

Strengthening of Extension Learning and Education or Sustainable Entrepreneurship

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Abstract

Sustainable entrepreneurship (SE) is a kind of entrepreneurship that meets the needs of the present without compromising the ability, efficiency and values of future generations to meet their own needs. SE leads to sustainable development. Sustainable entrepreneurs should be developed through well-conceived and well directed extension learning and education programmes around thrust areas, thus advancing the frontiers of theories and practice sustainable entrepreneurship. The objectives of the study are : (i) To implement the concept of SE based on entrepreneurial research conducted in South India , (ii) To formulate and appraise forty three number of detailed project reports of Diploma in Entrepreneurship and Business Management (DEBM) extension learners in eleven batches attached with the present author , counselor and co-ordinator of Entrepreneurship Development Institute of India -Ahmedabad during the research year (RY) 2007-2014 , (iii) To promote policy recommendation so as to strengthen scientific and technical services focusing on extension education, training and research The design of the study was cross sectional. The study has been conceptualized and launched based on an innovative entrepreneurship development programme through distance learning and personal counseling. DEBM extension learners were equipped with the knowledge, skills and motivation to set up their sustainable enterprises and function dynamically and manage successfully. All entrepreneurial business planning assessment regimes (EBPARs) have been accomplished for credibility and communicability. Project analysis for forty three extension learners has been discussed. Green design and structure of resultant products and services were environmental advantage with good performance and prices. A famous project case on unsafe chromium pollution and contamination of 18 000 to 30 000 mg/kg from Indian cotton roller ginning factories and development of green design roller gin rollers for cotton gin machine has been presented. Such low-carbon and energy-efficient technologies of agricultural hi-tech industries have made important contributions to mitigating the impacts of economic growth on global warming. SE is an innovation in order to advance science and technology and sustainable mechanization. Hitherto state-of-the-art literatures, market effects have been considered. It is reported that non-market impacts such as environmental and social impact assessment should be considered for proposed, plans, programs, policies and legislative action projects for sustainable development and poverty alleviation.

Keywords: alleviation; education; enterprise; entrepreneur; environment

INTRODUCTION

Sustainable development is a kind of development that meets the needs of the present without compromising the ability, efficiency and values of future generations to meet their own needs. The concept of sustainable development challenges that fosters long-term protection of the environment and its habitants as the technological developments are guided by efficiency, productivity, profitability, health and environmental impacts, resource and energy conservation, waste management, and social impacts such as public convenience, unemployment and crime (Hendry , 2004). Extension learning education and research in the field of sustainable entrepreneurship (SE) is introduced so as develop sustainable entrepreneurs on large scale so as to

set up sustainable enterprises for sustainable development and poverty alleviation. Entrepreneurship is a process of setting up of new enterprises to pursue opportunities. In spite of the state-of –the –art literatures available on sectoral entrepreneurship e.g. agriprenurship, eduprenurship, healthcare entrepreneurship, tourism entrepreneurship etc., research on SE for sustainable development has been introduced which is an important area in the relevant literature (Iyer, 2014). An entrepreneur, who organizes, manages, assumes risks and enjoys profits of business successfully. SE is defined as a process of setting up of sustainable enterprise at considerable risk. SE involves all the functions, activities, and actions associated with

the perceiving of new sustainable opportunities and the creation of sustainable enterprises to pursue them. Entrepreneurs perceive new opportunities and create enterprises to pursue it (Legg, 2004). A sustainable entrepreneur combines efficiently and effectively all six kinds of input resources can be referred to as "The six Ms" such as man-power, machinery, material, method, money and market in order to transform into output goods, products or services (Iyer, 2013). Sustainable entrepreneurs consider the environment in an organizational planning and decision making and to arrive at actions which are more environmentally compatible plans. The concept of sustainability is highlighted when the resources do not get depleted due to business endeavors. Sustainable enterprise creation process is a solution for unsustainable development which is research problem under investigation (Iyer, 2014). The author, expert counselor and coordinator has got an autonomy to conduct one year Diploma in Entrepreneurship and Business Management (DEBM) duly awarded by Entrepreneurship Development Institute of India (EDI) to forty three DEBM extension learners during the research year (RY) 2007-2014. DEBM counselor has to provide the learners' necessary academic support and guidance, conduct of course work, two contact sessions, evaluation of assignments, tutorials, detailed project reports (DPRs) and conduction of term end examinations. All DPRs have been formulated and appraised on green design and structure of products and services. DEBM learners have been awarded diploma. The course is recognized by All India Council for Technical Education (AICTE), University Grants Commission (UGC) and Distance Education Council (DEC) as per reference <http://www.debm.ediindia.ac.in>; reference agency code number 80410. Website: www.ediindia.org & <http://debmcourse.blogspot.in/>

To address the need of developing new and committed sustainable entrepreneurs, there is a need of extension learning and education programme through distance learning and personal counseling.

RATIONALE AND BACKGROUND

Education coupled with entrepreneurship is an intricate sustainable educational process towards sustainable development that can be focused on sustainable rural development and poverty eradication from the emerging enterprise spirit (Iyer, 2014). The poverty is a result of inefficient use of resources (Iyer, 2014). If it aids for sustenance then that can be eradicated. About 88% of economic growth is created by innovation (Iyer, 2013). To achieve this degree of excellence, resources must be utilized at optimum and sustainable levels to maximize

efficiency as per the results analysis of optimum competitive and social markets (Iyer, 2014). The referred "A.K" economic model for an optimum output level of economic growth is the product of engineering or technical factor level (A) and the capital (K) (Iyer, 2014). The solution is the creation of new sustainable enterprises. The entrepreneurial idea generation is based on the concept of entrepreneurship and innovation management. The economic growth development of is explained by three factors (Iyer, 2014).

The natural increase in the accumulation of labor potential, Capital accumulation or money with which a business is being started and run, and Technological momentum can be referred as total factor productivity (TFP) or efficiency in industrial processes.

The fundamental sustainable entrepreneurial momentum keeps the capital development dynamic which comes from the new agricultural enterprise creation process, new agricultural products or service requirements from customers, the new methods of production and processes, new transportation, and new agricultural markets and new forms of industrial organization.

Standard Production Function (SPF) is expressed as

$$Y = f(C, L)$$

Where Y=Output, C=Capital, and L=Labor

As knowledge is an important factor for the economic growth,

Standard Production Function (SPF) is modified as

$$Y = A(C, L) f(C, L)$$

'A' represents Knowledge on engineering or technical extension

Y= Output, C= Capital, L= Labor, f = Standard production function

As per the given standard production function, knowledge is a decisive production variation. Therefore it is importance of application of low-carbon and energy-efficient green product designs and structures for sustainable development through SE.

To address the need of developing new and committed sustainable entrepreneurs on a large scale, there is a need of an innovative scientific and technical extension education programme through distance learning and personal counseling in extension education system. A dynamic and pragmatic approach is introduced to create sustainable entrepreneurs on a large scale and to strengthen extension education.

METHODS AND PROCEDURES

One year DEBM course is offered by EDI and sponsored by Friedrich-Naumann-Stiftung (FNSt)-A foundation of International repute from Germany(EDI,

2012). Professional expert counselor has conducted DEBM course independently to forty-three extension learners during the research year (RY) 2007-2014 in eleven batches as per EDI guidelines. EDI has provided guidelines to conduct the course as per the website reference <http://www.debm.ediindia.ac.in>. SE was the targeted research area. The methodology of the DEBM course includes, self-instructional study material, assignment, personal counseling through professional expert counselors and contact sessions during the course. The award of the diploma is based on assessment of the assignments, detailed project reports (DPRs) submitted by the learners and performance in the final (TEE) examination. Forty three green product design projects were appraised duly proposed by DEBM

learners under the research guidance of expert counselor during the given RY. List of forty-three extension learners and their academic records were uploaded in URL <http://www.debm.ediindia.ac.in/counsellors/studentrecord/candidates.jsp>, and counselor code number (User ID) 80410.

www.ediindia.org & <http://debmcourse.blogspot.in/> http://www.ediindia.org/doc/List_of_Institutions_for_website_latest.pdf serial number 68.

Figure 1 shows a schematic map of sustainable enterprise creation process for setting up of sustainable enterprises

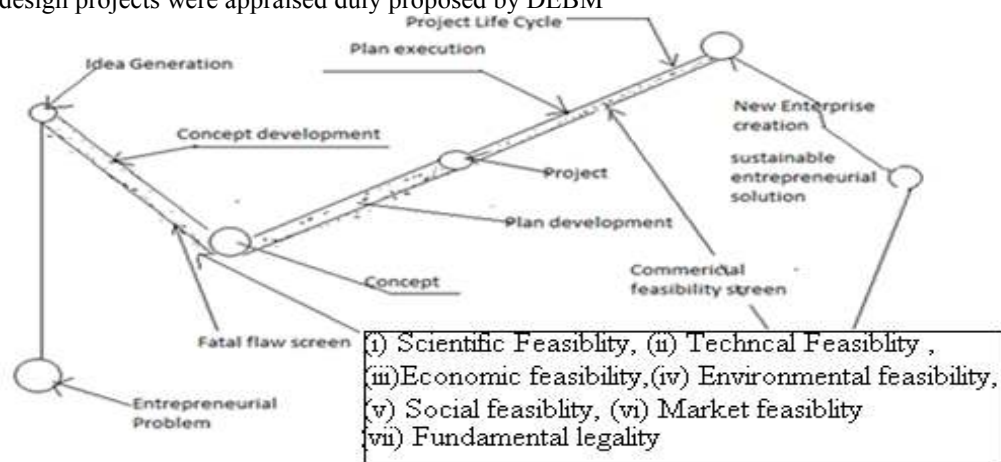


Figure-1: A Schematic Map of Sustainable Enterprise Creation Process

Rural poverty the world over, has been observed to be a major problem in the socio-economic development of rural inhabitants. Poverty has been conceived to be the lack of command over commodities and resources that provide people with income and consumption (Lipton and Ravallion, 1995). Also, Sen (1984) viewed poverty as the extent to which the consumption of certain goods and services affords certain capabilities. Therefore, poverty occurs where there is poor production, income inequality, low income, rising vulnerability, destitution resulting from misdistribution of resources, low calorific intake, absence of resources, low life expectancy, stagnation of local economic growth and limitations of access to health, sanitation and education. In spite of the economic policies and institutional structures aimed at reducing income inequality, most rural economies are still characterized by low incomes and rising vulnerability (World Bank, 2008).

These manifestations confirm the prevalence of poverty in Akwa Ibom State, especially among the rural and peri-urban dwellers. Inequality is high in Akwa Ibom State as the total expenditure per month of the highest

10 percent of the population (N8, 235) is seven times higher than that of the lowest 10 percent of the same population (N1,120). Also, using the Gini Index, inequality is 44 percent for food items and 55 percent for non-food items. Additionally, while the overall urban poverty index was 53 percent, rural poverty index was 76 percent. Also, 81 percent of the rural poor use uncovered traditional pit latrines with HIV prevalence rate of 8 percent, second only to Benue State with 10 percent prevalence rate. Rural Akwa Ibom is inhabited by landless, uneducated poor and its crop yield is low because of degraded and polluted land. Its agriculture is mostly subsistent and rain-fed and its man-land ratio is approximately 1. Furthermore, 89.2 percent of the population in Akwa Ibom State resides in the rural areas and 74 percent live below the poverty line of ₦4,954 per adult per month. Therefore, the incidence of poverty has been described as "high, extensive and deep" (AK-BASES, 2005). Based on these, there is high (36.1 percent) unemployment among the rural residents who are characterized by low incomes, high level of poverty, poor quality of life, poor shelter, lack of access to potable water, poor sanitary conditions, poor

transportation, poor energy supply and even poor storage facilities for harvested agricultural produce. Consequently, these have led to increased rural-urban migration, high crime rate, kidnapping, advance fee fraud, social unrest and juvenile delinquency thus, making the rural socio-economic growth and development stagnant and redundant and the urban areas vulnerable to insecurity.

All DEBM projects were screened for the seven fatal flaws, namely, (i) scientific feasibility, (ii) economic feasibility, (iii) technical feasibility, (iv) environmental feasibility, (v) social feasibility, (vi) marketing feasibility, and (vii) fundamental legality. The sustainable entrepreneur or a trusted member of an entrepreneurial team have acquired skills in ethics, accounting, law, finance, team creation and marketing aspects in order to avoid failures in the process. Sustainable entrepreneur has thorough knowledge on environmental management system (EMS) and social management system (SMS) in order to skillfully bring about and manage resources efficiently to do a dedicated sustainable entrepreneurial process. EMS is a system of a continual cycle involving various processes as planning, implementing, reviewing and improving the activities for the enterprises to comply technical, economic, environmental and social obligations. EMS ensures that agricultural organizations identify and focus on improving areas where they have significant environmental and social impacts (Iyer, 2014). Sustainable entrepreneurs have followed the principle of sustainable process approach as depicted in Figure-2. . Extension learning and education system (ELES) functions as per the principle of process approach - an activity based management system as outlined in Figure 2 (Iyer, 2014). Monitoring, measurement and control opportunities in extension learning system through process approach have been identified and evaluated during the RY.

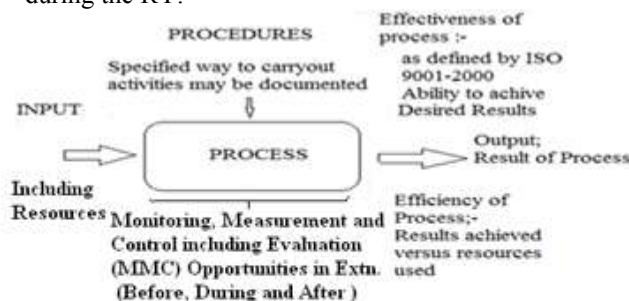


FIGURE-2 ; SCHEMATIC REPRESENTATION OF SUSTAINABLE ENTREPRENEURIAL PROCESS

In order to make the venture a dynamic and growing sustainable enterprise, the entrepreneurs have been skillfully brought about and managed resources efficiently to dedicated sustainable entrepreneurial process. A process approach has been developed in order to bring labor, capital, technology, management, market, machineries, land and information together in new ways and to establish a new mechanism for sustainable rural development and eradicating poverty by providing scientific and technical services. This approach enhanced innovation in science and technology (S & T) through an efficient extension education system. A famous case (DPR-I) on eco-friendly rubberized cotton fabric roller development for cotton roller ginning machines elaborates in World Scientific Engineering Academy and Society (WSEAS) (Iyer, 2011) .

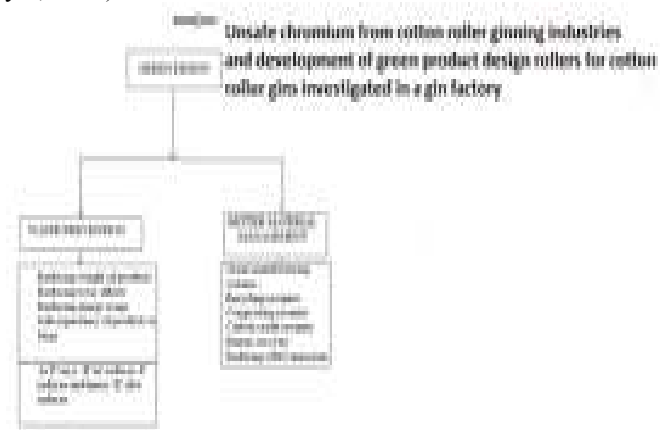


Figure-3: Green Design and Structure For Sustainable Development

Projects have been scrutinized for the fatal flaws (Figure-3). A famous case is discussed on unsafe chromium contamination and pollution from Indian cotton roller ginneries and development of green design roller gin rollers for cotton ginning machines duly investigated in a ginning factory (Iyer, 2007). It realizes the hazards of chromium contamination and pollution caused in the use of chrome composite leather-clad (CCLC) rollers commonly used in cotton roller ginning industries and attempts to eliminate the chromium contamination and pollution during the complete process (Iyer, 2014). The cotton roller ginning process is the mechanical separation of cotton fibres from their seeds by means of one or more rollers to which fibres adhere while the seeds are impeded and struck off or pulled loose (Gillum, 1974). Most of the cotton ginning operations are done using roller gins. The CCLC roller coverings contain about 18 000 to 30 000 mg/kg (ppm) as total chromium of trivalent and hexavalent forms which are toxic to human health (Iyer, 2007). When the seed-cotton is ginned, due to the persistent rubbing of CCLC rollers over the fixed knives, the cotton and its

products contaminated with the total chromium of trivalent and hexavalent forms. Hexavalent chromium leaks threat to cotton mill workers and to those who wear cotton garments (Iyer, 2009). Cotton garments contaminated and polluted with toxic hexavalent chromium (Iyer, 2010). Consumers of cotton garments and ginning mill workers are exposed to chromium pollution and are susceptible to health hazards. Toxic effects are produced by prolonged contact with airborne or solid or liquid chromium compounds even in small quantities (Iyer, 2007). There are many chromium based diseases that come out of the case industries (Iyer, 2014). To avert the problems in cotton ginning factories, an eco-friendly rubberized cotton fabric roller has been designed and developed. This green design product has been successfully implemented and demonstrated for its sustainable performance (Figure -4). The objectives of DPR-I were (1) To identify and study the environmental and health related problems existing with the present CCLC rollers employed in cotton roller ginning industries and 2) To design and develop green design cotton roller gin rollers for seed-cotton roller gins and evaluate its performance with a particular reference to technical, economical, and environmental and social aspects in Indian seed-cotton roller ginning industries.



Figure-4: Seed-Cotton Ginning Using Green Design Rollers

RESULTS AND DISCUSSIONS

Entrepreneurial process is a set of inter-acting and inter-relating entrepreneurship activities in an organized manner (Iyer, 2013). Forty three DPRs were formulated and appraised. Study material of the DEBM course for learners and help provided by EDI counselors enable the extension learners to set up their own sustainable businesses (Entrepreneurship development Institute of India). The course targeted the learners to assess their entrepreneurial competencies and understand weakness and strength to start business. Overall the extension learning course equipped learners to function dynamically and acquired the requisite knowledge and skill to plan and successfully launch their own ventures. The result analysis of all projects have been uploaded in website reference; <http://www.debm.ediindia.ac.in/counsellors/studentrecord/candidates.jsp>, and counselor code number (User ID) 80410.

Website: www.ediindia.org & <http://debmcourse.blogspot.in/>

The success of a good entrepreneur is determined by a sustainable business plan development. It is an important document that provides critical aspects, basic assumptions, and financial projections regarding the business venture (Iyer, 2013). It is the basic document used to interest and attract financial support. All entrepreneurial business planning assessment regimes (EBPARs) have been identified and evaluated for their credibility and communicability. A sustainable entrepreneurial venture has included four key ingredients:

A talented lead sustainable entrepreneur with a balanced and compatible team.

A technically and environmentally sound and marketable idea for a green product or service.

A thorough venture analysis leading to a complete sustainable business plan.

A clear statement of the cash required, phased over the period until the venture becomes cash flow positive and an indication of the minimum equity component.

DEBM extension learners were also focused to work on green design products and services with the resultant low-carbon and energy-efficient technologies during the RY. Sustainable enterprises have reduced environmental and social impacts associated with the manufacture, use and disposal of products. The output of green products and services which are sustainable production, environmental advantages with good performance and price (Masters, 2008).

A case study of a DPR-I on unsafe chromium pollution and contamination from cotton roller ginning industries and development of green design rollers for cotton roller gins investigated in a cotton ginning factory, a pilot plant of which has been implemented and demonstrated. Such low-carbon and energy-efficient agricultural technologies of agricultural hi-tech industries can make important contributions to mitigate the impacts of economic growth on global warming (Iyer, 2014). SE has provided innovation to improve S & T and sustainable agricultural farm mechanization for alleviation of rural poverty. All DEBM extension learners were equipped with the knowledge, skills and motivation to set up their sustainable enterprises and function dynamically and manage successfully. The DEBM programme promotes the application of multidisciplinary technologies to agricultural industries and sustainable production.

All DPRs are accessed from the reference website <http://www.debm.ediindia.ac.in>.

Website: www.ediindia.org & <http://debmcourse.blogspot.in/>

As per the study on characteristics and assessment of DEBM extension learners, entrepreneurial requirements have been identified and evaluated. An entrepreneurial leaflet has been compiled along with guidelines to become a successful entrepreneur and to set up sustainable enterprise (Iyer, 2013). It represents fifteen steps as given below.

Step- 1: Decision to be self-employed to become a sustainable entrepreneur and to set up a sustainable enterprise.

Step- 2 : Product and Innovative Process selection including marketing feasibility .

Step -3 : Deciding on size of the unit

Step -4 : Location of the unit

Step- 5 : Technical and financial feasibility of the unit

Step- 6 :Environmental and Social feasibility of the unit.

Step -7 :Awareness on statutory requirements including fundamental legality.

Step -8: Infrastructures for the unit

Step -9 : Working out project cost

Step -10: Provisional micro, small and medium scale industry (SSI/MSME) registration

Step- 11: Bio-data of the entrepreneur

Step- 12 :Preparation of sustainable business plan /Entrepreneurial Business Planning and Assessment Regime (EBPAR)

Step- 13: Project implementation schedule (PIS)

Step -14: Project report preparation –Bankable project report (Preliminary project report and detailed project report)

Step- 15 : Financial assistance for setting up an enterprise.

Step-6 : Environmental and Social Feasibility of the Project

Step number six (6) has been taken up as a research problem which has been focused on SE. Such of those projects, plans, programs, policies, and legislative actions which may be technically and economically feasible but has been implemented only if environmentally and socially feasible. Environmental impact assessment (EIA) is stated precisely as the systematic identification and evaluation of the potential projects, plans, programs, or legislative actions relative to the physical-chemical, biological, cultural, and socio-economical components of the total environment(Canter, 1996). The purpose of the EIA process in SE was to encourage the consideration of the environment in planning and decision making and to ultimately arrive at actions which were more environmentally compatible. Further, it is important to conduct social impact assessment (SIA) separately for all the projects (Iyer, 2014). As per the state-of-the-art literatures on entrepreneurship is concerned, only market effects have been considered. The present

research has been considered non-market impacts in addition to techno-economic feasibility of projects for sustainable development and poverty alleviation. As far as the entrepreneurship education, training and research is concerned, techno-economic entrepreneurial development is not only sufficient for sustainable development and poverty alleviation. It should be mandatory to develop social and sustainable entrepreneurship by strengthening extension learning and education. This action-based field research study on SE facilitated to promote policy recommendation to strengthen extension learning and education based on an entrepreneurial study conducted in India.

CONCLUSION

Extension learning and education in the field of SE has been concluded in order to develop entrepreneurs on large scale and to set up sustainable enterprises for sustainable development and poverty alleviation. Sustainable entrepreneurs should be developed through well-conceived and well directed learning and educational programmes around thrust areas, thus advancing the frontiers of theories and practice sustainable entrepreneurship for sustainable development. SE has challenged that fosters long-term protection of the environment and its habitants as the technological developments are guided by efficiency, productivity, profitability, health and environmental impacts, resource and energy conservation, waste management, and social impacts such as public convenience, unemployment and crime. The development of new knowledge should be an important factor for the sustainable economic growth. The standard production function has indicated that knowledge is a decisive production variation. About 88% of sustainable economic growth should be created by innovation. The organizational project planning and decision making should include the integrated consideration of technical, economic, environmental and social factors. The most important of these considerations can be referred to as “The four *Es*” (engineering or technical, economics, environment and ethics) in planning and decision making process. A project may be technically and economically feasible but should be implemented only if environmentally and socially feasible. A sustainable process approach has been developed in order to bring labor, capital, technology, management, market, machineries, land and information together in new ways and to establish a new mechanism for sustainable rural development and eradicating poverty by providing scientific and technical services. Monitoring, measurement and control opportunities in extension learning and education system through a sustainable process approach should be implemented. The objective of the DEBM extension

learning and education course is “New Enterprise Creation and Management”. DEBM course has developed motivation to extension learners and reinforces entrepreneurial traits with the spirit of setting up sustainable enterprises. Forty-three green design projects proposed by DEBM extension learners attached with the counselor during RY 2006-2014 have been formulated and appraised. Projects were screened for five fatal flaws, viz., (i) scientific feasibility, (ii) economic feasibility, (iii) technical feasibility, (iv) environmental feasibility, (v) social feasibility, (vi) marketing feasibility, and (vii) fundamental legality. Hitherto state-of-the-art literature on entrepreneurship, only market effects have been considered. The present research dominant non-market impacts in addition to techno-economic feasibility of projects for sustainable development and poverty alleviation. EBPAs have been accomplished for their credibility and communicability. All learners have set up their own sustainable enterprises based on sustainable enterprise creation process under the research guidance of author expert counselor. Sustainable enterprises were set up to focus on green design products and services that reduced environmental impacts associated with the manufacture, use and disposal of products. Such results were of environmental advantages with sustainable production, good performance and price. All extension learners have been duly awarded DEBM.

Education coupled with entrepreneurship should be an intricate sustainable educational process towards sustainable development that has been focused on sustainable rural development and poverty eradication from the emerging enterprise spirit. Agricultural cleaner technologies have produced more output than conventional technologies by causing fewer damages to the environment. Agricultural greener technologies as those that are less polluting, use resources in a sustainable manner, recycle more of their wastes and products and handle all residues in a more environmentally acceptable way. A famous project on unsafe chromium pollution and contamination of about 18 000 to 36 000 mg/kg from Indian cotton roller ginning industries and development of green design roller gin rollers for cotton gins has been demonstrated for its sustained performance. As far as the entrepreneurship education, training and research is concerned, techno-economic entrepreneurial development is not only sufficient for sustainable development and poverty alleviation. It should be mandatory to develop social and sustainable entrepreneurship by strengthening extension learning and education.

DEBM study material and help provided by counselor enabled the learners to set up their own enterprises. It assessed their entrepreneurial competencies and understood weakness and strength to start sustainable business. The design of the study has facilitated to promote policy recommendation so as to strengthen extension learning and education based on the entrepreneurial research conducted in south India. The programme has promoted the application of multidisciplinary technologies to agricultural industries and sustainable agricultural production. It is recommended that such kind of entrepreneurial learning and education system should be essential for sustainable development and poverty alleviation. As concluded in this paper, it is imperative that such a dynamic and pragmatic approach be implemented to create sustainable entrepreneurs on a large scale. For further reading <http://www.ediindia.org/doc/List of Institutions for website latest.pdf> serial number 68.

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