

Enterprise-enabling Technology and Rural Women: A Study in Coastal Karnataka

Dr. Ganesh Bhat. S*

Let me begin my paper with an anecdote. Once the great scientist, Michael Faraday, founder of the dynamo (electric generator), was invited to exhibit his new invention in front of an august gathering in England. When he moved a magnet inside the copper coil, the electrometer showed the presence of electricity. Everybody applauded except a skeptic lady holding a small baby. After sometime that lady asked "What is use of your invention?" Then Faraday replied "Madam, Can you tell me what your baby can become after twenty years from now?" Piquant young mother could not answer. Of course, it is quite difficult to answer 'what is latent within technology'. Even when one visualises 'technology' as fourth factor of production apart from the conventional - land, labour, capital and entrepreneurship - it offers differing snapshots. One, for a inventor it is the baby that has the potential to make inventor's name immortal; two, for the innovator who puts technology for commercial use visualise it as a societal change-maker and a wealth creator; three, for the beneficiary it is the agent of socio-economic wellbeing; four, for a social scientist, it is the instrument of social change thru inclusive growth; and five for social entrepreneur, it is the path for social innovation that address social inequalities and six for the State, it is device to ensure socio-economic welfare of people and equitable governance.

Since independence, many science and technology establishments promoted by Central and State governments have developed and disseminated different technologies - sophisticated as well as indigenous. In the later years, the liberalisation regime further softened the continental technical-know-how flow from developed West to less-developed. Consequently, India became the 'back-office' of best-known companies worldwide. Eventually, it led to a socio-economic change - from an

agrarian economy to service sector-dominating economy. However, enlightened minds have already warned the policy planners that fast emerging economies like India should not be too complacent about external-led growth rather than internally driven. Obviously, for a balanced development of economy, there is a challenging task before the development administrators to give enough push for a technology that:

- Reduces the great urban and rural divide - apart from digital divide;
- Even-handles both men and women for organising their occupational pursuits;
- Supports innovations that ensure inclusion of excluded - not only educated but even the less-educated, well-to-do as well as the poor.

This paper is mainly focused on beneficiaries' world-view of 'scaled down industrial technology'. While doing so it tries to capture those imageries by analysing a few cases of 'less-educated' 'women-owned' enterprises established in coastal Karnataka - individual-owned as well as group-owned - in rural setting, majority of which are engaged in value-addition to farm products. Technologies used by these entrepreneurs are producing the goods in: one, cost-effective manner; two, adaptive to local settings; three, ensures egalitarian distribution of goods and services, and four space for everyone to become self-reliant and enjoy 'enterprise-surplus'. The units included are:

1. Sri Raksha Areca-sheath plate manufacturing unit
2. Sri Radhakrishna Readymade Garments unit at the foothills of Western Ghats
3. Citronella oil unit operated and managed by SHGs.
4. Cashew-kernel extraction and cashew-oil thru indigenous technology

*Associate Professor of Commerce, St Mary's College, Shirva, Udupi District. Article Based on the paper presented at the International Conference held at JKSHIM, Nitte on December 29-30, 2012.

Hence, each case is analysed for (1) creativity and originality, (2) issues of technology management in all three areas: technology acquisition, in-use and up-gradation, (3) potential for addressing social and environmental concerns. Field survey-based 'case profiles' developed for the major research project funded by Department of Scientific and Industrial Research (DSIR), New Delhi are used to highlight technologies used, innovations made and socio-economic changes noted in the rural-setting. All these units are supported by Sri Kshetra Dharmastala Rural Development Project (SKDRDP)¹ a well-respected temple-based NGO guided by Dr Veerendra Heggade, Dharmadhikari, Sri Dharmastala Manjunatheshwara Temple, in Dakshina Kannada District in Coastal Karnataka. Majority of these entrepreneurs are trained and supported by Rural Development and Self-employment Training Institute (RUDSETIs)² sponsored by Sri Dharmastala Manjunatheshwara Education Trust, Syndicate Bank and Canara Bank and managed under the chairmanship of Sri Heggade.

After the introductory paragraphs, this paper concentrates on conceptual perspectives to provide a cross view of key concepts: technology, innovation and social change. Thereafter there will be a development of a framework for analysis of each case of women owned enterprise. It is followed by conclusions drawn from this study.

Technology: An Analysis

Semantically the word technology is derived from the Greek word - 'technologia' - implies systematic treatment. Scholars realised that technology is, and will continue to be all pervasive, as all sectors of economy use it and all segments of society influenced and affected by it. In its broadest sense, technology is the means (concrete mechanism) by which materials things are produced. It is the application of the science and technical advances to the production of materials to serve human needs. It is said that modern technology is the natural development of human curiosity about how certain phenomena work and one's desire to

develop better tools to fulfil human needs. The person behind the technology, its creator - the technologist is a tool maker, a weapon maker, and replacer of human energy by mechanical energy using wind, water, fossil or nuclear fuel or solar energy (Singe, 1978). Of course, understanding its multi-functional nature, most technology analysts define technology in relation to function. A few other scholarly definitions of technology have been provided hereunder:

- "A use of devices and systematic patterns of thought and activities to control physical and biological phenomena in order to serve man's desires with a minimum of resources and maximum of efficiency." (Dorf, 2001:71)
- "Technology has both hardware and software components. Hardware is the term borrowed from the computer industry and now widely used to represent physical embodiment of technology: tools, implements, machines, devices and equipments. While software is the non-material dimensions of technology, e.g. knowledge, experience, organisational forms, managerial tools, institutional structures, legal provisions and financial incentives" (Jequirer & Blanc, 1983:10).
- "Technology is a mirror that reflects human nature and intentions: (1) we want certain things done and we want tools to do those things; (2) we are finite, frail, and mortal; (3) we create technology in order to bring alternative worlds into being; (4) we do not know why we create or what values should guide us. Imagination is central to technology. Human nature and human freedom are brought into focus when we reflect on the central role of imagination in technology" (Hefner, 2002:655).
- "Technology has incorporated four interconnected elements: the hardware (machinery or equipment) of production; the software (knowledge and skills needed to produce something); the organization that enables production to take place; and the product itself" (Hillebrand et al. 1994).

¹SKDRDP won the Asheden award 2012 with a prize money of £40,000, better known International and UK Gold Award instituted by UNDP for its innovative work on delivering sustainable energy to the poor through ethically managed microfinance.
²Presently there are 24 RUDSET units spreading over 14 States in India. <http://rudsetitraining.org>.

Interestingly some of the above definitions provide a restricted view mainly because they focus only on the most tangible elements of technological solutions, the physical artefacts or technological 'hardware'. These include the process equipment, infrastructures and products. Other definitions are little more broad-based and include the notions of technological 'software' along with hardware. Software represents the knowledge, know-how, practices and organisational skills needed to develop technologies and to produce and use artefacts. Although not so tangible as technological hardware, software is reflected in organisational and institutional arrangements, which are as important as hardware in determining the capacity of societies to perform useful tasks, and show how societies increase these capacities by pushing out the technological boundaries imposed by the limits of the current hardware and software. They directly influence the inception, development and diffusion processes of technologies.

When summarised, one can conclude that technology is a marriage of form and function. The complexity of the function usually defines the complexity of the form. Function, again, is related to need. A more complex need implies a more complex function calling for a more complex form (Subbakrishna & Gardner, 1989). Therefore, in a sense of knowledge organised to do a task, the technology has always played a major role in economic and social security. Indeed, the material levels of living, the character of social and cultural life and security of societies, have always been closely related to the technologies they have used. But occurrence of the industrial revolution, first in Britain, its subsequent spread to other parts of Europe and then to USA, Japan and other parts of world, led to technology to occupy centre-stage in the development of nations.

Innovation: Some Insights

Generally, technology spurs innovation that unleashes social change. But what exactly is innovation? Most fundamentally, it implies newness. Although innovation is sometimes narrowly seen as new, commercially

exploitable technologies, it also encompasses new ways of doing things across diverse arenas of human activity (Menon, 2001). Consistent with a practice-centred understanding of entrepreneurship (Gartner, 1989), developing new products, initiating more stream-lined and responsive business practices, diversifying markets, or forming new business alliances etc offer convenient examples of innovation. Manimala (1988) has identified a total of ten types of innovations including the classical Schumpeterian innovations. These cover broad areas of innovation in the context of a commercial enterprise as given below:

1. Introduction of a new product or new quality of an existing product
2. Introduction of new method of production, or modification to an existing product
3. Development of a new market or a new marketing strategy in an existing market
4. Development of a new source of supply
5. Use of new ways of managing finance
6. Development of new structure, systems or procedures in the organisation
7. Introduction of a new culture especially through the induction of innovative people at lower levels
8. New ways of managing and developing personnel
9. New ways of managing quality control and R&D
10. New ways of dealing with government and other external agencies

Understanding Social Change

Learned people say - 'nothing is permanent in this world except change'. It is a Law of Nature and is an on-going process (Rao, 2005, Kuppuswamy, 1996). Change is seldom, if ever, contained within any one factor. So also the social change! It is a derivative of changes in ecological, physical, technological, cultural factors, social legislations and education.

Experts defined social change as one that herald the changes in living, changes in attitude and beliefs of

people, and changes even go beyond human control of biological and physical nature of things. Changed social images describe variations or modifications of any aspect of 'social process, social interactions or social organisations'. Some scholars believe that the variations from the accepted modes of life; whether due to alterations in geographical conditions, in cultural equipment, in composition of population or ideologies and whether brought about by diffusion or invention within the group as social change (Gillin and Gillin, 1950). In 'co-occupational context', social change means that a large number of persons are engaging in activities that differ from those of their forefathers engaged in some time before. Believing that society is composed of a vast and complex network of 'patterned' human relationships in which all people participate, gauging human behaviour in the process of modification is only another way of indicating that social change (Hansraj, 2000).

Social changes cannot be studied in isolation because it has links with a series of changes occurred or likely to occur in others; it is connected with the past and has effects on future as well (Hansraj, 2000). To understand how social change takes place and why it follows certain path, makes it necessary to investigate its relation to three great orders - the bio-physical, the cultural and the technological (Maclver and Page, 1959). In 'A Casebook of Social Change', Niehoff (1966) describes three approaches to understand the process of change:

1. 'Economic approach' is to analyse the means of production, distribution and consumption of wealth and to call for vast investments in the expansion of key limiting sectors of system.
2. 'Technical approach' is based on the assumption that technological advances make the nations rich and lack of such expertise will keep the nations poor.
3. 'Socio-cultural component' is recognised in the third approach, based on the belief that technical know-how and economic patterns are embedded in cultural

systems, elaborate patterns of customs and beliefs which can either act as sanctions or barriers to technical and economic change.

The basic question that begs answer at this stage is how to monitor and understand the social changes that are taking shape over the years, may it be in urban setting or in countryside. Implicit need is to have appropriate ground-level research that provide enough data of social indicators and substantiate theories that will enable society to alter the magnitude, speed or even direction of change in relation to explicit normative criteria (Madden, 1966). Social changes happening in urban areas are outside the scope of this paper. Hence in the Indian rural area context, the trends of socio-economic changes may be briefly summarised as follows:

1. The rapid transformation of agrarian society from subsistence - based traditional society to market-based, profit-oriented, commercialised agrarian sector of Indian society.
2. Rapid introduction of modern science & technology gadgetry to completely transform the existing loose, scattered and underdeveloped feudalistic agrarian economy into a well-knit compact unit and its organic integration into total national economy.
3. Emergence of a complex network of various associations and institutions within the agrarian society in its efforts to move towards knowledge society.
4. Attempts of State and non-State actors to empower and energise underprivileged voiceless sections of rural society (Desai: 1979).

Technology, Innovation and Social change

Technology has established itself as a powerful agent of social change. It is the distinguished difference in technology helped scholars to categorise the different phases of human history into hunter-gather society, horticulture society, agrarian society, industrial society, post-industrial society or the modern day knowledge-society and e-society. Influence of technology on society

seems to be so powerful that it led to development of the concept 'technological determinism' (Ogburn, 1937). Common perception is that technology is the catalyst of change: more the society advances due to technology, more it encourages technology. Naturally more rapid the technological changes, more rapid will be the social changes. The recent argument is that the 'technology opportunism' or 'social determinism' is quite relevant to contemporary world order than its classical view (Grimes & Lyons, 1994).

During the second half of 20th century, advances in sciences and technology, coupled with entrepreneurial daredevilry converted innovations into economic value added (EVA) goods and services, produced tremendous socio-economic impact; it changed not only living habits but even the thinking process. For instance: progress in medical sciences reduced death rate, altered the population structure and eventually gave primacy to geriatrics - a branch of medical science that deals with diseases and problems specific to old people; industrial and managerial innovations led to 'SADS' (Severe and Acute Downsizing Syndrome) in established factories and government departments; and traditional cultural tastes and preferences received the beatings in the hands of radio, TV, computer and internet. In the West the situation reached such a stage where socialisation process has become more complex and sunk. Interestingly, Robert Putnam (2000) has documented a long term decline, since the 1960s, in American civic involvement due to influx of TV and other electronic media. This decline includes the lessened ability of citizens to articulate and organise requests for good governance, the movement away from community life, and increased psychological alienation (Bhat, 2008).

Analytical Framework

This paper throws light on relational dimension of entrepreneurial processes to understand interplay of technology, innovation and social change occurred in women owned enterprises in Coastal Karnataka. Relational thinking gives primary emphasis to coordination through (and by) which entrepreneurial

opportunities are brought into being and realised (Fletcher and Watson, 2005) through infusion of technology and resultant innovation. It challenges the notion that opportunity discovery is the product of cognitive processes (Shane and Venkataraman, 2000) occurring as 'light bulb' moments in individual minds. Instead, it believes that opportunity recognition and enactment are the result of interaction processes that develop in a highly relational (and social) context (Steyaert and Katz, 2004). The two-way nature of this process, whereby entrepreneurial activity contributes to and is an effect of social change (at a personal, family and community level), is rarely made explicit in studies of entrepreneurship. Thus, entrepreneurs, the business ideas they enact and the business enterprises that they establish, technology they use, innovation process they handle are not to be seen as isolated events but as sequential. They are always emergent, in a process of becoming - 'coming ever afresh into existence out of an alternation of events that have gone before and will "become" again' (Steyaert, 1998). Hence, for this purpose, entrepreneurship defined as:

"a way of making a living in which people with novel ideas for a product or a service create, develop and realise those ideas as part of their social becoming - something they do through envisaging how those ideas might in some way 'make a difference' and shape or influence the social becoming of their potential customers or clients (Fletcher and Watson, 2005)."

From the above one can understand that technology as a vital input in enterprise development wherein innovation is the process of using technology for achieving organisational and social goals, and social change is the intended or unintended effect during the life cycle of enterprise on personal, family of entrepreneur and community around. The following pages will give the analysis of select cases of women-owned enterprises.

Farm to Plate with Eco-sensitivity: Case of Areca Nut Sheath Plates

Areca (betel nut) is well-known India since Vedic period and is needed for many Hindu religious rituals. Areca groves are called as 'Poogivana' in Sanskrit. For centuries areca is a plantation crop and presently for more than two crores Indian agriculturists it is a major crop. Bio-degradable quality of areca-nut sheath plates can definitely edge out plastic plates, known for environmental hazard. A healthy areca palm tree sheds 5-6 leaves and as per an estimate about 1000 million leaf sheaths are available annually in India alone (Basappa and Murthy, 1960; Menon et al. 1982). For decades its use was confined to traditional uses head-caps and hats for farm workers, containers and packing cases for collecting and transporting materials at home like toddy, fish, etc and to scoop water in the farm fields (Raghupathi et al. 2002). In recent times attempts have been made to commercially exploit it by preparing 'dinning-party plates' and other value added products. When many eco-sensitive countries (some extent even in India) have already decided to stop use of plastics, it is the areca sheath that has everything to catch the imagination of the public for bio-degradable quality and economic enrichment potential for rural economy.

Leaf sheath of area palm (betel-nut) extensively cultivated in South India as well as in Eastern India as a cash crop, supplies a strong pliable material that is amenable to shaping. This product is obtained from the plant leaf part, which in the course of its biological life cycle, dries, falls and regenerates. This naturally shed leaf sheath is strong, semi flexible yet not brittle, odourless, water and heat resistant. Moreover, leaf sheath has its own natural grains and texture, very much similar to those seen in furniture grade wood. An added advantage with this material is that it can be used to bake foodstuff and can even tolerate microwave cooking. With such amazing properties there is no wonder that this material can be every well used to manufacture a variety of items such as disposable plates, rain caps and also as packaging material.

Palm shed leaf sheaths are first carefully sorted and then thoroughly washed and mechanically pressed in a pre-heated mould. A final trimming process gives finish to the products. The entire manufacturing process uses no chemicals, resins, and dyes, strengthening agents or synthetic materials whatsoever. A specialized baking & sterilization process ensures that the plates are totally germ free, hygienic, and suitable for food consumption.

These days areca-plates are commonly used in birthday parties, wedding parties, religious functions, corporate get together, picnics, tours, sports events or any other indoor/outdoor caterings etc. and it has been certified by Central Food Technology Research Institute (CFTRI) at Mysore. These plates are economical (no waste of water for cleaning work) and lighter (save on transportation), and extremely sturdy to turn into aesthetic shapes.

The areca-nut cup machine is a simple pedal operated machine, manually operated with minimum power consumption. Its heating mould can be heated with gas/electricity and even by kerosene oil blow lamp. First the leaves are washed and dried to retain their pliability and kept in a polythene bag to avoid drying before use. The leaves are placed on the lower mould, the pedal is pressed down when the upper mould hard presses the leaf and is released after a few seconds. All the operation like folding, trimming, pressing into shape and drying are done in a single operation by pressing the pedal lever. The leaf cup, subjected to heating to 150 degree C for 10 seconds also gets sterilized. There is no major pollution problem associated with this industry except for disposal of edge-cuttings that can either be used manure or burning fuel domestic use.

Even they can be customized in shapes like oval, round, rectangle etc., and also they are biodegradable, non-toxic, light weight etc. South Karnataka is known for vast cultivation of areca nut, usually areca nut leaves are burnt as fuel or used as manure.

The unit under study, Sri Raksha Areca nut Plates, was sponsored by Sri Dharmasthala Rural Development Project and managed by three self-help groups (SHGs). Three SHGs contain 26 members. It began its operations in 28.2.2003 with borrowed capital of Rs. 3,46,560. Apart from the loan, Swarnajayanti Gram Swarajgar Yojna (SGSY) gave a loan of Rs. 1,73,280. Even for the construction of building, SGSY advanced a loan of Rs. 3,65,000. It is running profitably for the last 5 years. They purchase raw materials in bulk from nearby areca nut plantations, dry and store in large quantities. Based on demand, they work and run their machines. They supply finished plates to Eco-vision, an export oriented unit situated nearby, with whom they have tie up for guaranteed purchase of areca nut plates. If each plate fetches Rs. 30 in international market, it is meagre Rs 2 per plate in Indian market. The return is still higher at export market. All the women employees expressed their satisfaction over the profession that they are carrying. Lakshmi, one of the partners expressed her opinion, "We are a well known manufacturer of disposable leaf plates that are 100 % natural and eco-friendly. Our products make a hygienic substitute for serving food items as these are disposable and biodegradable. Customers can avail these in different shapes and sizes for serving hot and cold food".

"Quo Vadis" (Where Are You Going): Radhakrishna Garment Unit at Savanalu

A few young women did not know any other work than rolling beedis for years. But now, the products they manufacture ('Shramik' and 'Quo Vadis' brand shirts) are competing with any other brands in the market. Affected by slump in beedi industry, nearly 60 women members (SHGs) availed a loan of Rs 11 lakh under the Swarnajayanti Gram Swarajgar Yojna (SGSY) special project for setting up a garment-manufacturing unit. Radhakrishna Garment Unit, ably assisted by Sri Dharmasthala Siri Gramodyoga Samsthe (marketing arm of SKDRDP), has a shop floor of 2,600 sq ft at Savanalu, a place close to Western Ghats in Belthangady taluk. Since no SHG member had any knowledge about

the garment production, the SKDRDP took the services of a master consultant. He trained them in various aspects of shirt production. Real production of shirts began four months after the establishment of the unit. At present, the unit manufactures nearly 300 shirts a day.

Considering the needs of common man, mainly farmers, the Dharmadhikari of Sri Kshetra Dharmasthala, Dr D. Veerendra Heggade, designed 'Shramik' brand of shirt, which is a combination of a T-shirt and a kurta, he said. Prices of the shirts range from Rs 55 to Rs 350.

Asked about the market for the product, Dr Manjunath, Executive Director of the project, said these shirts are in a good demand in Dakshina Kannada and Udupi districts. At present, the product is being marketed through 15,000 SHGs of SKDRDP and Siri Gramodyoga Samsthe through various outlets. He said that every woman in the garment-manufacturing unit earns at least Rs 100 per day. After deducting the cost of maintenance and raw materials, each member brings Rs 15 revenue on every shirt, he added. The workers are happy, contented and expressed satisfaction about the terms and conditions of work. "We were earning only Rs. 20 before joining. Now we get more than Rs 80 per day. Apart from it, we get satisfaction while working with friends, well wishers. There is coordination, harmony and sense of belongingness among workers. The unit possesses all the technical requirements for the manufacturing shirts, blend cutting as well as button inserting machine.

Aromatic Grass Oil Extraction: A Case of Women-led Rural Enterprises

It was an unusual scene for the researcher, which visited interior villages of Byndoor hobli of Kundapura taluk of Udupi district. Situated right on the foothills of Western Ghats, these villages have become the hub of an unusual economic activity of grass oil extraction. As we entered deep into the villages, the pleasant smell of citronella oil greeted us, as many households extract oil from citronella grass. Citronella oil is the volatile

aromatic mixture derived from citronella grass used as an ingredient for quality toilet soap production.

They extract Citronella Oil (*Cymbopogon winterianus*) from the perennial, aromatic and light green citronella grass that grows up to a height of 1.2 to 2 meters. Oil of Citronella is light yellow and transparent with its major ingredients as Citronellal, Citronella and Geranial that provides relief and soothes the senses. It is widely used in perfumery, soaps, detergents, disinfectants, flavours, cosmetics, household cleaners and mosquito repellents.

The village is predominantly occupied by local tribes called as Marati (Scheduled Tribe) and have learnt citronella cultivation from migrant Keralites. Every 40 days, the grass is ready for cutting. The furnace plant constructed through indigenous knowledge estimated to serve up to 10 years. Marketing of oil is not a problem, as people from Kerala and even some shops at nearby Kundapura buy it. One kilo of oil fetches Rs 195, hence, it is a profitable venture. One boiler operation fetches them 4 to 5 kg of grass oil. The whole process requires 6 hours. The whole operation of setting up of boiler unit may require an investment of Rs. 30,000.

Whenever a household cannot set up its own unit, on rental basis it can use other's unit. Only irritant is firewood needed for furnace which is consternation between them and officials of forest officials. Oil extraction process requires lot of water, for boiling purpose as well as for cooling. They have constructed check-dams across rivulets and diverted it in a small canal.

It runs very close to site of furnace but again they have a balancing reservoir pond. Its stagnant water naturally flows into oil cooling chamber through a water jet. Hence, water flow continuously without using any power. They have devised an indigenous rural technology through which water is made to operate as the coolant. Initially 200 kgs grass is stuffed into firewood fuelled boiler. After six hours of continuous heating, steam-filled slurry is allowed to come out to cooling chamber.

The collecting chamber is unique in the sense that it has a let out tap at the bottom. It allows high density water to move out and low density oil gets collected on the top. Once in a few hours oil will be removed and filled in a plastic barrel. Another unit owned by SHG and its group leader Mrs Mary of Ganganadu apprised the SHG activities. Since, 2004-05 their SHG working on Grass Oil Extraction Unit is working well and in the coming years as well.

The technology for extraction of citronella oil is classified as agro-based indigenous technology. Aside from being an import-substitute, the citronella oil has export potential and its production offers enough space for rural women. The commercialisation of extracting citronella oil resulted in the establishment of small-scale citronella oil extraction units in remote villages.

This industry suffered setbacks in the past due to the following constraints: inconsistency in the quality and quantity of extracted oils, unavailability of fabricators in the project site, lack of prototype distillation set-up, accidental burning of grass in the distillation unit, fluctuating market price and limitation of market to small scale soap manufacturers rather than to huge industrial users. Often, the problem is aggravated by the lack of technical and managerial skills of the technology user. Applications: Citronella Oil is widely used in perfumery, soaps, detergents, disinfectants, flavours, cosmetics, house hold cleaners and mosquito repellents.

1. Cashing on Cashew: Case of Keni Cashew

Starting from Goa to Kerala, west coast of India, dotted with cashew processing units employing sizable number of rural youth and earning enough foreign exchange as well. Of late technology up-gradation in cashew processing has reduced dependence on human hands to a large extent, though not replaced it entirely. Notwithstanding these changes, cottages in Keni village in Uttara Kannada district of Karnataka buzz with cashew processing using indigenous technology for nearly a century. During summer, SHG members become active to spruce up their portico and nearby

open-space for traditional cashew processing. They need sea-shells of a specific variety (Figure 7) and enough earthen pots of two different sizes to start their seasonal enterprise operation.

Their production process can be described as follows: First, properly sun-baked cashew nuts will be water-soaked for three days (Figure 8) in big-sized earthen pots (that were sunk in neck-deep pits). Cashew-nuts become smooth enough to prick open by the sharp edge of sea-shell (Figure 9). Skilled hands will remove fresh cashew kernel to pass it the collection earthen pot kept before each working women. Depending on one's skill of nimble fingers to de-husk, rural women earn in these courtyards.

They have a technology to take out shell oil as well. They take a medium sized earthen pot and fill it with cashew shells (after taking out kernel) and cap it with a small vessel for collection of oil. They turn them upside down and fix them neck deep in earthen pit (Figure 10). Upon these lined up vessels buried in a line pit, they place dried leaves and other wastes to burn it for a few hours. Slow burning for hours, bakes the cashew shell filled in the small necked pots and helps to move the precious cashew oil down to smaller vessel. After overnight cooling, oil will be shifted to bigger vessels. It can be viewed as a type of brewing as shell oil (black in colour) trickle down to lower lot for hours of baking.

Inferences Drawn

Technology: In the context of garment manufacturing unit as well as areca sheath plate manufacturing unit, the SKDRDP, a well-known temple-based NGO, assisted in 'access to technology'. The NGO noted the vendors, installed and trained requisite people to use. Women had no problem in 'in use' as well as 'up-gradation' of technology too as there are no big issues involved while use of technology on day-to-day basis. However, in the case of Keni Cashew, it is indigenous technology, that has been inherited from generations. For instance, in areca sheath plate production unit, needful repair services are made available on need-basis. Unit

surveyed uses LPGas cylinder for heating process. However, they are making efforts to acquire new/modify pressing unit to electricity-mode. Agriculture Research station (a field unit of Agriculture University at Brahmavar), has shown the improved pressing unit using electivity as heating agent. If areca-sheath has more water content in the pressing process, the circuit breaker disconnects the system. In the case of citronella grass oil extraction, for local rural women, the technology is alien, but they have adapted an unknown production process by associating with neighbouring migrant Keralites.

Innovation: Innovative of method of cashew extraction localised in Keni village is praise-worthy for the simple reason that it provides employment for sea-shell collectors (they sell them to rural women for four pieces a rupee), potters of the village and itinerant traders, who lift dried cashew kernels for far and wide markets. It has not been replicated elsewhere simply because it is seasonal. Area sheath plate units are totally eco-friendly, their products are bio-degradable and have gained wider acceptability in these days. These plates have enough export potential as the unit near Kasargod in Kerala is exporting quality sheath plates to European markets.

Social Change: It may be noted that social change is not uni-directional. If one measures the economic content of social change, it can be noted that these units have absorbed sizeable number of young less-educated rural women in non-farm employment. Moreover, steady cash-flow into rural economy has hastened the pace of rural development. People prefer 'non-grain economy' rather than grain economy to take them towards economic salvation. These rural women have become more economically empowered than before. Second, concept of social entrepreneurship rarely fits for starry figures like Rajarashi Dharmadhikari Dr Veerendra Heggade, for the simple reason that all those institutions promoted and running under his leadership are on the lines of 'sustainable charity' and 'scale-up-excellence.'

Conclusions: Enterprise Facilitation of Social Change and Social Change Facilitation of Enterprises

Historians of technology tell us that virtually none of the technologies that structure our current social landscape were produced by the application of science; on the contrary, science and organised objective knowledge are more commonly the result of technology (Fores, 1982). Quite often, it is the human creativity that makes breakthroughs; however, multi-dimensional changes in society will occur when people show courage to accept something alien, at times too foreign to native culture. The modern management guru, Peter F Drucker, long back in 1960's puts it in a different manner by citing a case of Japan. "In Japan, which showed complete ability to adopt Western technology despite being a non-Western country, the farmer also has remained, until recently, pre-industrial in his technology. The great increase in food production in the last ten years, which converted Japan from a food-deficit country into a country capable of feeding a very much larger population, is the direct result of applying a little modern technology to the age-old tools, seeds, and methods of Japanese farming. But this began only after World War II; and then it was not Japanese engineers but largely American soldiers on occupation duty who first re-designed the farm implements of Japanese agriculture. The Japanese artisan even today is almost completely untouched by modern technology in his tools even though he may use the latest plastic with familiarity and ease." Hence, it the ability of the people to utilise change-making technology broadly available in the society for their benefit leads social change. In the cases analysed above makes amply clear that enterprises owned and operated by women stimulates social change and the social change in turn facilitates enterprise formation. Second, the role of 'risk reducing' and 'reassuring' development agents become very essential in rural setting. For instance, SKDRDP has demystified the technology for rural women and hand-held their enterprises leading to social change in their

surroundings. Third, scale of social changes heralded by rural enterprises owned and operated by SHGs and other looks pale when compared with what corporate monoliths can do. However, one cannot ignore the reply given by Michael Faraday in the anecdote cited above. Fourth, there exists indigenous knowledge which must be codified and conserved, and validated with living standards of modern society. Fifth, nascent concept - social entrepreneurship will become more vibrant if it combines 'developmental spirituality' with the motto 'returning rightful dues' to common people to make them economically independent as well as socio-culturally strong. Finally, one must bear in mind the touchstone of social change through enterprise development: do such enterprises reduce the great urban and rural divide - apart from digital divide; even-handle both men and women for organising their occupational pursuits; support innovations that ensure inclusion of excluded - not only educated but even the less-educated, well-to-do as well as the poor. If the answer is 'yes', rest will follow: symbiotic farm and non-farm economy wherein more enterprises will sprout and flourish.

Notes

1SKDRDP won the Asheden award 2012 with a prize money of £40,000, better known International and UK Gold Award instituted by UNDP for its innovative work on delivering sustainable energy to the poor through ethically managed microfinance.

2Presently there are 24 RUDSET units spreading over 14 States in India. <http://rudsetitraining.org>.

3The SKDRDP was established in 1982 by Dr D. Veerendra Heggade, dharmadhikari of Shri Kshetra Dharmasthala, to commemorate the installation of 39-ft monolithic statue of Lord Bahubali at Dharmasthala. SKDRDP is the biggest NGO micro-finance institution in the country with the members saving Rs 66.13 crore and a credit turnover of Rs 476.12 crore. At present, it operates in 559 gram panchayats consisting of 1,884 revenue villages and 31 towns. Of around 1,300 staff members, nearly 50 per cent are women. The organisation has promoted 45,756

self-help groups (SHGs) consisting of 4.6 lakh members. Farmers with small and marginal holdings, labourers and women are the members of these SHGs. Over the years, 97,000 farmers with small and marginal holdings have converted 50,000 hectares of barren land into productive green land.

In its initial years SKDRDP was mainly a charity programme aimed at small and marginal farmers of the region who were suffering from poverty, illiteracy, ignorance, not to mention social evils like alcoholism. The project identified these underprivileged people of the region and distributed amongst them necessary agricultural equipment, seeds, fertilisers, and other items of daily requirement. But by 1992 it had become clear to SKDRDP that help in the form of mere charity was not sufficient and people's participation in the work was very much needed for the developmental programmes to sustain themselves and grow. This led to SKDRDP organising itself into a more systematic body during 1992-93, with projects like Pragathibandhu, Janajagruthi and Jnanavikasa Kendra taking shape to include even the women and landless poor of the region. Today, after 25 years of its inception, SKDRDP is an integral part of the lives of the less privileged people of 16 districts of Karnataka. The major beneficiaries of all the programmes are women, that too poor rural women. Through its community development activities, SKDRDP has taken up the creation of rural assets. The organisation has contributed Rs 15.93 crore and ensured people participatory contribution in excess of Rs 100 crore.

References

- Basappa, K.V.A. and Murthy, K.N. (1960). Potentialities of areca nut stem and leaves. *Areca nut Journal*, 10: 61-64.
- Bhat, G. (2008). Passage to paradise: Some inferences on IT-changes in rural India. In R. R. Prasad and G. Rajanikanth (eds). *Rural development and social change*, Discovery Publishing House, New Delhi: 354-378.
- Dorf, C.R. (2001). *Technology, humans and society: Towards a sustainable world*. California: Academic Press.
- Drucker, F. P. (1963). Modern technology and ancient job. *Technology and culture*, 4(3): 277-281.
- Fletcher, D.E. and Watson, T.J. (2006), Entrepreneurship, management learning and negotiated narratives: Making it otherwise for us - otherwise for them, *Management Learning*.
- Fores, M. (1982). Technological change and the technology myth. *Scandinavian Economic History Review*, 30:167-88.
- Gartner, W.B. (1989). 'Who is an Entrepreneur?' is the wrong question. *Entrepreneurship theory and practice*, 13: 47-68.
- Gillin and Gillin. (1950). *Cultural sociology*. McMillan: New York.
- Grimes, S. and Lyons, G. (1994). Information technology and rural development: Unique opportunity or potential threat? *Entrepreneurship and regional development*, 6: 219-237.
- Hansraj. (2000). *Society in India*. SBD Publishers and Distributors. New Delhi: 362-374.
- Hefner, P. (2002). Technology and human becoming. *Zygon*, 37(3):655.
- Hillebrand W., Manner D. & Meyer-Stamcr J. (1994): *Strengthening technological capability in developing countries: Lessons from German technical co-operation*. Working Paper 12. German Development Institute.
- Jequier, N & Blanc, C. (1983). A few definitions of technology. In M. Carr (ed) *The Reader -Theory and Practice in Appropriate Technology*, London: Intermediate Technology Publications: 10.
- Kuppuswamy, B. (1996). *Social change in India*. Konark Publications: New Delhi.
- MacIver, R.M. and Page, C.H. (1959). *An introductory analysis of sociology*. McMillan: London.
- Madden, J. P. (1966). *Social change and public policy in rural America: data and research needs for the 1970's*. Undated working papers: 308-314.
- Manimala, J. M. (1988). Managerial Heuristics of Pioneering - Innovative (PI) Entrepreneurs: An Exploratory Study. *Unpublished doctoral thesis*. Indian Institute of Management, Ahmedabad.

Menon, M.G.K. (2001). The Characteristics and Promotion of Innovation. *Social Sciences and Innovation*. Paris: OECD: 77-87.

Menon, S.R.K., Annamalai, S.J.K, and Nayar, K.M. (1982). Arecanut leaf sheath - raw material for product development. Proceedings of PLACROSYM III, India Society for Plantation Crops, Kasargod, India: 237-244.

Niehoff, H.A. (1966). *A case book of social change*. Aldine Publishing Co. Chicago: 3.

Putnam, R. (2000). *Bowling alone: the collapse and revival of American community*. Simon & Schuster. New York.

Raghupathy R., Viswanathan R. and Devadas, C. (2002) Quality of paper boards from arecanut leaf sheath. *Bio-resource technology*, 82(1): 99-100.

Rao, C.N.S. (2005). *Principles of sociology with an introduction to social thought*. S Chand Publications: New Delhi.

Shane, S. and Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25 (1): 217-26.

Singe, H. (1978). *Educational conditions for technology for rural development*. In Radhakrishna, (Ed) Technology for Rural Development. Proceedings of a joint MSA seminar, Kaula Lumpur, Malaysia, April: 24-29.

Steyaert, C. (1998). A qualitative methodology for process studies of entrepreneurship: Creating local knowledge through stories. *International Studies of Management and Organisation*, 27 (3): 13-33.

Steyaert, C. and Katz, J. (2004). Reclaiming the space of entrepreneurship in society: Geographical, discursive and social dimensions, *Entrepreneurship and Regional Development*, 16 (3): 179-96.

Subbakrishna, N. & Gardner, J. (1989). Assessing alternative energy technologies for developing countries: technology assessment groups and software. *The Environmentalist*. 9(1):55-65.

Compendium of Papers presented in an International Conference held at JKSHIM

