Traditionally, turning used to be carried out simple hand lathes called *patris* made by local carpenters. A bow string was used to turn a rotating axle in the center of wooden lathe. The turning tool was held in the free hand and pressure was added with foot shaping the spinning wood. The advantage of the *patri* is its simple construction and ease of operation. Being a hand-powered tool it does not require electricity to operate. The major disadvantage of this machine is that it failed to keep pace with the market demand, and could not handle new the improved designs.

11.2.5 Innovation by the Community

11.2.5.1 Power Lathe

Increasing market demand led to the introduction of the electric power lathe. The power lathe is fixed at one end (the headstock) and the other end (the tailstock) can be adjusted by shifting the wooden base block. These are connected by a tie member with a sliding lock. The wooden member rotates around a spindle. The head stock consists of a revolving axle attached to two belt pulleys. The belt runs over a pulley mounted on a revolving shaft that is driven by an electric motor. The use of power lathe considerably reduces time of production, as both hands are free

to operate turning tools. Now availability of electricity is not a problem in Dholka. Therefore, power lathes are operational since quite some time. The craftsperson sit on a low seat and use both hands and feet when working the lathe. The motors are placed above the work area on a rigid wooden frame. The motor turns a cotton rope which through a system of pulleys directly turns the wooden member. The tension on the rope is maintained by a system of counterweights. The motor has a stepped wheel which allows for the rotational speed of the lathe to be adjusted. The rope itself is braided into a continuous loop without any knots so it may turn the wood smoothly. These tools have longer handles for more leverage, needed to counteract the tendency of the tool to react to the downward force of the spinning wood being cut or carved.

It is noteworthy that the need for switching to electrically operated lathe emerged out of the needs and understanding of the craft by the craftsperson and not because of any intervention from outside.

11.2.5.2 Other Machines

There are several other small machines that have been adopted by the craftsperson. They have not discontinued altogether using their hands, rather they have been adopting machines to improve the speed of operations. This way customization of craft still exists, and they have not adopted machine-driven mass production strategy.

11.3 Changes and Small Innovations in Traditional Knowledge Systems

Significant changes have resulted by integrating innovation (improved tools, power lathe and other machines) with the existing methods of wood turning and lacquer craft. The major improvements are as follows:

11.3.1 Better Efficiency and Increased Production

Production rate has increased. Moreover products are still customized, unique, and not mass produced. Products are made in different scales, proportion, form, colour scheme, arrangement, assembly and function.

The performance of technology application is described below,

Process/stage	Craftspeople involved and time duration
Storing	1 craftsperson
Cutting	1 craftsperson – one square section to octagonal section takes approximately 1.5 h
Turning and shaping	2–3 craftspeople – depending on the section and proportions it takes approximately 3–5 h
Sand-papering	1 craftsperson – one log takes approximately 5 min
Lacquering	1 craftsperson – one *ghodiyu* requires 40 min
Polishing	1 craftsperson – one log requires approximately 2–5 min
Painting	1–2 craftsperson – one log requires approximately 5 min
Varnishing	1 craftsperson – one log of wood generally requires approximately 2–5 min
Assembly of Elements	1–2 craftsperson – one *ghodiyu* generally requires approximately 15 min
Packaging/storing	1–2 craftspeople
Transporting	1 craftsperson

Considerable times are saved in each stage by using machines as compared to the time taken while using the traditional lathe and hand tools.

11.3.2 Explorations

Generally, the craftsperson make traditional products for selling as well as for personal use. As discussed, the major product is *ghodiyo*. They also make *dandiya* sticks and small drums. Thanks to technology and innovative practices, these craftsperson have started experimenting and exploring newer ways to handle larger and thicker sections of wood. They also experiment with other materials such as bamboo. Power lathe and other machines help them achieve gentle and sharp curvatures, undercuts and successive curves for greater variety of products. The combinations of turned and unturned sections, grooves and forms, new kinds of joinery, and several other permutations and combinations are also tried out. Anilbhai Suthar has designed new products – partition system, shelving system, exhibition panel system, units of a modular display system, staircases, railings and other space-making elements utilizing wood turning and lacquer craft. Technology has enhanced their skills and expertise and unlocked their design capabilities. They understand their own crafts in different dimensions such as space making thus extending the conventional forms for new products.

11.3.3 Easy to Operate

Power lathe operates on a simple rope and pulley mechanism, this improvisation was done by the craftsperson themselves considering their own growing needs and changing demands. In this way, technological innovation has aided their methods of working.

11.3.4 Better Opportunities and Standards of Living

Adoption of innovative methods and application of improvised machines increased productivity to fulfil the increased market demand for larger quantity and new products. This has increased earning of the craftsperson hence the standard of living. Now they are no more skilled labourers. Designers from diverse fields (interior-architecture, product design, toy design, industrial design, arts, installations, craft-design etc.) have also started collaborating with them on several projects. These craftsperson were also approached by various institutes to participate in the workshops conducted by them, and work on a common platform with students as well as professionals. According to Liu and Hwang (2010) 'Creating a learning mechanism for community residents, the audience, and crafts workshops is helpful to the sustainability of local cultures. Continuous learning and innovation is the key for sustainability of local cultures in an open and competitive international market' (p. 403).

This has added to the confidence of these craftsperson.

11.4 Future Possibilities

Following are the possibilities for further improvisation which were explored during the Study.

(a) Improve the lathe: Though power lathe has simplified the operations and enhanced the efficiency it cannot accommodate wooden logs larger than 7 ft in length. This issue needs attention of voluntary organizations, academic institutions, designers.
(b) Usage of other materials: As discussed experiments have already began for usage of bamboo, there also exists possibilities for trying out with other materials with different designs. This will add to newer products offered the market and also improve earnings of the craftsperson.
(c) Aware about current market trends: Systematic research on current market trends is also required to throw challenges before the craftsperson to innovate and explore diverse aspects of this craft.

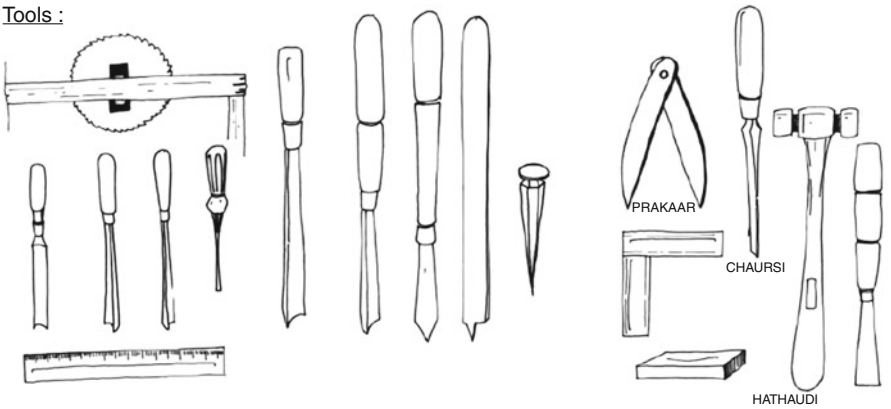
Conclusion
The craftsperson community has adopted incremental innovation, which provides opportunities for radical innovation. The craftsperson community has enhanced and improved their tools and machines, thus creating a new range of products acceptable to the markets. It has also explored different materials that are inexpensive and evolved new processes without losing the originality of concepts. Moreover, now the community has the know-how to handle these innovations on its own. These small steps have enabled them to revive their crafts and bring social change. They have better standard of living. New platforms can now be created for design students to experience hands-on to try out new ideas and innovations. It is crucial to appreciate the relationship between craft revival and social change through innovation.

Appendix 1

Craftspersons' Local Vocabulary[3] for the Hand Tools

Nakhlau (Gouges) – used while turning wood – 1″ blade
Chaursi (Chisels) – for finishing, while turning wood – 1″ blade
Kaus – for supporting sections of wood, while turning them
Sainiyuu – for making grooves
Prakaar (Compass) – for measuring radius, marking
Animaar (Awl) – tool with a long, pointed spike, used for making holes in wood
Hathaudi (hammer) – small and big – used for beating and nailing
Kaanch paper (sand paper) – used for finishing
Sauya – needle used for supporting dadham (component of ghodiyu, explained later)
Punck/*Keela* – used for joining huks
Vindnu, Pharsi – used for making holes

[3] The local vocabulary kit for the hand tools is the outcome of the field research done by the author at DICRC.



Note: Research done by the author, and Illustrations done by Soumya Basnet at DICRC, showing the various kinds of hand tools

Craftspersons' Local Vocabulary[4] *for the Machines*

Chakel – machine used for cutting wood
Hangada – available in two sizes (small and big) – used for turning and painting
Drill Machine – used for making holes
Khada – used for applying silver and golden paint – it is faster than hangada

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Chapter 12
Technology and Social Change Among the *Ho Adivasis* (Tribals) of West Singhbhum, Jharkand, India

Upasana Ray and Asoka Kumar Sen

12.1 Introduction

The use or lack of technology is generally considered as a factor in determining the depth and expanse of progress in human civilization. It may be argued that *Adivasi* communities in India and abroad largely remained retrograde because of their initial failure to respond to prevailing technology. Lexically, the term technology stands for 'scientific knowledge used in practical ways in industry'. Ordinarily, however, the term represents in the industrial era the mechanism to produce as well as apply instruments in human life that, as Michael Adas avers, provides 'scientific and technological measures of human worth and potential' (Adas 1989, p. 3).

This idea is engaged in diachronically examining the attitude of the Ho, one of the four major demographic groups in Jharkhand, India and the most numerous Adivasi group in West Singhbhum[1] district in Jharkhand, to technology during pre-colonial and colonial periods that impacted their material and moral culture. This historical intervention is crucial in understanding the graduation of this itinerant community from a hunting and foraging socio-economy to a settled agrarian and rural way of life. But very decisive change came in their material and moral culture, when mostly due to contact with non-Ho people they were

[1] Singhbhum was once a large district in the present-day Indian state of Jharkhand. Chaibasa was the district headquarters of the erstwhile Singhbhum district. In the nineteenth century, this area formed a part of the Chota Nagpur Division of Bengal Presidency in British India.

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acculturated to the contemporary pre-industrial iron-age technology. This historic transformation in response to technology forms the theme of the present chapter.

Divided into three broad sections, the first section reconstructs the story of Ho rooted to an era where the milestones of technology were the fire, bow and pottery[2]; the second explores the technological changes that conducted the transformation of material base of Ho life as they take to agrarian way of life and metal working; and the last expresses the moral changes that shaped attitude and mentality in their life as the art of writing imbibe. Set in the pre-industrial backdrop, the essay seeks to historically reconstruct the story of transformation of Ho adivasis from stone-age to iron-age technology. This may help us in understanding to what extent this aided or impeded its passage into the industrial age that later ruled over the world. In the light of the present study, social change implies the alterations in the form of rules of behaviour, social organization and value system that can be witnesses in the Ho community from the pre-colonial into the colonial period. The process of socialization is further described as the process that became prevalent in the society and acceptable to an individual due to social influences.

12.2 Pre-colonial Culture: Entry of Contemporary Technology Among the Ho Rooted to a Backward or No Technology

This section portrays two stories, first the Ho rooted to backward technology and then how and why they moved towards higher technology and how this impacted their life. It is historically incorrect to say that Ho adivasis, rather the Mundas of Chotanagpur, the mainstock from which the Hos of West Singhbhum originated, had no contact with technology. Among the tribals of Jharkhand, the Asurs were the harbingers of iron-smelting technology. But the early aversion of the Mundas to this technology was seemingly culture-centric. Their *Asur Kahani* or legend in their creation myth recorded the ire of *Singbonga* against smelting and Asurs, its pursuers. Demands of the trade prompted the Asurs to run their furnaces whole days and nights. This supposedly caused a disastrous drought on earth and even inconvenienced Singbonga in heaven. Being appealed to by the distressed animals, he sent three pairs of bird-messengers, to order the Asurs to limit their work either to the day or to the night. But they spurned the order. This angered Singbonga and he destroyed all Asur-men (Hoffmann and Emelen 1998, pp. 240–243). The legend shows that the Mundas were aware of iron-smelting technology and the superior material culture that the Asurs practiced. But Singbonga's ire against non-stop

[2] Employing Montesquieu's categories of savagery, barbarism and civilization, Morgan subdivided the first two categories into three stages (lower, middle, and upper) and gave contemporary ethnographic examples of each stage. 1876. Systems of Consanguinity and Affinity of the Human Family.

smelting, possibly leading to using resources more than necessary, was behind the repugnance of the Mundas and other Adivasi communities of Jharkhand to technology. This seemed also to prompt them, like other tribals of the world, to prudently appropriate natural elements for material betterment.[3]

We should however seek the reason for Adivasi technological lag in their polity and socio-economy. If we contextualize this to understand Ho technological backwardness, we find that they represented a pre-state, pre-peasant and pre-literate social order (Sen 2004a). More or less, egalitarian, Ho society, could not generate enough capital conducive for introducing either a state system or new technology.[4] This adversely impacted their socio-economy.

Colonial ethnography (Tickell 1840, p. 695; Tuckey 1920, p. 118; O'Malley 1910, p. 116) and later historical and empirical studies[5] inform that the Hos, nay tribals in general, were quasi peasants, who practised shifting cultivation, hunting, fishing and gathering. Ho oral tradition does not relate how they gave up their nomadic life and adopted cultivation. Their story of the creation of the world however informs that they were at a pre-peasant stage. This is confirmed by the fact that unlike the parent Munda stock, their legend did not narrate the making of the plough by them. Moreover, they prioritised animal flesh rather than agrarian produce. This underlines the food-gathering and pastoral state of their culture.[6]

Tickell mentioned that at the time of their immigration into Singhbhum the Hos lived 'chiefly by hunting' without much appreciating the value of cultivation.[7] History though relates that while migrating this section of the Mundas had come into contact with the agrarian Oraon and Chero communities. This contact might have initiated them to primitive *beora* (ploughing seeds in holes drilled with a pointed bamboo) and *jhum* (shifting cultivation) cultivation, which some tribal groups of Chotanagpur continued to practise later.[8] So it may be argued that with this cultivating tradition, how so ever rudimentary it might be, the immigrants entered Singhbhum.

At this juncture, we extend our enquiry to their gradual shifting from the jhum cultivation towards settled agrarian life. Here, we notice the inflow of technology from more advanced ethnic communities. After they entered Singhbhum and occupied forested northern parts, they were exposed to the influence of their neighbours, the *Bhuiyan* tribe, who were 'rich in cattle and industrious cultivators.'[9]

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[3] A 'deeply felt spiritual and emotional nexus with the earth and its fruits' has been emphasized in the context of indigenous peoples of Africa (Wachira 2010, p. 7).

[4] Ibid., pp. 27–30.

[5] This observation was relevant for other Jharkhand tribals also who being primitive agriculturists 'have not yet been weaned from their wild nomadic life' (Singh 1969, pp. 653–654).

[6] Sen (2004b). For a revised version, see Saikia (2008, pp. 13–20).

[7] Tickell, 'Memoir', p. 695.

[8] Singh, 'Pattern of Agricultural Changes', pp. 653–655. It in a way corrects the empirical notion that the Kharias and Mundas of Chotanagpur plateau had been 'settled agriculturists probably ever since they entered Chota-Nagpur centuries ago'. Roy (1982, p. 65).

[9] Tickell, 'Memoir', p. 696.

The other group was the copper-producing and agrarian *Sarak* community, the lay Jainas, of Singhbhum. The contact with the *Saraks* can be one of their gateway into the metal age, but there is dearth of evidence that suggests that they had adopted this technology. The Hos also became acquainted with the mango groves of the *Bhuiyan*s and *Saraks* and large Sarak ponds, locally known as the *surmidurmi* tanks. The contact with superior agrarian community caused early advance from shifting to settled agriculture, a trend that sharpened at their advent of settled rural life.

Since their break with the parent tribe, the Ho had initially led the life of itinerant and nomadic group of people. They first chose the northern part of Singhbhum where from they gradually spread over its southern parts and founded permanent villages. The Village Papers suggest an essential link between Ho ruralism and peasantization since the eighteenth century AD.[10] At this stage, Ho villagers invited functional castes, including Hindu blacksmiths, carpenters and potters to settle in Ho villages.[11] Blacksmiths produced iron implements that helped them clear jungles for settling permanent villages. The appearance of the Ho villages changed. Iron tools became a common feature along with wooden implements and earthen pots. Two other influences at this stage need to be emphasised. One was the use of cattle in tilling land. The second was the use of cattle-driven carts. The total result was that agriculture developed more around populous and well-cultivated villages in north Kolhan.[12]

12.3 Advent of Superior Technology During Colonial Rule

The above acculturation to technology was accelerated further with colonial rule. This was fostered mainly due to the revenue system, money economy, modern roads system, railways, mining and industry, but also new administrative techniques through the land revenue system, law and courts and modern education that they inaugurated (Sen 2012, pp. 43–47). Moreover, they allowed technologically superior communities greater leverage to function. During British rule, the immigration of advanced agrarian communities like *Mathurabasi Goalas* and Kurmis from neighbouring districts of Bihar and Orissa increased considerably. When this was the external catalyst, the pressure of regularly paying the land revenue to the government forced Ho villagers to cultivate their lands more earnestly. Next, when their free expansion into the forests was curbed by the colonial forest rules since the

[10] For a more detailed information, see Sen (2011).

[11] E. Roughsedge to C. T. Metcalfe, Secretary to the Government, 9 May 1820, para.18, South West Frontier Political Despatch Register, 20 April 1820 to 7 June 1821, Vol. XXVII. (Bihar State Archives). The significant role of functional castes was a rather generic tribal phenomenon. For the role of blacksmiths in Santal life, see Man (1983, pp. 54–55).

[12] Roughsedge to Metcalfe, 9 May 1820, paras. 17–18.

1890s (Sen 2008a, pp. 78-88), the community had to concentrate on the existing arable lands. Moreover, the British administrators provided certainty of tenure, freedom from agrarian disputes, low rate of rent, and helped in the extension of roads and growth of trade to the community (Hunter 1976, p. 77). In the British eyes by the 1870s, the Ho had become a 'purely agricultural people' (Dalton 1973, p. 196). In fact, cultivation became the principal occupation of people in Kolhan and elsewhere in Chotanagpur.[13]

The occupational shift was complemented by the application of an increased number of metal and wooden tools in marked contrast to the earlier *Beora* technique in which cones of bamboos was used for drilling and sowing seeds. These were wooden plough, tipped with iron, spade or hoe, *kurul (hatchet), henga* or *chauki* (harrow), sickle and *tangi* (battle axe) and other equipments that a Ho used in cultivating his lands.[14]

Agrarian advance was facilitated in a major way by the incorporation of another technology in the form of tank irrigation (Sen 2010). We learn that the Hos did not know the technique of tank making[15] during pre-colonial times. Even after the contact with the Saraks and Bhuiyans, they converted existing tanks into arable lands.[16] The British patronised public water works in order to promote agriculture for the steady flow of revenue and to protect villagers from famine and drought.[17] But what was more significant is the socialisation of the technique in Ho villages, participated by individual raiyats as also the entire village. As mentioned earlier, first were those constructed by individual *raiyats*. Second was the village tank. Constructed with the collective labour and expenses of villagers, this became a common village property. There was yet the third type excavated by people of more than one village. The last were those which were excavated at the initiative and expense of the government with social participation in the form of labour and money. Though not so popular, mainly due to cost factor, introduction of the well-making technology was witnessed. In Kokcho, two wells were constructed by Captain David Manki and Turam Manki, both Ho, while in Baliposhi wells were in common use seemingly made very likely by Ho villagers. [18]

The economic impact was momentous. Though with 'extremely superstitious and conservative idea of agriculture',[19] a Ho cultivator could raise multiple rice

[13] In Kolhan, out of a total population of 237,320, cultivators numbered 170, 516 i.e. 71.85 % (Craven 1898, p. 18).

[14] More details are available in Majumdar (1937, pp. 49–51). But these details are also not as vivid as that about the Mundas by Roy (1970, pp. 226–8).

[15] Tuckey Settlement Khuntkatti Papers (TSKP), Rengarbera, pp. 3–8, Vasta (Bag) No. 47. District Record Room, Chaibasa.

[16] Sen, 'Water bodies, Changing Social Ecology and Ho Adivasis of Colonial Singhbhum', p. 63.

[17] The other factor was identified as 'a rhetoric of protection... against flood, poverty and especially famine' (Morrison 2010).

[18] Sen, 'Water bodies, Changing Social Ecology and Ho Adivasis of Colonial Singhbhum', pp. 63–64.

[19] Tuckey, *Final Report*, p. 121.

crops, instead of original practice of raising a single crop only. This meant that agriculture had become a full-time job for many villagers. The crops were the *Gora* or early, *Bad* or autumnal and *Bera* or winter.[20] Though rice was the staple product, a peasant could raised various pulses as *mung (kidney-bean), urid (phaseolus-radiatus)*, *kurthi* (d*olichosbiflorus*), *rahar* (c*ytisuscajan*); oil seeds as*til or sesamum, mahua (bassialatifolia)* and other such items as*chunna, surguja, gundli (Panicummiliare*), maize, cotton and tobacco as well as vegetables like *jhingi, khukra*, cucumber, pumpkin and *baigan* as early as the 1840s.[21] A few decades later, such new items as *masur (lentil)*, *khesari*, *tisi (linseed)*, *matar (pea)*, but (and), chillis were widely cultivated, while wheat and spices were done selectively.[22]

It meant therefore that over decades cultivators not only added crops which they did not traditionally produce. Next, from the original subsistence economy, they started producing a surplus to be sold in the market. This becomes clear from the export of rice from Kolhan as early as the 1880s, a trend that widened with years.[23] Oilseeds were the other ones.[24] Consequently, we notice 29 % increases in cultivated area between 1897 and 1918.[25]

Vital to Ho rural life was the slow and steady entry of two more techniques, the road system and money economy. We learn that even though there were prosperous and well-populated villages, the road system had not covered the entire Ho region. About the abundant forest region, a British official wrote:

> roads there were none, only jungal-paths from village to village. Now and again the forest was so thick that it was almost impossible for one man to walk along, and a way through had to be cut as they advanced. Range after range of hills had to be crossed where progress was slow and difficult (Bradley-Birt 1903, p. 91).

To facilitate their political economy the British inaugurated the regime of modern road system. The network of roads connected the Ho villagers not only with the administrative headquarters, but also with other towns of Bihar and the neighbouring provinces.

Similarly, trade and commerce was limited, as the economy was still rooted to barter system. This is evident from the uncertain response to money economy. Tickell wrote:

> With money the Hos are getting pretty well acquainted, but still hold copper coin in great disdain seldom taking the trouble to count a large quantity, but reckoning it by handfuls, to the unfeigned astonishment of our Hindu servants.[26]

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[20] Hunter, *Statistical Account of Bengal*, p. 80: Dalton, Tribal History, p. 195.

[21] Tickell, 'Memoir', p. 805.

[22] This is known from a perusal of Village Notes.

[23] *General Administration Report* (GAR) 1883–1884, Singhbhum district (Top cover missing, no further information), para. 21; *LRAR*, 1907–1908, DCOS, GD, RB, CNXI Returns, FN16, para 21vi, (DRRC).

[24] Craven, *Final Report*, p. 15.

[25] Tuckey, *Final Report*, p. 4.

[26] Tickell, 'Memoir' p. 806.

But slowly and steadily the rustic Ho was acculturated with money economy. They learnt of the use of money not only in the weekly markets or haats they visited but as a means of payment in other aspects of life.

12.4 The Change in Social and Moral Structure

Not only Ho economy, but social and moral institutions and attitudes changed considerably as colonial rule progressed.[27] This was the cumulative result of the technological and social changes that had occurred among them. The onset of settled cultivation promoted in a major way the growth of settled village life. This is evidenced by the sharp rise in the number of villages from 622 in 1837 to 911 in 1897. This was done by colonization of forest areas before the rules were introduced. Second was the conversion of the left out forest areas within village boundary into arable lands and bifurcation of larger villages into independent villages (Sen 2008b). This would not have been possible had not iron tools, particularly iron axe, were put into large use in deforestation.

Spurt in commerce was largely aided by the introduction of market economy, road and railways. This was fostered by establishment of growing number of weekly markets at the government initiative.[28] This in its turn encouraged them to produce beyond family needs.[29] This proliferated further since the 1880s, when Kolhan rice became the major exportable product. It became an increasing trend thereby causing a rise in its price from 44 *seers* a rupee in 1883–1884 to 13 *seers* and 4 *chataks* in 1906-1907.[30] This ushered the socialisation of money economy, the trend of which had begun during the early part of colonial rule.

Agricultural transformation was attended by the change in the Ho collective identity. Since the gradual reduction of dependence on forest, the community came to identify themselves as a peasant, contrary to their original identity of a forested community.[31] But the fact remains that even their adoption of technology failed to

[27] This section draws on Sen, 'Peasantization and the changing socio-economy of the Ho *adivasis* of Singhbhum', paper presented at the National Seminar on *Environment, State and Society* organised by Department of History, Jadavpur University on 1–2 March 2010; Sen, 'Water bodies, Changing Social Ecology and Ho *Adivasis* of Colonial Singhbhum', pp. 68–72; A.K. Sen, *The Construction of Indigeneity: Adivasi Self-fashioning in Jharkhand* (Unpublished).

[28] The number rose from the first established at Chaibasa in 1837 to 37 in 1913–1918. Tuckey, *Final Report*, p. 3.

[29] Craven Settlement Village Papers, Dhobadhobin, Bag N. 494, p. 4. See also Bhangaon a much larger remote haat which had more numerous attendance greater numbers of exchange items. Ibid., Bhangaon, Bag No. 646, pp. 3–4. (DRRC).

[30] GAR, 1883–1884, paras 20–1; Land Revenue Administration Report,, Deputy Commissioner's Office Singhbhum (DCOS), General Department (GD), Revenue Branch (RB), Collection No. (CN) XI Returns, File No. (FN) 12, 1906–1907, para. 47. District Record Room Chaibasa (DRRC).

[31] Sen, 'Peasantization and the changing socio-economy of the Ho *adivasis* of Singhbhum'.

give them the identity of a manufacturer. Ho aversion to the vocation of an artisan becomes clear when we see that except only rudimentary carpentry, the community assigned the entire manufacturing world to the functional castes who were inducted into the village community.[32] Presumably, this aversion may be linked to the linger impact of the Asur legend popular among Jharkhand indigenes.

Above changes in material culture adversely impacted Ho mentality. The shift from nomadic and predatory life shook their original wildness. It is observed: 'Now a days a Ho of the cultivated parts is very different from the wild Larka Kols of former days.' The result was that they had largely to surrender their 'shyness, truthfulness, physical courage and physical development'.[33] With this, their carefree and non-material attitude to life seemed to ebb. This may be confirmed by two instances. First was the growing trend among Hos to stock rice to stave off future crisis,[34] and perhaps also to gain greater price in the developing rice market of Kolhan. Second was the land hunger creeping into Ho psyche particularly among alert and more energetic cultivators.[35] This could not however grow more because of a watchful local administration.

The attachment to land as a means of property, which was absent among the Hos when they were jhum cultivators, greatly increased. This led to marked rise in civil suits where both men and women contested for landed property.[36] The other sign was that forest rules preventing previous free expansion in the forests, the growing pressure of number compelled many to migrate to the adjacent districts of Orissa like Keonjhar and Mayurbhanj where the demand of the Ho as pioneering cultivators was very high.[37]

From the ideal of egalitarianism, Ho society gradually drifted towards differentiation. Though not comparable to other agrarian societies, the high, middling and low elements had emerged as early as the 1840s. This trend proliferated with time. The socio-economic stratification was the result of both the topography and distribution of land. Topographically, Kolhan had both plain and highly arable parts as well as hilly and forested areas. So the material condition of cultivators largely depended on their geographical locus. The other factor was the quantum of land possessed by them. Majority of villagers had less than 10 *bighas*, with a lesser number having between 30 and 50 *bighas*, while only a few beyond that. This fissured society manifested itself in the house structures, items of family use, food, dress and amount of *gonong* (bride price) paid during marriage.[38]

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[32] Tuckey, *Final Report*, pp. 23, 118.

[33] Ibid., pp. 8, 118.

[34] Deputy Commissioner's Report on Trade and Commerce of the District for 1910–1911, DCOS, GD, RB, CN XI, FN 26 of 1911–1912, sec. IX (DRRC); O'Malley 1910, p. 120.

[35] Tuckey Settlement Village Note, Vol. III, pp. 176, 203. (DRRC).

[36] See Craven Settlement Village Papers and Tuckey Settlement Tanaza, U/S 83 and 85 Papers. (DRRC).

[37] LRAR, 1932–1933, FL, DCOS, GD, RB, CNXI, FN.2 of 1933, section 14 VII. (DRRC).

[38] Sen, 'The Process of Social Stratification'. pp. 27–37.

Another major impact was the marginalization of the gender. Historically, as civilization progressed, the 'economic foundations of mother-right were weakened'. In Ho society, women were gradually saddled with newer and perhaps more sustained family liabilities. The male-dominated society conducted a sex division of work according to which hunting, tilling and sowing, in which technology had much greater role, were assigned to the male folk while the rest were left to the ladies. This implied that gender disempowerment was reinforced through technological disempowerment. The extent of gender work burden caused this comment: 'A Ho male is an indolent and a lazy fellow. The women are the more hardworking members. In a Ho family, except ploughing and sowing seeds they do all works in connection with the agriculture.'[39] This is a stark comparison to the earlier Ho who could be recognized as a fighter. Marginalization is perhaps reflected in another evolving social practice. We would like to propose that the fall of the Ho from monogamy to polygamy was prompted by the need to provide an extra working hand through marriage.[40]

Conclusions

The above study makes it clear that the failure of the Ho adivasis to adopt technology was due to the affinity with their creation myth and also to their pre-state and pre-literate social roots. Pre-colonial Ho community therefore tardily passed, as Morgan's generic study informs, from savage to barbaric phase. Consequently, they remained a pre-peasant nomadic group dependent on shifting cultivation, foraging and hunting. Though the idea of change was ethnically inspired that provided them early training into primitive cultivation, major turnaround was witnessed when they came in touch with non-Ho neighbours like the *Saraks* and *Bhuiyan*s and other non-tribal communities, who were equipped with superior technology. The Hos were then ushered into iron technology through the blacksmiths, pottery through potters and carpentry through carpenters, their fellow Hindu villagers. The process was accelerated with the advent of British rule which not only introduced more advanced administrative norms and institutions but also modern roads, railways, money economy, mines and industries. We would like to sum up this essay with the argument that changes in Ho material and moral life, witnessed through peasantization, ruralisation and change in world view, occurred largely due to the impact of technology.

[39] Tuckey, *Final Report*, p. 121. A later empirical work, which details the sex distribution of work, reveals the extent of burden further (Majumdar 1937, pp.49–51).

[40] Inspired by Chanock (1985, pp. 39–40).

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Glossary

Adverse Selection Due to information asymmetry, one party might choose a wrong partner of exchange, it is called adverse selection problem.

Alebrijes Crafts made with cardboard and painted with bright colors. Generally, the alebrijes represent an imaginary animal that is a combination of several animals.

Animaar Awl: tool with a long, pointed spike, used for making holes in wood

Appropriate technology Technology which promotes the satisfaction of basic human needs, facilitates social participation and control and is ecologically sound, use of which can make small people productive and relatively independent.

Asur Kahani Tribal legend.

Bad Autumnal.

Balance value matrix A multi-disciplinary performance measurement scheme of social, economic, and intrinsic values.

Bavla or Babool Teak wood.

Beora Ploughing seeds in holes drilled with a pointed bamboo.

Bera Winter.

Black mud Crafts produced in the Mexican state of Oaxaca with a mud that has special properties that when it bakes acquires a completely black color.

Bottom of the pyramid Large and poor social economic group.

Bt *Bacillus thuringiensis* (*Bt*) is a spore-forming (*flash animation*) bacterium that produces crystals protein (cry proteins), which are toxic to many species of insects.

Bt. Cotton Bt Cotton has a foreign gene obtained from a soil bacterium Bacillus thuringiensis (Bt) that codes for a protein toxic to the American bollworm, which has been genetically engineered into its genome. Bt. Cotton, which is the only genetically modified crop that is being used by farmers in India, has been developed by transferring a gene from the soil bacterium called Bacillus thuringiensis (Bt.) into cotton. The gene has the ability to produce a toxin that can kill bollworm, an insect pest that attacks cotton plant.

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Chakel Machine used for cutting wood.

Chaursi Chisel: tool used for finishing, while turning wood – 1" blade.

Child Labour Works that deprive children of their childhood and harmful to their physical and mental development.

Civil Society Organization Civil society organization is an organization which expresses 'the interests and values of their members or others, based on ethical, cultural, political, scientific, religious or philanthropic considerations'.

Craft Pastime or a profession that requires some particular kind of skilled work.

Craft guild An association of artisans formed to protect mutual interests and maintain standards.

Craftsmanship The quality of design and work shown in something made by hand.

Dandiya Traditional sticks used while performing the popular dance form *Garbha* in Gujarat.

Dholka Dholka or Dholaka is the headquarters of Dholka *Taluka* in Gujarat.

E-Choupal It is the unique web-based initiative of ITC's Agri Business Division designed to tackle the challenges of Indian agriculture, characterized by fragmented farms, weak infrastructure and the involvement of numerous intermediaries, among others.

Economic Agents Include individuals, groups or entities that engage in a form of economic relationship that will involve decision making for the fulfilment of a particular objective. They general comprise households, firms and government agencies.

Effectual logic An entrepreneurial way of thinking, a decision making process under conditions of uncertainty to create a desired future state.

Enforceability of contract Legality of a contract and ability for an economic agent to seek possible legal redress when the terms of the contract are perceived to be breeched.

Entrepreneurship It is a process through which a person organizes, operates and assumes the risk for a venture.

Family Structure House hold or family set–up.

Gangajal Water from the Ganges river.

Genetically Modified Crops Genetically modified crops (GMCs, GM crops, or biotech crops) are plants used in agriculture, the DNA of which has been modified using genetic engineering techniques.

Ghodiyo or Ghodiyu Traditional crib frame or a cradle for baby.

Gora Early.

Gran Nayar Cultural region where inhabit five ethno-linguistic groups: Huichol, Cora, Tepehuanes, Nahua and Mestizos. This region covers the mountainous parts of the Mexican states of Nayarit, Jalisco, Durango and Zacatecas.

Handicraft Is any of a wide variety of types of work where useful and decorative objects are made completely by hand or by using only simple tools.

Hangada Available in two sizes (small and big) – machine used for turning and painting.

Hathaudi Hammer: tool available in two sizes – small and big, and used for beating and nailing.

Hats Weekly markets.

Henga or Chauki Harrow.

Hierarchy It is an arrangement of objects/ systems / values / categories where these are ranked and represented as being above or below or at the same level as one another.

Huichol One of the four indigenous groups that live in the region known as the Great Nayar, at the southern portion of the Sierra Madre Occidental, Mexico.

ICT utilization The usage of Information and Communication Technologies for economic purposes. It includes for business activities, contract initiation and other forms of economic transactions.

Indigenous Knowledge Indigenous knowledge is the local knowledge that is unique to a culture or society. Other names for it include: 'local knowledge', 'folk knowledge', 'people's knowledge', 'traditional wisdom' or 'traditional science'.

Information Asymmetry In an exchange when two parties do not have the same information about the subject of exchange, it is a case of information asymmetry.

Information and Communications Technology It is an integration of telecommunications, computers as well as necessary enterprise software, middle ware storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information.

Innovation It is a process of translating new ideas into practice.

Institutional quality The 'state or nature' of the rules, regulations and guidelines that direct and oversee the economic relationships existing between two or more parties (economic agents).

Intellectual Property Intellectual property (IP) refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce.

Jhum Shifting cultivation.

Joint Liability Lending This is a process of lending where a group of members is jointly liable for each other's loans.

***Kaanch* Paper** Sand paper: used for giving a smooth finish.

Kaus Tool used for supporting sections of wood, while turning them.

Khada Machine used for applying silver and golden paint – it is faster than *hangada*.

Kurul Hatchet.

Lac or Jatu or Jatusa Lacquer (resin).

Liberalization Policy Multilateral agreements to liberalize ownership and control restrictions of telecommunication services.

Marginalized Communities Individuals and communities socially excluded from getting the rights, opportunities, and resources a of society.

Market Failure In an equilibrium, if there is either excess demand or excess supply, the situation is called market failure. It happens due to existence of externalities.

Market friendly policies Public policies that support the active private sector.

Mathurabasis, Goalas and Kurmis Other lower Hindu castes.

Microfinance Microfinance refers to the provision of financial services to low-income clients.

Nakhlau Gouge: tool used while turning wood – 1" blade.

Nierikas In the Huichol language, it means "view", "awake", "being alive", "be aware". It is also the name given to some art created by the Huichol Indians.

Panchayat Governing body (of a village).

Papad Thin, round, savoury snack from India, roasted or fried to make it crisp before eating.

Patents A patent is an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem. To get a patent, technical information about the invention must be disclosed to the public in a patent application.

Patri, Patris Traditional lathe (s) for turning the wood.

Patriarchy A form of social organization in which a male is the family head.

Peer Monitoring Under group lending, members of the group monitor each other for loan repayment. This is called peer monitoring.

Peyote A cactus that grows in the northern Mexico's deserts. This cactus contains an alkaloid called mescaline that is a drug with similar effects to LSD. Peyote has been used by indigenous cultures for many years to induce altered states of consciousness during religious rituals.

Prakaar Compass: tool used for measuring radius, marking.

Private sector development The growth of private businesses and ventures.

Problem mapping Understanding a problem in its different dimensions and complexities in order to find a solution (Contrast: Scientific problem solving where a problem is broken down into simplified manageable parts to seek solution).

Property rights The legal right of ownership of a property or an asset.

Proprietary Technology At the outset, 'proprietary technology' refers to a process, tool, system or similar item that is property of a business or an individual and provides some sort of benefit or advantage to the owner.

Punck/Keela Tool used for joining huks.

Saghvan Saghvan or Sagwan or Teak (Tectona grandis), is a tall and handsome deciduous tree. Its botanical family is verbenaceae.

Sainiyuu Tool used for making grooves.

Sammaan *A Hindi word, which means respect.*

Samriddhii *Samriddhii* is a Hindi word. It does mean prosperity in English.

Sanchalika Female branch manager.

Sarvodaya Movement Movement for upliftment of all, especially the deprived, for inclusive growth and progress.

Sauya Needle used for supporting *dadham* (component of *ghodiyu*).

Scalability Potential for the ability to accommodate growth.

Self Help Groups Self Help groups are affinity groups of 5–20 people. These groups are formed to address the common issues.

Self-Efficacy Ability to persist to reach goals.

Sheesham Variety of a hardwood, which is also known as Indian Rosewood.

Sickle and tangi Battle axe.

Singbonga Sun God.

Social Change Any significant alteration over time in behaviour patterns and cultural values and norms.

Social Change Every society is based on social norms and values. Any change in the social norms and values is called Social Change.

Social Entrepreneurship It is an approach through which a person works on his or her social mission innovatively to bring the Social Change.

Social Norms Social norms are informal understandings that govern the society's behaviours.

Social relations Relationship between two or more individuals.

Social Structure Patterns of organized relationship within a society.

Sound policy Policies that are based on proper consultations and can benefit the target groups when implemented.

Start Up Capital The first capital investment of any enterprise is called start up capital.

Stratified Random Sampling This is a random sampling method. If the population is known and it consists of several groups, for good representation of each of the group in the sampling, population is stratified. In each of these strata, random sampling method is used for choosing the sample units.

Sulabh Shauchalaya Accessible sanitation or toilets, public toilets created by *Sulabh* International.

Sustainable Agriculture In simplest terms, sustainable agriculture is the production of food, fibre, or other plant or animal products using farming techniques that protect the environment, public health, human communities, and animal welfare. This form of agriculture enables us to produce healthful food without compromising future generations' ability to do the same.

Talavera Type of fine Mexican earthenware featuring colored decoration on an opaque white glaze, produced principally in the Mexican state of Puebla.

Taluka Also known as tehsil, tahsil, tahasil or mandal is an administrative division, which consists of an area of land with a city or town that serves as its headquarters, with possible additional towns, and usually a number of villages.

Technology It is a body of knowledge which creates tools, skills and extracts materials by using scientific knowledge.

Vertical Relationship A hierarchical relationship in a family.

Vindnu, Pharsi Tool used for making holes.

Wada A community in the Dholka region of Ahmedabad in Gujarat (India), which practices the woodturning and lacquer craft.

Wixárika Means “fortune teller”. This name was used to designate the Huichol Indians, one of the most important indigenous groups from Mexico, who dwells in the Mexican states of Nayarit, Zacatecas and Durango.