

Agri-Preneurship through Agro-based Technologies



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हर कदम, हर डगर
किसानों का हमसाफर
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Promoting Agri-preneurship through Partnership

Institute Entrepreneurship Linkage Programme (IELP) – Technology Application for Income Generation (TAIG)



ICAR-ATARI, Bengaluru

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FOREWORD

Agri-preneurship has got the potential to generate growth, diversifying income, providing widespread employment and entrepreneurial opportunities in rural areas. A shift from agriculture to agribusiness is an essential pathway to revitalize Indian agriculture and to make agriculture more attractive and profitable venture. In addition to ensuring food and nutritional security to rural families, agri-preneurship may bring socio-economic transformation through providing employment and income generation opportunities.

Identification of appropriate technologies and potential entrepreneurs are the two important basic aspects for imparting knowledge and skills for promoting agripneurship. I am happy to note that contents of this publication focus on the basic concepts of agri-preneurship, entrepreneurship skills, methodology for identification and selection of entrepreneurs, business opportunity guidance and project formulation which are essential for undertaking capacity development programmes to promote any agri-enterprises.

I am confident that this publication will be useful for all the stakeholders involved in promoting agri-preneurship in Indian context. My hearty congratulations to the authors for their efforts in bringing out this publication "*Agri-preneurship through Agro-based technologies*".

(A.K. Singh)

New Delhi

Dated : 20.09.2021

PREFACE

Creation of Agri-incubator platform urges the ICAR institutions to unite, strengthen linkages, improve the technology transfer strategies and share the available resources. Institutional facilities available in ATICs and KVKs in the country are emphasising entrepreneurship development and linking the entrepreneurs with the ZTM-BPD units. Therefore, it is essential to scientifically study the feasibility to promote entrepreneurship activities with respect of those technologies developed by the NARS having the income generation potential. Equipped with appropriate technologies with their known commercial value it is easy to promote entrepreneurship among rural youths and farm women through technological and methodological support in coordination with the ZTM-BPDs.

With proper technology support and guidance, opportunities can be created at grass root level for promoting rural entrepreneurs. What is needed is an entrepreneur friendly environment for providing technological support, guidance and a platform for interaction among the stakeholders. Therefore, an attempt was made to identify potential technologies for starting a rural enterprise and a capacity development module for identification of potential rural entrepreneur and for imparting knowledge and skill for starting an enterprise.

Three potential technologies namely, Soil Moisture Indicator (SMI), Settling Transplanter, and Bio fertiliser production were selected based on their income generation potential and starting an enterprise. What would be the potential entrepreneurial qualities required for a successful entrepreneur has been answered by our attempt to develop a testing tool comprising 25 entrepreneurial competencies to determine the level of entrepreneurs quality.

Other prerequisites for an entrepreneurial development programme were answered through developing an attitude measuring scale and knowledge test for recognizing pre-learning and post learning levels of the selected entrepreneur before and after the capacity development programme.

Present publication Agripreneurship through Agro-based Technologies is the outcome of the research project “A Feasibility Study of Recommended Sugarcane Production and Protection Technologies for Promoting Rural Entrepreneurship” undertaken by the team. Keeping in view of the requirements of the capacity developers in entrepreneurship Part-1 of the publication dealt with the chapters giving details of The Concept of Entrepreneur and Entrepreneurship, Entrepreneurship Education-Concept Base, Approach and Methodology, Identification and selection of Entrepreneurs, Business Opportunity Guidance, Product Identification and Selection and Project Identification, Formulation and Approval .

Project Back ground and Research Methodological aspects were given in the Part-2 of the publication. Part 3 of the publication gives the details about Capacity Development and Business Plan Template for SMI, Bio-fertiliser and Settling Transplanter. Chapters on Technology Product and Capacity Development, Knowledge and Skill Development on SMI Assembling, Knowledge and Skill Development on Bio-fertiliser Production and Knowledge and Skill on Assembling of Settling Transplanter were included in this part.

PREFACE

We are confident that the publication will help the students, research scholars and personnel of grass root institute like KVKs, ATMA, BPD units etc in identifying potential entrepreneurs, technology identification and imparting knowledge and skill for promoting agripreneurship among rural youths.

We express our sincere thanks to Director of ICAR-Sugarcane Breeding Institute for the overall guidance, support and encouragement given to us. We also acknowledge with gratitude the support received from Head, IACR CIAE-RC, Coimbatore and his team for providing their expertise in finalising the chapter on Knowledge and Skill development in Settling Transplanter. Our sincere thanks for the guidance and support given by Dr K. Vijula, Professor, TNAU, Coimbatore in drafting the chapter on Knowledge and Skill development in biofertiliser production. We also acknowledge the help of Shri N. Rajagopal, CEO and MD, C2Y Technologies Coimbatore for his guidance in working out business plans and project management concepts.

We feel happy in bringing this piece of work in the hands of all those in the process of building a strong rural economy through promoting agripreneurship.

Authors

Foreword

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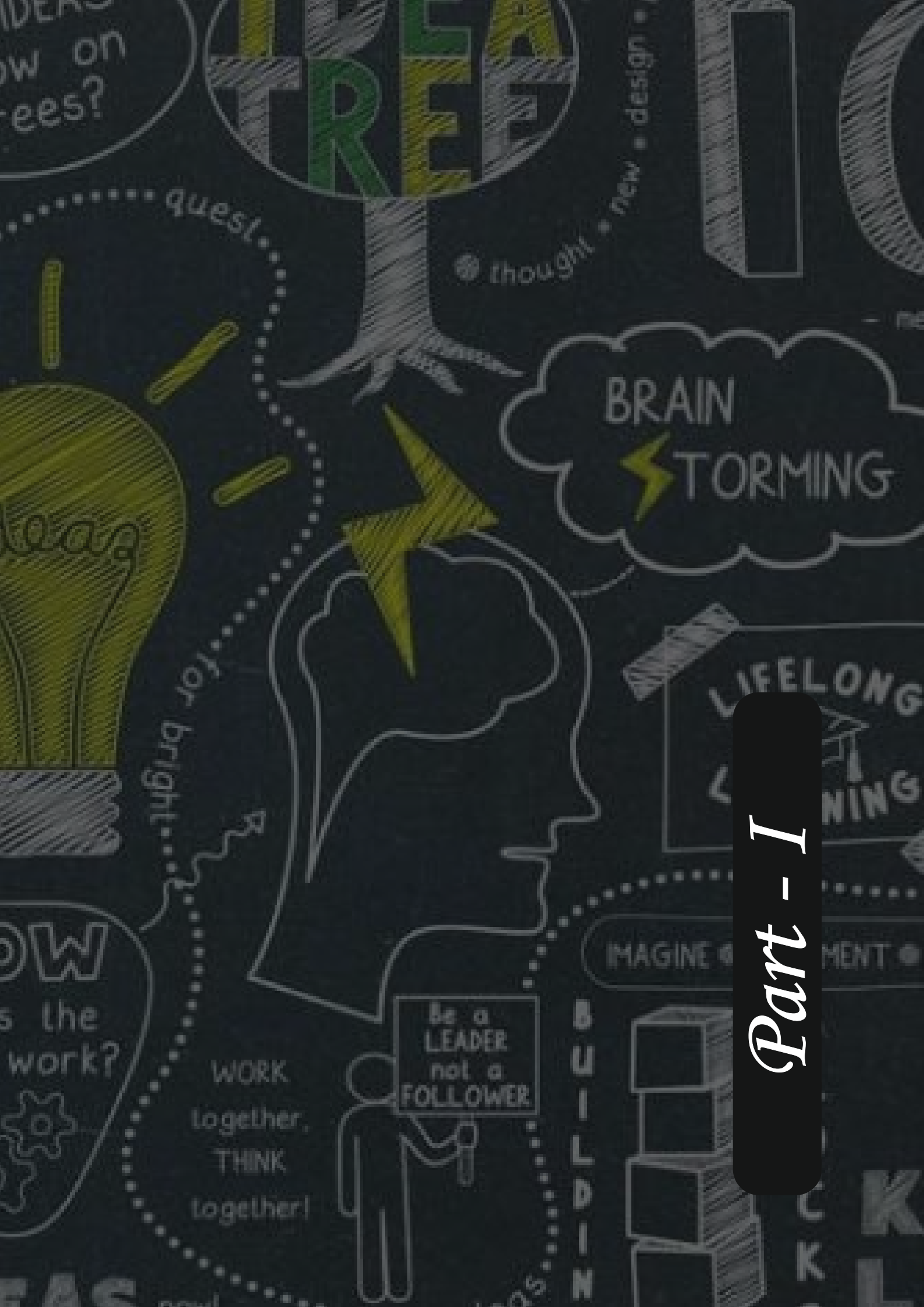
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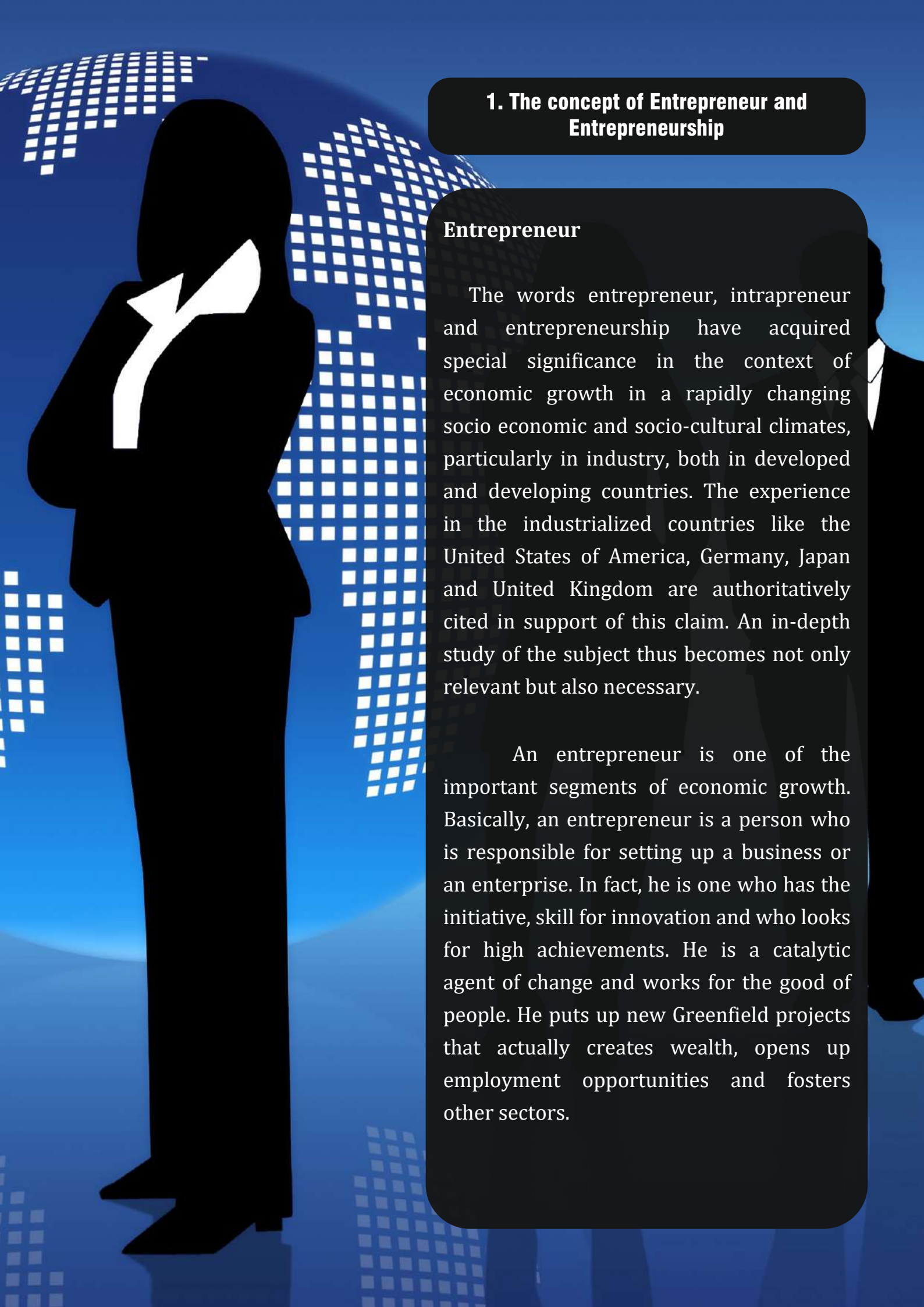
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Abbreviations

ABI	Agri-Business Incubator
ATIC	Agricultural Technology Information Centre
BPD	Business Process Development
CD	Capacity Development
NAEP	National Agricultural Education Programme
NAIP	National Agricultural Innovation Programme
NOS	National Occupational standard(s)
NVQF	National Vocational Qualification Framework
NSQF	National Qualification Framework
NVEQF	National Vocational Educations Framework
QP	Qualification pack
PME	Project Monitoring and Evaluation
SMI	Soil Moisture Indicator
TQM	Total Quality Management
ZTM	Zonal Technology Management Unit



Part - I



1. The concept of Entrepreneur and Entrepreneurship

Entrepreneur

The words entrepreneur, intrapreneur and entrepreneurship have acquired special significance in the context of economic growth in a rapidly changing socio economic and socio-cultural climates, particularly in industry, both in developed and developing countries. The experience in the industrialized countries like the United States of America, Germany, Japan and United Kingdom are authoritatively cited in support of this claim. An in-depth study of the subject thus becomes not only relevant but also necessary.

An entrepreneur is one of the important segments of economic growth. Basically, an entrepreneur is a person who is responsible for setting up a business or an enterprise. In fact, he is one who has the initiative, skill for innovation and who looks for high achievements. He is a catalytic agent of change and works for the good of people. He puts up new Greenfield projects that actually creates wealth, opens up employment opportunities and fosters other sectors.

Who is an Entrepreneur?

The entrepreneur as a person brings in overall change through innovation for the maximum social good. Human values remain scared and inspire him to serve society. He has firm belief in social betterment and he carries out this responsibility with conviction. In this process, he accelerates personal, economic as well as human development.



The entrepreneur is a visionary and an integrated man with outstanding leadership qualities. With a desire to excel, he gives top priority to Research and Development. He always works for the well-being of the society. More importantly, entrepreneurial activities encompass all fields/sectors and fosters of enterprise for the welfare of mankind.

The entrepreneur is a critical factor in the socio-economic change. He is the key person who envisages new opportunities, new techniques, new lines of production, new products and co-ordinates all other activities.

Importance of an Entrepreneur

The Entrepreneur is one of the most important inputs in the economic development of a country or of a regions within the country. Entrepreneurial competence makes all the difference in the rate of economic growth. In India, state and private entrepreneurship co-exist. The small-scale industrial sector and business are left completely to private entrepreneurs. It is in this context that an increasingly important role has been assigned to the identification and promotion of entrepreneurs for this sector.

The need for a broad-based entrepreneurial class in India arises from the need to speed up the process of activating the factors of production, leading to a higher rate of economic growth, dispersal of economic activities, development of backward and tribal areas, creation of employment opportunities, improvement in the standard of living of the weaker sections of the society and involvement of all sections of the society in the process of growth.

Several factors go into the making of an entrepreneur. Individuals who initiate, establish, maintain and expand new enterprises constitute the entrepreneurial class. The socio political and economic conditions, the availability of industrial technology and know-how, state of an and culture of business and trading, existence of markets for products and services and incentives and facilities available for starting an industry or business, all have a bearing on the growth of entrepreneurship. A conducive environment is created through the policies and interest of the government in economic and industrial development.

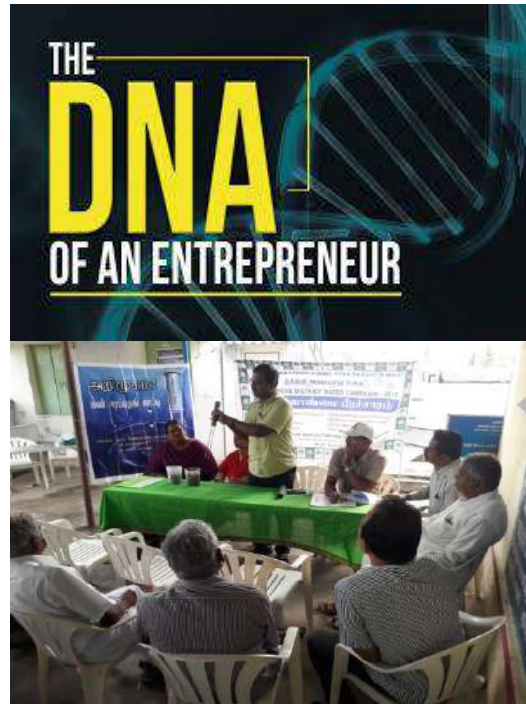
In essence, successful entrepreneurs have proved that it is possible to build a world-class enterprise from scratch by systematic and focused hard work. That you don't need big business backing or access to large amounts of capital when you can leverage equity with equal success. By providing leadership to a group of committed individuals, none of whom may have been a star in his or her own.

Urges of an Entrepreneur

An urge to exercise power over things and objects persists among all human beings. The urge may vary in degree from person to person. This urge is an intrinsic quality of an entrepreneur. Sociologists consider him as a sensitive energizer – in the modernization of societies. The psychologists look upon him as an 'entrepreneurial man', his motivations and aspirations as conducive to development. Political scientists regard him as a leader of the system. To economists, he is a harbinger of economic growth. He combines entrepreneurial drive with leadership and innovativeness.

An Entrepreneurial Career

Entrepreneurship plays an important role in economic growth and development of a nation. It is a purposeful activity indulging in initiating, promoting and maintaining economic activities for the production and distribution of wealth and service. An entrepreneur is a critical factor in economic development and an integral part of socio-economic transformation. It is a risk taking activity and a challenging task, needs utmost devotion, total commitment and greater sincerity with fullest involvement for his personal growth



and prosperity. The entrepreneurial career is not an one day job nor it is a bed of roses. Prosperity and success never come easily. It takes time and needs hard work, systematic planning and business acumen to be a successful entrepreneur.

Therefore, before choosing this path one should be vary careful in knowing about oneself. This introspection process helps him in knowing about himself. Every person has his own potentiality and resource. How he looks in to this aspect, is what is most important than all other aspect. If the person can understand or identify his inner traits then it helps him in choosing right path for which he should look into his beliefs, faith, values etc. For an entrepreneur it is of great importance to know about himself on the basis of above mentioned individual consideration. These considerations gives him ample scope to face his himself by asking the question "Who I am ?". If he can give meaningful answer to this complex question with exemplary courage and utter personal disregard for being exposed, then it helps him in getting a fair idea about himself. On the whole it helps him in making the right decision in choosing the right path for getting himself involved for deciding the future course of action.

This is nothing but a self-identification process. After having being properly identified his strength, weakness and ability, he can make a decision of his choice, whether he will take up entrepreneurship as a career or not. If yes, then in which entrepreneurial area.

Choosing entrepreneurial career is like choosing a life partner. The person has to be there in the job forever and may have to continue in that chosen line for generation to generation and grows in the process if it is matching, if it mismatches it goes the other way round.

Considering this aspect he should always be governed by three basic qualitative instincts to survive in the world of uncertainty. These are: 1) Will, 2) Zeal and 3) Skill.

The first two qualitative instincts, 'Will' and 'Zeal' can be termed as integral factors which comes within the person and is guided by his personal behaviour, inhabitant talent, and of course, it is guided by his interest. The other qualitative instinct 'Skill' can be termed as external factor and can be acquired through separate help.

Based on his inner strength and his interest in a specific area, if any one has chosen his entrepreneurial carrier then chances of becoming successful and sustaining in the activities appears to be higher.

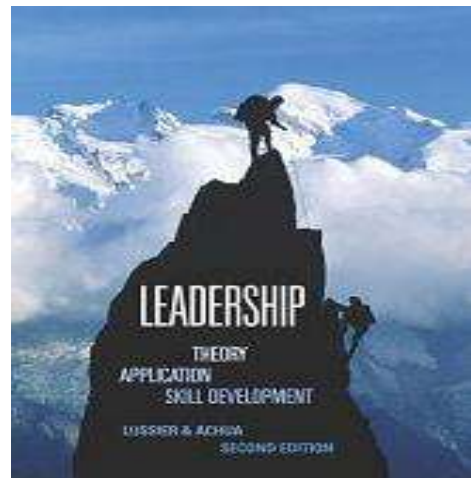
Who is an Entrepreneur?

- : He is person who develops and owns his own enterprise.
- : He is moderate risk taker and works under uncertainty for achieving the goal.
- : He is innovative.
- : He pursues the deviant pursuits.
- : Reflects strong urge to be independent.
- : Persistency tries to do something better.
- : Dissatisfied with reutilized activities.
- : Prepared to withstand the hard life.

- : Determined but patient.
- : Exhibits sense of leadership.
- : Also exhibits a senses of competitiveness.
- : Takes personal responsibility.
- : Oriented towards the future.
- : Tends to persist in the face of adversity.
- : Convert a situation into opportunity.

The characteristics of an unique entrepreneur are :-

- Need for achievement.
- High need for power.
- Independence.
- Propensity to take risk.
- Personal modernity.
- Support.
- Business enterprise.
- Leadership.



Entrepreneurship is not the proprietor quality of any caste or community. Many may posses the "potential qualities, but are baffled with too many questions why, what and how to get about starting new venture.

Are you prepared to accept it ?

Why?

1. Are you prepared to put in hard work for achieving your goal?
2. Do you possess a strong will power to face and overcome the difficulties and setbacks and make the enterprise successful?
3. Is your family environment congenial in leaving the traditional family occupation and undertaking a new venture?

4. Are you prepared to wait if it takes time to set the results of your efforts ?

What?

- Information needed
- Prospects & Scope of a particular industry or business.
- Technical details.
- Quantum of Investment etc.
- Information from different field about the particular trade.
- Market Survey Report.
- Drawing up a business plan.
- Purpose of being in business.
- Responsibilities towards customers, employees Society etc.
- For marketing your product be aware of your product strength and weakness of your competitors.
- Factors affecting Market/Demand.
- Cost and mode of distribution etc.
- Manufacturing process.
- Plant & Machinery.
- Availability of Raw materials.
- Production cost.
- Manpower.
- Fund requirement of Working Capital.
- Assessment of Profitability & repayment of Term Loan.

How?

- Implementation Plan
- Final Selection of Product.

- Prepare Project Report.
- Registration
- Apply to Financial Institutions
- Provisional Registration.
- Obtain Licenses.
- Apply for Shed, Land & Power etc.
- Arrange your own capital.
- Plant Layout.
- Construct Shed.
- Obtain Utilities.
- Order for NOC.
- Order for Raw material supply etc.
- Recruitment & Training of Manpower.
- Arrangement of Sales network.
- Trial run/Sales promotion technique .
- Introduction of Product.
- Commercial production / Return.

The New Age Entrepreneur

Since the 1980s the world of work has changed dramatically. We have all witnessed the turbulence resulting from waves of corporate restructuring and downsizings. Thus, it is not surprising that the career aspirations of those people left in the workforce would also start changing. The old corporate 'psychological contract' implying a lifetime employment of loyal workers has now become virtually null and void any many workers departing from corporations often prefer to try a new career directions.

We now see patterns in corporate hiring practices and these have a substantial impact on the language and strategies of people in the labor force. For example many people who in the past would have preferred traditional full time employment, have now become acknowledged entrepreneurs, choosing to describe themselves as '**independent contractors**' to earn interim income via 'foot-in-the-door' assignments. Often these assignments are with potentially attractive employers who may not have full time openings, yet still have work which needs to be done. The contractor gets a chance to show off his or her skills prior to trying to securing traditional employment should an opening eventually arise or be created. Thus in the new paradigm wearing an entrepreneurial that can often be an effective job search strategy and can also provide interim income.

Moreover another pattern that is developing is the rise of the '**situational entrepreneur**'. Some departing employees are now using the windfall of an attractive severance package to buy a business not because they are so committed to entrepreneurship per se but rather because they wish to '**buy a job**'. For various reasons, often due to their age and economic status, they believe that their chance to earn a solid income is better served by entrepreneurship than by seeking another full time job. These examples represent just two of the many career patterns and configurations occurring in today's complex workforce.

Entrepreneurship has very little to do with money. It is instead an attitude, a way of thinking. It goes beyond simply starting a company. In other words not all people who start their own organizations can necessarily be categorized as entrepreneurs. Entrepreneurs challenge assumptions, recognize opportunities in periods of change, reveal patterns where others see chaos and mobilize limited resource to achieve an objective.

Entrepreneurship is simply finding new opportunities to do things better and then seizing the opportunity. Relentlessly pursuing new opportunities, commitment to innovation and challenging traditional boundaries of thought is what entrepreneurship is all about. Entrepreneurship is the life blood of a free market

economy and with changes in the business processes in the market economy, we today see the emerging profile of the ICE age entrepreneur has been mainly due to growth of Internet Economy and Venture Capital funding. The Internet Economy has rewritten the business rules and opened a lot of opportunities for the Indian entrepreneurs in the field of information, communication, entertainment, various IT enabled services and pharmaceuticals. The new internet economy is based on creating service organizations with strong information base and making profits from cutting costs of intermediaries and converting losses and wastages into savings and revenues. There has also been a rise of venture capital as a source of finance and is expected to grow further. The following are the five principles of business revolution in the new information economy:

- Ideas are more valuable than factories, equipment, natural resources and cash
- Its not enough to have good ideas. One must implement them more quickly than ever before
- Companies complete globally
- Companies are less hierarchical than they used to be
- Companies have may shifting alliances

In the light of these developments, the profile of the entrepreneur has also changed.

Changing profile of an entrepreneur

Access to resources rather than ownership of resources:

In the traditional economy, large capital and ownership of the resources like land, building, machinery was needed to carry out production activity. Financing was also asset based, i.e. bankers and financial institutions were funding entrepreneurs who were the owner of the resources. Hence a trend had developed where the entrepreneur was giving high importance to ownership of physical resources and share markets were also reflecting this philosophy. Heavy asset based companies

like ACC, Reliance etc were the market heroes. But in today's internet economy entrepreneurs believe in access to resources rather than ownership of physical assets. Most of the new age entrepreneurs are in the knowledge based service industry where the quality of service is the key thing and it is due to knowledge of the professionals employed rather than physical assets. Share markets also give high valuations to companies having human assets.

Inclination towards building non tangible assets

In the days of the traditional economy due to excess of demand over supply whatever was produced by the industry was sold irrespective of quality. Also entry barriers for new players were very high hence building non tangible assets like brands etc were not a priority for the entrepreneurs. But in today's economy, the entry barriers to many businesses have been lowered and Indian firms are competing with multinationals and dumping from countries like China, Taiwan etc. Hence today's entrepreneurs are focusing on building non tangible assets like brands, information base, team of qualified professionals which are key differentiating factors in knowledge based service industries.

Increasing trend of adoption entrepreneurship as a career by people from service backgrounds

Earlier knowledge of business was not easily available, it used to reside in business community. To start manufacturing unit heavy investment was required and due to lack of venture funding as a source of finance the entrepreneurs from family business background, who had access to family funds were having an upper hand over entrepreneurs with service backgrounds. But in the internet economy knowledge based service industries were required. The knowledge based industries required low investment and had lower entry barriers. This encouraged people from the service background to take up entrepreneurship as a career availability of venture capital catalysed the process.

Importance of entrepreneurial skills than ability to control business

In the traditional economy the survival and growth of entrepreneur depended on his/her ability to on control business environment i.e. ability to handle various inspectors, government departments have laws. With changing business environment the new age entrepreneur gives more importance to various entrepreneurial skills like creativity, innovation etc. in order to grow and survive. In today's dynamic business environment those who offer best service will survive.

The emergence of Professional Entrepreneurship

The traditional economy entrepreneur used to nurture his enterprise like a baby and his emotional attachment never allowed him to sell his enterprise. But today's entrepreneurs are becoming more professional and are selling their successful start-ups to bigger business and moving further in their journey of entrepreneurship. Sabir Bhatia of Hotmail and Rajesh Jain of India world are examples of professional entrepreneurs. The new age entrepreneur also prefers to outsource the production activity and concentrate on knowledge-based activities. There is also a distinct preference for service sector opportunities rather than the manufacturing sector. In view of the changes mentioned above, the role of education and training becomes very import and ant and in this contest it is possible to envisage three key ways in which the word 'enterprise' and 'entrepreneurship' can be linked.

- Education ***about*** enterprise
- Education ***through*** enterprise, and
- Education ***for*** enterprise

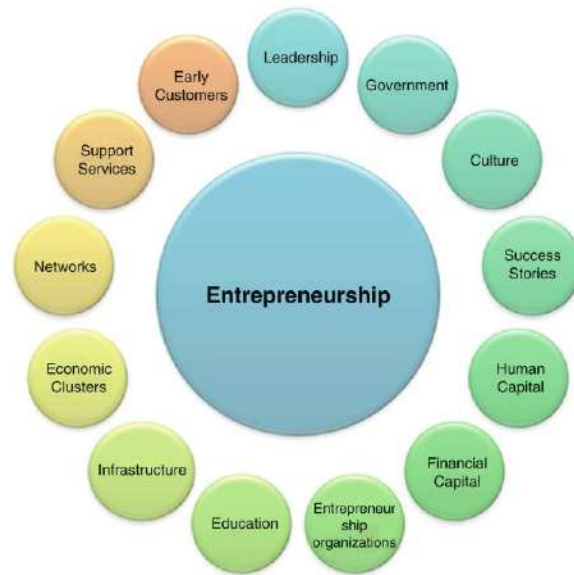
The first of these relates to the role of education in raising the awareness of enterprise and entrepreneurship as a key change agent in the economic process. The second concern the ways in which the education process itself can be enhanced by using pedagogic styles which work in and makes use of 'enterprising' situation,

including student centered and real world project driven approaches. The third is specifically aimed at entrepreneurship development and would include training existing entrepreneurs as well as for new startups.

Entrepreneurship

Entrepreneurship is a process undertaken by an entrepreneur to augment his business interests. It is an exercise involving innovation and creativity that will go towards establishing his / her enterprise.

Under this heading, the concept of entrepreneurship and of its related issues are analysed, discussed and deliberated.



One of the qualities of entrepreneurship is the ability to discover an investment opportunity and to organize an enterprise, thereby contributing to real economic growth. It involves taken of risks and making the necessary investments under conditions of uncertainty and innovating, planning, and taking decisions so as to increase production in agriculture, business, industry etc.

Entrepreneurship is a composite skill, the resultant of a mix of many qualities and traits – these include tangible factors as imagination, readiness to take risks, ability to bring together and put to use other factors of production, capital, labour, land, as also intangible factors such as the ability to mobilize scientific and technological advances.

A practical approach is necessary to implement and manage a project by securing the required licenses, approvals and finance from governmental and financial agencies. The personal incentive is to make profits from the successful management of the project. A sense of cost consciousness is even more necessary for the long-term success of the enterprise. However, both are different sides of the

same coin. Entrepreneurship lies more in the ability to minimize the use of resources and to put them to maximum advantage. Without an awareness of quality and desire for excellence, consumer acceptance cannot be achieved and sustained. Above all, entrepreneurship today is the product to team work and the ability to create, build and work as a team. The entrepreneur is the maestro of the business orchestra, wielding his baton to which the band is played.

Entrepreneurship: Concept & Definition

Entrepreneurship

- : A theory of evolution of economic activities.
- : A continuous process of economic development.
- : An ingredient to economic development.
- : Essentially a creative activity or an innovative function.
- : A risk taking factor which is responsible for an end result.
- : Usually understood with reference to individual business.
- : The name given to the factor of production which performs the functions of enterprise.
- : A vibrant assertion of the fact that individual attitude can be changed.
- : Creates awareness among people about economic activity.
- : Generates self- employment and additional employment.

Why Entrepreneurship?

- : To improve backwardness of the people.
- : Economic development of the region.
- : To analyze resource utilization.
- : Proper utilization of human potentiality.
- : Special attention to take up new activities.

- : To create self-employment and generation of employment opportunity.
- : Eradication of regional imbalances.
- : Better economic gain.

The early history of entrepreneurship in India reflected from the culture, customs and tradition of Indian people. The *Baliyatra* festival of Cuttack, Orissa reminiscence of past glory of international trade. The process of entrepreneurship, therefore, passed through the potential roots of the society and all those who accepted entrepreneurial role, had the cultural heritage of trade and business. Occupational pursuits opted by the individual under caste system received different meaning or value attached to entrepreneurship, which is based on social sanctions. *Vaishyas* were considered to venture in to business pursuits. A society grow and the process of occupation depended & value to work tended towards change and the various occupational role interchanged with non-role group and sub-groups. People from different castes and social status also entered in to the entrepreneurial role.

The emergence of entrepreneurship in this country got localised and spread effect, took its own time. The concept of growth theory seems to be closely related in explaining the theory of entrepreneurship development as well.

After second world war only the entrepreneurship, received new meaning for attaining economic development within shortest possible time. But in the process they were seriously handicapped by the rigid Institutional set up, political instability, marketing imperfection and traditional value system. Britishers who for their ulterior motive forcefully destabilise the then self-sufficient Indian economy. England flourished and India has to pay for that. In the process India suffered industrial as well as loss.

Development of business enterprise is a complex phenomenon influenced by, both the internal and external factor. Internal factor originates in the policies and the attitude of the enterprise themselves in managing their business. External factors are beyond the control of the business entrepreneur, they alone account for

unpredictability of returns and risk assumed by the entrepreneur. A steady growth can be observed on the basis of long cherished history of entrepreneurial development in the country, is certainly promised on the environment to be created by the state and its agencies.

The entrepreneurial motivation is one of the most important factor which accelerates the pace of economic development by bringing the people to undertake risk bearing activities. In many of the developing countries a lot of attention is being paid to the development of entrepreneurship because it is not the proprietary quality of any caste or community.

The entrepreneurship is usually understood with reference to individual business. Entrepreneurship has rightly been identified with the individual, as success of an enterprise depends upon imagination, vision, innovativeness and risk taking. The production is possible due to cooperation of various factors of production, popularly known as Land, Labour, Capital, Market, Management and of course Entrepreneurship. The entrepreneurship is a risk-taking factor which is responsible for end result in the form of profit or loss.

According to A Schumpeter "The entrepreneurship is essentially a creative activity or it is an innovative function."

The economic activity with a profit-motive can only be generated by promoting an attitude towards entrepreneurship. The renewed interest in the development of entrepreneurship to take up new venture should emphasize an integrated approach. The development of entrepreneurship will optimise the use of the unexploited resources, generate self-employment, and a self sufficient economy.

The young entrepreneur should be motivated to come out with determination to do something of their own and also to contribute to the national income and wealth in the society. If the country wants to achieve the growth at the grass root level, through social justice and elimination of poverty, it will have to provide institutional support and structural changes in organisation of financial institutions

to promote entrepreneurship development. Industrial development in any region is the outcome of purposeful human activity and entrepreneurial thrust.

David Mclelland emphasised the importance of achievement motivation as the basis of entrepreneurial personality and a cause of economic and social development through entrepreneurship by fulfilling the following needs such as :-

- Need for Power,
- Need for affiliation and
- Need for achievement.

Another school of thought says "Entrepreneurship is a function of several factors i.e Individual, Socio cultural environment, and Support system."

Entrepreneurship is vibrant assertion of the facts that individual can be developed, their outlook can be changed and their ideas can be converted in to action through an organised and systematic programme for entrepreneurs. It was also felt that systematic training can give a better output and economic scenario can be changed by attracting people for taking up business venture.

Basic objectives in developing entrepreneurship and multiplying them in the society has been to enable the society to generate productive human resource, mobilize, sustain the same in subsequent process of development. The spontaneity and continuity of the process would depend on the kind of people that can be promoted and groomed in the entrepreneurial career.

Sociologist, Psychologist and economist have all attempted to give a clear picture of the entrepreneur. Sociologist analyse the characteristic of entrepreneurs in terms of caste, family, social value and migration.

Psychologists on the other hand attempt to isolate entrepreneurs from general population on various personality traits such as need for achievement, creativity, propensity to take risk, independence leadership etc.

Economists lighted situational characteristic such as occupational background, access to capital, business and technological experience and managerial skill with economic gains considered as characteristics of Entrepreneur.

An entrepreneur by implication is one who ventures out, who prefers change as a means of growth and in the process is prepared to take a calculated risk while taking risks, he is aware of the possibilities, success as well as the consequence of failure.

What is entrepreneurship?

Entrepreneurship is the propensity of mind to take calculated risks with confidence to achieve a pre-determined business or industrial objective. In substance, it is the risk-taking ability of the individual, broadly coupled with correct decision-making. When one witnesses a relatively larger number of individuals and that too, generation after generation in a particular community, who engage themselves in the industrial or commercial pursuits and appear to take risks and show enterprise, it is acknowledged to be a commercial class.

The commercial class is a myth just like that of the so-called martial race. There are neither, for all time, martial races nor commercial classes. Communities which in the course history once appeared to be martial in spirit have in later period emerged as mercantile societies. Those who were once concerned with and relished in trade, later in history seem have taken to the profession of these word.

Today, it is quite evident to anyone that national communities which have developed world-wide industrial and consequent commercial interests are militarily powerful; nay, great industrial powers have today become super-military powers as well. An enterprise finds manifestation in different ways. The capacity to take risk independently and individually with a view to making profits and seizing and opportunity to make more earnings in the market-oriented economy is the dominant characteristic of modern entrepreneurship.

An enterprise, ready for the pursuit of business and responsive to profit by way of producing and/or marketing goods and commodities to meet the expanding and diversifying actual and potential needs and demands of the customers is what constitutes the entrepreneurial stuff. But this category of enterprising citizens throws up a species of entrepreneurs who are mostly mercantile in outlook and performance.

In countries like India, a new species of entrepreneurs is desirable because here the economic progress has to be brought about along with social justice. Entrepreneurship in India therefore, has to sub-serve the national objectives. The apparent conflict between social objectives and economic imperatives has to be resolved first by the individual entrepreneur in his own mind and initiate economic growth which includes industrial development as one of the instruments of attaining the social objectives. A high sense of social responsibility is thus an essential attribute of the emerging entrepreneurship in India.

Entrepreneurs start with nothing more than a creative idea. They create 'venture teams' that have the ability and limited resources to take ideas to the point at which the start-up can sustain itself on its own and internally generate a positive cash flow. Typically, they are starting from scratch; they have no offices, no salespeople, no computer, no suppliers, and no customers. The job at hand is to put all the ideas and resources together and somehow make a profit as quickly as possible. Professional entrepreneurs are masters of this process. They know how to overcome hurdles, how to bounce back from failures. Essentially what they become good at is starting up new ventures.

Some typical beliefs of entrepreneurs are:

- They are in control of their own destiny
- They are capable of solving any problem
- The climb to becoming a CEO requires owning the ladder

- There are no limits on personal income
- their internal strength and wisdom comes from overcoming risks and hurdles

An entrepreneur is someone who perceives a new idea and creates an organization to harvest the opportunity; the activity involved in the pursuit is called the entrepreneurial process. The entrepreneurial process is very much a series of fits, starts and brainstorming. What makes an entrepreneur successful is the ability to navigate through uncharted waters and, when faced with a tough challenge, to continue on.

The education of potential entrepreneurs is a difficult task, one that is complicated due to the absence of any clear career patterns. Also, there is really no such thing as a 'true entrepreneurial profile' from which to learn. Entrepreneurs come from a variety of educational backgrounds, family situations, industries, and work experiences. The next really successful entrepreneur may presently be a nurse, secretary, assembly line worker, salesperson, mechanic, homemaker, manager, engineer, or someone sitting next to you in a seminar or classroom.

You will find that many potential entrepreneurs are not formally educated in business or engineering schools – in fact, many do not know that they are going to be entrepreneurs in the future. We simply offer this definition of tomorrow's entrepreneur.

“One who is involved in the process of finding, leading, and coaching a close-knit group of talented people, committed to pursuing an ideal: providing, marshalling and allocating the resources needed to take advantage of a limited opportunity.”

Entrepreneurs are rewarded with the freedom to do what they want, the ability to selectively control and reduce risks; they are rewarded with the potential to generate unlimited amounts of income. This ideology requires a well-articulated business plan and a far-reaching vision that people can understand and follow.

Understanding Entrepreneurship

“As the inventor produces ideas, the entrepreneur gets things done”. Economist Joseph A. Schumpeter. Entrepreneurship is not something that grew out of the Internet. Richard de Cantillon introduced the term “entrepreneur” two centuries ago, when he identified risk bearing as the primary role of entrepreneurs. Since then, the definitions of an entrepreneur and of entrepreneurship have evolved in many different and sometimes contradictory ways.

The intellectual history of the entrepreneurial management field dates back to the late 1930s when Joseph Schumpeter, Arthur Cole and others at the Harvard Business School studied the entrepreneur. A distinguished group of scholars gathered here to define the “who” and “what” of entrepreneurship. In the 1950s, academic attention shifted from the economic role played by entrepreneurial activity to analysis of the personal characteristics of entrepreneurs. Recently, interest in entrepreneurship has expanded to government, academia, and practice.

Entrepreneurship is about creating ideas quickly and seizing opportunities in the business world. The challenge, however, is to see and anticipate ideas and opportunities before others see them and act. To most of you, entrepreneurship means the exciting process of putting together a unique team of creative individuals in pursuit of a limited opportunity. But being an entrepreneur has come to mean more than having innovative ideas; it means taking on risks.

Because no such “venture team” led by any entrepreneur can control all the necessary critical capital resources, such as employees, equipment, raw materials, and start-up money, pursuing such opportunity requires a ‘bridging of the resource gap’. Because of this gap the entrepreneur is burdened with numerous risks. Prudent decision making should be based on acting in a manner that is consistent with risk reduction and growth.

Key points to consider about entrepreneurship

- What is entrepreneurship?
- Why is studying entrepreneurship important?
- Who is the typical entrepreneur?
- What is the typical path of a new business venture?
- How can entrepreneurs be more successful in their new ventures?
- What is found in common with successful new business ventures?
- What are the different types of entrepreneurs?
- Who will be the entrepreneurs of tomorrow?
- What characteristics will separate the winners from the losers?

Small and Medium sized Businesses (SMBs) run by entrepreneurs are critical to the health of economy; they create two out of every three new jobs and are twice as innovative as large companies. The entrepreneur has also become increasingly important in restoring the competitive advantage of many multinational companies around the world. In theory entrepreneurship includes several sub-disciplines, including small business, women-owned business, high-technology start-ups, home-based business, joint-ventures, global start-ups, and family business.

Stimulation of Entrepreneurship

Entrepreneurship development is probably one of the most elusive, complicated and perplexing issues in the promotion and growth of small enterprises. Recently, a number of development agencies have been involved. However, in spite of all these efforts there have been only a few partially successful programmes, and there are many *Instances* of colossal failures in this field.

The stimulation of entrepreneurship is a function of both internal and external variables. The presence of certain personal qualities in an individual is a requisite. Some of the findings about entrepreneurs are as follows :

- (a) Mainly there are two types of entrepreneurs: the Government and private individuals.
- (b) In a family-run business the entrepreneur is owner as well as manager. Entrepreneurs are frequently found to have parents who were engaged in business-related occupations.
- (c) In the family, a change is taking place. Now the educated young members are becoming entrepreneurs rather than head of the family who generally is old.

The exciting lure of entrepreneurship draws a lot of people into trying to be entrepreneurs who really aren't fit for it. In fact, this is one reason why so many new start-ups fail. Most people have no business ever starting a new venture. Faced with these odds, entrepreneurs exhibit many of the qualities of the early pioneers: they are prepared to take enormous risks. They must innovate in areas where most say that it cannot be done, work incredibly long, lonely hours over extended periods of time, and even suffer personal problems, all for the excitement of developing a new product or building an enterprise. They have passion and bring a singular concentrated focus to their projects. Most have an ability to sell themselves and their ideas, few recognize their own strength and weaknesses, and even fewer understand that they can't do it all by themselves.

Entrepreneurship - An Analysis

Entrepreneurship can be defined as the creation of value through creativity and innovation matched with the pursuit of opportunity. This activity is becoming the lifeblood of the global business environment. New ways of thinking-seeing a new business opportunity, and capitalizing on it through a new business venture – have created paradigm shifts and even entire industries and, as a result, are fueling worldwide economic growth. As long as people who willingly accept the risk of the unknown – in a creative idea into a successful reality.

According to Peter Drucker, 'Entrepreneurship is neither a science nor an art. It is a practice. It has a knowledge base. Knowledge in entrepreneurship is a means to an end. Indeed, what constitutes knowledge in practice is largely defined by the ends, that is, by the practice'.

Innovation and entrepreneurship are thus needed in society as much as in the economy, in public-service institutions as much as in business. It is precisely because innovation and entrepreneurship are not 'root and branch' but 'one step at a time', a product here, a policy there, a public service yonder; because they are not planned but focused on this opportunity and that need; because they are tentative and will disappear if they do not produce the expected and needed results. In other words, they are pragmatic rather than dogmatic and modest rather than grandiose – that they promise to keep any society, economy, industry, public service, or business flexible and self-renewing.



Thus, entrepreneurship is a complex phenomenon. 'Some think of entrepreneurs primarily as innovators, some chiefly as managers of enterprise, some as bearers of risks, and others place major emphasis on their function as mobilisers and allocators of capital.

"In the Indian context, however, an entrepreneur may at best be defined as a person (or a group of persons) responsible for the existence of a new business enterprise".

Entrepreneurship is an attitude of mind which calls for calculated risks; a true entrepreneur is one who can see possibilities in a given situation where others see none and has the patience to work out the idea into a scheme to which financial

support can be provided. The stimulation of entrepreneurship is a function of both internal and external variables. In developing countries, there is no dearth of ideas but there is a real scarcity of men with the right blend of vision and practical sense to become successful entrepreneurs. The objective of the programme is to identify such people and to provide them with the support needed to make them a success. They then become “demonstration models” to the community; and once a right climate is generated, entrepreneurship becomes a way of life.

Industrial growth in a country is achieved through a ‘mix’ of the large and small industry; the entrepreneurship for the former comes through the large companies often in collaboration with the multinationals. Simultaneously, economic growth also depends upon the level of development and use of information system in the country.

In fact, the small-scale industry sector is considered as an ideal nursery for the rapid growth and development of entrepreneurship. But also, there are only a handful of entrepreneurs in the true sense of the term in the sector. The men who will set up small industry units have to come from within the country and the community; they are ‘locals’ in a true sense and their success, therefore, has a much greater impact on generating the right climate for successful entrepreneurship.

Programmes for developing entrepreneurship must recognize that, ultimately, the change they seek to induce is attitudinal – it is more than just providing information, land or money. It is to provide new goals so that a motivated young person is no longer content to take up a secure job which will assure him a modest income but seeks bigger challenges in setting up and running his own business. The risks are greater but so are the rewards both in monetary sense and psychologically, in the feeling of confidence and pride it generates in the person. It is through the efforts of such persons that a small industry can become a dynamic sector of the economy and hence, the effort made to develop such persons is well worth the investment in terms of labour and cash. The need of the hour is the growth of entrepreneurship to accelerate the process of economic growth.

According to Drucker, the entrepreneurial management, in a way, the society needs innovation and entrepreneurship in a normal, steady and on ongoing basis. Just as management has become the specific organ of all contemporary institutions and the integrating organ of our society of organizations, so innovation and entrepreneurship have to become an integral life sustaining activity in our organizations, our economy, our society.

This requires of executives in all institutions to make innovation and entrepreneurship normal, ongoing, everyday activity, a practice in their own work and in that of their organization. Entrepreneurship is the cornerstone of the emerging economic scene in the world.

The entrepreneur usually lacks managerial and technical know-how, as well as marketing, production and personnel management skills. These are needed so that even if the entrepreneur can operate on only a small-scale basis, the operation will be economically viable.

Technological advances in the environment create new needs for the entrepreneur as far as adaptation and adjustment are concerned. The entrepreneur may need to learn how to adjust to the new technological environment, or to take a set of advance technologies and bring this to his own level in this sector. Either way, constant re-examination is needed for possible utilization and improvement of existing technologies.

Finally, the socio-cultural environment also creates a very important climate for the survival of this sector. Small enterprises need the following conditions to keep them alive: (1) Tolerance for changes in the society and culture; (2) Social mobility; (3) Tolerance of profit making; and (4) Tolerance of private ownership.

Japanese Experience

The Japanese have very successfully integrated their culture with their business and have achieved great success. Some of the values they have brought into their management are lifelong employment, worker participation, quality circles,

loyalty and pride in the organization, Similarly, whatever is good in Indian culture should be reflected and reinforced in the business culture also. In the absence of this, Indian cannot design its own unique form of management, suitable for its values, and achieve excellence.

Some of these values could be mutual respect among the management and workers, commitment to nation building similar to the spirit it shown during the Independence movement and pride in whatever one does. A sense of equity and pride in one's own profession will be an antidote for the old caste based professions and their unequal values. Similarly, the ancient philosophical tenets like equality before God could be extended to mutual consideration and respect in the workplace also. This requires a conscious acceptance of these values by the managers and its constant practice. Strong corporate culture suitable for one's own traditional values like strong family cultures have to come from within or be cultivated by individual leaders to maximize the achievements.

Culture building is achieved by selecting the ideals, motivating through retaining and encouraging such ideals in employees. It requires refining of the human resources development tools and consistency in recognizing the achievements.

Strategy and culture - each contribute to the success of any organization. Brilliant strategies bring great business successes and strong cultures survive great upheavals. In the absence of one, the other is useless. The Indian situation badly needs both.

CONCLUSION

An ideal entrepreneur is one who combines values in the market economy; that profits do not somehow preclude ethical behaviors; that growth is possible even if political patronage is not used to bend rules and cut corners, and quite simply that pursuit of wealth can be a mannerly one. He takes with him the interest of his people, his country, his natural resources, the ecology and sees that his

enterprise becomes a catalytic agent of development. There is thus a need a need of true entrepreneurs, who do not for incentives, infrastructure, government support; but build his enterprises, harness the resources and develop. They adopt a responsible value-driven corporate philosophy for their enterprises and/or business activities.

As such, there is no dispute among economists and social thinkers about the urgent need for the emergence of an entrepreneurial society as a forerunner of accelerated development of the economy in an integrated manner. The success of an entrepreneur in any enterprise depends on the degree of his vision, leadership, competitiveness, talent, self-reliance, connections communication and resourcefulness.

2. Entrepreneurship education-Concept Base, approach and Methodology

Introduction

Entrepreneurship play an important role in developing and contributing to the economy of a nation. It is all the more so in developing world where there are ample opportunities for innovations to exploit the available resources and initiate entrepreneurial venture. But emergence of entrepreneur in all countries and all parts of the same countries is not usually even. Commonly we see more entrepreneurs comparatively more developed areas. Another paradox exists in terms of increasing number of unemployed population, seeking wage earner's career and unaware about the wide open opportunities for entrepreneurial career This is, by and large because of the lack of education about entrepreneurship. In most of the developing world including India, entrepreneurship has not found the place in educational curriculum particularly in school education.

Education is a very strong intervention to set values, develop attitudes and add drive for the person to move in any profession or vocation.

Values, attitudes and motivation combined together proper masses to acquired skills and competencies to achieve the goal (s) directed by values which are mostly acquired at early education stage. In the present era when there are ample opportunities and increasing need

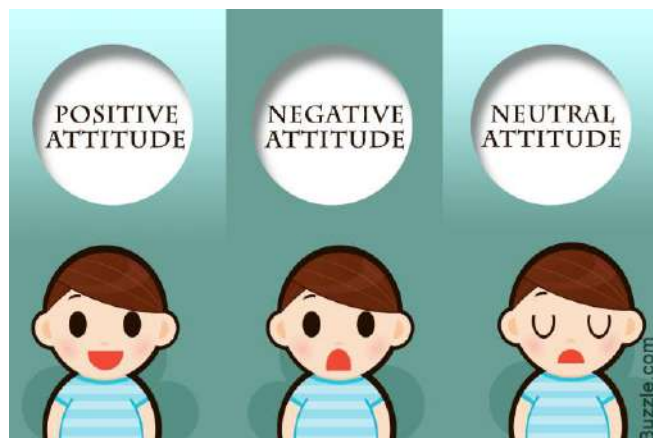
for entrepreneurship, the short supply of entrepreneurs in the society is largely because of the absence of entrepreneurship element in the education system.



In spite of massive investment made in the successive Five Year Plans, the actual impact on life of common people in the remote area has been comparatively limited. It is for this reason that administrators and planners are slowly beginning to realise that monitory assistance and the infrastructural facilities are necessary but not sufficient conditions for economic/industrial growth and that the human factor will remain significant. One recall Gandhiji's dictom "man is the supreme consideration" and education has the prime role of moulding human resource in a particular direction. Considering this, there is a need to develop a sound conceptual base for evolving the curriculum which can be used in the school system that ensure the emergence of entrepreneurial spirit including values and attitudes motivation; and competencies among masses at very early sage of their development to successfully take up entrepreneurial pursuit.

Entrepreneurial Values and Attitudes Values

Value orientation is the constellation of values present in a person. It may be defined as a generalised and organised conception, influencing behaviour, of



nature, of man's (Gasse, 1982). In other words, it is a set of beliefs about various aspects of the world. In general, it is accepted that value provides standards that guide behaviour. They are multi-faceted standards which lead individual to take particular positions on social issues, predispose a favouring of one particular ideology over another, guide representation of the self to others and provide basis upon which one may evaluate or judge (Rokeach, 1973). "Values reflect the culture of the society and are widely shared by the members of that culture". Values, in general, are beliefs about what is desirable and what is not desirable (Krech, Crutch Field & Ballachey, 1962).

In general, values provide goal direction. It is inner most layer of the self which provides the action direction to an individual. More specifically, in terms of entrepreneurship, it means the cognitive functioning of entrepreneurs. Cognitive content refers to the individual's idea about persons and things. Only certain objects, among all objects that are "out there", enter into a selectively organised conception of the external world. These perceptions need to be objectively confirmed. Starbuck (1976) pointed out that environmental uncertainty is an inevitable component of ideology or system of belief. Entrepreneur's conception of the environment and their reaction will, then largely depend on their prior beliefs about business matters.

In case of entrepreneurship, researches have shown the existence of values for innovativeness; independence/ownership; outstanding performance & respect for work, comparatively in greater degree and strength in all entrepreneurs. These values have been found discriminating between entrepreneurs and non-entrepreneurs in terms of their strength and degree.

1. **Innovativeness:** Ettlic & O'Keefe (1982) empirically investigated question as to what constitute innovation follows innovative attitudes, values and intension in organisations. Making use of several questionnaire and multi-varieties analysis, they arrived or some of the characteristics as:

- I. Experimenting with new ideas
- II. Enjoying change
- III. Facing uncertainty in order to try new ideas
- IV. Not giving up or becoming upset when errors are made in doing the new work
- V. Valuing unconventional behaviour
- VI. Finding problem to solve
- VII. Finding a new use for existing methods or existing equipments or existing services
- VIII. Demonstrating originality
- IX. Working of a problem which causes great difficulty for others
- X. Providing critical input towards a new idea
- XI. Looking for unstructured work assignments
- XII. Providing evaluation of proposed ideas

More recent researches have shown careers patterns of entrepreneurs follow paths in order to afford opportunities to be creative and innovative (Ronstadt 1985). The entrepreneurs careers anchors is creativity and innovation, same as manager find their career anchor on the competence and efficiency while college professors prefer autonomy having control and discretion over one's time as a career anchor (Timmons, 1978). An entrepreneur want to experiment with new ideas facing uncertainty and therefore, it involves imagination, intuition and taking risk.

No entrepreneurial activity is possible without being innovative either in terms of activity, location or ideas. At the same time, no entrepreneurial activity can be conceived without risk. Accordingly, entrepreneurship essentially means doing things that are not generally done in ordinary courses of routine work (Schumpeter 1934). Schumpeter's entrepreneur is an "ideas man" and a man of action which possesses the ability to inspire other and who does not accept the boundaries of structured

situation. He is a catalyst of change, able to carry out new combinations, instrumental in discovering new opportunities which is the uniqueness of entrepreneurial function (Varies 1977).

2. **Independence/ownership:** Equally important the norm of self-reliance. The values attributed to independence is important for entrepreneurship. Instead of waiting for suggestions or direction from others, an entrepreneur works out plans of his own and explores resources and experience an inner urge to meet the enterprises success (McClelland and Winder, 1969). This makes him a self-reliant and independent. Entrepreneurs value freedom of expression and also of action (Gasse, 1986). They do not like to be controlled by others. They consider it desirable to be the master of their own. Training in independence has been found to contribute to the development of achievement motivation (McClelland 1961). When a boy is encouraged to do things of his own and seeks guidance and help only when needed, he is being oriented to independence. Over protection and over guidance in childhood or later in the work organisation leads to dependence (Rao and Pareek, 1975)
3. **Outstanding Performance:** Entrepreneurs develop value for outstanding performance, displaying certain standard of excellence (McClelland and Winter 1969, Berd, 1986); Performing routine task or repeating what others have done does not attract an entrepreneur who values contributing something that strengthens their belief that they can influence the environment. They believe taking initiative to change rather than leave everything to luck and God or to force beyond their control. They believe that they can make their own destiny even though they might have faith in God and other forces or power. They take initiative, struggle and tend to attain things in life by their own performance and the too outstanding performance. In psychological terms this is also referred to as internal locus of control (Rotter, 1966; McClelland et al. 1953, Atkinson, 1957; Beattie, 1969; Leo 1970; Rao and Pareek, 1975).

They would like to experience that they can make things rather than see things happening by themselves. This value for outstanding performance helps them to accept their mistake and improve on them and work for successful completion of the task and not avoiding it (Rao and Mehta, 1975). This adds value for systematic planning based on the information gathered. They tend to analyse the situation thoroughly and with pros and cons, their own strength and weaknesses before setting challenges but realistic and attainable goal.

4. **Respect for Work:** Value for work has been found to be an important factor for entrepreneurship. Nandy (1973) and Fox (1973) have reported that the one major factor which distinguishes the entrepreneurs from the non-entrepreneurs culture, in two northern and southern community respectively was the willing to work with his hand - the value given to work. Non- work values of some communities prevented that for taking to entrepreneurial pursuit. Instance can be cited where persons with low resistance to manual labour have succeeded as entrepreneur whereas those who agitated in work with hand failed. There are situations where a small entrepreneur is able to work himself in order to run his enterprise and to make it success. He is never found waiting in performing a task need to achieve the set goal (Rao and Nadkarni, 1973). He respects work. To him there is nothing 'big' and 'small' 'low' work. Entrepreneurs value work and consider that anything and everything can be achieved through work and accordingly work is worshiped (Hornaday, 1986).

Attitude

Those who value innovativeness, independence/ownership, outstanding performance and respect for work generally develop common tendencies' to act in any given situation. For example, one who values innovativeness develops tendency to use imagination for sensing opportunities/goal. He would further show a tendency to take certain amount of risk while selecting goal or line of action or means of tackling the situation. A group of such tendencies which are also termed as

attitude have been identified in respect to entrepreneurs. These attitudes show that entrepreneurial pursuits.

Under the given circumstance, a group of persons may decided similar or different course or action because of similar or different attitudes that they possess . Accordingly, the attitude is defined as a "enduring organization of motivational, emotional, perceptual and cognitive process with respect to some aspect of individual's ·works" (Krech & Crechfield 1952). The genesis as such attitudes however can be trussed in the value system. Accordingly, entrepreneurial values as described earlier and illustrated give rise to the following attitudes :

1. **Tendency to use Imagination/Intuition:** Under given situation, a common tendency is to take a course of action based on the facts which are obvious, observable and the common interpretations of those situations. Unlike this, one may possess a tendency to use imaginations for perceiving the not-apparent part of a given situation and also apply intuition in assessing the future course. The later is a tendency commonly found among the entrepreneurs (Solomon and Fernaid 1988, Hagen, 1971, Prasad, 1976). As a result of which most of the time, the decisions and the line that they pursue are innovative, new and unique.
2. **Tendency to take Moderate Risk :** Against the given stimulus, common people demonstrate a tendency to follow the path having no risk. This means they maintain status quo or follow a beaten Path or try the course of action which has become a routine traditional oath. Opposed to this, there is a tendency among entrepreneurs to try such path or goal which has certain amount of risk, not a common path followed by many others and also not routine task (McClelland 1969; Palmer, 1971; Alkinson, 1957; Meredith et al. 1982; Litwin, 1960). Because of this tendency to take risk, he is tempted to try something new either in terms of ideas, activity, location and time.
3. **To enjoy Freedom of Expression and Action:** Entrepreneurs have been found having a tendency to enjoy freedom of expression and action. They

don't feel happy getting instructions and then acting upon . This tendency very often results into giving up job and trying their own ventures. Since they value independence and ownership, they like to think of their own and act accordingly. They have a tendency to enjoy both freedom of thinking and action (Rao and Mehta 1978)

4. **Look for Economic opportunities:** Since entrepreneurs value independence and ownership, they are found highly perceptive and keen in locating economic opportunities for himself in any given situation. to others, the situation be that of a crisis, festival, social and recreational, but he has a tendency to look for economic opportunities in all such situations (Meredith et al 1982). This tendency makes him different than others.
5. **To find satisfaction from successful completion of Task:** Entrepreneur are people who value performance, that too outstanding performance. Successful completion is an indication of performing well. They have a tendency to get satisfaction from such feed back about their performance (McClelland and Winter, 1969; Bailey et 1986; Rapo & Mehat 1978). As a matter of fact, this tendency to celebration and over expression of satisfaction from successful completion of the task (Baunback and Man, 1981).
6. **To believe that they can change the environment:** Entrepreneurs tends to believe in their capacity to influence environment. They have a tendency to change it rather than leave everything to luck and God or to forces beyond their control (Rao and Mehta, 1978). This naturally emerge out of their value for performance which make them believe that anything and everything can be achieved through their own efforts. Being influenced by this value they develop a tendency to think that in any given situation they can change and influence the environment.
7. **To take Initiative:** Since entrepreneurs workshop work and they believe that for achieving anything, one has to work, the natural tendency among them is to take initiative. Entrepreneurs have a tendency to act and not

remain onlookers. They have a tendency to act and initiate action before some longer situation force been to act. They have a tendency, they are not the mere dreamer but hey act for converting their dream into reality. Entrepreneur shows the tendency to define task for himself, becomes the source of origin for any activity and tendency to be proactive (Hornady, 1986; Pizer, 1969)

8. **To analyse situation and plan action:** Since entrepreneurs respect to work they can not effort to perform any task without due seriousness. Out of the respect to work, he develops a tendency to analyse situation very cautiously and then plan action (Meredith et. al 1982). Every work in which he is involved, he respects and cannot afford to invest. It is a tendency of analysing situation into its parts, assessing pros and cons , weighing against resources, and foreseen alternatives and planning action before actual commencement of the task is a very significant distinguishing tendency of entrepreneurs to involve in work. Entrepreneurs develop a tendency to take any work with all seriousness and due commitment. It is a tendency to perform work with full emotional commitment. The work may be simpler or complex significant or insignificant to the outsider but to him it calls for the total commitment whatever works he takes up . It is a tendency to have full involvement in the work.

The above values and attitudes provides 'goal direction' and 'tendency' to act in any given situation. Since these values and attitudes are commonly found among entrepreneurs, they form the core of entrepreneurship and are usually regarded as 'Entrepreneurial Spirit'. The entrepreneurs spirit is the first thing to be introduced to the educational system. Once the entrepreneurial spirit is internalised, it becomes easier and logical sequence for them.to eel need and urge sensing into arousal of entrepreneurial motivation.

Entrepreneurial Motivation

Entrepreneurial spirit comprising of values and attitudes is probably the staring point which provided direction and tendency to act against each stimulus in

that direction. But to pursue the path in such direction one needs force, drive and energy. Such forces are provided by creating inner urge in the individual for efficacy that reflects through competition with other or with one's own standards of performance or to *do* something new, something unique, or to make the maximum utilisation of resources. The total process is termed as Achievement Motivation on which the extensive work has been done by McClelland and this associated. (McClelland and Winter 1969, Hauckhausen 1967; Levine 1969). Added to that is the concern for influencing the environment individual and institutions to achieve the entrepreneurial goal. Motivation for this later part is referred to as a power motivation (Winter 1975 and McClelland 1975). In addition to these two motives, the urge to help others which Pareek (1967) has termed as Extensive Motivation is also a significant force. Combining all these, one gets the total picture of 'Entrepreneurial Motivation'.

Achievement Motivation which is usually aroused by providing experiences to associative network are comprised

- i. Clarity of Goal;
- ii. Visualising Need;
- iii. Taking Action towards goal;
- iv. Anticipating success or Failure;
- v. Identifying success or Failure;
- vi. Perceiving and seeking help to overcome Blocks, and
- vii. Positive and Negative Feelings to success and Failure

Achievement Motivation, however, is not synonymous to Entrepreneurial Motivation. Coping ability, tolerance to ambiguity persuasiveness and influencing ability and search for emotion support for sustaining a sense of purpose are generally beyond the purview of achievement motivation and these needs to be added to ensure arousal of entrepreneurial motivation.

'The entrepreneurial motivation is usually aroused by providing experiences about the self in relation to associative network goal setting and interpersonal support. The arousal of motivation is further accelerated by introducing the incentives and enhancing the chances of success by providing enterprise launching and management inputs.

Entrepreneurial Competency

The values and attitudes which provides goal direction and tendency to act against stimulus in the way, when combined with due motivation providing energy to act, requires certain skill to perform entrepreneurial function. Such skill are usually terms as 'entrepreneurial competencies'. For better understanding, these competencies may be categorised as:

1. Behavioural competency
2. Enterprise launching competency
3. Enterprise management competency

The competencies are skills and answer the 'how' part of it. Generally these are acquired through practices with sound knowledge of concepts.

1. Behavioural Competencies

Entrepreneurial values, attitudes and motivation give rise to several personal competencies which are practices throughout the entrepreneurial career starting from identification & selection, launching, management and growth of an enterprise.

These competencies cut across the size, location type of enterprises since they mostly refer to behavioural process. The list of such behavioural competencies includes those refereed by McClelland and McBer. besides some other commonly perceived as significant in terms of entrepreneurial values, attitudes and motivation are as follows :

- i. **Creativity and Innovation:** The entrepreneurial role has long been recognised as a prime source of innovation or creativity. The inventor produces new ideas, the entrepreneur adopts that idea first in context of time, location or formats

Innovation is the process of adopting the existing ideas (Roger and Kirn, 1985). Further an innovation is an idea, practice, or object perceived as new, matters little whether or not the idea is objectively new as measured by the lapse of time since its first use or discovery. Innovation is, thus, an economic and social term. It is the act that endows resources with a new capacity to wealth. With different approaches to achieve goal at disposal, the entrepreneur is prepared to try out the alternatives. He may not be a creative person in the sense a painter or a writer is. He is, however, ingenious in adopting and modifying whatever is at hand to solve the problem that comes in the way of achieving the objective. Schumpeter (1934) discusses entrepreneur as the pivot on which everything turns. He reforms or revolutionizes the pattern of production by using an innovation or more generally an untried technological possibility ideas and processing in producing a new commodity, products and sourcing.

The competency at creativity and innovation comes by continuously practicing the imagination and intuition to see things objects and services - means of availing new economic opportunities in a system and to adopt them for the first time where these are absent.

ii. Risk Taking: Risk is an important element in entrepreneurial pursuit. A person who goes for entrepreneurial ventures faces up with various uncertainties that affect the outcome. One cannot be completely sure about the factors such as sales of goods, demand, performance of equipments, prices of inputs, and even supply of raw materials. These lead to a situation in which the entrepreneur has to make decision under certain uncertainty. Therefore, entrepreneur has to develop skill and competency of risk taking. For this, he may have to understand that entrepreneur neither works on traditional fields of endeavour or those requiring knowledge and skills under fully controlled conditions nor he is involved in situations where the outcome totally depends on the factors outside his controlled dimension as in the case of gambling. He stands between the two extremes – better described as "Calculated or moderate risk taking" involving some efforts

and some chance. Risk taking skill is mastered by practicing analysis of situation, assessment of possible blocks and resources to overcome these blocks, conditioning for alternatives, and calculation of risk to opt in favour of moderately difficult but attainable goal. Entrepreneur has to develop an appreciation of the fact that when probability of winning (success) is low - a difficult task - the amount of satisfaction in winning (succeeding) is high and vice-versa. Entrepreneur perceives challenges in taking risk and sees possibilities in resources within himself as well as in his surroundings. He is not inhibited by the possibility of failure rather he is motivated by possibility of success.

iii. Initiative: One of the important behavioural competencies needed by entrepreneurs should be able to judge situation faster and start action before being asked or compelled by the situation. Though imagination and intuition he foresees things happening and loses no time to act accordingly. This makes him ahead of others. Because of this ability he remains dynamic and found changing in terms of expansion, diversification, adaptation of new products and inertia and be a leader in the field of business. This competency is acquired by exposing himself to new ideas, process and products and practicing the habit of starting action in the area where there is no precedence. Initiatives must be encouraged and consequences may be used as feedback useful to future course of action. Instead of curbing the initiative (which is very commonly practiced by elders/teachers in respect to children's initiatives), it may be useful to assist them analysing the consequences and try alternatives.

iv. Problem Solving: Whenever an entrepreneur takes up entrepreneurial career he faces lot of problems, many of them very new and unique. In order to achieve his goal, he has to face and solve these problems. As a matter of fact, the satisfaction and gain that entrepreneurs derives is from success he attains by solving problems. Entrepreneurs require competency in solving problem, This is done by repeatedly practicing the followings:

- a) Accept that there will be problems;
- b) Feel confident to solve it;
- c) Look for alternate strategy solving the emerging problems;
- d) Keep generating new ideas and innovative solutions to the given problem;
- e) Look for resources that will help in solving problem and take initiative to use such resource for solving problem. By repeated use of the aforesaid behavioural exercises, one develops competencies in problem solving.

v. Persistence: Entrepreneurial pursuits being complex, comparatively new and composed of a number of activities, demands greater perseverance on the part of entrepreneurs. It is not likely that he may achieve success in the first attempt. More common experiences are that he is required to make repeated efforts to overcome obstacle. Behavioural skill to persists even when obstacles are visible and the success has not been achieved in first attempts, in very significant to entrepreneurs. He is conditioned to make repeated efforts or different actions to overcome an obstacle. This competency requires lot of confidence which come automatically if due care has been taken up in setting the goal. The more scientifically, the goal has been selected by considering very nature, blocks and resources, the greater confidence and conviction is built amongst entrepreneurs that provides greater persistence, It also increases or decrease as per the degree of commitments of entrepreneurs to the cause.

vi. Standard/Quality of Work Performance: Since entrepreneurs value outstanding performance, one of the behavioural skill necessary for his is the sensitivity to and concern for the 'standards' and 'quality' of work. Entrepreneur does not work for the work sake but rough work he tries to ascertain standard of excellence which gives him satisfaction. He develops skill of comparing quality of the products/service with certain standard which he himself evolve or set by other or make it unique. Behaviourally he is ready to repeat and reject the products and services which does not come up to the set standard quality.

This skill for looking for standard/quality of work performance is not limited to the product and services but is also extended to the efficiency - to do things faster with fewer resource of at lower cost . Mentally he is condition to analyse the quality/standard cost, time and energy used in performing the task. The improvement of such dimension gives him greater satisfaction.

vii.Information Seeking: Information plays very crucial role at every stage of enterprise building and management. The quality and extent of informations collected and the way these have been used for taking various decisions by and large decides the success and failure and any entrepreneurial venture. An orientation to seek information and use it for taking decisions is very useful to entrepreneur. This he does in many ways such as:

- a. by contracting consulting experts or experienced persons to elicit relevant informations
- b. by personally observe the non going related business/activities
- c. by personally conducting research, trials and developing prototype and organising trials on smaller scale
- d. by using his/her own feedback from the previous related experiences
- e) by establishing contacts to the established information network
- f) making use of all these sources developing behavioural skill of information seeking and taking use of information of taking decisions

viii.Systematic Planning: Systematic planning is an essential feature for an entrepreneur. Every entrepreneur has limited resources in terms of time, finance and manpower,. He puts his life saving and total energy in creating entrepreneurial venture and can not afford to lose or waste these. Before putting the whole thing in operation he is required to develop detailed blue-print. For this he clearly states his objective breaks into smaller objective; identify activities; anticipate obstacle enlist alternative; locate resources and use all possible information to see that the whole strategy is built on paper before being put it

into actual operation. Both the orientation and conviction about the use of systematic planning in successful enterprise launching and management is very crucial to all entrepreneurs. First he does it in respect to smaller activities and later on repeat the same for more complex activities and thereby develop competencies in systematic planning. The feedback proves him the incentive and re- enforcement to repeat systematic planning more often in future activities .

ix. Persuasion & Influencing Others: One of the important functions of an entrepreneur is to influence environment comprising of individuals and institutions for mobilising resources, obtaining inputs, organising productions and selling their product and services. All these require skills at persuasion, convincing and influencing others. The confidence and belief that they can influence the environment. following this, they have to practice highlighting the strong points of their product and services; asserting the technological competencies of their enterprise to produce quality goods and services, selectively limits the information given to others; impressing concern for others through quality of the product and services; highlighting the social and economic relevance; articulation of their ideas through quality economic relevance; articulation of their ideas and though quality of the product and services; highlighting the social and economic relevance, articulation for their ideas and thoughts; socialising their own needs; adherence to high standards; quality and efficiency. Besides these, they have to constant add the new and innovative element to their product and services to make them more relevant.

2. Enterprise Launching Competencies

The opportunity exists in the society but not all of us are sensitive to it. Large group in the society can perceive only the apparent and traditional offerings of earning. Similarly, resources are also available but very few make the efforts to make use of these resources. Besides economic insight for sensing opportunities in the area, prospective entrepreneurs may have to develop capability of selecting suitable project;

formulating project reports; arranging plant machinery etc . and availing facilities and resources relevant to launching their enterprises . To be more precise, it requires competencies related to sensing opportunities; project/product selection; project formulation availing incentives; resource mobilisation and finally launching the enterprise. Competencies in specific areas under each categories may pertain to.

i. Environment Scanning and Opportunity Sensing :

- Steps in project identification;
- Govt. policies - programmes, incentives and institutional network;
- Reservations of products for exclusive manufacture in SSI Sector;
- Govt . purchase scheme.

ii. Market Assessment :

- Techniques and procedures for conducting market survey;

Understanding the market and product matrix through market segmentation;

Assessing market alternatives; Demand analysis;

An overview of the future product development and market strategy over a period of time; Methodology for upgradation available market survey report;

Deciding upon product to be chosen .

iii. Project Selection :

- Project Identification - generating ideas for selection of project.

Procedure for short listing of ideas generated. Factors to be considered for final selection of product.

SWOT Analysis.

iv. Project Formulation:

- Need for a project report;
- Understanding the format and contents of a project report;

- Determining project size keeping in view the manageability, investment possibilities, production and market aspects;
- Choosing appropriate technology.
- Selection of plant and machinery;
- Determining labour and raw material requirement;
- Estimation of cost : a) Project Cost
b) Production Cost and Profitability Estimates;
- Break-even analysis, profitability rates, return on investment etc . :
- Time scheduling, project monitoring and review technique;
- Study of typical project reports;
- Project Appraisal - technical, economic, financial, commercial and managerial aspects;
- Understanding requirements of banks and financial institutions.

v. Availing Incentives, Support, Procedural Requirements :

- Understanding the role and functions of institutional network set-up for promotion and supporting small entrepreneur s;
- Scope and benefits of assistance and incentive scheme of different institutions;
- Understanding the procedures and formats of applications forms of institutions supporting entrepreneurs.

vi. Resource Mobilisation:

- Estimating resource requirements;
- Identifying officials/persons from where resources are to be mobilised;
- Networking;
- Developing influencing capabilities.

vii. Establishing the Unit:

- Procedures in setting up an enterprise - Fulfilling legal requirements;
- Determining the constitution of the firm registration requirements (Registrar of firm in context another etc.)

3. Enterprise Management Competencies:

The enterprise may be small or big but it demands management abilities in its owner/manager. The various management functions such as production, marketing, finance etc. are crucial functions for entrepreneurs. These influence the result directly and, therefore, are necessary determinants for sustenance of an enterprise. The management skills of the potential entrepreneurs also raise their expectancy for success. These act more or less as control devices ensuring success. Although the extent of management skills required will vary as per the size of the enterprises, the management competencies in the following areas are minimum basic requirement:

i. Decision Making

- Decision making ability as the distinguishing mark of an entrepreneur,
- Determining present capacity for decision making,
- Enhancing decision making ability,
- Determining solutions, Implementing decisions.

ii. Production Management

- Concept of production management,
- Difference in line and batch production,
- Quality control and ISI specifications,
- Plant maintenance - Preventive & break down maintenance,
- Industrial Safety - Care and precaution in industrial environment.

iii. Financial Management

- Concept of Capital : Fixed and Working.
- Sources of Finance.
- Book-keeping and Accounts.
- Costing Procedures.
- Financial Monitoring & Control : Balance sheet, profit & loss account and simple ratios.

iv. Marketing Management

- Concept of marketing and selling.
- Deciding on the product mix to be taken up for marketing.
- Channels of distribution: Sole selling agents, wholesalers, retailers, stockists, distributors, etc
- Purchase procedures for selling to Govt.
- Different forms of advertisement.
- Methods of sales promotion.
- Types of packaging and their relative advantages. Product display.
- Salesmanship : Characteristics of a good salesman dealing with customers etc.



v. Industrial Relations & Personnel Management

- Recruiting labour.
- Work motivation.
- Laws applicable in employer-employee relationship.

Growth and Development

Concept of sustaining entrepreneurship.

Expansion, diversification and modernization: factors contributing to growth and development of an enterprise.

vi. Entrepreneurial Education and capacity Development

Kourilsky (1995) of CELCEE placed emphasis on three curricular components for entrepreneurial education and capacity development.

- Opportunity recognition
- The marshaling and commitment of resources
- The creation of an operating business organization.

Latter, Amar Bhidé and Myra Maloney Hart at the Harvard Business School zeroed on three main concepts in entrepreneurial courses:

- Evaluating opportunities;
- Securing resources;
- Growing and sustaining the enterprise (Gottlieb & Ross, 1997).

Noll's (1993) recommended entrepreneurial education that includes topics:

- Defining entrepreneurship;
- Completing a self-assessment;
- Creating an idea;
- Developing the business plan (including marketing, financial projection and organizational plan);
- Running the business;
- Environmental, political and international issues.

Kimberly Roach listed the following objectives for entrepreneurial course at North Georgia Technical Institute (North Georgia Technical Institute, 1999) USA.

- Knowledge of the characteristics of an entrepreneur;
- Ability to recognize business opportunities;
- Basic skills and knowledge to create an effective feasibility plan for a business venture;
- Ability to identify the various business entry strategies available to entrepreneurs;
- Understanding of the skills needed and means available to collect the market information needed to evaluate the feasibility of a new business concept.

The three general categories provided by Kourilsky and Bhidé and Maloney are similar in their intent to look at entrepreneurial education as teaching the skills to develop a small business enterprise. The recommendations by Noll and Roach focus more on the characteristics needed to be a successful entrepreneur -- the skills that can be applied to entrepreneurial enterprises whether in business, government or the social arena. Both Noll (1993) and Roach (North Georgia Technical Institute, 1999) suggest defining an entrepreneur and entrepreneurship as a starting place when teaching entrepreneurship. Therefore, curriculum of entrepreneurship education broadly covers the following areas:

Learn to develop ideas by:

- Learning to recognize business opportunities;
- Researching customer insights;
- Understanding the needs of the market in terms of services, products, and price;
- Conducting a self-assessment of personal creativity;
- Conducting a feasibility study;
- Identifying various business entry strategies.

Prepare to start a business by:

- Assessing personal resources and financial status;
- Researching and evaluating the risks necessary to get started;

- Writing a working business plan;
- Approaching others for money and other resources.

Build a viable business by:

- Learning to allocate resources;
- Using various marketing strategies;
- Managing money and personnel

How these course to be applied in our own context? Akhoury M.P (1998) suggested for applying the course curriculum as terminal intervention. That is, these essential curricular components could be applied at the termination of every educational package - school education, college and university education, general education, and vocational, professional and technical education. This would be treated as complementary to the existing educational curriculum, which together aims at increasing the total value of the education imparted to the students.

The problems of introducing entrepreneurship education in our country are presently perceived to be many. How to introduce entrepreneurship education to the youth? How to make them interested and eager to learn? How to prepare the educators required for such work requiring devotions? How to make learning environment conducive? What should be the methods and teaching techniques? How to develop and make text and teaching material readily available for the entrepreneurship education? Rudimentary nature of the concept of entrepreneurship education in our country and paradigm based on traditional education certainly would create the list of challenges more exhaustive. But the benefit of instilling a sense of entrepreneurship in the young generation through education would lead to multiple and synergistic benefits to the nation. As so eloquently articulated by J. Gustafson (1993): Entrepreneurship ... frames an ideals context for students/trainees to address the perennial questions concerning their identity, objectives, hopes, relation to society, and tension between thought and action. Concerted effort for overcoming challenges is crying need of hour for integrating entrepreneurship education with the existing educational system as terminal intervention.

The background of the slide features a grid of white human silhouettes. A large magnifying glass with a dark blue frame is positioned over the center, focusing on a single purple human silhouette. The handle of the magnifying glass extends towards the bottom right, pointing towards the text area.

3. Identification and selection of Entrepreneurs

Are we creating entrepreneurs or pseudo-entrepreneurs? Very often the policy-makers and even those who preach about development of entrepreneurship themselves encounter this fundamental question. When someone wants to appraise the approach of identification and selection of entrepreneurs, certain clarification are still needed. An attempt is being made in this chapter to present an overview on entrepreneurial selection, with special reference to the strategy adopted at NISIET (SIET Institute, Hyderabad).

Rationale of Selection

Early research in the field to understand the emergence of entrepreneurship suggests that the concept of 'entrepreneur' has undergone radical change right from 16 century when an entrepreneurs was described as a man engaged in military expedition, to his definition as an owner/manager responsible for the crucial act of economic development, at a national seminar in 1995. Even today, there is need to redefine this concept as it continues to be misused.

The early economist emphasised that economic strategies (Kilby, 1971, Schumpeter, 1934) were responsible for the growth of entrepreneurship. Later on, sociologists and anthropologist (Hagen, 1971, Kunkel, 1991)



stated the factors like caste, family, social status, value, etc. were responsible for entrepreneurship. On the basis of studies they conducted, psychologists (McClelland, Winter, et al., 1969 and Christopher, 1969) concluded that certain personal characteristics are responsible for a person to become an entrepreneur. Further McClelland proposed a theory according to which a person with entrepreneurial potential can be developed into a successful functioning entrepreneur by motivating him and imparting to him certain managerial skills. All these approaches tended to understand the emergence to entrepreneurship, were unidimensional in nature and it is only recently that a holistic approach has come in vogue. Entrepreneurial behaviour in the social or environmental context and hence characteristics are only one dimension of this behaviour. Therefore, to understand entrepreneurial behaviour the field should also be understood.

Profile of an Entrepreneur

In search of a profile of an entrepreneur, various were made by scholars, planners and administrators, ranged from casual and planned observations to empirically tested studies. Table 1 given below gives a list of characteristics as arrived at by Akhouri 1977.

Table 1

Reported characteristics of entrepreneurs

Category	Empirically tested based (those with asterisk on observation were found statistically significant)	Characteristic
Psychological	Ach*	Lack of problem
Characteristics	N Power*	Resolution
	Independence	Rebellion
	Propensity to take Risk	Creativity
	Personal modernity*	Diligence
	Sense of efficacy	Not completely
	Autonomy	Content
	Aggression	Challenging tests
	Conformity	Willing to learn
	Recognition	Adaptability
	Benevolence will power	Self-confidence and
	Tension	Determined to work Result –
	innovativeness	oriented
Economic	Support*	Access to capital Experience
	Business Experience*	of technology
	Occupational back-	Time is important to him
Sociological	Leadership*	
	Symbolic or Actual	
	Rejection of Father*	
	Lack of social mobility drives*	
	Caste Family background	
General	Age	Good salesman Pleasing
	Education	personality Person of
	Emerging entrepreneurial profiles	integrity
	High need for achievement	
	Independence	
	Propensity to take risk	
	personal modernity	
	Sense of efficacy	
	Support	
	Business experience	
	leadership	
	Symbolic or actual rejection of father	
	Lack of social mobility drives	

*If we accept this as a general profile of an entrepreneur, basic questions that arise are: "Can all these qualities be found in one individual?" "Are we in a position to measure these qualities, most of which fall under the non- cognitive category?"

Indian Experience in Selection Strategy

Intensive Campaign

In order to hasten the decentralised development of small industries, the SIDO launched an integrated programme of industrial development in a few selected states of India.

The strategy for selection of entrepreneurs was to attract greater participation through mass media methods. There were no specific selection criteria, and all those who responded to the publicity were offered generous financial assistance. However, this campaign was a failure and one of the reasons for its failure may be its poor selection strategy.

Gujarat Experience

The Gujarat Entrepreneurship Development Programme was started by the State Government in the early 1990's. The basic assumption underlying this programme is that entrepreneurship could be induced or developed. Hence, efforts were made to develop entrepreneurial qualities among employees, workers merchant and all those who were self-motivated. The trainees were selected after elaborate tests were conducted to identify potential entrepreneurs. These tests were specially designed for the programme by the Behavioural Sciences Centre, Delhi and explored in Depth, achievement motivation, decision making capacity, risk taking ability, capacity to stand pressure, competition and uncertainty. Intensive training was also given to the trainees for theoretical and practical orientations. Of those who were trained, 66 per cent were successful in setting up an enterprise.

Crash programme for self-employment in AP

The schemes encouraged by the Andhra Pradesh Government for educated unemployed were mostly self-employment schemes. The potential entrepreneurs were selected from those who responded to the advertisement in the news papers. Emphasis was laid on the feasibility of the projects. In the self-employment programme, the financial institutions were involved from the beginning in the

screening and selection of feasible projects and they also accepted the responsibility of financing the entrepreneurs (Sharma, 1975). This experiment was a partial success.

Requirements of a Selection Procedure

In the light of the selection strategies employed in various states, it will be meaningful here to elucidate on the requirement of a good procedure. The selection procedure should:

1. be based on sound theoretical background;
2. have standardised tests for identification and selection of entrepreneurs;
3. be administered by experts; and
4. have an in-built evaluation component

Feature of NISIET Selection Procedure

The NISIET has developed selection as a part of the NISIET integrated model for entrepreneurial development. This procedure comprises of :

1. Psychological tests like TAT, risk-taking, personal efficacy;
2. Finding out the social-economic/educational back- ground of the candidate; and
3. Personal interviews.

In the initial experiment of selection, the following weightages were given to different dimension of an entrepreneurial profile by officer - trainees who came from various states of India to attend an Entrepreneurial Motivation Development Programme at NISIET (Table 2).

Table-2
Scoring schedule (weightage)

Written test and background data		Model I, J&K Assam Marathwada	Model II Karnataka
A.	Psychological	10	5
	1. Need for achievement	5	5
	2. Risk-taking	5	5
	3. Personal efficacy		
B.	Family Background	5	5
C.	Social participation and leadership skill	5	5
D.	Educational background	5	5
E.	Past experience	20	20
F.	Knowledge, skill and attitude towards business	25	25

G. Efforts made so far towards

The scores obtained by a candidate give his rank among other in respect entrepreneurial potential. But, it does not have any point below which a candidate can be rejected.

Jammu and Kashmir Experiment

NISIET selection procedure was first put into practice at Jammu and Kashmir in response to the request to develop entrepreneurship in the state. A group of 26 officers from Jammu and Kashmir were trained at NISIET in the following three major areas .

1. Socio-psychology aspect of development of entre-preneurship
2. Economic aspect of self-employment; and
3. Management aspect of self-employment.

On their return, the officers who were trained at NISIET widely publicized the programme and collected application from educated unemployed youth. Written tests and personal interview were employed to select the candidates. The project

proposals were carefully reviewed and in-plant training was given where needed. The result of this integrated model action were beyond expectations. Within a year, 575 units came into being and functioned successfully.

Karnataka Experiment

Another application of NISIET's selection procedure was made in Karnataka, which an ancillary development programme was conducted. Sixteen candidates were sent to NISIET for training, these candidates have already been screened by the NISIET faculty by using the selection tests. All these candidates completed the 12 weeks training course and were sanctioned loans. There were no dropouts from this group, even though 14 of them were engineering graduates with good job prospects.

A contemporary ED Programme in Karnataka, where NISIET selection was to be adopted, but could not be executed due to some reason gives a different dimension.

For a self-employment promotion programme, 107 candidates were selected by department officials at Bidar in the month of March 1995, of them, 95 candidates opted for training. After the training and follow-up, only 17 could start their enterprise. The poor response may particularly be attributed to a defective selection procedure.

Assam Experiment

In Assam, NISIET's selection procedure was adopted in six entrepreneurial training centres for selection of entrepreneurs from among the educated unemployed. After preliminary screening, 1550 prospective entrepreneurs completed their training. More than 30 per cent established their units and others were reported to be in the process of establishing their units (Akhouri, 1995). These effects were made during individual to become an entrepreneur ranges from 2 to 3 years. One observation which is evident is that selection and training are necessarily interdependent and complementary. Isolated affects of each have not yet been studied in a systematic manner. However, NISIET has since taken up a project titled 'A follow-up study of entrepreneurs selected by NISIET. Another study conducted by Shah, Gaikwad and

Pareek (1976) throws light on the efficacy of utilising scientific procedures, in comparison with the traditional methods of selection.

NISIET's Improved version

In 1978, another attempt was again made at NISIET to improve the existing selection procedures, since an entrepreneur is required to perform a number of activities starting from self-management to human and technical management, it was decided to measure these qualities by making use of the following:

1. Analysis of application blank;
2. Psychological tests;
3. Group planning exercise (added dimension); and
4. Personal interview (Table-3)

Table-3

The different dimensions of entrepreneurs and the methods to assess them the potential

Aspects need to be assessed		Method employed to assess them
1.	Achievement motivation	TAT
2.	Risk propensity	Ringtoss
3.	Personal efficacy	Locus of control questionnaire
4.	Leadership quality	Group Planning exercise
5.	Commitment to task	Group Planning exercise
6.	Team spirit	Group Planning exercise
7.	Planning Organising ability	Group Planning exercise
Aspects need to be assessed		Method employed to assess them
8.	Decision making	Group Planning exercise
9.	Education, training and previous experience	Application blank analysis
10.	Family background	Application blank analysis
11.	Social participation	Application blank analysis
12.	Knowledge, interest and involvement in the proposal enterprise	Personal interview

Analysis of Application Bank

Comprises of the questions related to educational background, family background, previous experience, social participation and level of aspiration of the individual.

A rigorous screening is being done on the basis of the analysis of the application blank.

Psychological Tests

NISIET has an edge over other organisations in that they have the expertise to administer tests. The psychological tests which have been used at the Institutions are:

- a) TAT;
- b) Ring toss game;
- c) Locus of control.

TAT

This test is being administered to the need for achievement/ need for power of a person. It is a semi-projective test in which six selected pictures are shown to the individual for a short period of 30 seconds each. He is then asked to write a story about each picture within a time limit of 5 mts. It is assumed that careful analysis of this test may give a clear indication of his need for achievement/power.

Ring Toss Game

The ring toss game is played with three rings and one distance from the peg is marked and the respondents are asked to select any distance for throwing all the three rings. The risk propensity of the respondents is scored according to the distance chosen and the amount of risk perceived by the respondents from that distance.

These scores are further used to categories respondents under the following three categories :

1. Blind risk-takers (BR)
2. Calculated and moderate risk-takers; and
3. Low risk-takers (LR)

It is the second category which is indicative of entrepreneurial potential. Here again, trained personnel are required to conduct and score the toss game.

Locus of Control

The locus of control is measured by administering a questionnaire consisting of 29 pairs of statements representing external and internal locus of control. They are given scores for their choice. It is assumed that a high score on internal locus of control is indicative of entrepreneurial behaviour.

Group Planning Exercise

Stimulated exercises can be used to observe the group behaviour and the explained frame is and usage of an individual. A task is given to the candidates objectives to be accomplished are explained are to them. Resources available are described and a time provided to perform the task. The proper construction of the exercise is the job of an expert trainer.

The task is the stimulated exercise is so designed that its performance elicits observable behaviour of the participants. While the task is performed, two observers score the commitment to tasks, planning and organising ability and decision making ability. The average score in respect of each aspect is computed and the respondents are categorised as:

1. Above average;
2. Average; and
3. Below average

Personal Interview

The personal interview is conducted to assess the knowledge, interest and skill required by the potential entrepreneurs. The interviewers score for each of the aspects. The scores given by all the interviewers are averaged.

Computation of Final Scores

Since an entrepreneur required potentialities on all aspects of his behaviour, it is not advisable to rank the entrepreneurs on the basis of the total scores obtained by them. In doing so, one is likely to pick up persons who are extremely good at one or two dimensions, but at the same time, extremely poor on other dimensions. The absence of any one of these qualities are likely to cause failure. In order to avoid this pitfall, we should go for consistency of these figures.

Evaluation of Selection Procedure

While contemporary practices of entrepreneurship selection have a fairly rational bases and confirmatory evidence to back them up, it can scarcely be denied that there is both scope and need for refinement, diversification and empirical evaluation of such procedures. Some of these points are indicated below:

- i) A majority of the selection procedures are costly, both from the point of view of time as well as the money involved. If the country is to embark on a mass programme of entrepreneurial development, then undoubtedly, there is a need to make such procedures less expensive and time consuming.
- ii) Another constraint is the fact that many of the selection tools involve a considerable input of expert professional services. Such services cannot conceivably be made available on a mass scale. This is an indication of the need to develop tools of selection which are simpler and can be handled by persons with the minimum professional expertise.
- iii) One also gets the impression that most selection procedures have been developed, keeping in mind the educated upper class urban population. Our selection procedures involve a high degree of verbal ability. This naturally restricts the utility of this selection procedure with people from rural areas who are not so highly educated. Efforts should be made to develop procedures which enable their application to a wider section of the population.

Selection procedures have also tended to employ arbitrary criteria. There has been a tendency to consider entrepreneurship as an all or none question. It was not unreasonable to state that the degree of entrepreneurial potential required of a person varies from context to context and also from the type of trade or enterprise. There seems to be an unquestionable need to develop principles and practices of matching potential entrepreneurs with the physical, social context and also the type enterprise. A rather weak point in the entire scheme of entrepreneurial selection is the absence of long-term undertaken selection procedures cannot hope to improve very much.

Behavioural Aspects of an Entrepreneur

An entrepreneur is also like any other individual. Yet we distinguish an entrepreneur from a non-entrepreneur (labour manager, Supervisor etc.) An Entrepreneur is his own boss.

- A person who develops & owns his enterprise.
- A moderate risk taker works under uncertainty for achieving the goal.
- An innovative person.
- He pursues the Deviant pursuit
- Reflects strong urge to be independent
- Persistently, tries to do something better
- Dissatisfied with routinised activities.
- Prepared to withstand the hard life Determined but patient
- Exhibits sense of competitiveness
- Takes personal responsibility
- Oriented towards the future.
- Tendency to pursue in the face of adversity
- Converts a hurdle into an opportunity

- A person who keeps his eyes and ear open to access the opportunities in environment, gather resources (men, material and money) to take advantages of the opportunity

What are the Characteristics of an Entrepreneur?

An entrepreneur has many characteristics. These characteristics distinguish them from other individual.

These characteristics are-

- 1) High need for achievement.
- 2) Need for power (but not excessive)
- 3) Propensity to take risk (calculated/moderate)
- 4) Prepare changes
- 5) Self confident
- 6) Intelligent (ability to grasp quickly)
- 7) Future-oriented
- 8) Likes to shoulder responsibility
- 9) Innovative
- 10) Optimistic
- 11) Persistence
- 12) Hardworking
- 13) Extrovert
- 14) Adaptive
- 15) Competitive
- 16) Sensitive and perceptive
- 17) Decision Maker/problem Solver
- 18) Ability to exploit situation
- 19) Persuasive
- 20) Like challenges

- 21) Strive for excellence in work
- 22) Compromising
- 23) Ability to work Under stress
- 24) Tendency to analyse environment
- 25) Willingness to learn and not to suffer from complex
- 26) Person of integrity
- 27) Initiative
- 28) Give value to time
- 29) Leadership quality
- 30) Pleasant personality
- 31) Sense of efficacy
- 32) Strong sense of personal commitment to meet deadlines
- 33) Strive for prestige
- 34) Profit Motive
- 35) Desires feedback and learns from experience, recognizing errors.
- 36) Set goals and realistic step by step sub-goals.
- 38) Egoist
- 39) Family and friend-second to business.

The list is not exhaustive, but only illustrative. You may not have many of these qualities. Yet you need not worry. If you have some of the qualities, you will be able to become an entrepreneur.

4. Business Opportunity Guidance

OPPORTUNITY

Synopsis

The structure of a new venture rests on the bed-rocks of business opportunities and the entrepreneur's response to it. If the foundation is not properly aligned and is thus weak, the structure may well collapse or require extensive repair and support efforts in course of time.

So, the time and trouble taken in preparing a sound foundation selecting or helping to select a right business opportunity for a venture, pay rich dividends in due course. Business Opportunity Guidance (BOG) for potential entrepreneurs, therefore, plays a very significant role in any Entrepreneurial Development Programme (EDP).

1. Structure

Based on the field experience of several EDPs this chapter highlights the four aspects of Business Opportunity Guidance (BOG) as they have evolved over a period of 14 years in Gujarat and other states of India.





- i. Importance and relevance of business opportunity
- ii. Process of identifying and assessing business opportunity
- iii. Linking potential business opportunities to the needs of potential entrepreneurs.
- iv. Modus operandi for Business Opportunity Guidance (BOG)

On the basis of our long and varied experience, it has been possible to develop suitable techniques for opportunity identification as well as appropriate training methods for imparting Business Opportunity Guidance to potential entrepreneurs. While discussing the above-mentioned aspects of BOG some successful techniques and counselling practices have also been presented.

2. Importance of Business Opportunities

Business Opportunity Guidance for prospective and potential entrepreneurs is one of the critical inputs in developing or guiding new entrepreneurs. The need is not only to identify potential business opportunities but also to counsel entrepreneurs for taking up viable and relevant business opportunities.

2.1 What is a good Opportunity?

An entrepreneur is supposed to be an opportunity seeker. His/her first task is to identify and select an attractive opportunity.

But what is an opportunity? Unless we have known that, we would not know what is a good opportunity.

In simple terms opportunity may be defined as an attractive project idea which an entrepreneur accepts for investment on the basis of certain assumptions about the feasibility of the project.

A mere possibility has to be distinguished from a real Business opportunity. In the latter, two ingredients are highlighted viz., (1) good market scope, i.e. gap between present supply and current or likely demand and (ii) an attractive return on investment.

It is difficult to define in exact terms what one means by a good market scope and an attractive return. The basic requirement is nonetheless clear and has to be specified in terms of the potential entrepreneur's individual perception which is, beyond all doubts, sharpened by his exposure to an EDP.

A trader doing good business, as an entrepreneur, is not likely to worry much about market scope but he will certainly be more concerned about production bottlenecks. On the other hand, an entrepreneur having technical background may be more worried about market and marketing activities than production or production-relating problems.

Apart from these two criteria of market-scope and investment returns, BO has to be analyzed from other viewpoints also: its technical / production and commercial/managerial viabilities the availability of raw materials, man-power needs power requirements etc.

Since EDP activities are carried out at a specific place or a centre and are aimed at local target groups BO also requires evaluation in the local context. For example, a business opportunity in a hilly or forest area, such as Assam, will not become same as one in an industrially developed region such as Gujarat.

Thus location considerations or constraints as well as individual strengths and weaknesses are to be considered while identifying good opportunities.

Thus, the entire process of identifying viable business opportunities is a very interesting and challenging one.

2.2 Importance and Need

To become an entrepreneur, the perquisites for an individual are : (a) a strong desire to take up a new venture, (b) sufficient motivational force and (c) readiness to face some uncertainty and take risks. However, one becomes an entrepreneur only when one has transformed his desire and motivational force into a feasible business opportunity.

One of the basic requirements of EDP activities, therefore, is to help the potential entrepreneurs in selecting suitable business opportunities, EDPs cannot be effective unless a basketful of attractive business opportunities suitable for a given centre or region is provided so that a large number of potential entrepreneurs readily come forward to join the programme.

The identification of such opportunities before the programme starts, normally helps in accelerating the process of entrepreneurial development and in generating institutional interests in the programme.

Apart from being an important ingredient of an EDP, Business opportunity Guidance is also crucial for potential entrepreneurs for taking right decisions. A host of problems even at the operational stage may crop up if a wrong project selection has been made. Therefore, a systematic approach to design and impart BOG training inputs as part of EDP becomes all the more important.

BOG, therefore, has to be evaluated and performed from the viewpoint of (i) those who wish to offer EDPs and (ii) those individual entrepreneurs who have to participate in such programmes.

3. Process of Identifying and Assessing Business Opportunities

3.1 Business Opportunity Identification

Identification of business opportunities calls for intensive efforts and specialised skills. However, certain indicators of guidelines may help one on identifying and assessing opportunities on the local level. Such main indicators are :



(a) Environment

- Basic features of an area and its resource inventory
- Population, occupational pattern, socio-economic background etc.

(b) Current Business Scene

- Present pattern of trading and business activities in the area with reference to inter-regional flow of commodities local consumption and needs for industrial goods and services
- emerging trends and patterns of trading and business activities in terms of new demands for consumption of goods and services in the area

(c) The Target Group

- their expectations, strengths and weaknesses (i.e. skills, knowledge, financial resources etc.)

These indicators can enable us to draw right conclusions on some specific opportunities for specific target group at a specific centre.

The actual process of identifying business opportunities begins from exploring potential opportunities in a given situation. This is a continuous process and requires sustained efforts for building up and updating the inventory of opportunities that can be readily offered to entrepreneurs such a gathering of potential investment opportunities or project ideas has to be undertaken during the pre-programme promotion work and must be undertaken before the actual implementation of EDPs.

The alternatives given below would help us to identify potential opportunities in any area. For a clear and analytical understanding the alternatives are listed below in terms of sources and areas to be approached for the identification of such opportunities.

(a) Resources

- (i) Industries based on mineral, agricultural, marine and other natural resources.
- (ii) Products based on waste such as agro-waste, wood-waste, metal-waste etc.

(b) Linkages

- (i) industries arising out of various types of linkages such as backward and forward integration from existing lines of manufactures.
- (ii) Ancillary development projects
- (iii) industries based on substitution i.e. products which are either obtained from outside the region or the country at large.

(c) Export-oriented/Import Substitution Products

At a given centre there is a possibility of some items either being imported from other states or of items that could possibly be exported to other countries. Such items offer excellent opportunities to promote enterprises based on them.

Between the two import substitution items make more attractive enterprises. In such cases not only special incentives are available but the market also is assured.

(d) Market Shift or Growth

Consumer and industrial products that have growth potential as a result of increased population or purchasing power, changes in life styles, living standards, etc.

(e) Special Products

- i. Research and invention-based products
- ii. Skill/knowledge-based products
- iii. Products based on Institution/Government purchases, Hospital/Schools etc.
- iv. Foreign Collaboration

(f) Service Sector

Household repair and maintenance service facilities/workshops/establishments to cater to industrial and household needs.

It is possible to viable business opportunities in many cases on the basis of readily available data/information. The initial process would involve collecting and co-ordinating relevant information from the right sources.

The various courses useful in identifying business opportunities can be grouped under three categories :

- i. Individual contacts
- ii. Institutional contacts and
- iii. Publications and other literature

But, let us hasten to add that the sources of identifying business opportunities are almost unlimited. With a creative and innovative approach, better results can always be obtained.

Great care has to be taken effectively explore the right sources for an appropriate purpose. Since each source has its own dependability, usefulness and limitations, the utilisation of these sources by a trainer or an entrepreneur has to be done very carefully.

Now, two pertinent questions arise : where does this process of identifying business opportunities begin and where does it end? And up to what extent should such an exploration be carried out? These questions have no ready answers in fact we cannot even definitely say anything about the form in which these opportunities should be identified and presented to the potential target groups. However, a more convenient and popular method being used at present to provide information about business opportunities to prospective entrepreneurs is through project profile (Giving preliminary information only) and Feasibility Reports (Giving preliminary information only) and Feasibility Reports (giving detailed information). And there is no plausible reason for us to suggest anything other than these.

3.2 Assessment of a Business Opportunity

The above mentions framework may simplify the task of identifying opportunities but the kind of preparation and effort required at this stage will have to be carefully formulated. It is not the extent of information or type of format (project profile) which is important understanding the expectations of the target group and the background of the location are factors of equal importance in devising the BOG strategy.

The task of this assessment is better understood if it is broken up in the following two stages :

3.2.1 Pre-Feasibility Study

Once the entrepreneurial response start forthcoming it becomes imperative to sustain and channelize entrepreneurial interests. This can be achieved just by the identification of opportunities and later consolidated by the pre feasibility study. The prime objectives of such a study are to determine whether :



- the investment opportunity is promising enough to take a decision in that regard
- the project is viable from marketing, manufacturing and other points of view
- the project justifies further analysis in terms of advanced feasibility study
- any aspect of the project is critical or crucial enough to call for in depth analysis.

On the whole, a pre-feasibility study is an intermediate stage between Project Opportunity Study and Detailed Feasibility Study.

3.2.2 Feasibility Study

Having determined the viability of a business opportunity, it is necessary to acquire a comprehensive technical, economic and commercial data for the final investment decisions. In most of the cases an entrepreneur has to explore the suitability of the opportunity in his own specific skills and expectations, e.g. an engineering workshop project, identified as business opportunity, calls for details of specific market survey etc. at pre-feasibility study state itself. But, at feasibility stage, technical skill and investment capabilities of an entrepreneur have to be assessed before a final decision about the investment is taken.

4. Linking Business Opportunities to Entrepreneurial Needs

The earlier discussions about the identification and assessment of business opportunities are more relevant and useful for working out EDPs at different centres for specific target groups. But more important and crucial pre-condition of



selecting those projects is to suit the individual needs of entrepreneurs.

It goes without saying that a good deal of personal counselling on the part of a trainer motivator becomes necessary at this stage whether the final selection of one single project-out of two or three opportunities identified earlier is done by a particular entrepreneur.

The matching of the chosen opportunities with the selected potential entrepreneurs is intriguing exercise. An entrepreneur's own criteria had his peculiar behaviour. In going for a particular business opportunity is a complicated and at times, confusing process. It is at this juncture that a trainer confusing process. It is at this juncture that a trainer motivator has to intervene and assist the entrepreneur in making highly objective efforts to match correct enterprise with the right entrepreneur one by one with a view to have the best yield of impressive results in EDPs. This is not difficult since the identified opportunities become specific goals towards which all efforts have to be directed and the specific training inputs related to.

The conceptual framework given below broadly helps the trainer to understand the intricacy of the matching process so that he may render more effective personal counselling to an entrepreneur in going for the best business opportunity available at the time.

- (i) Understand major criteria for the final selection of business opportunities by entrepreneurs and analyse their relevance in different contexts.
- (ii) Remember the stages of the cycle an entrepreneur goes through before he makes a final decision to select his venture.

4.1 Major Criteria for Final Selection of a Business Opportunity

An entrepreneur is a person who perceives a business opportunity and finally transforms it into a successful economic activity with an ambition to expand it. As such, apart from any motivations one of his important aims is profitability. But, then, this is common for all entrepreneurs. What makes the study more interesting is to look out for typical motivation of different entrepreneurs. While the simplest answer would be a profitable venture, yet it is not easy to formulated about an entrepreneur's motivation, yet it is not easy to formulate about an entrepreneur's

motivation. Some of them want to minimise risks while others look for congenial sort of activity which is easily manageable. A few may be reckless and are prepared to wait for a long period to reap enormous gains.

Keeping in mind various target groups and different motives of entrepreneurs, their peculiar preferences, the more common limiting factors in the selection of final project tend to be :

- i. Amount of investment ; and
- ii. Nature of technology

Other factors are somewhat flexible and can be adjusted to suit the situation or individual preferences through personal counselling.

4.2 Cycle of Stages of Individual Decision

An entrepreneurs is described as an iceberg - one- tenth of which is visible while the rest is deep in water. It is therefore, at times, frustrating to probe into the process of business opportunity selection made by an entrepreneur. Before an entrepreneur finally decides about his venture, he passes through various stages of decision making, some of which are peculiar.

The process of business opportunity selection, however, is a continuous one, requiring exploration of situations from all angles like marketing, finance, infrastructural facilities etc. till the first decision is reached. In order to facilitate and accelerate this process of decision-making, it is necessary that entrepreneurs are provided with sources of information and right contact points at the right time. In EDPs, continual counselling by aq trainer to help contact right persons or gather required information smoothen the process of decision-making. Meetings with successful entrepreneurs, technical advisers, or references to authoritative data will hasten and help an entrepreneur in taking the final decision.

EDP experience also reveal that absence of information sometimes delay the final decision considerable. And there are instances of some entrepreneurs even forced to abandon their schemes due to that.

The other critical aspects of opportunity selection are (i) family members support; (ii) encouragement by friends or relatives and (iii) an entrepreneurs faith in his judgement. These factors deeply influenced the choice of business opportunities in quite a few cases. The EDP trainer-motivator who has to know the individual strengths and weaknesses of his trainee entrepreneurs has an important role to play in this regard. He can meaningfully help role to play in this regard. He can meaningfully help the entrepreneurs in individually reaching more correct and sound decisions.

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5. Modus-Operandi for Business Opportunity Guidance (BOG)

The BOG process understood and practised as on today may be described in two stages:

- (i) Pre training preparations ; and
- (ii) Business opportunity Guidance sessions with proper approach

5.1 Pre-Training Preparations

Ideally speaking, EDP training programme should be announced in a particular centre only after identifying and preparing ready project profiles (product notes). This would yield better results. But considering the milted

resources and certain operational difficulties, actual practices differ. These range from no project profiles to a large number of profiles.

During the promotional stage of the training, a trainer explores the possibility of various business opportunities largely on the basis of local needs and resources. The process is discussed in detail in an earlier part of the paper. Simultaneously, during his search for potential entrepreneurs, he also tries to get the feel regarding opportunities which are likely to become attractive.

In many cases, a list of potential feasible business opportunities is circulated to all interested prospective entrepreneurs. This attracts between local response with more persons coming forward with interest in EDP and eventually joining the programme. On the whole, the success of a centre would largely depend upon the preparations the trainer has been able to make for identifying opportunities in that centre.

5.2 BOG Session

The content and intensity of training inputs needed in an EDP package have their own importance at different stages. The inputs required for business opportunity guidance also have their own challenges and demands. It has been the fate of many other models of EDPs that many a time majority of the potential entrepreneurs are unable to finally decide on their projects. The whole training exercise then becomes infructuous because it is not geared to the goal of leading the entrepreneur to specific business enterprise to be set up. This aspect has been taken care of in the EDI-EDP Model which emphasizes selection of business opportunity in the very initial stage of the programme and further provides suitable guidance for this purpose during the programme. This not only enables the entrepreneur to have clarity regarding his goal but also subsequently helps him to make better use of the training programme.

The trainer has to classify the trainees into different groups based on their education, preparedness level, knowledge, investment potential etc., and on the

basis of the classifications, the trainer discusses with individual trainees, their preferences and helps them in collecting maximum information about the type, class, level of investment, size of venture etc. of their choice.

This information is then classified into several groups based on the type and nature of industry such as chemical engineering etc. A team of expert advisers and counsellors are then selected on the basis of these groups. Keeping that in view, even the training methodology adopted involves individual personal counselling and discussions with team of experts. The basic approach is to find out how feasible a specific business opportunity is for the individual and which other relevant opportunities can be explored by him. Instead of the approach being merely that of an auditor, it is to help and guide an entrepreneur in solving difficulties and hindrances implicit in a specific opportunity. The trainer has to play a critical role of satisfying the trainees and get the best out of experts through co-ordination and liaison. As a result of this most of the entrepreneurs are left with one or two business opportunities with which they could proceed for final selection. Though the decision is not instantaneous the process enables them to gain confidence.

5.3 Trainer's Role

Apart from individual counselling which the trainer provides, it will be necessary to help to guide the entrepreneur in his final decision by providing external assistance and support. Such external help is not only restricted to the supply of information but also extended to counselling assistance and support. Such external help is not only restricted to the supply of information but also extended to counselling assistance. The trainer arranges requisite visits to appropriate persons officers institutions and units in the region. At this stage, it is not only the trainer's ability, but also the entrepreneur's, initiative, activity level and efforts which play an important role. The final decision is reached only after the entrepreneur conducts his own market survey and is fully convinced about the feasibility of the project at present as it is evolved, the BOG component takes the first two weeks of an EDP.

The formal sessions may be two or at the most four, but the supporting sessions to supply relevant information and impart personal counselling take all the time.

6. Concluding Remarks

Only carefully implemented BOG training-cum-counselling sessions can lay a strong foundation for the success of an EDP/ However, well planned and sound the rest of the training programme may be, the success will not be forthcoming unless business opportunity guidance work is carried out properly at the initial stage. One cannot build upon a foundation which is not strong enough to take the load of

the eventual business venture. In other words if the initial decision concerning the project is defective, the project may eventually fail in actual practice or run into serious troubles.

The approach or objective is not to force a project choice on an entrepreneur. The decision has to be his own: in the sense that he should feel responsible for it and must pursue it with commitment and conviction. This, however, is not possible unless he goes through the whole process at various stages intensively and personally. The trainer can only facilitate and quicken the decision-making process as also help the entrepreneur in avoiding a false trail or from going into a wrong direction.

The trainer-counsellor will have to strike a balance between carrying out efforts for identifying business opportunities identified may not be subsequently taken up by entrepreneurs. This makes the trainer's role more difficult and often quite frustrating. Yet it is the understanding of the individual needs of entrepreneurs that can help the trainer in maintaining a balance between the two possibilities effectively.

5. Product identification and selection

(How to identify and select your product)

For the product identification you can go through the following

1. List of SSI reserved items
2. Project profiles prepared by SIDO
3. Action plan of District Industries Centre
4. Land Bank Report, Bank Consultancy Cell Report
5. Various Journals of Small Scale Industries e.g., Laghu Udyog samachar, SENDOC Bulletin of NISIET Appropriate Technology Bulletin, Industrial Product Finder, Electronics for you, Research and Industry etc.
6. Market Survey Report prepared by promotional organisations and consultants
7. Discussion with existing entrepreneurs.

You should select your product very carefully. The product chosen should have good market potential. You may consider the following factors while selecting your product/project.

1. Product line have less competition
2. Idea should be new
3. You have good experience in the line
4. Raw materials for the product to be manufactured is readily available
5. Product is not banned or not in the restricted list of the Government
6. Technology is available
7. Product will meet the requirement of the society
8. Expansion capacity

After identification of few products, you can go through the process of final selection of product.

NEEDS

YOUR PERSPECTIVE

WHAT IS AN OPPORTUNITY/PRODUCT?

DIFFERENT OPPORTUNITY AVAILABLE

PROCESS GENERATING IDEA - SHOUT LISTING - FINAL SELECTION

STEPS IN IDEA GENERATION

FACTOR FOR SHORT LISTING

FINAL SELECTION - GOVT. POLICY SWOT ANALYSIS

TYRE OF PRODUCTS

TYPE OF MARKET/CUSTOMERS

INTERPLAYOFMARKET SURVEY AND PRODUCT SELECTION

FINAL CRITERIA

PRODUCT EVALUATION

(Stabilities, growth, marketability, enterprise related factors, product capabilities)

OTHER CRITERIA

Resource, Skill, demand Analysis:

For product feasibility you have to study natural resource, the skill, the demand of a product which is demanded by somebody and that somebody is willing to pay for the converted goods.

PLANNING FOR SETTING UP AN ENTERPRISE

An Entrepreneur is to plan activities both before and after the decision to start an unit. The planning should be step by step and in doing so an entrepreneur should carefully consider the steps given below. Some mistakes can be prevented if an entrepreneur plans things in advance. In other words, there should be check list to be followed so that nothing important is left out.

Naturally, this list does not cover everything. In face it is not possible to give an exhaustive list. Yet an attempt has been made to enumerate the different steps of the ladder an entrepreneur has to climb.

Some briefs and suggestions for step by step planning are as follows.

Planning activities broadly involve our basic steps:

- Analysis
- Selection
- Implementation
- Post implementation

Analysis step

- ❖ Analysis of self
- ❖ Analysis about the proposed product
- ❖ Analysis technology
- ❖ Analysis about financial involvement
- ❖ Analysis market potential.
- ❖ Collect information on machinery and equipment raw materials, manpower, government policy, permit, license, etc.

Selection Steps

- ❖ Selection of right product
- ❖ Selection of suitable site
- ❖ Selection of appropriate technology
- ❖ Selection of suitable machinery
- ❖ Selection of appropriate raw materials
- ❖ Selection of right manpower
- ❖ Selection of distribution channel
- ❖ Selection of financial organisation
- ❖ Selection and constitution of right form or organisation

Implementation Steps

- ❖ Registration under District Industries centres
- ❖ Scheme preparation
- ❖ Action plan for launching the project

1. National Resource Analysis:

- Forest resource
- Mineral resource
- Live-stock resource
- Agricultural resource

2. Human resource Analysis:

- Skill personnel
- technical personnel
- Managerial personnel

(Education, Training Research Institute)

Type of Demand

Derived Demand

Where demand for one product intimately connected with and sustained by the demand of another product

Consumer Demand : (Major determinate)

- Price
- Population (People available to purchase)
- Income (economic and non-economic)
- Substitutes
- Competition
- Advertising and promotion

The response of demand depend in both the product and market characterizes.

The product characteristics included

- Consumer product or a industrial product
- It is a consumable or durable
- It is low price or high price product
- If the product has any close substitute

The market characteristics would include considering whether :

- The SSI is in a monopolistic situation or not
- The buyer is individual or an institute
- The product are sold directly to the customers or through middleman
- The competition has better financial strength or not
- The competitor has better brand strength or not

Implementation State

- ❖ Filled up prescribed form
- ❖ Collection of No Objection Certificate (NOC) from competent authority
- ❖ Fund arrangement
- ❖ Project Report
- ❖ Design and estimate of building
- ❖ Loan sanction for power
- ❖ Collection of required documents like, NOC/from Local authority, NOC from Pollution Control Board quotations of Machinery & Equipment
- ❖ Machinery Procurement
- ❖ Installation of Electrification
- ❖ Arrangement of raw materials
- ❖ Recruitment of right persons
- ❖ Trial run.
- ❖ Commercial Production
- ❖ Arrangement of marketing channels and pricing

Post implementation Steps:

- ❖ Inventory control
- ❖ Production Planning
- ❖ Calculation of profit margin
- ❖ Record keeping
- ❖ Expansion, modernization and diversification of unit

6. Project Identification, Formulation and Approval

1. PROJECT IDENTIFICATION

Project may be defined various way

1. It is a small unit of activity that can be separately planned, analysed and administered
2. It is a package of activities each of which needs to be performed over the given period of time
3. It can be any organised activity designed to exploit an economic opportunity

Project has basically two parts, one is preceding and another is following/ Before the venture can be started, some degree of thinking and effort must go in to selecting, setting it up, management and evaluation. The project can be started by any one at any time and almost any where. However the systematic progress and successful completion of a project requires not only an expert handling but also careful consideration of the various aspects relevant to it. In general the following aspects should be considered and analysed carefully in starting a project.



1. The purpose (Objectivity)
2. The Budget
3. Personnel
4. Material and Equipment's
5. Activities
6. The schedule of time frame
7. Measurable units of indicators of evaluation

Following guidelines would help an entrepreneur in identifying a new project:

1. Analysis the performance of existing industries
2. Examine the input & output of the industry
3. Examine imports & Export
4. Study plan outlays and government guidelines
5. Look at the suggestions of Financial Institutions & Developmental Agencies
6. Investigate local materials & resources
7. Analysis economic & social trends
8. Study new technological developments
9. Look out for export potential
10. Attend trade fair
11. Stimulate creativity for generating new product ideas.

2. PROJECT FORMULATION

The process of project formulation aims at an objective assessment of the project potential. It is therefore an attempt to examine step by step the feasibility economic and physical aspects of project.

The process of formulation may have the following six steps.

1. Selection of project
2. Collection of information
3. Analysis of data
4. Preparation of statements
5. Writing of the report
6. Evaluation

Planning Commission's Guidelines for project formulation

In order to process investment proposal and arrive at investment decisions the Planning Commission has issued guidelines for preparing, formulating industrial projects which may be summarized as follows :-

- a. General Information
- b. Preliminary analysis of alternations
- c. Project Description
- d. Marketing plan
- e. Operation requirement and cost
- f. Financial analysis
- g. Economic analysis

3. PROJECT APPRAISAL

Before appraising the project from different dimensions of feasibility, a sound decision criterion has to be fixed for this purpose. Some of the criteria are as follows :-

1. Employment potential Criteria
2. Product Capital Ratio

3. Price stability to the producers
4. Foreign Exchange benefit criteria
5. Distributive justice criteria

Evaluation of Project

The project appraisal is a critical review of the feasibility of a project. Broadly four types of appraisal may be conducted while evaluating a project.

A. Market Appraisal

The kind of information required for market appraisal are as follows:-

- ❖ Consumption trends in the past and present consumption level
- ❖ Past and present supply position
- ❖ Production possibilities and constraints
- ❖ Imports & Exports
- ❖ Structure of competition
- ❖ Cost structures
- ❖ Elasticity of Demand
- ❖ Consumer behaviour, intentions, motive, attitude, preferences & requirements.
- ❖ Distribution channel & marketing policies in use
- ❖ Administrative, technical and legal constraints

B. Technical Appraisal

Important questions raised in technical appraisal are

- ❖ Whether the preliminary tests and studies have been done or provided for ?
- ❖ Whether the availability of raw materials, power and other inputs has been established?
- ❖ Whether the selected scale of operation is optimal?

- ❖ Whether the production process chosen is suitable?
- ❖ Whether the equipment and machines chosen are appropriate?
- ❖ Whether the auxiliary equipments and supplementary engineering works have been provided for
- ❖ Whether provision has been made for treatment of effluents
- ❖ Whether the proposed layout of the site, buildings and plant is sound?
- ❖ Whether work schedules have been realistically drawn up?
- ❖ Whether the technology proposed to be employed is appropriate from the social point of view?

C. Financial Appraisal

The aspects looked into while conducting financial appraisal are

- ❖ Investment outlay and cost of project
- ❖ Means of financing
- ❖ Cost of capital
- ❖ Projected profitability
- ❖ Brea-even-point
- ❖ Cash flows of the project
- ❖ Investment worthwhile ness judged in terms of various criteria of merit
- ❖ Projected financial position and flows
- ❖ Level of risk

D. Economic Appraisal

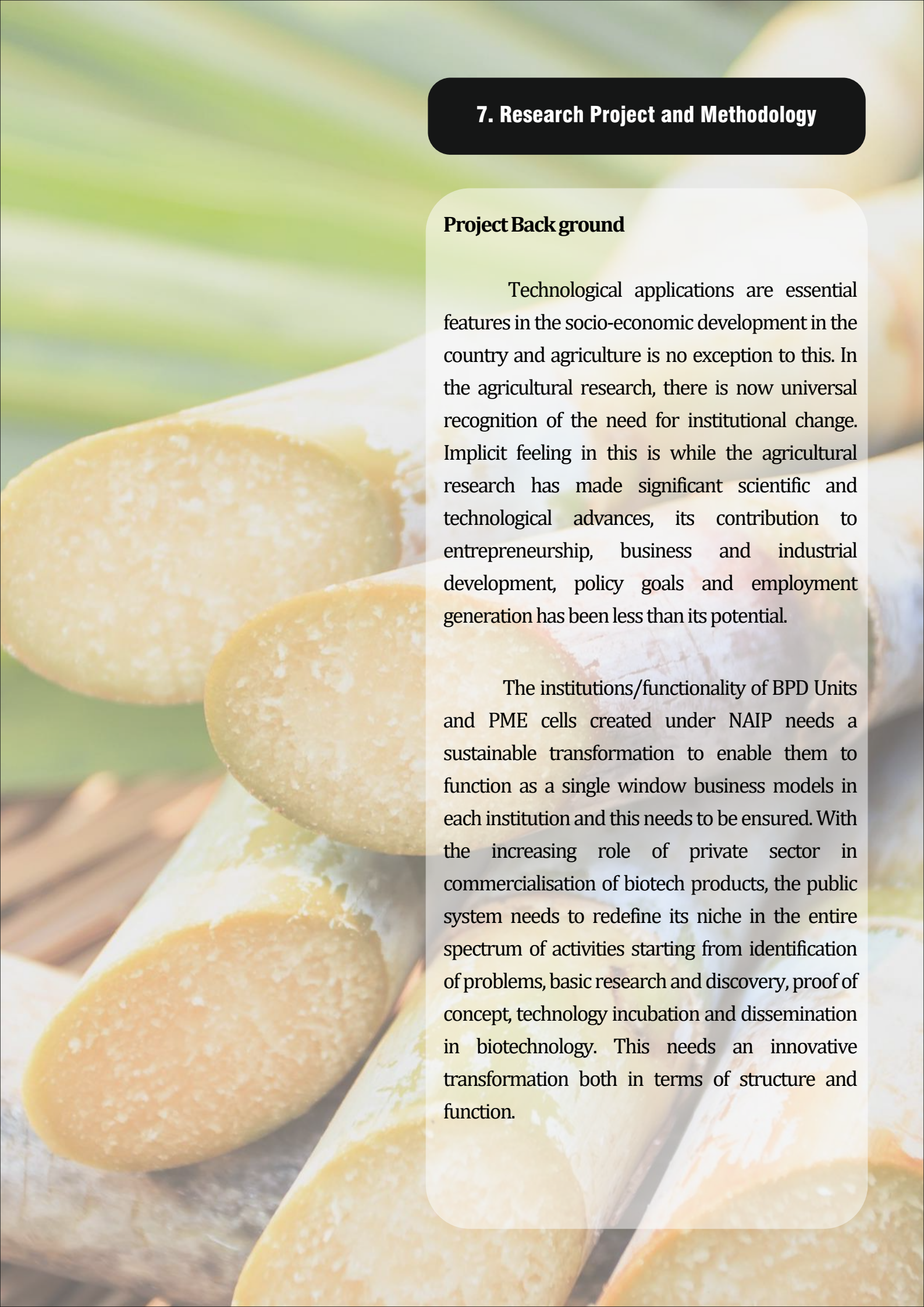
The questions sought to be answered in an economic appraisal are

- ❖ Where are the direct economic benefits and costs of project measure in terms of shadow (efficiency) prices and not in terms of market prices?

- ❖ What would be the impact of the project on the level of savings and investment in the society?
- ❖ What would be the contribution of the project towards the fulfilment of certain merit wants like self-sufficiency, employment social order?



Part - II



7. Research Project and Methodology

Project Back ground

Technological applications are essential features in the socio-economic development in the country and agriculture is no exception to this. In the agricultural research, there is now universal recognition of the need for institutional change. Implicit feeling in this is while the agricultural research has made significant scientific and technological advances, its contribution to entrepreneurship, business and industrial development, policy goals and employment generation has been less than its potential.

The institutions/functionality of BPD Units and PME cells created under NAIP needs a sustainable transformation to enable them to function as a single window business models in each institution and this needs to be ensured. With the increasing role of private sector in commercialisation of biotech products, the public system needs to redefine its niche in the entire spectrum of activities starting from identification of problems, basic research and discovery, proof of concept, technology incubation and dissemination in biotechnology. This needs an innovative transformation both in terms of structure and function.

Innovation is the total process of putting knowledge into social and economically significant use, not just creation of knowledge through research alone. Unlike invention, innovation also concerns putting ideas into use, with innovation being something new to a particular situation and in this project it is oriented towards the business and entrepreneurship development environment component of agricultural research and organisations. Hence, there is an immediate need to scientifically study the feasibility to promote entrepreneurship activities with respect to those technologies having the income generation potential.

Research –Technologies for Income Generation-Entrepreneurship:

Technology incubators established by ICAR have been successful in creating an institutional mechanism for commercialization of agricultural research products/ technologies generated from public research institutions. These incubators are expected to provide the entrepreneurs with access to variety of technologies and experts. Sugarcane breeding institute (SBI) is continually developing new varieties and technologies to increase sugar cane production in the country. Apart from improving sugarcane production in the country, some of the technologies developed from the institute have got good income generation potential and also suitable for rural entrepreneurship promotion.

With proper technology support and guidance, opportunities can be created at grass root level for promoting rural entrepreneurs in this sector. What is needed is an entrepreneur friendly environment for providing technology support, guidance and a platform for interaction among the stakeholders.

The creation of Agri-incubator platform urges the ICAR institutions to unite, strengthen linkages, improve the technology transfer strategies and share the available resources. Institutional facilities available in ATICs and KVKs in the country are emphasizing entrepreneurship development and linking the entrepreneurs with the ZTM-BPD units. Therefore, as an important step in this direction it is essential to scientifically study the feasibility to promote entrepreneurship activities with respect to those technologies developed the

institute having the income generation potential. Equipped with appropriate technologies with their known commercial value it is easy to promote entrepreneurship among rural youths and farm women through technological and methodological support in coordination with the ZTM-BPDs. Hence the study “A Feasibility Study of Recommended Sugarcane Production and Protection Technologies for Promoting Rural Entrepreneurship” is proposed with the following objectives (RPF-I).

- To prepare an inventory of technologies suitable for entrepreneurship promotion.
- To assess the income generation potential through promoting entrepreneurship with respect to recommended technologies.
- To prepare a model project and training module for promising technologies to promote entrepreneurship.

Two potential technologies of ICAR-SBI and ICM - CISE (SMI and Settling Transplanter), and one promising allied enterprise like production of Bio fertiliser were selected based on their income generation potential and starting an enterprise (IRC:2017 and 2018).

Based on the recommendations of IRC 2017 and 2018 the objectives were revised and the final objectives taken up for the study were given here under:

Objectives Approved: (RPF-II)

- **Analysis of entrepreneurial qualities and needs of potential rural youth for providing technological and methodology support related to starting an enterprise and Developing a Capacity Development template for developing entrepreneurship.**
- **Analysis of Men and Material, Manufacturing process, Knowledge, skill and financial requirements etc and preparing a Business plan/project report on three selected enterprises (SMI, Bio-fertiliser and Settling Transplanter).**

Problem Definition

Generally, the technologies developed by academic and research institutions are at 'proof of concept' stage. Rendering them fit for commercialization requires catalytic support and facilities for demonstration of innovative product and process technologies so as to traverse the journey from 'laboratory' stage to 'pilot' stage and then commercial production. Compounding the dilemma are the regulatory aspects of research that have become increasingly burdensome, complex and difficult to understand and comply with.

This program ware component would address specifically the issues of mid - level validation of research results that would require translational research engagement, invariably in partnership mode. It would include technology refinement, scaling up and provide for technology verification, process/technology scale-up assistance, pilot scale design/ construction/operation services, as well as identification and solutions for process scale-up and regulatory issues.

In this study we attempt to identify potential technologies having the entrepreneurship value and then develop a feasibility report along with a training module to train the interested entrepreneurs, therefore the study is proposed with the following objectives.

Immediate Objectives: (RPF-II)

- Analysis of entrepreneurial qualities and needs of potential rural youth for providing technological and methodology support related to starting an enterprise and Developing a CD module for developing entrepreneurship.
- Analysis of Men and Material, Manufacturing process, Knowledge, skill and financial requirements etc and preparing a Business plan/project report on three selected enterprises (SMI,, Settling Transplanter and Bio-fertiliser).

Long-term Objectives

It is expected to generate i) scientific information on the expectations of an entrepreneur, ii) reference material on technology inventory and iii) valuable

training material along with a feasibility report for potential technologies with entrepreneurial value.

Review of Status of Research in the Subject:

From the vast number of review of literature consulted for framing the study objectives and methodology some of the important literatures of national and international importance on the subject are presented here.

To take the benefits of scientific and improved farm technologies to the millions of small and marginal farmers it is required to look at technology more from the point of appropriateness and their income generation value (Chambers and Jiggins, 1986; Osten, 1989; Bernadas, 1991)

Farmers Commission report emphasised the promotion of agripreneurship through income generation activities in the rural areas through appropriate technologies. Similarly, NAIP also envisaged the promotion of entrepreneurship through the establishment of BPD units. Economically and socially weaker section of the population is to be provided with adequate employment opportunities. Most of the income generation activities are technology and skill based requiring adequate technology and methodology backstopping (Venkatasubramanian et al, 2002).

Developing entrepreneur and secondary agriculture involves old and new technologies, capital investments in rural infrastructure, marketing and some change in Govt. regulations. If successfully implemented, however this sector can add 100' billions of rupees to the Indian economy and create millions of new jobs making fundamental change in rural life, which has so far not occurred in a significant way over the last 60 years. This entrepreneurial revolution is in fact what Gandhiji wanted "*Gramina Udhhyog Badhao*" (NAEP, ICAR, 2014).

Project Technical Profile:

Organization of Work Elements (For each objective and participating Investigator giving Man-months involved):

FIRST YEAR: April, 2017- March,18

Sl. no	Name of the activity	Duration (in weeks)	Scientist involved	Time spent by each scientist (weeks)		
				PI	Eco	Ex
1	Technological assessment and analysis for opportunities for entrepreneurship development using sugarcane technologies.	18	PI, S (Eco) and PS (Extn)	10	06	02
2	Need Analysis for entrepreneurship promotion and development using identified technologies	25	PI and PS (Extn)	14		11
4	Analysis of job role and skill requirement	15	PI and PS (Extn)	09		06

FIRST YEAR: April, 2017- March,18

Sl. no	Name of the activity	Duration (in weeks)	Scientist involved	Time spent by each scientist (weeks)		
				PI	Eco	Ex

SECOND YEAR: April,2018-March,2019

4	Analysing the current entrepreneurs profile, status and spread of enterprises on sugarcane technologies	13	PI, S (Eco) and PS (Extn)	06	03	04
5	Preparation of technological inventory	11	Do	03	06	02
6	Skill development module development	12	Do	02	06	04

Sl. no	Name of the activity	Duration (in weeks)	Scientist involved	Time spent by each scientist (weeks)		
				PI	Eco	Ex
THIRD YEAR: April,2018-March,2019						
7	Data analysis and development of feasibility report.	13	PI and S (Eco)	04	09	
8	Final report writing and submission	22	PI, S (Eco) and PS (Extn)	12	06	04
9	Total	129		60	36	33

Estimated Man-months:

Estimated Man months: - 15 man months

Scientific – 10 months (PI), 2 months (1st Associate), 01 month (for second, third and fourth Associate)

Period: April, 2017 to May, 2020 (three years)

Methodology:

Analysis will be done for each technology to project the benefits of the technology and income generation capacity. For the selected technology a detailed feasibility report along with a training module will be prepared.

Budgeting:

Part IV : Project Expenditure (Summary) in Lakhs			
Year April 2017- May 2020			
A	Total Recurring Expenditure		
		Estimated	Actual
A1	Salaries : (Designation with pay scale)		
	i) Scientific	24.00 lakhs	28.67 lakhs
	ii) Technical	Nil	Nil
	iii) Supporting	Nil	Nil
	iv) Wages	Nil	Nil
	Sub-Total	24.00	
A2	Consumables		
	i) Chemicals		
	ii) Glassware		
	iii) Others	6.00 lakhs	0.50
	Sub-Total	6.00	29.17
A3	Travel	Nil	Nil
A4	Miscellaneous (other costs)	Nil	Nil
	Sub-Total (Recurring)	30.00	29.17
B	Total Non-Recurring Expenditure (Equipment and Works)	Nil	Nil
	Sub-Total (Non - recurring)	Nil	Nil
Total (A and B)		30.00	29.17 lakh

Proposed Research details

A scientific way of assessing the entrepreneurial value of any agricultural innovation is to evaluate its potential to generate income at the field while it is being applied to undertake as a commercial activity. Return over the investment, payback period, internal rate of return and the market demand are some of the feasibility

factors to be studied. The commercial value of the technology is assessed through a specified benefit -cost function and is mainly based on the commercial value associated with the use of the innovation.

Importance of the project :

The project results would provide the important information like extent of entrepreneurship at present in the sugarcane sector, opportunities available technological details for promotion of entrepreneurship and feasibility reports and preparedness for skill development for the technology takers for developing an entrepreneurship development program in the institute.

Questions Attempted to be Answered:

- What are the technologies that have the entrepreneurship potential?
- What would be the potential entrepreneurial qualities required for a successful entrepreneur?

Anticipated Process / Products/Technology/Knowledge Expected to be Evolved by Pursuing the Project

- i) Inventory of technologies having potential entrepreneurship opportunities.
- ii) Feasibility report and the skill development module for the potential technologies for their commercial application as an enterprise.

Practical Utility of Results of the Project:

a. Immediate Benefits:

Technology Inventory: Having income generation potential and entrepreneurial opportunities.

b. Medium-term Benefits:

Availability of Project Feasibility reports and Skill Development modules for promoting entrepreneurship.

c. Long-term Benefits:

To promote entrepreneurship and income generation activities in the sugarcane production system.

Methodology Adopted in the Study:

Objective 1:

1. Determining Entrepreneurial Competencies

Entrepreneurial competencies identified by Entrepreneurship Development Institute of India (EDI), Ahmadabad were validated and further improved through seeking responses of 142 successful entrepreneurs, 41 management specialists/ academicians and 118 agri business managers selected for the study and as a result 25 entrepreneurial competencies were identified as essentials for promoting an agri-preneurship. Based on the 25 entrepreneurial competencies identified a testing tool was developed to determine the level of entrepreneurs quality..

2. Test Battery/Tool for identifying Level of Entrepreneurship Quality

1. The Questionnaire is made of consists of 30 statements.
2. The respondents need to read out each statement and decide how well it describes him.
3. It is ensured that he replies honestly. The score will help him to get the capacity Development support. So he need not worry to project himself to get high score by means of false response.
4. As given below a score is assigned to rate the respondents that how well the statement describes his personality.

Score	Level of similarity
5	Very much similar
4	Closely Similar
3	Some What
2	Very little
1	Not at all me

Give Your Response

S.No	Statement	Score
1	Normally I do like to interact with new people and visit places.	
2	I look for new opportunities and like to know about them	
3	I also know and accept to others that I have to improve myself	
4	I also tell others when they failed to match the expected performance	
5	I always explore new ways and means to improve my work and performance	
6	I face the challenges and problems confidently and hopeful of achieving success	
7	I work out suitable means and strategies to win others confidence and trust.	
8	I always try to honour my words and promises give. Take care that I donot disappoint others.	
9	I convince others of my ideas. At the same time give a honest hearing to others and also accept in case if I am wrong.	
10	I do evaluate my finance status periodically and decide about my expenses based on my income and commitments	
11	I always clear my present committed liabilities before making any expenses	
12	My debt level is below my six months net income	
13	I feel responsible for my failures and composed when things go wrong and challenging time	
14	I make personal sacrifices and make extra steps to fulfill my commitments and promises	
15	I change my mind if I am wrong and others are right	
16	I always seek information before taking any decision	
17	It is important for me to do high quality job	
18	I seek others help in terms of ideas, knowledge, experiences whenever required	

S.No	Statement	Score
19	I usually make planning and prepare myself before starting any work or undertaking travel	
20	I keep my things in order and like neatness	
21	I donot like to purchase things which are not of my immediate use	
22	I am not for a simple life and contended life	
23	I wish to test new things and change my households once a new model is launched in the market.	
24	I strict to my decisions inspite of others disagreeing it	
25	I take decisions based on facts and logic	
26	I do not admit that luck plays a big role than honesty and hard work bringing success	
27	I like to take calculated risk based on known facts and expert guidance.	
28	I am for change and development through adopting new ideas and technologies	
29	I always explore alternatives and think of as many ways to do things	
30	I feel guilty if I waste my time and involve in unproductive things or work	

A. Give your Response for the following statements.

Instructions:

5. This Questionnaire consists of 30 statements.
6. Read each statement and decide how well it describes you.
7. You must reply honestly. The score will help you to get the capacity Development support. So you need not worry to project yourself to get high score by means of false response.

8. Assign a score given below to rate yourself how well the statement describes your personality.

Score	Level of similarity
1	Very much similar
2	Closely Similar
3	Some What
4	Very little
5	Not at all me

Give Your Response:

S.No	Statement	Score
1	I am contended with what I have and often associate my poor performance and failures with my fate and environmental factors	
2	I see often people are non cooperative and donot give right advice.	
3	I see there is no meaning of developing strategies and plans because we cannot foresee things and things will not go as we expect	
4	In my opinion there is no need to work for long hours and struggle hard to finish the target. Instead we can ask excuse and take our time to complete our work leisurely.	
5	I consider going to salaried job is better than starting an enterprise to avoid all risk and tensions	
6	I take decisions and will not strict to it always. Often I change my decisions with the influence of friends and relatives.	
7	I do not search for new ideas. Instead I play safe by relying on tested paths and believe in old is always Gold	
8	I do not spend much time and do not bother about how to influence people and seek their support.	
9	I do not need much data or information while taking decisions and normally take decisions spontaneously	
10	I always choose or do activities I am comfortable and familiar with.	
11	I always rely upon conventional solutions to the problems rather than looking for new and alternatives	
12	It will not bother me if things are not done well and I accept or compromise with what I get rather than trying to redo it again	
13	I never have the habit of competing with others and compare my performance with others	

S.No	Statement	Score
14	When I disagree with others, I will not let them know	
15	If my approach to the problem does not yield result I will not bother. Instead leave it and accept the result.	
16	I do not get along with people who has got strong opinions, ideas, strategist, change seekers and innovative in approach	
17	I am not persuasive with others and will not compromise my ideas.	
18	I normally do not try new things which are different from what I have done before.	
19	Opportunities are normally limited and it is not possible to create new opportunities	
20	When trying something difficult and new I feel discomfort and think I may not succeed.	
21	I tell people what to do even if they do not seek my opinion or value my ideas.	
22	When I am doing a job assigned by someone I rarely take any effort to know their feed back or satisfaction about the job done.	
23	I never bother about the things if they go wrong	
24	I like to do things in a more structured ways than act freely	
25	I am comfortable to think and act structurally than free thinking and function in an open free environment.	
26	I do not generally initiate anything on my own, I am comfortable to do the assigned job and in the manner I was told to do.	
27	I do not like to take calculated risk based on known facts and expert guidance because risk is always a risk whatever it may be.	
28	I am for change and development but afraid of adopting new ideas and technologies because I wanted to be safe and tension free	
29	For personal benefit and happiness I am ready to do anything that suits me and come to my hand.	
30	I feel happy to take long vacation spend leisure time with friends and involve in works which is not remunerative for the sake of my happiness.	

Evaluation Criteria: Total Highest score: $60 \times 5 = 300$. Lowest score: $60 (60 \times 1 = 60)$

Potential score: $240 (4 \times 60 = 240)$: Medium score: 120 to $180 (2 \times 60 = 120 \text{ to } 3 \times 60 = 180)$. Based on the above scores the range of score for evaluating the entrepreneurial score has been arrived at. Accordingly the ranges arrived at were: Above $275 =$ Excellent and High Score: 225 to $274 =$ Very Good and in potential range: 175 to $224 =$ Good and in considerable range: 125 to $174 =$ Average and needs caution while selecting the respondents. Below 125 : Poor and rejection range.

1. The items in the test battery reflect the 25 traits of an entrepreneur.
2. The score of respondents reflect their individual preparedness for their role as an entrepreneur.
3. The evaluation of Respondents based on the score secured:

Score	Inference	Further Action
275 to 300	1. Respondent has not responded truly 2. The facilitator has not administered the test carefully 3. Respondent is an ideal entrepreneur	1. Re judge the qualities of the respondents and triangulations to confirm the validity of the high score 2. Re-administer the test batteries to those respondents whose qualities exhibited during the personal observation with their score. 3. By mixing the items in the two test batteries the responses need to be obtained 4. Readminister the test battery by asking cross questions and verification through examples and incidences to verify the claim 5. Select him for the training and place him as a potential trainee under promising category.
225 to 274	Very Good	1. Ensure that the responses given are matching with the qualities of the respondent exhibited during the personal interaction with the facilitator.

Score	Inference	Further Action
		2. Triangulations need to be done with the peer groups and the local referees. 3. Re-administer the test batteries to those respondents whose qualities exhibited during the personal observation with their score. 4. By mixing the items in the two test batteries the responses need to be obtained.
175 to 224	Good	In considerable range for selection. The individual test items of the respondents need to be analysed and triangulated with the observed qualities of the respondents during the personal interaction with the facilitator.
125 to 174	Average	Caution need to be exercised while selecting respondents in the range.
Below 125	Poor	Need not be selected for the programme

Developing Entrepreneurial Skills(ES)

ES:1. Personal Attributes: High nAch, innovativeness, independence, creative, industrious, risk taking, ready for change, continuous learner, managerial abilities, high emotional and communication quotient.

ES:1. Self Analysis –Personal Attributes(PA)

Identification of personal traits and introspection for his preparedness	PA1. Understanding the level of trainees preparedness to start an enterprise PA2. Trainee Should able to identify the strengths, weaknesses, opportunities for improvement and threats in him PA3. Trainee should Know the 25 Desirable Personal traits/competencies of an entrepreneur
--	--

PA1. Understanding the level of trainees' preparedness to start an enterprise:

Score obtained:

1. Indicate your score obtained in the test on analysis of entrepreneurship traits/quality:..... (Max:300)
2. Indicate your Pre learning score obtained in the Pre learning preparedness of the trainee:.....(Max: 100)
3. Indicate your Attitude score obtained in the attitude test on entrepreneurship:..... (Max:100)

ES.2. Behavioural Attributes: Understanding entrepreneurship, understanding of entrepreneurship traits, preparing to be an entrepreneur, self analysis for improvement, acquiring knowledge and skills related to human relationship, problem solving and related emotional management.

ES.3. Functional Attributes(For Objective 2): Are learned attributes essential for an entrepreneur before starting an enterprise. They are management tools and techniques, understanding and practicing skills related to making business plans, economics, banking and finance, the product manufacturing, marketing etc.

Attitude Towards Entrepreneur and Enterprise

Attitude is considered as an organized predisposition to think, feel, perceive and behave towards a referent or cognitive object. It is an enduring structure of beliefs that predisposes the individual to behave selectively towards attitude "referent" (Kerlinger,1964). Attitude is also defined as the positive or negative feeling towards a psychological object (Thurstone, 1946).

It is important to know the attitude of the respondents selected for entrepreneurial development programme in addition to their other personality traits or qualities related to be an entrepreneur and starting an enterprise. This will help to select the suitable respondents and also understand their quality traits to design impart the capacity development programme more effectively and efficiently.

S.No	Attitude statements	SDA	DA	UND	A	SA
1	Starting an enterprise is very difficult and lot of risk involved					
2	Taking a job is always better than being an entrepreneur					
3	Many successful agri-enterprises and business house like <i>Hatsun Dairy, Suguna Poultry, Venkys Hatcheries, Nuzivedu seeds, Rasi seeds</i> etc were started in humble way and hard work and vision had lead to the current name in the industry					
4	To become a successful entrepreneur one has to do lot of personal sacrifices family life and health will get affected duet o stress associated.					
5	An entrepreneur has to do lot of manipulation and dishonest towards client and Govt for earning profit.					
6	It is difficult to get financial assistance required for starting a new enterprise					
7	One must be a business graduate or must have strong business background to start an enterprise.					
8	There are no suitable or profitable technologies available for starting an enterprise.					
9	Getting capacity development and acquiring skill for starting an enterprise involves lot of money / resources and recommendations.					
10	An entrepreneur is not only self employed but also creates job for many individuals.					
11	Being an entrepreneur one can realize one's actual potential and achieve self esteem and attain self-actualisation in the life					

S.No	Attitude statements	SDA	DA	UND	A	SA
12	One can attain more satisfaction in the life in terms of money, assets and social status as an entrepreneur than an working as an employee					
13	An entrepreneur is a free bird and not to work under some one as a subordinate.					
14	An entrepreneur get ample opportunity than an employee to implement his creative ideas, to grow professionally in the life and get lot of learning opportunities.					
15	An entrepreneur is a leader and gets good number of opportunity to show his leadership qualities. Whereas an employee rarely gets an opportunity to show his leadership qualities.					
16	Market is full of unhealthy competition and very few enterprises can able to withstand today and majority of the enterprises are failure and closed.					
17	Often one has to make huge investment continuously in order to change his product profile when the market opportunities decrease or no demand for the product.					
18	Agro based rural enterprises are back bone to the farmers and supports the rural economy					
19	Agri-preneurs are local leaders, role models, source of motivation for rural youth and also helps the farmers.					
20	The profit potential and opportunities are more in agri based enterprises in our country.					

The scale consists of 20 attitude statements with 10 positive and 10 Negative statements. These 20 statements were scored on the pattern of 1 to 5 for positive statements and 5 to 1 for negative statements with a theoretical score extremes 25 and 100.

The attitude Score:

Scoring pattern for positive statements:

SDA	DA	UND	A	SA
1	2	3	4	5

Scoring pattern for negative statements:

SDA	DA	UND	A	SA
5	4	3	2	1

A score of 50 and above is recommended for selecting a candidate for training.

Attitude scale Construction: In this research attitude has been viewed as the degree of favourable or unfavourable disposition held by the respondents towards an entrepreneur and enterprise. The attitude scale was developed in line with Likert type scale construction technique by adopting following step- wise procedure.

1. **Collection and editing of attitude statements:** After careful analysis of the various aspects related to an entrepreneur and an enterprise a total number of 90 statements were framed/constructed. These statements were edited as per the 14 criteria enumerated by Edwards (1969) and as a consequence, 12 statements were deleted. The list of remaining 78 items were circulated among the judges to give their opinions about the relevancy of the statements. Based on their judgement and opinion, a total number of 60 statements were selected for item analysis. These statements were arranged on a five point strongly disagree to strongly agree continuum.
2. **Response to Raw items:** For the purpose of uniformity in the administration of the statements and to avoid translation errors each time, the attitude statements were translated errors each time, attitude statements were then administered to 70 respondents.

3. **Item Analysis and scoring:** The responses thus collected were analysed as per the procedure laid down in the summated rating technique. The total score for each of the 70 respondents was calculated by adding the scores of the individual items in the attitude scale. For favourable statements, the strongly disagree response a weight of zero. The scoring pattern is reverse for the unfavourable statement.
4. Calculation of 't' values and selection of statements: Based on the total scores obtained, the respondents were arranged in the descending order. The top 25 per cent of the respondents with high total scores were considered as high group and bottom 25 per cent as the low group so that these two groups provided the criterion groups in terms of selecting the individual statements. With the help of these criterion groups, 't' values were computed for all the 58 statements by using the formula given by Edwards,1969.

$$t = \frac{\overline{X_H} - \overline{X_L}}{\sqrt{\frac{(X_H - \overline{X_H})^2 + (X_L - \overline{X_L})^2}{n(n-1)}}$$

where,

$\overline{X_H}$ = The mean score on a given statement for the high group

$\overline{X_L}$ = The mean score on the same statement for the low group

$(X_H - \overline{X_H})^2$ = the variance of the distribution of responses of the high group to the statement

$(X_L - \overline{X_L})^2$ = the variance of the distribution of responses of the low group to the statement

n = number of subjects in low or high group

t = the extent to which a given statement differentiates between the high and low groups

5. The individual statements with their respective 't' value are given in Annexure for reference. The statements with significant 't' values 1.80 and above were included in the final attitude test battery. Thus the final scale consists of 20 statements with ten positive and ten negative statements. These 20 statements were scored on the pattern of 1 and 5 and the theoretical score extremes were 25 and 100.
6. **Reliability:** The reliability of the attitude scale was established by using split-half technique. The final scale consisting of 20 items was administered to 30 respondents and the correlation between odd and even item scores were calculated was 0.67 which is highly significant ($p < 0.01$) and this value when subjected to Spearman Brown formula yielded a value of 0.76 which being highly significant and demonstrates that the scale has got high internal consistency.
7. **Validity:** The validity of this attitude scale was established through content validity which means the representativeness or sampling adequacy of the content of a measuring instrument. Nunnally (1967) indicated two major standards for ensuring content validity: i) a representative collection of items, and ii) sensible method of test construction. The scale satisfied both these criteria as the clause of all possible statements that could be made about an entrepreneur and enterprises, was gathered from literature. The scale was constructed in accordance with the steps enunciated in the summated rating technique. Therefore, it was assumed that the scores obtained by administering this scale measured nothing other than the attitude towards an entrepreneur and enterprises.

Knowledge Test for Recognition of Prior Learning (RPL)

Recognition of pre learning status is one of the important conditions in the skill development activity and suitable test is required to understand the prior learning level of the trainee. The preparedness level of the trainee to undergo the

capacity development in the entrepreneurship helps the trainer to orient his programme in a more effective way and facilitate the teaching learning process.

RPL through measuring the Knowledge on entrepreneur qualities, activities of an enterprise (SMI, Bio-Fertilizer and Settling Transplanter)

S.No	Statement	Response
A	Indicate whether the following statements are True or false	True or False
1	Soil Moisture Indicator is a machine used for knowing the underground water source/level in a farm for digging the bore wells and open wells	
2	RTGS and NEFT are used to send money from one bank account to another bank	
3	5-S means Safety, Service, Security, Self employment and Settlement	
4	RTGS stands for Real time Gross settlement and NEFT stands for National Electronic Fund Transfer	
5	Fixed and Variable cost together makes companies Total cost	
6	Gross profit is always less than Net profit	
7	A computer has two parts namely Hardware and software	
8	The cost of soil moisture indicator is about Rs10,000/	
9	4 Ps in marketing indicate, Product, Price, Promotion and Place	
10	Customer Relationship Management is not so important as earning profit in a business	
11	MUDRA scheme is meant for promotion of yoga	
12	NABARD bank provides start up loan directly to the beneficiary	
13	One cannot use SMI in clay soil	
14	SMI is a device used to measure moisture level in the soil	
15	Soil Moisture device uses sensors to measure the moisture level.	

S.No	Statement	Response
B	Give your Response in one or two words/lines	Response in words
16	Give name of any two nationalized bank	
17	For business purpose the enterprise has to open which one of the following account in a bank? a) savings account and b) current account	
18	Give the full form of NABARD	
19	What is the aim of Swatch Bharat Abhiyan launched by Govt of India?	
20	Name three insurance companies that provides risk coverage to individual and materials	
21	Venture capital stands for what?	
22	Name three direct taxes	
23	Name any indirect tax	
24	What is the abbreviation CA stands for ?	
25	Name any three qualities of a good entrepreneur	
C	Answer the following Questions	Write your answer in one or two lines
26	a. What is a recurring deposit account ?	
	b. What is a fixed deposit account?	
26	Name two technologies, tools and machineries that are having potential for starting rural enterprise.(for example SMI, and Banana fibre extractor)	

S.No	Statement	Response								
27	What do you understand a business plan means?									
28	Classify the following taxes under direct and indirect tax heads: Income tax, capital gain tax, securities transaction tax, corporate tax, sales tax, service tax, ,GST, excise duty and customs duty	<table><tr><th>Direct Tax</th><th>Indirect Tax</th></tr><tr><td>1.</td><td>1.</td></tr><tr><td>2.</td><td>2.</td></tr><tr><td>3.</td><td>3.</td></tr></table>	Direct Tax	Indirect Tax	1.	1.	2.	2.	3.	3.
Direct Tax	Indirect Tax									
1.	1.									
2.	2.									
3.	3.									
29	What is the full form of GST?									
30	Answer any two of your choice. What do you understand the terms cash flow, working capital, profit margin and payback period? a)..... B).....									

Total marks: 30. There are no minimum qualifying marks to be obtained. The RPL or knowledge test score indicates fairly an idea about the prior learning of the trainee.

S.No.	RPL Score	Level
1	Above 25	A grade/ Excellent
2	20-24	B grade/Very Good
3	15-19	C grade/Good
4	10-14	D grade/Average
5	Below 10	Poor

Measuring the Knowledge on entrepreneur qualities, activities of an enterprise (SMI, Bio-Fertilizer and Settling Transplanter)

The knowledge test to know the RPL about entrepreneur qualities, activities of an enterprise for example, SMI, Bio-Fertilizer and Settling Transplanter were operationalised and measured as an extent of understood information possessed by the respondents on various dimensions of the traits of an entrepreneur, the business activities and the SMI. The knowledge test was developed and standardized by following the procedure adopted by Lindquist (1951). The following steps were adopted to construct the knowledge test.

- I) Selection of statements:** A test usually contains problems tasks graded on difficulty from very easy to very hard by known steps or interval (Garrett, 1966). These problems or tasks are referred to as test items. With the help of experts and scientists as many as 35 knowledge test items were selected through preliminary screening of the initial 52 statements collected for the knowledge test battery.
- II) Statement selection:** The Preliminary test consisting 35 statements was administered to dummy respondents. Their responses were scored by assigning 1 to each correct answer and 0 to incorrect answer. The total score of each respondent was arrived by summing up scores on all the items of the knowledge test. The difficulty index, discrimination index and point biserial correlation coefficient for each of the 35 statements were calculated according to the procedures described below.
 - a) **Item difficulty:** The difficulty of an item, according to Garrett(1966), can be determined in several ways (i) by the judgement of component people who rank the statements in order of difficulty, (ii) speed with which the items can be correctly solved: and (iii) by the number of examinees in the group who get the statement correct. Here, the last method was used to find out the indices of statement difficulty as this one is considered as

more objective and, thus, the standard procedure for determining the difficulty (Garrett,1966).

The proportion of respondents who answered a statement correctly was taken as an index of item difficulty. Item difficulty indices were calculated for all the items and those items which have the difficulty index ranging from 20 to 80 were collected with a view to eliminate most difficult and most easy statements

- b) **Discrimination Index:** It expresses the extent to which the given statement/item discriminates among the subjects who differ sharply in their knowledge measured by the test as a whole. Individuals are discriminated when they obtain different scores. An item or statement is considered to have more discrimination power when it is answered correctly by some rather than an item or statement which is answered correctly either by all or none.

For this purpose, the total scores of all the 70 respondents were arranged in ascending order to cut off the two extreme groups, the top 25 percent and the bottom 25 per cent which were used in computing the discrimination indices of all the 35 items. The discrimination index of a statement/item was calculated by using the following formula:

$$E^{1/3} = \frac{S_T - S_B}{N/3}$$

where

$E^{1/3}$ = index of discrimination

S_T = frequency of correct answers in the top group,

S_B = frequency of correct answers in the bottom group

N = total number of respondents (70)

Those items with discrimination indices above 20 were considered for final inclusion in the test.

- c) **Point-biserial Correlation:** The point-biserial correlation was suggested for further analyzing the items of a test (Garrett,1966). In this, the criterion of validity was considered to be internal consistency. Internal consistency is the relationship between the total score and dichotomized response to any given statement. Thus, the validity power of the statement was computed with the help of correlation of the individual statement scores with the whole test scores.

The formula for obtaining the point-biserial correlation values as suggested by Garrett(1966) is as follows:

$$r_{p\ bis} = \frac{M_p - M_q}{SD} \times pq$$

where

$r_{p\ bis}$ = point-biserial correlation

M_p = mean of the total scores of the respondents who answered the item correctly

M_q = mean of the total scores of the respondents who answered the item incorrectly

SD = standard deviation of the entire sample

p = proportion of the respondents giving correct answers to the item

q = proportion of the respondents giving incorrect answers to the item

- iii) **Final Selection of statement:** The item having a difficulty index between 20-80, discrimination index of above 20 and significant point biserial correlation value were considered. Only 14 statements which satisfied the above criterion of selection were included in the final knowledge study.

iv) Reliability of the Knowledge Test: Reliability is the accuracy or precision of a measuring instrument (Kerlinger,1964). A scale is said to be reliable when it consistently produces the same result when applied to measure the object. Though there are many techniques that can be used to measure the reliability, here we used split-half technique, the most commonly used method was used. In split-half technique, the final knowledge test comprising 14 items was administered to 30 respondents. The responses to item were scored as '1' for correct and '0' for incorrect answers. The total score ranges from zero to 14 if all are answered wrongly and rightly respectively. The total scores obtained by each of the respondents on odd and even numbered statements/items in respect of the two halves of the test were calculated separately. The Pearson Product moment Correlation coefficient between two sets of scores was calculated. The 'r' value thus calculated was 0.70 which was found to be significant at 0,01 level of probability. Since the 'r' value obtained was for half of the test, the spearman Brown Prophecy formula was used to obtain the reliability co-efficient of the whole test and the value was found to be 0.70. This indicates that this test had high internal consistency.

v) Validity: The validity of the knowledge test was established through content validity which means the representativeness of the content of a measuring instrument. All possible statements covering all aspects of entrepreneurship and the business management were gathered from management literature and research publications. These statements were subjected to difficulty and discrimination indices, and point-biserial correlation to select the final statements. Therefore, it was logical to assume that the test satisfies representativeness as well as the sensible method of test construction, the two criteria of content validity laid down by Nunally (1967).

The Attitude statements with their 't' values

S.No	Attitude statements	Scale Values/ 't' value
1	Starting an enterprise is very difficult and lot of risk involved	3.94
2	Taking a job is always better than being an entrepreneur	3.34
3	Many successful agri-enterprises and business house like <i>Hutsun Dairy, Suguna Poultry, Venkys Hatcheries, Nujivedu seeds, Rasi seeds</i> etc were started in humble way and hard work and vision had lead to the current name in the industry	2.92
4	To become a successful entrepreneur one has to do lot of personal sacrifices family life and health will get affected duet o stress associated.	2.73
5	An entrepreneur has to do lot of manipulation and dishonest towards client and Govt for earning profit.	2.71
6	It is difficult to get financial assistance required for starting a new enterprise	2.64
7	One must be a business graduate or must have strong business background to start an enterprise.	2.61
8	There are no suitable or profitable technologies available for starting an enterprise.	2.52
9	Getting capacity development and acquiring skill for starting an enterprise involves lot of money / resources and recommendations.	2.50
10	An entrepreneur is not only self employed but also creates job for many individuals.	2.32
11	Being an entrepreneur one can realize one's actual potential and achieve self esteem and attain self-actualisation in the life	2.21
12	One can attain more satisfaction in the life in terms of money, assets and social status as an entrepreneur than an working as an employee	2.21
13	An entrepreneur is a free bird and not to work under some one as a subordinate.	2.10
14	An entrepreneur get ample opportunity than an employee to implement his creative ideas, to grow professionally in the life and get lot of learning opportunities.	1.94

S.No	Attitude statements	Scale Values/ 't' value
15	An entrepreneur is a leader and gets good number of opportunity to show his leadership qualities. Whereas an employee rarely gets an opportunity to show his leadership qualities.	1.92
16	Market is full of unhealthy competition and very few enterprises can able to withstand today and majority of the enterprises are failure and closed.	1.91
17	Often one has to make huge investment continuously in order to change his product profile when the market opportunities decrease or no demand for the product.	1.91
18	Agro based rural enterprises are back bone to the farmers and supports the rural economy	1.84
19	Agri-preneurs are local leaders, role models, source of motivation for rural youth and also helps the farmers.	1.82
20	The profit potential and opportunities are more in agri based enterprises in our country.	1.80

Knowledge Test Point Biserial Correlation, Difficulty Index and Discrimination Index Values for the Knowledge Test Items

S.No	PBS	Item difficulty	Discrimination index	Status
1	.510	88.21	24.42	Rejected
2	.293	98.24	12.86	Selected
3	.297	31.21	30.52	Selected
4	.594	74.61	69.47	Selected
5	.136	94.62	5.72	Rejected
6	.231	96.62	6.32	Rejected
7	.387	21.36	28.52	Selected
8	.521	76.32	57.94	Selected
9	.246	97.45	4.78	Rejected
10	.347	78.57	42.17	Selected

S.No	PBS	Item difficulty	Discrimination index	Status
11	.291	93.27	18.16	Rejected
12	.365	33.11	36.23	Selected
13	.234	93.18	16.24	Rejected
14	.184	20.00	52.94	Rejected
15	.523	88.75	42.27	Selected
16	.128	52.38	10.99	Rejected
17	.292	38.75	39.71	Rejected
18	.218	54.81	10.41	Rejected
19	.421	75.61	63.70	Selected
20	.308	24.28	38.41	Selected
21	.383	61.21	42.78	Selected
22	.339	81.34	29.38	Selected
23	.054	91.78	05.63	Rejected
24	.172	93.14	05.84	Rejected
25	.421	90.15	17.67	Rejected
26	.371	92.35	41.17	Selected
27	.063	90.24	05.66	Rejected
28	.263	100.0	00.00	Rejected
29	.421	64.28	64.74	Selected
30	.041	43.21	05.28	Rejected
31	.456	87.14	32.92	Selected
32	.204	68.57	52.94	Rejected
33	.160	82.85	17.64	Rejected
34	.159	40.00	81.35	Rejected
35	.301	20.00	11.26	Rejected

Technology Product and Capacity Development Module Template Developed: (Objective :1)

1. Qualification Pack (QP) – Occupational Standards (OS) for Entrepreneurship in Agriculture and Allied Industry

Contents

Introduction

Qualification Pack

OS Units.....

Glossary and Key Terms

What are Occupational Standards (OS)?

OS describe what individuals need to know and understand in order to carry out a particular job role or performance or function.

OS are

Performance standards that individual must achieve when carrying out functions in their job/work place, together with specifications of the underpinning knowledge and understanding

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Qualification Pack- Entrepreneurship in Agriculture and Allied Industry

Sector: Agriculture and Allied

Sub-Sector: Sugarcane Entrepreneurship

Occupation: Entrepreneurship in Soil Moisture Indicator, Biofertiliser and Settling Transplanter

Reference ID: ICAR-SBI/SMI/Bio-Fert/Settling Transplanter-2020

Entrepreneur: The word entrepreneur is derived from the French word “*entrependre*” meaning “undertaker” or “go between”. Entrepreneur is a person who searches for change, responds it and exploits opportunities (Peter Drucker, 1964). Entrepreneur is an initiator and establisher of an economic activity or an business enterprise/unit (Pareek and Nadkarni, 1978). An entrepreneur is a person who identifies market needs, invest money and organise resources to produce a product or service, apply business managerial techniques to maximize profits, take calculated risk to achieve success, continuously looks for opportunities to grow, foresees market changes, foresight opportunities and risks and adapt his business accordingly.

Skill: Skill is the ability to do things and effectively apply knowledge, personal aptitude and attitudes in work situation.

Brief Job Description: Three dominant perspectives evolved.

- **Personality:** Related to entrepreneurship characteristics and traits such as attitude, leadership, communication, change seeking and risk taking behavior etc.
- **Behavioural:** Related to set of activities and process associated with new venture or enterprise creation.
- **Functional:** Technical knowledge and skill, aptitude, managerial competencies, and business economics.

An economist view an entrepreneur as “one who brings resources, labour, materials and other assets into combinations that brings about value addition and increase their economic/market value. The economists view an entrepreneur as a fourth pillar of production along with land, labour and capital.

Psychologists view an entrepreneur as a person typically driven by certain wishes and forces within self to achieve certain goals to make experiments or to gain independence.

Sociologist Views entrepreneur a person with strong achievement motivation supported with certain favourable socio-economic conditions to pursue his economic pursuits.

Personal Attributes: High nAch, innovativeness, independence, creative, industrious, risk taking, ready for change, continuous learner, managerial abilities, high emotional and communication quotient.

Behavioural Attributes: Understanding entrepreneurship, understanding of entrepreneurship traits, preparing to be an entrepreneur, self analysis for improvement, acquiring knowledge and skills related to human relationship, problem solving and related emotional management.

Functional Attributes: Are learned attributes essential for an entrepreneur before starting an enterprise. They are management tools and techniques, understanding and practicing skills related to making business plans, economics, banking and finance, the product manufacturing, marketing etc.

Qualification Pack Code	ICAR-SBI/SMI/Bio-Fert/Sett Trans/2020
Job Role	Agri-preneurship in Soil Moisture Indicator/Biofertilizer/Settling Transplanter-2020
Sector	Entrepreneurship Development in Sugarcane
Sub-sector	Tools and equipments
Scope	Capacity Development for Self analysis, understanding entrepreneurship, acquiring knowledge and skill related to i. Personal attributes, ii. Behavioural attributes iii. Technical attributes
CD course details	1. Theory 2. Practical and hands on training

Qualification Pack Code		ICAR-SBI/SMI/Bio-Fert/Sett Trans/2020	
Job Role		Agri-preneurship in Soil Moisture Indicator , (SMI), Bio Fertilizer and settling Transplanter	
Role Description			
NVEQF/NVQF level	5		
Minimum Educational Qualifications	12th pass		
Maximum Educational Qualification	Not Applicable		
Training/Capacity Development (Mandatory)	Hours: 30 Theory: 9 hrs (12 modules each 45 mts duration) Practical:12 hrs (Four sessions each 180 mts duration) Visit to successful Agri-enterprise: Eight hrs (one man day) Number of Days: Four Days (3+1)		
Applicable Occupational Standard	National	Compulsory ICAR-SBI/SMI/NOS-19 on Agri-entrepreneurship on SMI, , Bio Fertilizer and settling Transplanter	
Performance Criteria	As described in the 12 Capacity Development units on Occupational Standards developed on Agri-preneurship on SMI, Bio Fertilizer and settling Transplanter		

NOS

National Occupational Standards for Agri-preneurship (SMI, Bio Fertilizer and settling Transplanter)

Task	Starting an Agri-Enterprise on Soil Moisture Indicator, Bio Fertilizer and settling Transplanter.
Description	This Occupational Standard is for starting a rural micro enterprise for manufacturing SMI, Bio Fertilizer and settling Transplanter
Scope	This task covers the following 1. Developing Entrepreneurial qualities and skill 2. Developing Skills for assembling/making SMI, Bio Fertilizer and settling Transplanter
Performance criteria (PC) with respect to scope	
Element	Performance Criteria
Identification of personal traits and introspection for his preparedness	To be competent, the user/individual must able to: PC1. Understand the level of his preparedness to start an enterprise PC2. Should able to identify the strengths, weaknesses, opportunities for improvement and threats in him PC3. Know the 25 Desirable Personal traits/competencies of an entrepreneur PC4. To know the RPL status and attitudinal orientation of the individual.
Entrepreneurial qualities and skills	To be competent the individual must able to: PC5. Explain leadership qualities required for leading an enterprise PC6. Digital literacy for seeking information and management PC7. Finance Management PC8. Preparing to be an entrepreneur PC9. Understanding Entrepreneurship
Assembling of SMI, preparing Bio fertilizer and Settling Transplanter	To be Competent the respondent/trainee must able to: PC10. Know and identify various components of SMI PC11. Explain the working principles of SMI, , Bio Fertilizer and Settling Transplanter PC12. Prepare the components required for the SMI ,Bio-fertilizer and settling transplanter. PC13. Assemble the SMI, preparation of Bio fertilizer and understanding the working principle of settling transplanter

Knowledge and Understanding(K)

1.Management tools and techniques for managing an enterprise	The individual on the job of starting an enterprise of SMI, Bio Fertilizer and Settling Transplanter need to know and understand: KA1.How to communicate effectively KA2.Problem Solving KA3.Identification of business opportunities KA4.Government Role in entrepreneur promotion KA5.Various management tools and Techniques
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2.The use and scope of SMI, Bio Fertilizer and Settling Transplanter and working principle	The individual on the job needs to know and understand: KB1.Importance of water and usage in agriculture KB2.Role of SMI, Bio Fertilizer and Settling Transplanter scope and associated benefits. KB3.Working Principle
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Skills(S)

A. Core Skills	Business management skills like Communication, Banking, The individual on the Job needs to know and understand: SA1.Good communication skills and techniques SA2.Preparation of project report and business plans SA3.Banking and Finance SA4.Emotional management for personality improvement SA5.Ethics and Values SA6. Marketing
B. Professional	Using Tools and Machines Practical (TM) TM.1 Hands on training through practical skill training for assembling the SMI, Bio Fertilizer and Settling Transplanter. TM.2 Hands on training for testing the SMI, Bio Fertilizer and Settling Transplanter under field conditions

Key words and definitions: Qualification Pack for Agri-preneurship in Soil Moisture Indicator (SMI), Bio Fertilizer and Settling Transplanter

Key words	Description
Sector	Sector is a conglomeration of different business operations having similar business and interests.
Sub-sector	Further breakdown based on characteristics and interests of its components
Occupation	Set of job roles, which perform similar/related set of functions in an industry
Job role	Defines unique set of functions that together form an unique employment opportunity in an organization
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context
Performance Criteria	Are statements that together specify the standard of performance required when carrying out a task
Occupational Standards(OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the work place, together with the knowledge and understanding they need to meet that standard consistently. Occupational Standards are applicable both Indian and Global contexts.
Qualification Pack(QP)	QP comprises the set of OS, together with educational, training and other criteria required to perform a job role.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.
Knowledge and Understanding	Knowledge and understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual need in order to perform to the required standard.
Technical Knowledge	Specific knowledge needed to accomplish specific designated responsibilities
Core Skills/Generic Skills	Core skills or generic skills are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment. These skills are typically needed in any work environment. In the context of OS, these include communication related skills that are applicable to most job roles.

Acronyms

NOS	National Occupational standard(s)
NVQF	National Vocational Qualification Framework
NSQF	National Qualification Framework
NVEQF	National Vocational Educations Framework
QP	Qualification pack

Entrepreneurial Competencies: Entrepreneurial competencies identified by Entrepreneurship Development Institute of India (EDI), Ahmadabad were validated and further improved through seeking responses of 142 successful entrepreneurs, 41 management specialists/academicians and 118 agri business managers selected for the study and as a result the following competencies were identified as essentials for promoting agri-preneurship. Accordingly the following 25 Entrepreneurial competencies have been identified by Venkatasubramanian et al, 2019 as an outcome of the study.

1. **Knowledge seeking and Learner:** Ability and interest to know new things continuously. All of us must have felt that we do not get time to learn as we are fully occupied with work and lack of learning opportunities and poor access to materials of recent developments. Therefore, creation of continuous learning opportunities through meeting right people, listening to news, reading news papers, technical bulletins and publications. An entrepreneur therefore keeps himself apprised of latest developments and advances in the knowledge, equipments, Government policies etc.
2. **Consistency and persistence:** Standard behavioural pattern without any ups and down and swing in the thinking process, approach and decisions made. Persistence indicates never give up approach in difficulties and challenging time. An entrepreneur needs high degree of perseverance in their work or task to be accomplished. On initiating a particular project, if he leaves in between and switch over to other problem and so on at no point of time he cannot come out with a successful solution and finally can build an enterprise.

3. **nACh:** High level of achievement motivation and need for achievements. This indicates not satisfying with the given situation and working to move further up for improvement in terms of quality, quantity, economic value, status etc.
4. **Effectiveness and Efficiency:** Effectiveness means doing the right things and efficiency means doing things rightly. Concern for conservation of time, money and effort. A successful entrepreneur takes care to do right things in a faster way with optimal resources at a cost effective way.
5. **Strategist:** Ability to conceptualise and visualize broad decisions to act, allocate resources in an innovative methodology supported by mathematics, logic and ethics to attain the objectives and Goal.
6. **Innovative Wisdom:** It is the person's ability to evolve new idea, practice through application of knowledge, experience, discretion and intuitive understanding, along with a capacity to apply these qualities well in a given situation.
7. **Managing Technologies or ability of technology management:** Technology management wrt entrepreneurship/agri-preneurship be defined as the integral planning, designing, optimization, operation and control of technological products, process and services for economic advantage of human.
8. **Good Communicator:** A communicator is that person who initiates the process of communication. He is the source, originator or sender of the message. Possesses good communication skills and communicates effectively with clarity.
9. **Attitude:** Attitude towards self is important. A favourable attitude towards self leads to confidence, self-esteem and optimism. A negative attitude will lead to low confidence level and poor self esteem. Self-confidence means not being afraid of the risks associated with the business and relying on one's capabilities to successfully manage the risks and challenges. A successful business entrepreneur has a strong belief in self and own abilities.
10. **Aptitude:** Aptitude is the person's potential capacity to do something. It is the innate and learned ability to do something. e.g. some people are good in a particular subject. A little training and efforts will help them to do well.

11. **Emotional Intelligence:** Emotions denotes a state of being moved, stirred up, aroused and involves impulses, feelings, physical and psychological reactions. Negative emotional response may lead to non-cooperation and non-participation, stoppage of work, or even stoppage of the work done. In programme of planned development like running an enterprise, the emotional intelligence of the entrepreneur is important.
12. **Initiation/Initiative:** Acting on his own and out of his choice than compulsions. This is the process that unfolds naturally and an important trait of an entrepreneur.
13. **Credibility:** It means trust worthiness and reliable. Commitment to work contract and promises made in terms of deliverables. His words and actions matches with each other. Taking pains and genuine steps to complete the tasks as scheduled and fulfill the promises made to the vendors and customers.
14. **Planner and Problem Solver:** Systematic in enterprise resource planning. Arranging things in order and execution of activities as per the priority. Planning helps to accomplish coordination between various business process/units in an enterprise and helps to utilise the time and resources in an effective and efficient manner. At the end it gives us the substance/ material for the evaluation of work carried out during a particular period of time in achieving the objectives and goal of the enterprise. The planning can be classified into informal, formal, short term and long term in accordance with its nature and time. Systematic planning is an important quality trait need to be possessed by an entrepreneur. Breaking up the complex whole into parts, close examination of parts and inferring about the whole. Example: Concentrating and systemizing the procurement, production, inventory, marketing and finance management in an enterprise. An entrepreneur develops and uses logical step by step by plans to run his enterprise through breaking s large task down into sub tasks, developing plans in anticipation of obstacles, evaluating alternatives and taking logical and systematic approach to activities. Problem solving means observing the symptoms, diagnosing and

curing. A successful entrepreneur identifies new and potentially unique ideas to achieve his goal and run the enterprise.

16. Concern for Total Quality:

Total quality management ensures quality of the deliverable in an enterprise which increase the brand value and the market image of an product. Good manufacturing practices (GMP), Good Quality Product (GQP), Good Engineering Practices(GEP), Just In Time(JIT), 5-S, six sigma, MBO, ERP etc are some of the quality management practices an entrepreneur has to adopt in an enterprise for bringing out quality product.



17. Creativity: Creativity is the use of one's intellect to produce novel and meaningful ideas, methods, process, actions and products. Unlike normal solutions to problems, many a time running an enterprise need creative solutions. An entrepreneur has to attempt unique way of conceptualizing and see things and world around him so as to get a new unique and a novel solution hitherto no one has visualized and practiced.

18. Persuasion: Influencing and motivating others to stay alive in the business. An entrepreneur needs high persuasive ability and skill to mobilize resources, obtaining inputs, organizing productions, and for selling his products or services. Persuading employees, consumers, input suppliers and financiers to run a business is highly essential.

19. **Business Intelligence:** Understanding the trade, commerce and economics associated with the enterprise is highly essential. An entrepreneur must have a thorough understanding about the trade potential, competition, product demand, consumer preferences, profit etc associated with the product or service he is planning to manufacture or deliver through his enterprise.
20. **Human Relationship Skill:** His ability to work effectively to build cooperation with those associated with his business enterprise. In addition to this other important quality trait associated is the conceptual skill. Every entrepreneur has to work through s personal situation and therefore he must understand his own attitude, assumption, beliefs and his limitations.
21. **Decision Making Ability:** Making good decisions requires trained sensitivity to make right decisions by weighing the alternatives and impact of the decisions made. Assessing the situation and problem is an important step in the decision making. An entrepreneur must understand his ability to make right decisions, time for taking a particular decision and benefit cost associated with his decision.
22. **Risk Taking and Bearing Ability:** Some degree of unfamiliarity with the outcome is what is termed as risk. Risk management is very important in startup enterprises and first generation entrepreneurs. Risk in terms of market demand, increase in inventory prices, loss due to fire, accident, non receipt of payment from the clients, sourcing finance from local money lenders, over stocking of inventories etc. are some of the common factors to be kept in mind.

The entrepreneur must understand and prepare for the risks associated with his business and enterprise. Man cannot discover new oceans unless he has the courage to lose sight of shore(Andre Gide). Risk taking is an entrepreneurial activity which is not same as gambling. A gambler is a blind risk taker. The outcome of blind risk depends on 'chance'.

The unfamiliarity of outcome is the challenge and an entrepreneur has to prepare himself to deal with this. Since risk taking is associated with the entrepreneurship, reinforcement of moderate risk taking behavior is considered as an important input for motivation development training. Ring-Toss game is one of the most commonly used game to explore and understand the dynamics of risk taking behavior.

23. **Analyst and Appraiser:** The environment in which business operates today is rapidly changing. A major agent of this change is change in technology, consumer preference, market fluctuations, entry of new products, change in cost of inventories etc. These dynamics associated with the business environment decides the success and failure of a business. Therefore, the entrepreneur must therefore a good business environment analyst and appraiser of the situation to take favourable decisions.

Capacity development to sensitise him to understand his own level of analytical intelligence and appraisal methodology by using the business analysis tools are therefore important. Resource appraisal for entrepreneurship development involves understanding of self in terms of business knowledge and skills, conceptual understanding, technical competencies required, human resource skills etc.

Knowledge about self and surroundings is necessary for an entrepreneur for making maximum use of available resources for achieving break even and profitable level of operation. The exercise of 'Tower Building' helps in providing information to an entrepreneur about how he makes his decision, whether he gets disheartened by apparent blocks and perceive them as real or it does not really deter him. The exercise on Tower building is useful in providing self-awareness on all of the above besides highlighting the concept of help and encouragement in task development.

24. Discipline: Discipline in both business process and personal level is a must for the success of an enterprise. The small but important issues like timely payment, delivery of product, punctual in attending repairs through after sale service, honest in pricing and quality, timely repayment of dues etc. The other important things are self discipline and individual habits account for the health, maintenance of interpersonal relations, stability etc.

25. Multiple Tasking: The success stories of great organizations start with the dream and will of one single person. In order to enhance the profit of the small scale agri-enterprise like manufacturing SMIs the entrepreneur must have the knowledge and skill about technical aspects associated with the components of SMI and the assembling procedure in addition to the business skills associated with the starting and running an enterprise. This will help him cost cutting and earn extra money. He will be the planner, inventory manager, worker giving his labour for manufacturing the equipment, accountant calculating the profit loss, marketer and service giver attending the after sales service.

Entrepreneur: The word entrepreneur is derived from the French word “*entreprendre*” meaning “undertaker” or “go between”. Entrepreneur is a person who searches for change, responds it and exploits opportunities (Peter Drucker, 1964). Entrepreneur is an initiator and establisher of an economic activity or an business enterprise/unit (Pareek and Nadkarni,1978).An entrepreneur is a person who identifies market needs, invest money and organise resources to produce a product or service, apply business managerial techniques to maximize profits, take calculated risk to achieve success, continuously looks for opportunities to grow, foresees market changes, foresight opportunities and risks and adapt his business accordingly.

An economist view an entrepreneur as “one who brings resources, labour, materials and other assets into combinations that brings about value addition and increase their economic/market value. The economists view an entrepreneur as a fourth pillar of production along with land, labour and capital.

Psychologists view an entrepreneur as a person typically driven by certain wishes and forces within self to achieve certain goals to make experiments or to gain independence.

Sociologist Views entrepreneur a person with strong achievement motivation supported with certain favourable socio-economic conditions to pursue his economic pursuits.

Brief Job Description of an entrepreneur: Skill is the ability to do things and effectively apply knowledge, personal aptitude and attitudes in work situation.

Three dominant perspectives evolved. They are:

- **Personality:** Related to entrepreneurship characteristics and traits such as attitude, leadership, communication, change seeking and risk taking behavior etc. **(Objective 1)**
- **Behavioural:** Related to set of activities and process associated with new venture or enterprise creation. **(Objective 1)**
- **Functional:** Technical knowledge and skill, aptitude, managerial competencies, and business economics. **(Objective 1 and 2)**

Personal Attributes: High nAch, innovativeness, independence, creative, industrious, risk taking, ready for change, continuous learner, managerial abilities, high emotional and communication quotient.

Behavioural Attributes: Understanding entrepreneurship, understanding of entrepreneurship traits, preparing to be an entrepreneur, self analysis for improvement, acquiring knowledge and skills related to human relationship, problem solving and related emotional management.

Functional Attributes: Are learned attributes essential for an entrepreneur before starting an enterprise. They are management tools and techniques, understanding and practicing skills related to making business plans, economics, banking and finance, the product manufacturing, marketing etc.

Test Battery/Tool for identifying Level of Entrepreneurship Quality ©

Name:.....Age:.....

Address:.....

Date:.....

B. Give your Response for the following statements.

Instructions:

- This Questionnaire consists of 30 statements.
- Read each statement and decide how well it describes you.
- You must reply honestly. The score will help you to get the capacity Development support. So you need not worry to project yourself to get high score by means of false response.
- Assign a score given below to rate yourself how well the statement describes your personality.

Score	Level of similarity
5	Very much similar
4	Closely Similar
3	Some What
2	Very little
1	Not at all me

Give Your Response:

S.No	Statement	Score
1	Normally I do like to interact with new people and visit places.	
2	I look for new opportunities and like to know about them	
3	I also know and accept to others that I have to improve myself	
4	I also tell others when they failed to match the expected performance	
5	I always explore new ways and means to improve my work and performance	
6	I face the challenges and problems confidently and hopeful of achieving success	
7	I work out suitable means and strategies to win others confidence and trust.	
8	I always try to honour my words and promises give. Take care that I do not disappoint others.	
9	I convince others of my ideas. At the same time I give a honest hearing to others and also accept in case if I am wrong.	
10	I do evaluate my finance status periodically and decide about my expenses based on my income and commitments	
11	I always clear my present committed liabilities before making any expenses	
12	My debt level is below my six months net income	
13	I feel responsible for my failures and composed when things go wrong and challenging time	
14	I make personal sacrifices and make extra steps to fulfill my commitments and promises	
15	I change my mind if I am wrong and others are right	
16	I always seek information before taking any decision	
17	It is important for me to do high quality job	
18	I seek others help in terms of ideas, knowledge, experiences whenever required	
19	I usually make planning and prepare myself before starting any work or undertaking travel	
20	I keep my things in order and like neatness	
21	I do not like to purchase things which are not of my immediate use	

S.No	Statement	Score
22	I am not for a simple life and contended life	
23	I wish to test new things and change my households once a new model is launched in the market.	
24	I strict to my decisions in spite of others disagreeing it	
25	I take decisions based on facts and logic	
26	I do not admit that luck plays a big role than honesty and hard work bringing success	
27	I like to take calculated risk based on known facts and expert guidance.	
28	I am for change and development through adopting new ideas and technologies	
29	I always explore alternatives and think of as many ways to do things	
30	I feel guilty if I waste my time and involve in unproductive things or work	

C. Give your Response for the following statements.

Instructions:

- This Questionnaire consists of 30 statements.
- Read each statement and decide how well it describes you.
- You must reply honestly. The score will help you to get the capacity Development support. So you need not worry to project yourself to get high score by means of false response.
- Assign a score given below to rate yourself how well the statement describes your personality.

Score	Level of similarity
1	Very much similar
2	Closely Similar
3	Some What
4	Very little
5	Not at all me

Give Your Response

S.No	Statement	Score
1	I am contended with what I have and often associate my poor performance and failures with my fate and environmental factors	
2	I see often people are non cooperative and donot give right advice.	
3	I see there is no meaning of developing strategies and plans because we cannot foresee things and things will not go as we expect	
4	In my opinion there is no need to work for long hours and struggle hard to finish the target. Instead we can ask excuse and take our time to complete our work leisurely.	
5	I consider going to salaried job is better than starting an enterprise to avoid all risk and tensions	
6	I take decisions and will not strict to it always. Often I change my decisions with the influence of friends and relatives.	
7	I do not search for new ideas. Instead I play safe by relying on tested paths and believe in old is always Gold	
8	I do not spend much time and do not bother about how to influence people and seek their support.	
9	I do not need much data or information while taking decisions and normally take decisions spontaneously	
10	I always choose or do activities I am comfortable and familiar with.	
11	I always rely upon conventional solutions to the problems rather than looking for new and alternatives	
12	It will not bother me if things are not done well and I accept or compromise with what I get rather than trying to redo it again	
13	I never have the habit of competing with others and compare my performance with others	
14	When I disagree with others, I will not let them know	
15	If my approach to the problem does not yield result I will not bother. Instead leave it and accept the result.	
16	I do not get along with people who has got strong opinions, ideas, strategist, change seekers and innovative in approach	

S.No	Statement	Score
17	I am not persuasive with others and will not compromise my ideas.	
18	I normally do not try new things which are different from what I have done before.	
19	Opportunities are normally limited and it is not possible to create new opportunities	
20	When trying something difficult and new I feel discomfort and think I may not succeed.	
21	I tell people what to do even if they do not seek my opinion or value my ideas.	
22	When I am doing a job assigned by someone I rarely take any effort to know their feed back or satisfaction about the job done.	
23	I never bother about the things if they go wrong	
24	I like to do things in a more structured ways than act freely	
25	I am comfortable to think and act structurally than free thinking and function in an open free environment.	
26	I do not generally initiate anything on my own, I am comfortable to do the assigned job and in the manner I was told to do.	
27	I do not like to take calculated risk based on known facts and expert guidance because risk is always a risk whatever it may be.	
28	I am for change and development but afraid of adopting new ideas and technologies because I wanted to be safe and tension free	
29	For personal benefit and happiness I am ready to do anything that suits me and come to my hand.	
30	I feel happy to take long vacation spend leisure time with friends and involve in works which is not remunerative for the sake of my happiness.	

Evaluation Criteria: Total Highest score: $60 \times 5 = 300$. Lowest score: $60 (60 \times 1 = 60)$

Potential score: $240 (4 \times 60 = 240)$: Medium score: 120 to 180 ($2 \times 60 = 120$ to $3 \times 60 = 180$). Based on the above scores the range of score for evaluating the entrepreneurial score has been arrived at. Accordingly the ranges arrived at were: Above 275 = Excellent and High Score: 225 to 274 = Very Good and in potential range: 175 to 224 = Good and in considerable range: 125 to 174 = Average and needs caution while selecting the respondents. Below 125: Poor and rejection range.

- The items in the test battery reflect the 25 traits of an entrepreneur.
- The score of respondents reflect their individual preparedness for their role as an entrepreneur.
- The evaluation of Respondents based on the score secured:

Score	Inference	Further Action
275 to 300	- Respondent has not responded truly - The facilitator has not administered the test carefully - Respondent is an ideal entrepreneur	- Re judge the qualities of the respondents and triangulations to confirm the validity of the high score - Re-administer the test batteries to those respondents whose qualities exhibited during the personal observation with their score. - By mixing the items in the two test batteries the responses need to be obtained - Readminister the test battery by asking cross questions and verification through examples and incidences to verify the claim - Select him for the training and place him as a potential trainee under promising category.
225 to 274	Very Good	- Ensure that the responses given are matching with the qualities of the respondent exhibited during the personal interaction with the facilitator. - Triangulations need to be done with the peer groups and the local referees. - Re-administer the test batteries to those respondents whose qualities exhibited during the personal observation with their score.

Score	Inference	Further Action
		9. By mixing the items in the two test batteries the responses need to be obtained.
175 to 224	Good	In considerable range for selection. The individual test items of the respondents need to be analysed and triangulated with the observed qualities of the respondents during the personal interaction with the facilitator.
125 to 174	Average	Caution need to be exercised while selecting respondents in the range.
Below 125	Poor	Need not be selected for the programme

Developing Entrepreneurial Skills

ES:1. Personal Attributes: High nAch, innovativeness, independence, creative, industrious, risk taking, ready for change, continuous learner, managerial abilities, high emotional and communication quotient.

ES:1. Self Analysis –Personal Attributes

Identification of personal traits and introspection for his preparedness	PC1. Understanding the level of trainees preparedness to start an enterprise PC2. Trainee Should able to identify the strengths, weaknesses, opportunities for improvement and threats in him PC3. Trainee should Know the 25 Desirable Personal traits/competencies of an entrepreneur
--	--

PC1. Understanding the level of trainees' preparedness to start an enterprise:

Score obtained:

- Indicate your score obtained in the test on analysis of entrepreneurship traits/quality:..... (Max:300)
- Indicate your Pre learning score obtained in the Pre learning preparedness of the trainee:.....(Max: 100)
- Indicate your Attitude score obtained in the attitude test on entrepreneurship:..... (Max:100)

ES.2. Behavioural Attributes: Understanding entrepreneurship, understanding of entrepreneurship traits, preparing to be an entrepreneur, self analysis for improvement, acquiring knowledge and skills related to human relationship, problem solving and related emotional management.

ES.3. Functional Attributes: Are learned attributes essential for an entrepreneur before starting an enterprise. They are management tools and techniques, understanding and practicing skills related to making business plans, economics, banking and finance, the product manufacturing, marketing etc.

NOS

National Occupational standards for Agri-preneurship in SMI, Bio-fertiliser and Settling Transplanter

Task	Starting an Agri-Enterprise on Soil Moisture Indicator, Bio-fertiliser and Settling Transplanter
Description	This Occupational Standard is for starting a rural enterprise for manufacturing the SMI
Scope	This task covers the following 1. Developing Entrepreneurial qualities and skill 2. Developing Skills for assembling/making a SMI
Performance criteria (PC) with respect to scope	
Element	Performance Criteria
Entrepreneurial qualities and skills	To be competent the individual must be able to: - PC5. Explain leadership qualities required for leading an enterprise - PC6. Digital literacy for seeking information and management - PC7. Finance Management - PC8. Preparing to be an entrepreneur - PC9. Understanding Entrepreneurship
Assembling of SMI	To be Competent the respondent/trainee must be able to: - PC10. Know and identify various components of SMI - PC11. Explain the working principles of SMI - PC12. Prepare the components required for the SMI - PC13. Assemble the SMI

Knowledge and Understanding(K)

1.Management tools and techniques for managing an enterprise	The individual on the job of starting an enterprise of SMI need to know and understand: KA1.How to communicate effectively KA2.Problem Solving KA3.Identification of business opportunities KA4.Government Role in entrepreneur promotion KA5.Various management tools and Techniques
2.The use and scope of SMI and working principle	The individual on the job needs to know and understand: KB1.Importance of water and usage in agriculture KB2.Role of SMI, scope and associated benefits. KB3.Working Principle

Skills(S)

C. Core Skills	Business management skills like Communication, Banking, The individual on the Job needs to know and understand: SA1.Good communication skills and techniques SA2.Preparation of project report and business plans SA3.Banking and Finance SA4.Emotional management for personality improvement SA5.Ethics and Values SA6. Marketing
D. Professional	Using Tools and Machines Practical (TM) TM.1 Hands on training through practical skill training for assembling the SMI TM.2 Hands on training for testing the SMI under field conditions

Attitude towards Entrepreneur and Enterprise

Attitude is considered as an organized predisposition to think, feel, perceive and behave towards a referent or cognitive object. It is an enduring structure of beliefs that predisposes the individual to behave selectively towards attitude “referent”(Kerlinger,1964). Attitude is also defined as the positive or negative feeling towards a psychological object (Thurstone, 1946).

It is important to know the attitude of the respondents selected for entrepreneurial development programme in addition to their other personality traits or qualities related to be an entrepreneur and starting an enterprise. This will help to select the suitable respondents and also understand their quality traits to design impart the capacity development programme more effectively and efficiently.

S.No	Attitude statements	SDA	DA	UND	A	SA
1	Starting an enterprise is very difficult and lot of risk involved					
2	Taking a job is always better than being an entrepreneur					
3	Many successful agri-enterprises and business house like <i>Hutsun Dairy, Suguna Poultry, Venkys Hatcheries, Nujivedu seeds, Rasi seeds</i> etc were started in humble way and hard work and vision had lead to the current name in the industry					
4	To become a successful entrepreneur one has to do lot of personal sacrifices family life and health will get affected duet o stress associated.					
5	An entrepreneur has to do lot of manipulation and dishonest towards client and Govt for earning profit.					
6	It is difficult to get financial assistance required for starting a new enterprise					
7	One must be a business graduate or must have strong business background to start an enterprise.					
8	There are no suitable or profitable technologies available for starting an enterprise.					
9	Getting capacity development and acquiring skill for starting an enterprise involves lot of money / resources and recommendations.					
10	An entrepreneur is not only self employed but also creates job for many individuals.					
11	Being an entrepreneur one can realize one's actual potential and achieve self esteem and attain self-actualisation in the life					
12	One can attain more satisfaction in the life in terms of money, assets and social status as an entrepreneur than an working as an employee					

S.No	Attitude statements	SDA	DA	UND	A	SA
13	An entrepreneur is a free bird and not to work under some one as a subordinate.					
14	An entrepreneur get ample opportunity than an employee to implement his creative ideas, to grow professionally in the life and get lot of learning opportunities.					
15	An entrepreneur is a leader and gets good number of opportunity to show his leadership qualities. Whereas an employee rarely gets an opportunity to show his leadership qualities.					
16	Market is full of unhealthy competition and very few enterprises can able to withstand today and majority of the enterprises are failure and closed.					
17	Often one has to make huge investment continuously in order to change his product profile when the market opportunities decrease or no demand for the product.					
18	Agro based rural enterprises are back bone to the farmers and supports the rural economy					
19	Agripreneurs are local leaders, role models, source of motivation for rural youth and also helps the farmers.					
20	The profit potential and opportunities are more in agri based enterprises in our country.					

The scale consists of 20 attitude statements with 10 positive and 10 Negative statements. These 20 statements were scored on the pattern of 1 to 5 for positive statements and 5 to 1 for negative statements with a theoretical score extremes 25 and 100.

The attitude Score:

Scoring pattern for positive statements:

SDA	DA	UND	A	SA
1	2	3	4	5

Scoring pattern for negative statements:

SDA	DA	UND	A	SA
5	4	3	2	1

A score of 50 and above is recommended for selecting a candidate for training.

Knowledge Test for Recognition of Prior Learning (RPL)

Recognition of pre learning status is one of the important conditions in the skill development activity and suitable test is required to understand the prior learning level of the trainee. The preparedness level of the trainee to undergo the capacity development in the entrepreneurship helps the trainer to orient his programme in a more effective way and facilitate the teaching learning process.

RPL through measuring the Knowledge on entrepreneur qualities, activities of an enterprise (SMI, Bio-fertilizer and settling transplanter)

S.No	Statement	Response
A	Indicate weather the following statements are True or false	True or False
1	Soil Moisture Indicator is a machine used for knowing the underground water source/level in a farm for digging the bore wells and open wells	
2	RTGS and NEFT are used to send money from one bank account to another bank	
3	5-S means Safety, Service, Security, Self employment and Settlement	
4	RTGS stands for Real time Gross settlement and NEFT stands for National Electronic Fund Transfer	
5	Fixed and Variable cost together makes companies Total cost	
6	Gross profit is always less than Net profit	
7	A computer has two parts namely Hardware and software	
8	The cost of soil moisture indicator/Settling transplanter/manufacturing of one litre Bio-fertiliser is about Rs10,000/	
9	4 Ps in marketing indicate, Product, Price, Promotion and Place	
10	Customer Relationship Management is not so important as earning profit in a business	

S.No	Statement	Response
11	MUDRA scheme is meant for promotion of yoga	
12	NABARD bank provides start up loan directly to the beneficiary	
13	One cannot use SMI/ Settling transplanter/ Bio-fertiliser in clay soil	
14	SMI is a device used to measure moisture level in the soil. Settling Transplanter is a device to make sugarcane setts/other name of Biofertiliser is ethanol and biodiesel	
15	Soil Moisture device uses sensors to measure the moisture level/ Settling transplanter is to transplant paddy/Biofertiliser is alternative to chemical fertilizer	
B	Give your Response in one or two words/lines	Response in words
16	Give name of any two nationalized bank	
17	For business purpose the enterprise has to open which one of the following account in a bank? a) savings account and b) current account	
18	Give the full form of NABARD	
19	What is the aim of Swatch Bharat Abhiyan launched by Govt of India?	
20	Name three insurance companies that provides risk coverage to individual and materials	
21	Venture capital stands for what?	
22	Name three direct taxes	
23	Name any indirect tax	
24	What is the abbreviation CA stands for ?	
25	Name any three qualities of a good entrepreneur	
C	Answer the following Questions	Write your answer in one or two lines
26	a. What is a recurring deposit account ? b. What is a fixed deposit account?	

S.No	Statement	Response								
										
26	Name two technologies, tools and machineries that are having potential for starting rural enterprise.(for example SMI, and Banana fibre extractor)									
27	What do you understand a business plan means?									
28	Classify the following taxes under direct and indirect tax heads: Income tax, capital gain tax, securities transaction tax, corporate tax, sales tax, service tax, ,GST, excise duty and customs duty									
	<table><tr><th>Direct Tax</th><th>Indirect Tax</th></tr><tr><td>1.</td><td>1.</td></tr><tr><td>2.</td><td>2.</td></tr><tr><td>3.</td><td>3.</td></tr></table>	Direct Tax	Indirect Tax	1.	1.	2.	2.	3.	3.	
Direct Tax	Indirect Tax									
1.	1.									
2.	2.									
3.	3.									
29	What is the full form of GST?									
30	Answer any two of your choice. What do you understand the terms cash flow, working capital, profit margin and payback period?									
	a).....									
	B).....									

Total marks: 30. There are no minimum qualifying marks to be obtained. The RPL or knowledge test score indicates fairly an idea about the prior learning of the trainee.

S.No.	RPL Score	Level
1	Above 25	A grade/ Excellent
2	20-24	B grade/Very Good
3	15-19	C grade/Good
4	10-14	D grade/Average
5	Below 10	Poor

S.No.	RPL Score	Level
Skills(S)		
A. Core Skills	Business management skills like Communication, Banking, The individual on the Job needs to know and understand: SA1.Good communication skills and techniques SA2.Preparation of project report and business plans SA3.Banking and Finance SA4.Emotional management for personality improvement SA5.Ethics and Values SA6. Marketing	

SA.1. Good Communication Skills and Techniques:

A good communication is the one which conveys the receiver what exactly the communicator wants to convey. A good communication depends upon the communicators' ability to organize the message with proper treatment suitable channel keeping in view of the receivers' type, cognitive ability and experience.

Why Effective Communication Skill for an entrepreneur?

An entrepreneur needs to be equipped with good communication skills. In order to develop these skills some of the basic concepts in communication and techniques to be followed are discussed in this section for the benefit of an entrepreneur.

Basic Communication skills:

From the speaker/sender point of view the following are the essential skills.

- skills to compose the message
- skill to deliver the message

From the receiver perspective one needs to have the following essential skill.

The skill of receiving or understanding the message-

- without assumption
- placing biasness aside
- Actively listening

In the phatic stage which is the initial exploratory stage in an interpersonal communication which determines the course of the conversation. This begins with the body gestures like greetings and other body gestures like eye contacts, smiling, hand shaking etc. In the formal encounter there is more psychological distance between the individuals. This initial stage also known as ice breaking and warming up stage.

Follow up of initial stage of communication is the personalized interaction wherein one generally brings down their reservations and interact more openly and freely. During this phase one should avoid criticisms and interrogating tone, blaming and embarrassing words. Similarly, the nonverbal gestures like rolling of eyes, movements, slow unwilling gesture, crossed arms and legs are to be avoided.

Slouching, hunching, lack of oral and personal hygiene, doodling, starrng, over fidgeting and lack of eye contacts need to be avoided

Barriers of effective communication

1. Lack of planning
2. Unclear assumption of the sender
3. Semantic distortion
4. Badly expressed message
5. Loss by transmission and poor relative capacity
6. Poor listening and premature evaluation
7. Fear, distrust and threat
8. Insufficient adjustment period to change
9. Biasness of the communicator
10. Psychological Barriers

Overcoming the Barriers to Effective Communication

1. Think more clearly about the message to be communicated
2. Use simple sentences
3. Engage in rehearsals
4. Focus on the listener and be an active listener
5. Avoid distortions of messages while conveying
6. Restrain from premature judgments or interpretations

Communication effectiveness Triad

Effective communication is a triad consisting of the leader, the colleague or member of the work group and the environment in which the work is to be done or performed. Communication made must be effective and efficient.

What is an effective and efficient communication means to an entrepreneur?

Effective Communication	Efficient
Communicating the right thing	Communicate in a right way, method and channel
Produce Results	Helps to solve problem
Manages the gap and improves interpersonal challenges	Reduces time and build confidence
Helps to increase profit	Lowers the operational cost
Optimises the resource use	Helps in safeguarding resources

When an entrepreneurs communicate efficiently they generally communicate in terms of objectives such as cost, productivity and work as well as worker turnover. When they deal with effectiveness, they often communicate in terms of demand, growth rate, return of investment and other criterion that can be used in comparing the agencies performance with that of the expected targets to be achieved. Successful entrepreneurs are interested in both efficiency and effectiveness.

Types of Communication:

The type of communication normally depends upon the leadership style.

- i) Authoritarian communication styles normally dictate and tell others what to do. It is normally an instruction. It is mostly used with subordinates.
- ii) Paternalistic communications is a two way communication and ask others to do the tasks agreed upon and also allows feedback and not discussion. In an enterprise this type of communication is engaged between groups and team members. Leaders normally engage in such type of communication to build the relationship among his team and get the response.
- iii) Participative Communication allows discussion and encourages free flow of ideas.
- iv) Laissez-faire communication style the entrepreneur takes on a very passive role and allows his team members to engage in free communication and normally leader keeps away from such communication going on among the team members.

How to write effectively?

- i) The language must be simple.
- ii) Use simple sentences.
- iii) Plan the content before and arrange in a logical manner
- iv) Decide about the format and order according to the type of communication made.
- v) Avoid unnecessary details, irrelevant sentences and repetitions.
- vi) Check the grammar, spellings, translations if any, punctuations, data and sentence construction by making thorough reading two or more times

Speech

For an impressive and successful communication voice quality and body language are very important. High pitch and shouting should be avoided. A focused, brief, medium pitch, natural lip movements smooth glottis control with adequate pauses make a smooth sweet and impressive communication.

Among the body language, eye contact and positive gestures are important. Unnecessary body movement will deviate the attention of the listener and also sends wrong signal or message. The body language should evoke confidence and positive attitude in the minds of the listener. Teeth grounding, frowning and threatening gesture need to be avoided at any cost. Communication intelligence and controlled emotions need to be kept in the mind while talking to others irrespective of the situation and provoking environment.

Paralinguistic Dimension:

It is defined as the vocal dimension of speech and the manner in which something is said rather than what is to be said. This dimension is particularly important in spoken form of communication. The paralinguistic dimension of the message treatment process is mainly for the impression formation. A brief description of this dimension is given below.

Voice qualities:

Pitch range	Spread to narrow
Pitch Control	High to low
Lip Control	Rasp to openness
Glottis Control	Sharp to smooth
Rhythm	Smooth to jerky
Tempo	Normal to decrease
Pause	Natural to unusual

Non-Verbal Communication:

Non-verbal communication plays an important role for an entrepreneur. 90 percent of all the communication we engage in our daily life are non verbal communication using body language. Non-verbal communication can be defined as the process of sending and receiving messages via means other than words, like facial expressions, gestures, behavior, tone of voice etc. It is expressed through non-linguistic means.

In all of our non verbal communication behavior, the gestures we do, the way we talk, walk, sit, how fast or how loud we talk, how close we stand, how much eye contact we make, send strong messages to the receiver.

In communication process, 7% of any message is conveyed through words, 38% through tone and voice account, and 55% through body language comprising the non-verbal elements like facial expressions, gestures, posture etc (Mehrbian, 1971). Non-verbal communication expresses the implicit messages whether intentional or not.

Characteristics of Non-Verbal Communication:

1. Sub-conscious
2. Contextual
3. Ambiguous
4. Socio-Cultural

Body language and meaning associated:

Body Posture	Implicit Message conveyed
Upright and strong posture	High level of Confidence and self control
Walking and sitting with slumped shoulders, hands in pocket and looking down	Lack of confidence or low confidence level or low self-esteem
Engaged in conversation with folded arms, fidgeting in chair, crossed legs and, drumming fingers	Disinterested, disagreeing, defensive or cold
Often looking at watch or clock, restless, looking somewhere.	Wanted to close the conversation, not interested, feeling bored etc
Arms crossed	Angry and disapproving
Arms open	Honest, open minded and accepting
Eyes centered	Gazing up thinking
Eyes Gazing down	Shame
Eyes Gazing on the side	Guilty
Wandering eyes	Bored and not interested
Frowning face	Unhappy and angry
Smiling	Happiness and welcome
Sneers	Dislike and disgust
Pouting lips	Sad

Interpretation of the Behavior

Warm Behaviour	Cold Behaviour
Direct eye contact	Stare
Touching	Fake yarn
Smiling	Looking away
Nods	Nervous habits and fidgeting
Eyes wide open	Shakes head negatively
Forward Lean	Moves away or trying to move
Positive face Expression	Negative facial expression

Physical distance and types of relationship

Close intimate	0.0 to 15 cm	Love and married relationship
Intimate	15 to 45 cm	-Do-
Personal	45 to 120 cm	Family and close friends
Social and consultative	1.25 to 3.5 mts	Non touching interactions, social and business
Public	Above 3.5	No interaction and ignoring

Evaluation of Non Verbal communication/gestures:

The non verbal gestures and body language shall be inferred on the basis of the important aspects of the body language/gesture depending on the specific communication taking place and situation explained hereunder. The time and place relationship is to be viewed.

Eye contact	Is eye contact being made? If so is it overly intense or just optimum and right?
Facial Expression	What is the face showing? Is it mask like and unexpressive? Or emotionally present and filled with interest?
Tone of voice	Does the voice project warmth, confidence, interest or is it strained, cracking and choked?
Posture and gesture	Are their bodies relaxed? Or stiff? And immobile? Or shoulders tense and raised or slightly sloped?

Touch	Is there any physical contact? Is it appropriate to the situation? does it make you feel uncomfortable?
Intensity	Do they seem flat, cool and disinterested or over the top and melodramatic?
Timing and pace	Is there any easy flow of information back and forth? Do nonverbal responses come too quickly or too slowly?
Sounds	Do you hear sounds that indicate caring or concerns?

Making an Extempore Speech:

- The body language should show that you are comfortable, confident and composed. It should not exhibit sign of fear, discomfort and you are shaky to come to stage.
- You must be well organized in your mind about the topic about the fact you are going to talk. For that give a little recollection exercise based on your information stored in your memory.
- Give a deep breath and ease out by giving a forced cough so that the tension built is relieved.
- Give some thought to understand the audience and about their level of experience and preparedness. So that you can match with their mental preparedness and level of maturity.
- Organise your points systematically and be clear about the ideas you are going to talk about. Not to begin with negative sentences such as you are not an expert, you are not knowing anything about the topic etc.
- Begin with a thought provoking and attention arousing statement.
- Conclude with a quick recap of the points and ideas put forward by you.
- Keep your speech always short, sweet and interesting with anecdotes, short stories and examples, facts and minimum statistics.

Feedback in Communication:

For an entrepreneur market feedback and information from his vendors and clients are important to make his business plan, analyzing the demand, making profit and loss calculations. Therefore, an entrepreneur need to be skilled enough to ensure an inbuilt feedback mechanism related to his business and enterprise.

Feedback is crucial to maintain a healthy and open business environment. There are three types of feedback namely, positive, negative and neutral. A positive feedback is resulting out when the ongoing action is same in line with the expected condition and the condition that triggers it. A negative feedback is as a result of action that opposes the condition that triggers it. The negative feedback may in the form of shortcoming and criticism and point towards hindrance of progress in the desired direction of performance or behavior change.

Feed back is needed for improvement. Giving and receiving feedback can help to gain insight .Feedback may be taken for different purpose such as:

- i) Evaluative: Making a judgment about the worth, goodness, or appropriateness of the other person's statement.
- ii) Interpretive: Explains the other person's statement means by his or her statements.
- iii) Supportive: Attempting to assist or bolster the entrepreneur.
- iv) Probing: Attempting to gain additional information, continue the discussion, or clarify a point.

Feedback dimensions:

Simplicity and intention, timing, source orientation, clarity and trust worthiness are some of the dimensions of the feedback.

A feedback may be continuous, relevant, action specific or general, action oriented, time and situational specific, and beneficial or irrelevant.

The feedback increase the confidence and helps for improvement. The feedback has got an implication on the decision making process. Decision making is largely based on feedback. The most important consequence of feedback information is its influence on the motivation and consistency of the decision makers and their decisions. It is generally agreed that a decision maker receiving positive feedback tend to become motivated and continue with the previously chosen course of action. Negative feedback leads to review and reconsideration of the course of action and de-motivating also.

Feed back and feed Forward:

While feedback is important for decision making and selection of actions based on the past and current information, feed forward focuses on avoiding problems in future and warrants adequate knowledge and intellectual thinking. Based on the past experiences, market trend and current situational analysis and future estimates a feed forward is given,. How the market situation will be in the coming days, consumer preferences, price fluctuations etc are the main issues addressed in the feed forward support.

Let the entrepreneur shall ensure that the feedback shall be timely and specific. The feedback should be reliable, genuine, accurate, focus on performance than criticism and judgmental. A feedback must be based on expertise through analysis of facts and figures, unbiased, honest and professional orientation.

An entrepreneur therefore must seek right feedback for all his business operations to take right decisions which is a must for the success and profit.

Exercises:

Communication games like i) Role Playing, ii) Individual exercises like assigning the participants to draft letters, iii) Interactive role playing exercise, iv) Communication distortion exercise v) Extempore talk about any topic of interest v) Case Discussion on Distortion of message at *MY LAI* and vi) *Exercises on message distortion*. The details are given in the practical manual.

Successful Cases in Agri-preneurship:

Case 1. The case of *Manvasanai*

Case 2. The case of Krishna Pickles

Case 3. The case of Banana Chips

Market

Understanding the market and market forces forms one of the basic skills of an entrepreneur. Market dynamics are to be understood for selecting right product, costing, product promotion and delivery. The 4Ps of marketing are Product, Price, Promotion and Place. An entrepreneur must understand the 4Ps of market and also able to visualize the market dynamics. The understanding of market gives an entrepreneur about the probable demand for the product, client profile, competition and market preferences. It helps to formulate suitable product range, competitive pricing and market strategy.

Instead of hastily starting an enterprise, a detailed market survey is a must. Market survey is the process of gathering, analyzing and interpreting market information on a product or service that is being sold in that market. It includes information on :

- i) Past, present and prospective customers. Customer characteristics and spending habits. The location and needs of the target market. The overall industry. Relevant competitors
- ii) Market information are of two types: Primary and secondary
- iii) Primary research can be of exploratory and specific
- iv) Secondary research can be of by using public data base, commercial sources and of research/educational institutions

Exploratory research is of open-ended and usually involves detailed, unstructured interviews. Specific research is precise in nature. It involves structured and formal interviews. Conducting specific research is more expensive than conducting explorative research.



Public sources of information are usually free and of Government sources. Commercial sources the information are priced, educational and research institutes the information are collected for their academic and research purpose.

4 Ps of marketing:

Product:

A product means for our purpose it is SMI or Bio-Fertiliser or settling transplanter. It is a tangible good. For example, the product SMI is used for indicating the moisture in the soil. The market domain is all over India.

Some of the questions to ask by the entrepreneur are:

- What does the customer/farmer want from the SMI and the service related to SMI?
- What need of the farmer it does satisfy?
- Are there any more features that can be added to SMI like rechargeable batteries?
- How will the farmers able to use it at his field?
- What is the after sales service plan?
- How the SMI different from similar product and how the farmer going to benefit?
- What is the cost of production of SMI?
- Can it fetch profit to me and how much I get profit for each piece?

Price:

Once the cost of production, and promotion costs are established the price of the product need to be worked out.

Price of the SMI will depend upon other factors like profit margins, supply and demand in the market

Some of the questions to ask yourself are:

- What is the value of the SMI to the farmers?
- Do any other product similar to SMI available in the market and its price?
- Is the farmer/customer who use the SMI is price sensitive?
- Should any discount or after sales service need to be offered?

Promotion

Once the product is manufactured and price is decided then next step is the promotion of SMI among the farmers. Some key elements of promotion are advertising, public relations, marketing, social media etc.

Some questions to be asked by the entrepreneur are:

- Where should you promote your product SMI?
- What is the best medium and way to reach your target farmers?
- When would be the best time to promote the SMI?
- How are you going to reach the farmers?

Place

According to most marketers, the basic of marketing is about offering the right price, at the right place, at the right time. For this reason, selecting the best possible location is critical for converting prospective clients into actual clients.

Some questions to be asked by the entrepreneur are:

- Will the SMI to be sold directly or through dealers?
- What will be the most appropriate distribution/marketing channel?

- Where and how are the similar products by the competitors marketed?
- How to reach maximum number of farmers?
- How to make attractive promotion strategy to attract the farmers?

Exercise: Arrange a brain storming session among the participants.

Objective 2.

Business Plan for SMI, Bio-Fertiliser/Settling Transplanter:

A business plan is a concrete plan of action developed to implement the basic business idea of an entrepreneur. This helps to know about the kind of resources required, amount of investment needed for the enterprise, technology related to SMI, Bio-fertiliser, Settling transplanter and their manufacturing process involved. A business plan is a tool for understanding how a business is put together. It can be used to monitor progress, foster accountable and control the fate of the business. It usually offers a 3-5 year projections and outlines the plan that the enterprise intends to follow to grow its revenues.

The business plan is required to assess the resource availability and also the possible credit mobilization, expert hand holding, plan of activities. The business plan also helps to know the viability and profitability of the project. Before making the business plan it is mandatory to understand the basic concept of a business:

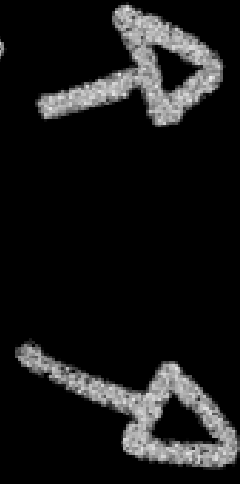
Accounting	A systematic method of recording and reporting financial transactions
Accounts payable	Money owed by a company is owed by its clients
Assets	The value of everything a company owns and uses to conduct its business plan
Balance Sheet	A snap shot of a company's own assets, liabilities and owner's equity at a given moment
Bottom line	The total amount a business has earned or lost at the end of a month
Business	An organization that operates with the aim of profit
B2B	Business to Business. A business that sells goods and service to another business

B2C	Business to consumer: A business that sells goods and services to consumers
Capital	The money a business has in its accounts, assets and investments. The two main types of capital are debt and equity.
Cash flow	The overall movement of funds through a business each month, including income and expenses.
Cash flow statement	A statement showing the money that entered and exited a business during a specific period
Contract	A formal agreement to do work for pay
Depreciation	The degrading value of an asset over time
Expense	The costs that a business incurs through its operations
Finance	The management and allocation of money and other assets
Financial Report	A comprehensive account of a business transactions and expenses
Fixed cost	A one-time expense
Income statement	Profit and loss statement shows the profitability of a business during a period of time
Liabilities	The value of what a business owes to someone else
Marketing	The process of promoting, selling and distributing a product or service
Net income/Profit	Revenue minus expenses
Net worth	The total value of a business
Pay back Period	The amount of time it takes to recover the initial investment of a business.
Profit Margin	The ratio of profit, divided by revenue, displayed as a percentage
Return on Investment	ROI is the amount of money a business gets as return from an investment
Revenue	The total amount of income before expenses are subtracted
Variable cost	Expenses that change in proportion to the activity of a business
Working Capital	Calculated as current assets minus current liabilities
NEFT	National Electronic Fund Transfer
RTGS	Real Time Gross Settlement
IMPS	Immediate Payment Service

BUSINESS-PLAN



IF WORK



Part - III

ELSE

\$



8. Knowledge and Skill Development on SMI Assembling

**Our mission is
skill development.
There can be
no development
with
a satiated system**

- Shri Narendra Modi

Theory and Practical

Assembling of SMI	To be Competent the respondent/trainee must able to: PC10. Know and identify various components of SMI PC11. Explain the working principles of SMI PC12. Prepare the components required for the SMI PC13. Assemble the SMI
Knowledge and Understanding(K) and Development of Skills	
Professional Skills(S)	Using Tools and Machines Practical (TM) TM.1 Hands on training through practical skill training for assembling the SMI TM.2 Hands on training for testing the SMI under field conditions

Functional Attributes: Are learned attributes essential for an entrepreneur before starting an enterprise. They are management tools and techniques, understanding and practicing skills related to making business plans, economics, banking and finance, the product manufacturing, marketing etc.

Objective: Our nation is Agricultural based and contains of huge share on youth in villages. So, the main object of this project is to empower the rural youth to grow the villages and support the farmers in large with modern technology by implementing modern tools in agriculture.



Need of Moisture Meter: Even in the modern days most of the farmers are not equipped with the new techniques to save water in irrigation. Even though the soil has got sufficient moisture due to lack of correct information about its actual level, they were wasting excess irrigation. Also the excess watering will spoil the crops in many cases.

So, the need of the exact quantity of water for plant or crop should be known to the farmers to correctly judge and feed sufficiently and save water resource for better water management.

“SAVING IS EARNING”

So, accurate measurement of moisture present in soil can be attained with the help of this simple moisture meter.

Principle of Moisture Meter: When there is a DC (Direct current) of 3.2 Volt from a battery is passed through the two sharp tipped poles of the meter. Which is then kept open from a resistive load the current will not flow through the same. And, when these poles are plunged inside the soil, the moisture presents in the soil complete the circuit. Now, the resistance values vary depends on the amount of water moisture in the soil. The variation of resistance due to the moisture is directly shown by the LED lights as analog output.





SOIL MOISTURE INDICATOR

DEVELOPED BY

भाकृअनुप - गन्ना प्रजनन संस्थान, कोयंबतूर - 641007
ICAR - Sugarcane Breeding Institute, Coimbatore - 641007

भारतीय कृषि अनुसंधान परिषद
Indian Council of Agricultural Research

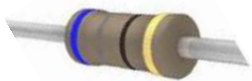
KEY HIGHLIGHTS

- It is handy & user-friendly electronic moisture-indicating device developed to save water and to facilitate irrigation scheduling.
- It helps farmers in deciding when to irrigate their fields.
- The sensor rods of SMI inserted into the soil indicate the soil moisture level.
- It is suitable for use in agricultural farms as well as in potted plants.



 SinghRadhaMohan  RadhaMohanBJP  radhamohanbjp  radhamohansingh.com

Recommended Project components:-

Component Name	Image
LM3914 IC	
18 pin IC Base	
68 ohms 1/4W resistor	
LEDs for output (RED, YELLOW, GREEN, BLUE)	
470uF / 35V capacitor	
100uF / 25V capacitor	

General purpose PCB for assembly	
9" long of Stainless Steel -304 grade rod as a test probe	
AA size BATTERY RECHARGABLE Li Ion Can be used with ordinary Cells also	
AA size BATTERY holder	
Push button	
Connecting wires	

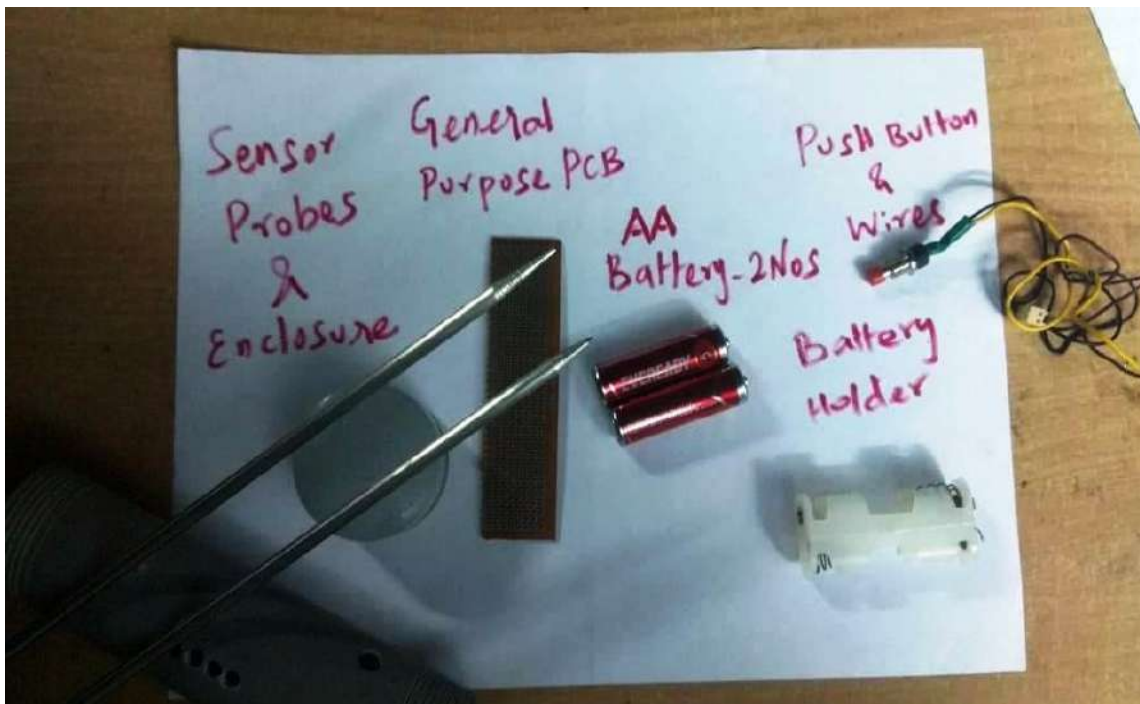
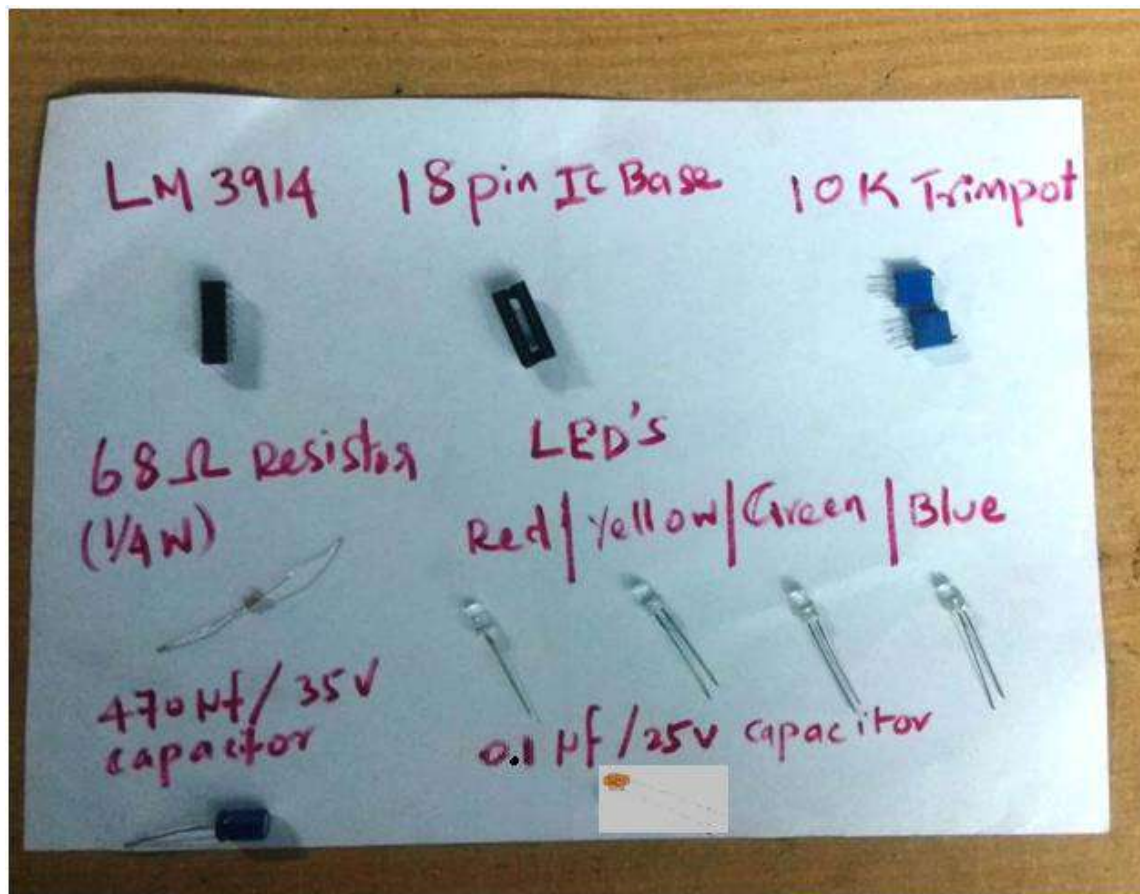
PVC pipe of 40 mm Dia and about 9" long	
PVC end cap	
Sliding bush	



PCB assembling Video.mp4



Unit assembling Video.mp4



How Moisture Meter works:- Here is an IC name as LM3914 based Soil moisture sensing circuit is connected with DC (Direct current) of 3.2 Volt from a battery. Different colored LEDs are connected to the output of the circuit for indicating the level of the moisture in the soil. The 9" long of Stainless Steel -304 grade rod as a test probe and it could measure the moisture level in the soil. The test probe is connected between the internal resistors of the circuit which works as a voltage divider. And, when these poles are plunged inside the soil, the moisture presents in the soil complete the circuit. Now, the resistance values vary depends on the amount of water moisture in the soil.

Construction of the meter:-

1. PVC pipe of 40 mm Dia and about 9" long
2. Fitted at both ends with end caps of PVC with threads.
3. One side is fitted with 10" long two SS 304 material of 5MM Dia. Having a guide bush of ABS materials or any other Non Conductive materials.
4. The PVC pipe is drilled with 3 holes for LED lights and another for a Press Button Switch.
5. The sensor PCB (Printed Circuit Board) with LED and Battery Connector is inserted from other end and connected with suitable wires.
6. And finally another removable end PVC cap is fitted with thread to protect the electronics.

How to Prepare the Pipe and Probes

1. The PVC pipe is to be cut into 9" long and both the ends are to be formed with threads. Normally the PVC pipes are available in the local market, which are used for water transportation in house and agricultural. UPVC or CPVC also can be used but the cost will relatively high.



2. At least one end of the 9" pipe should be with the thread to fix the cap for fixing the Stainless Steel 5 mm Rods.
3. The two rods of each 9" long of Stainless Steel -304 grade to be selected and one side of the rod to be formed with thread of 10 mm long and other side of the rod to be sharpen to a length of 1" long.



4. Take one PVC cap and drill two holes of 5 mm diameter at 1 Inch apart to fix the above 2 SS rods with nuts on inner and outer sides of the cap.



5. Take the 9" PVC pipe and make a hole of 6MM Dia about 2 inch from the other end. And 3 holes of 5MM Dia to be drilled to the size of the 3 LEDs. Just opposite side to the 6 mm hole on the pipe.



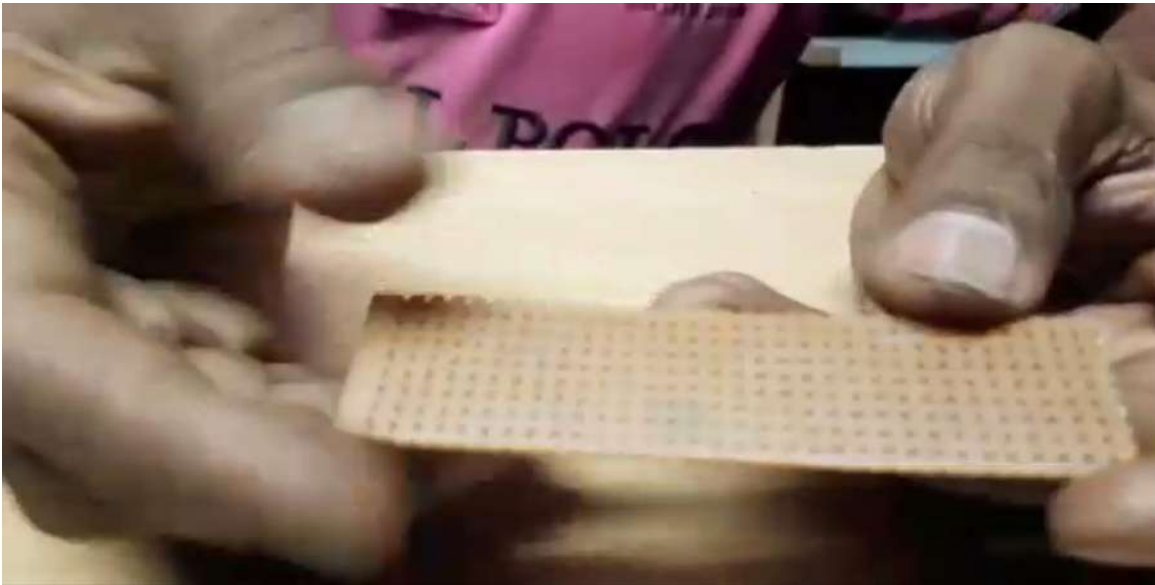
6. About 1" (Inch) thick ABS / Plastic or Hard Rubber with 40 MM Dia to be taken and exactly about 1" (Inch) apart 2 holes of 5MM to slide.



HOW TO MAKE THE PCB AND ASSEMBLE THE UNIT

PCB ASSEMBLY

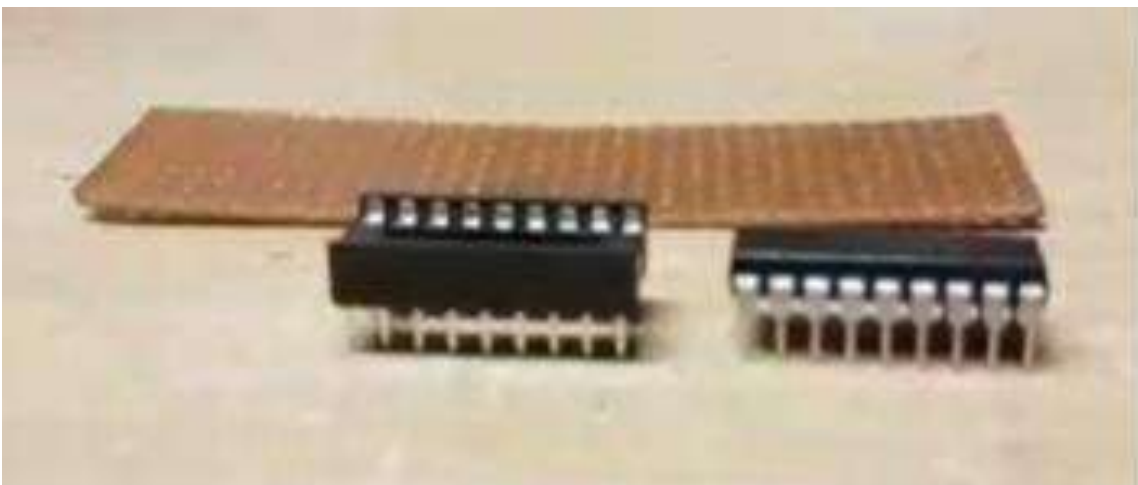
PCB board
assembly



Take the General Purpose PCB about

IC and IC

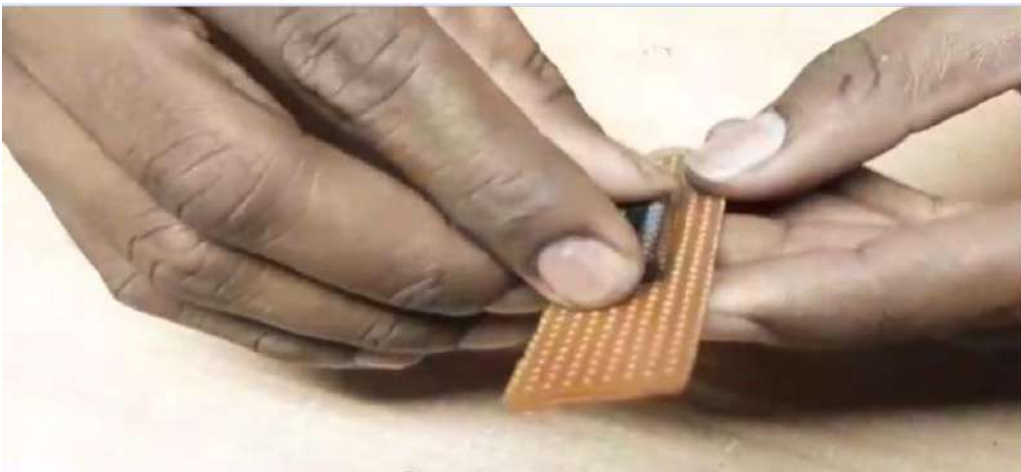
Base



Electronic components as per requirement



Place the IC Base into PCB



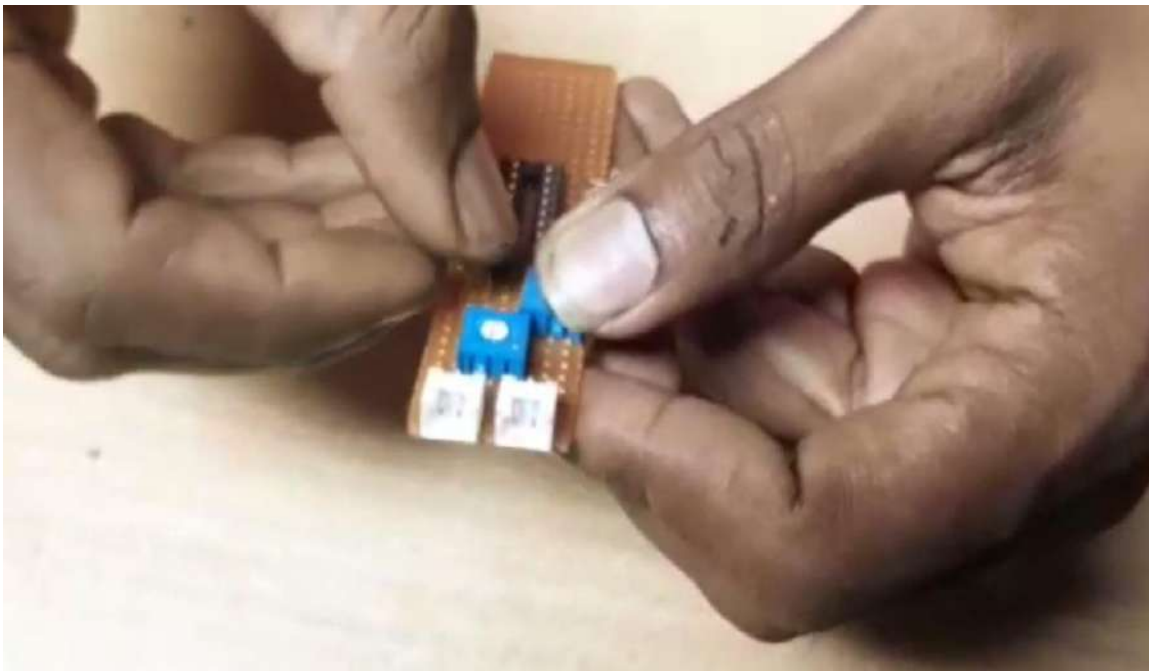
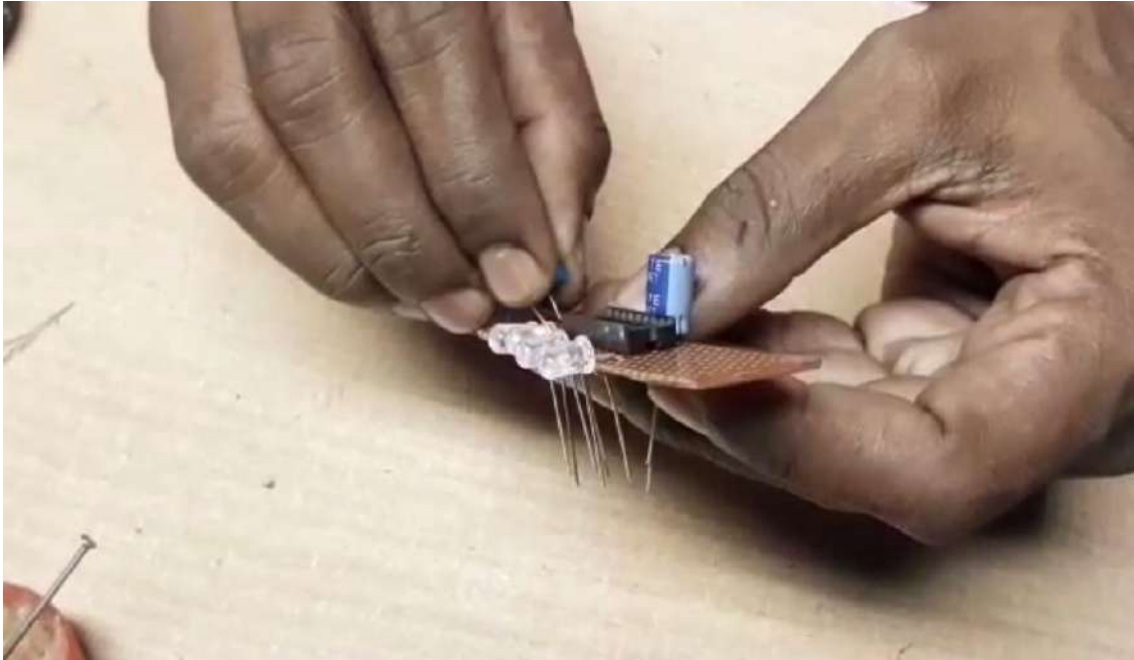
Solder the IC base in PCB

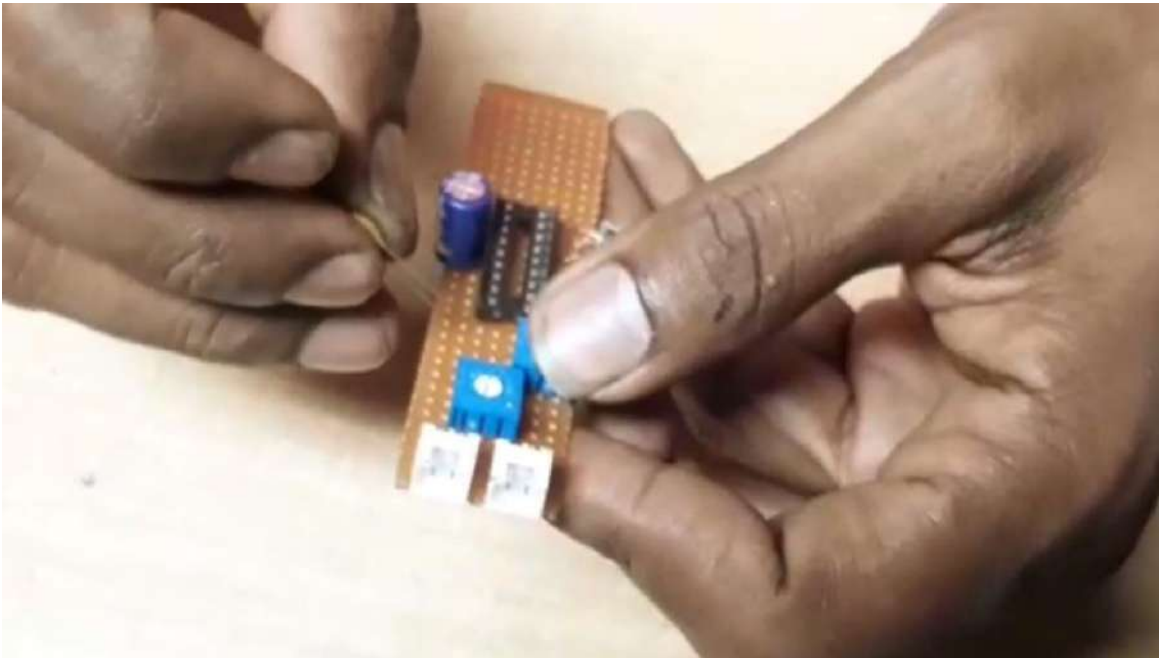


Place the LEDs as per the order RED, YELLOW, GREEN and BLUE.



Place the capacitor and rest of the components as show in the picture below

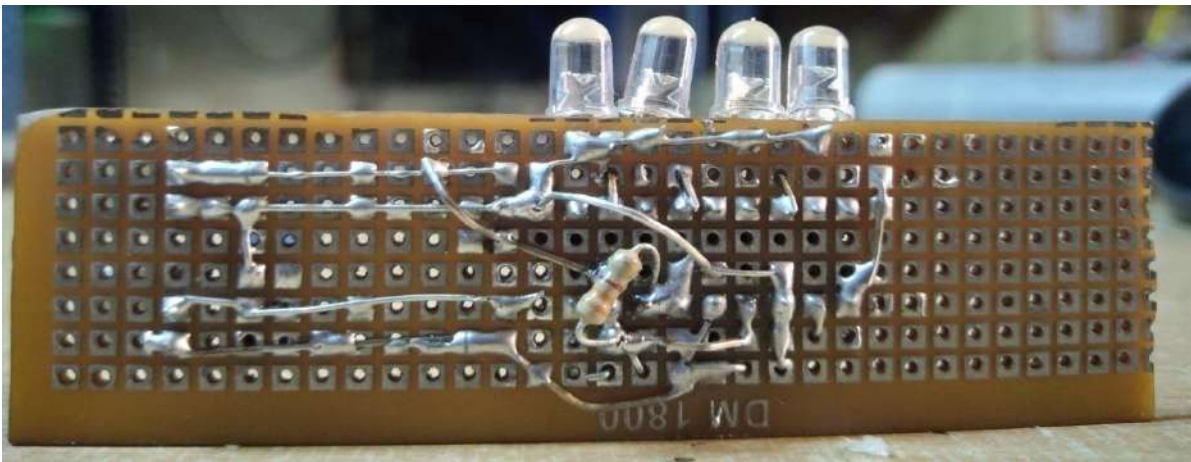




Solder the components in order properly and cut the extra lead with the wire cutter / trimmer and clean the soldering side with thinner. Check properly once again the extra leads are not present to avoid short circuits.

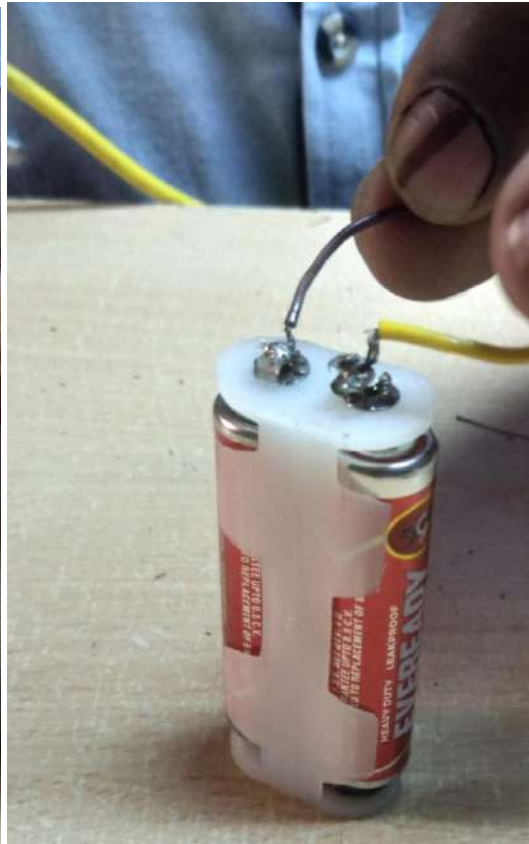
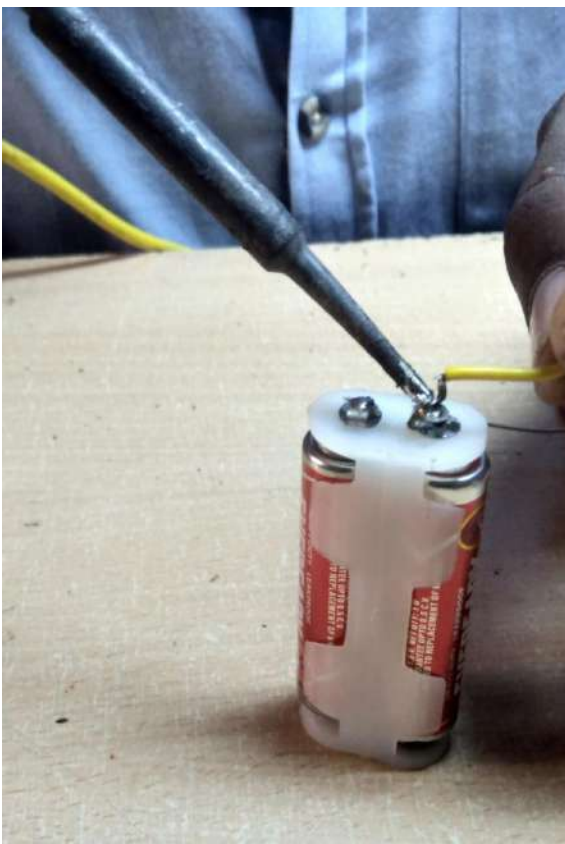


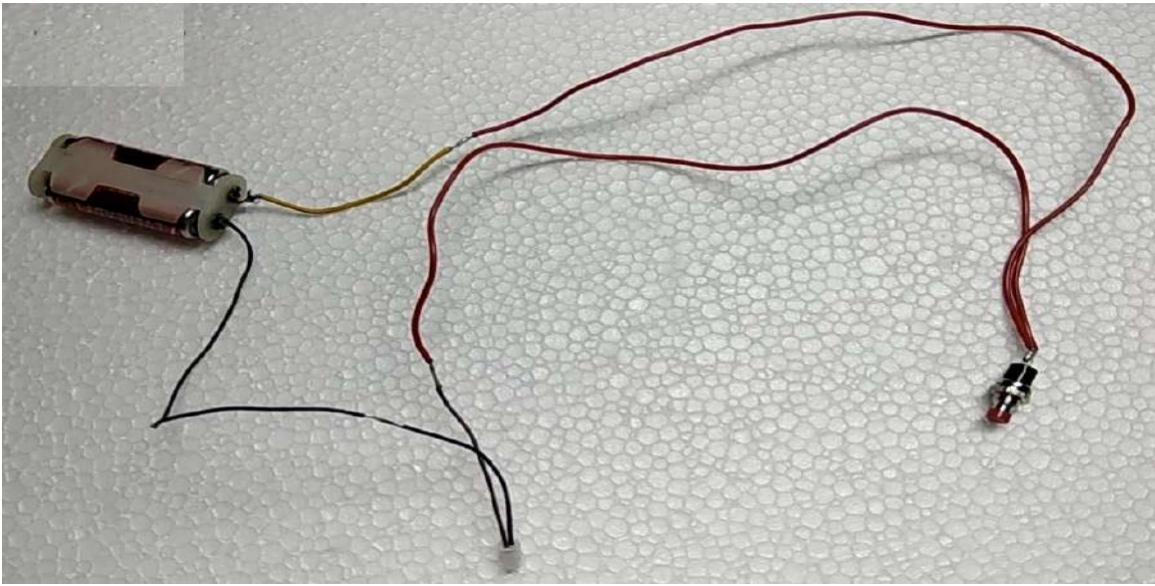




Battery and Battery Holder fittings for power supply







COMPLETE ASSEMBLY OF THE UNIT :-

PVC body



Sensor Probs and PVC top and bottom caps



Top cap in plain with thread



Bottom cap with 2 holes for inserting sensor probes



Homemade washer for sensor probes fitting



Insert the washer into the pvc top cap



Sensor probes



Nuts and washers for fixing



Fixing the nut into the sensor probe thread



Insert the rod with the front nut in one of the hole.



Lock with another washer and nut from Inside of cap firmly.



Insert another Rod same like above

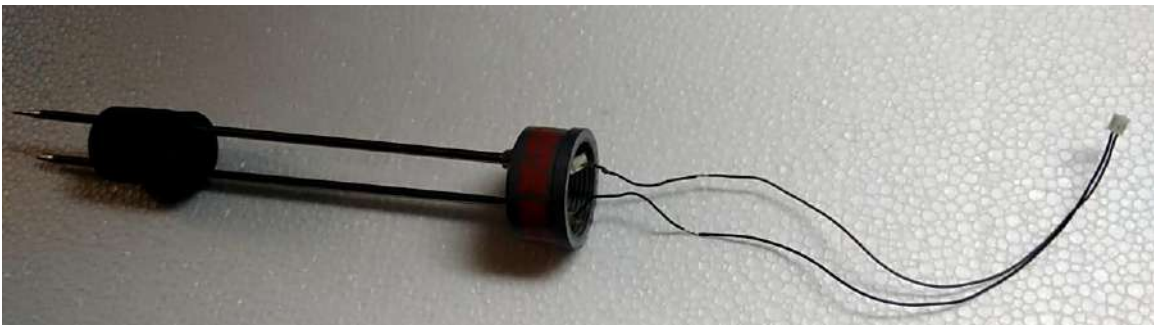




Connector wire to be fitted on the rod with additional washer and nut



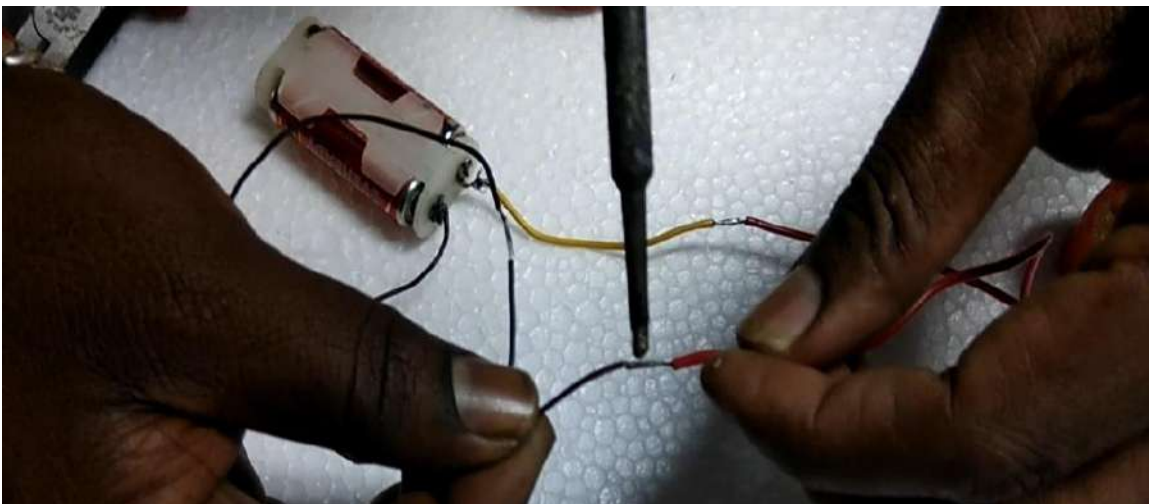
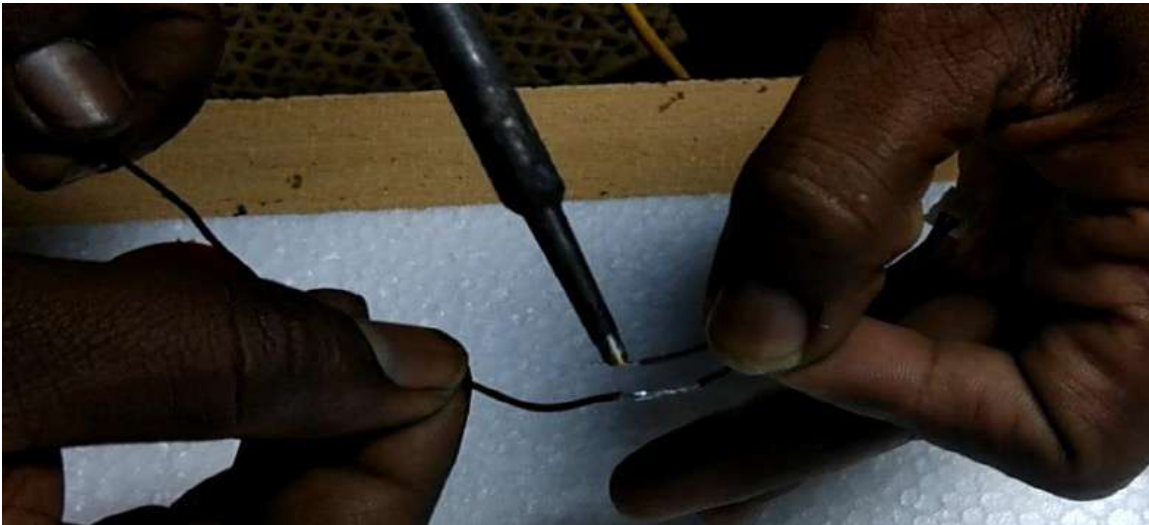
Finally the probe is connected



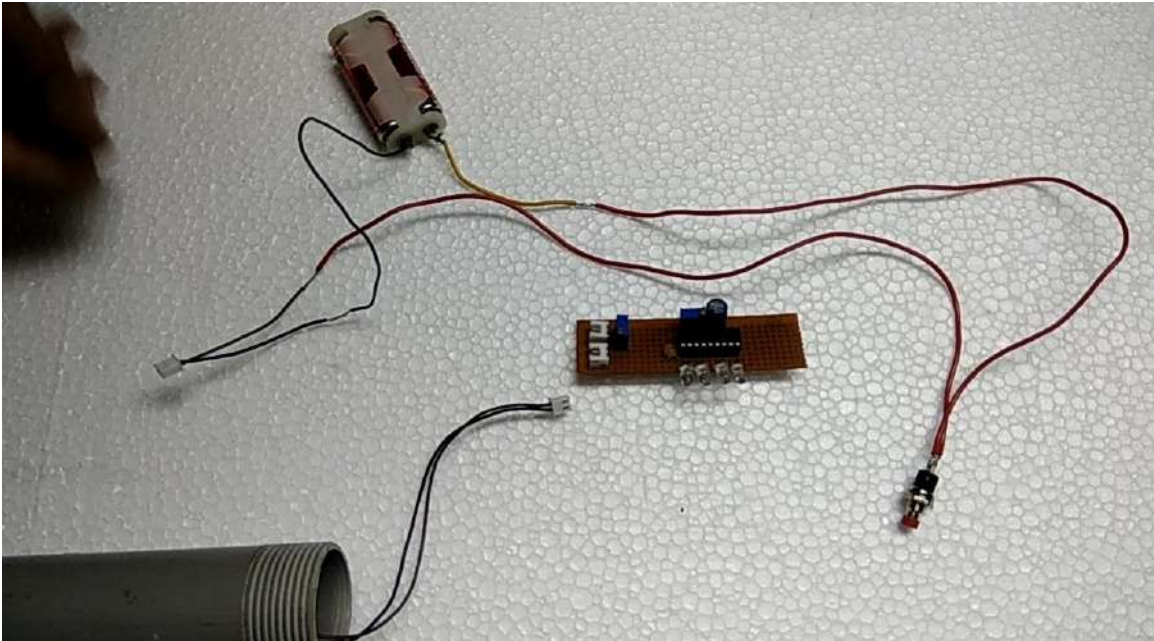
The connector has to be inserted through the pipe from one side and probe cap to be threaded.



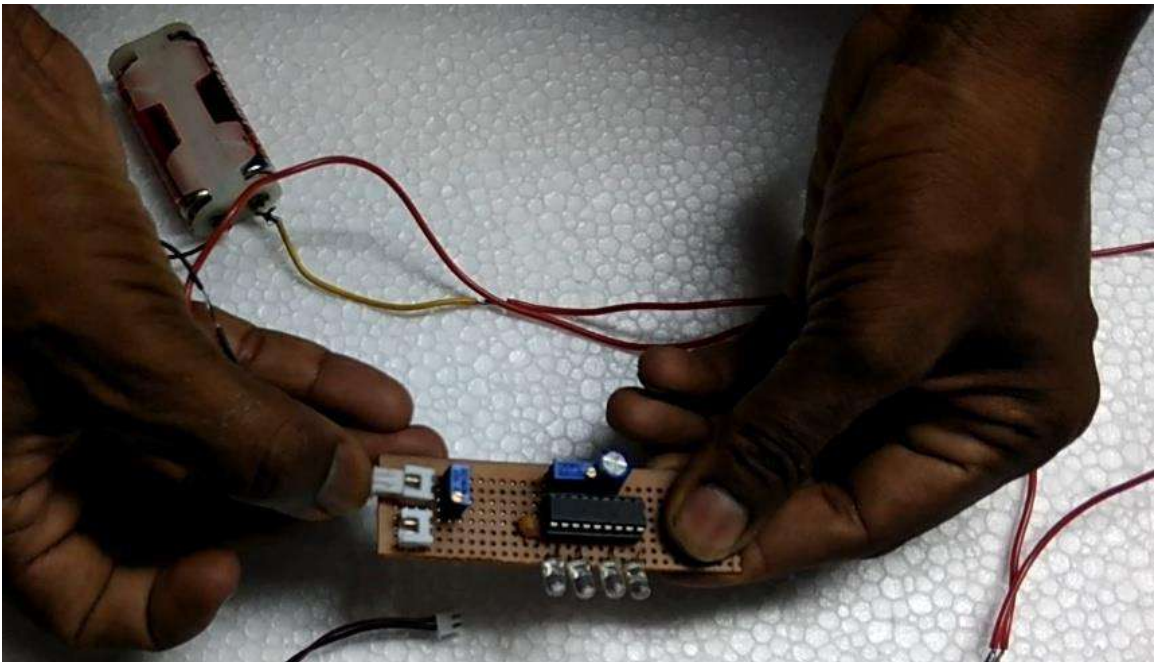
Connect the Battery with the switch



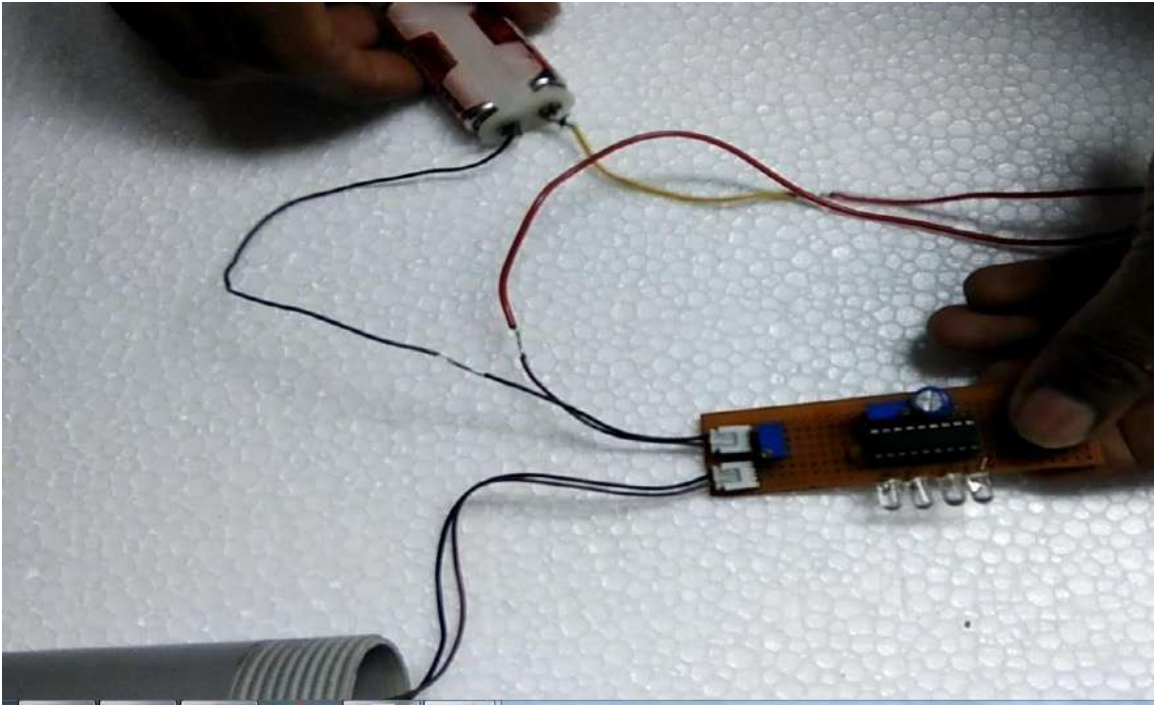
Ready to fit the power supply into the board and fix the enclosure



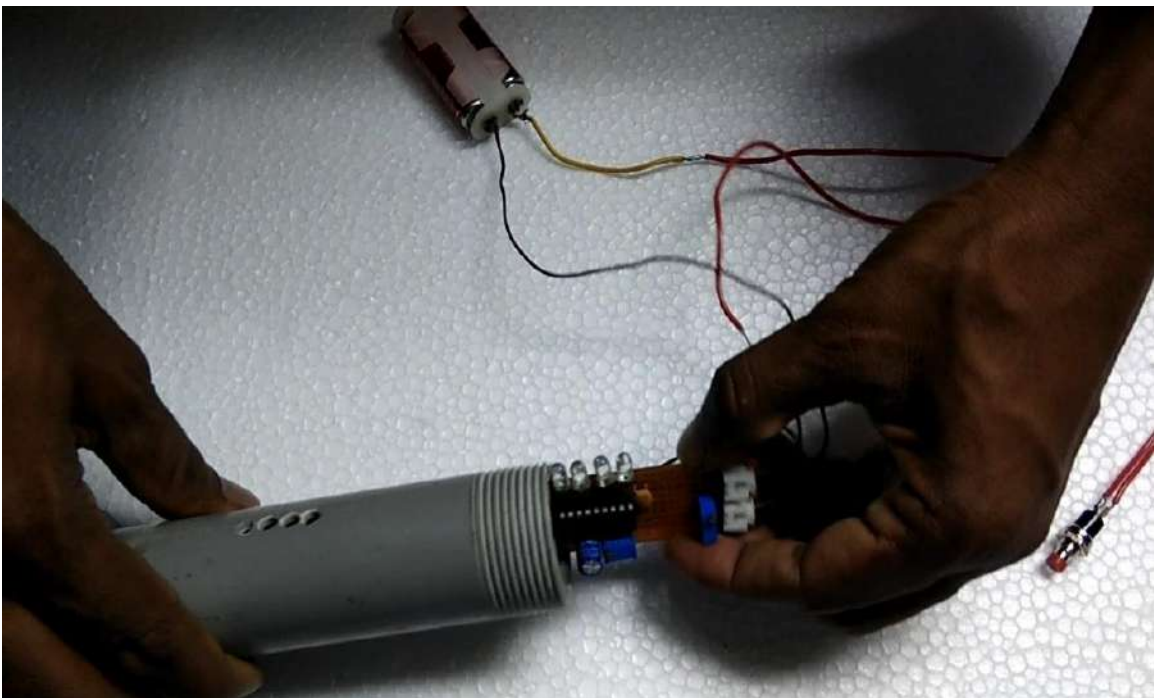
Insert the connector of the Battery



Insert the connector of the Probe in PCB



Insert the LED PCB inside the pipe



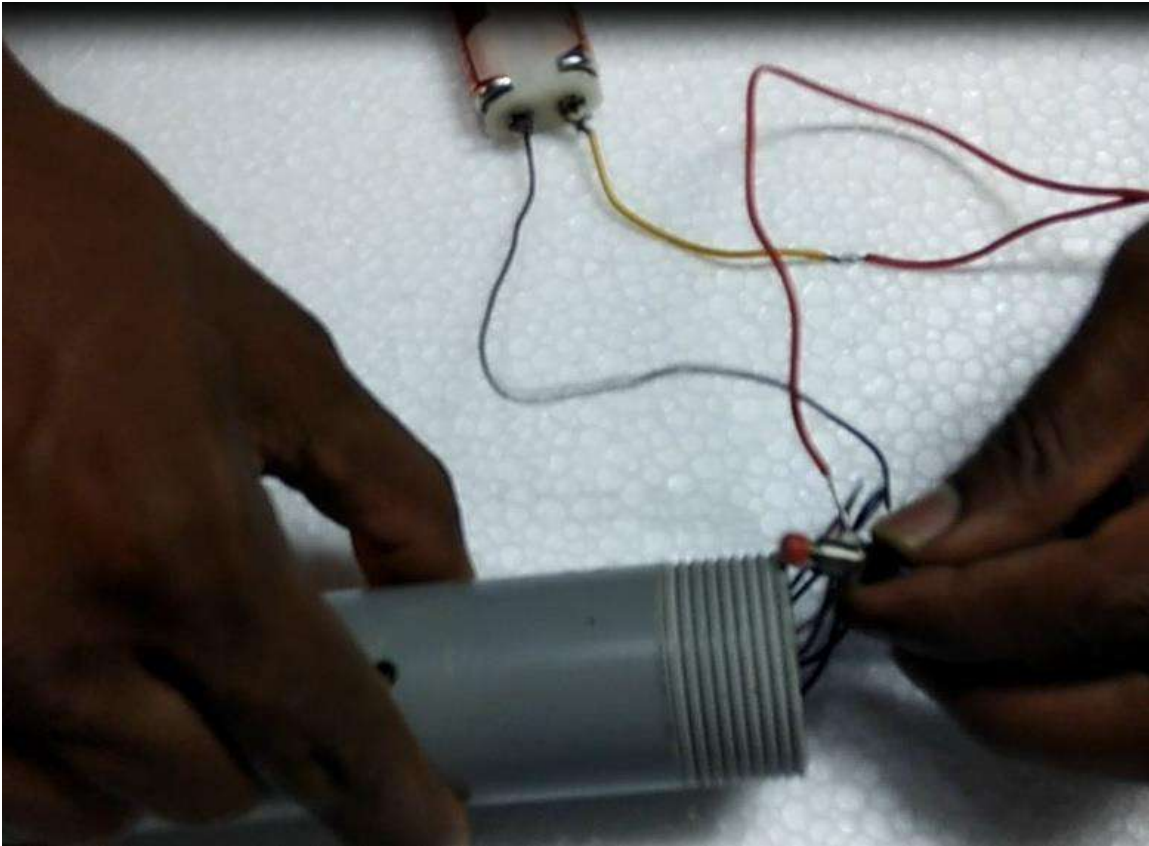
Position of the LED after fixing



Remove the nut in the switch



Insert the Switch in the pipe to fit in the hole



Switch is fixed in the position by thread the screw over the pipe after Insertion



Battery pack to be inserted in the housing.



Find the gap in between the switch and the pipe and push the battery pack with the wires.



Finally closing End Cap to be Fixed with Thread. By holding the pipe and turn the cap this time.



Final Assembled Kit

S.NO	ITEM IN DETAILS	COST PRICE
1	SS ROD 2 FEET LONG WITH NUT ON TREAD AT ONE END AND SHARP TIP AT OTHER END MACHINED	100
2	PVC PIPE ENCLOSURE WITH RUBBER HOLDER WITH LABOUR	100
3	MULTIPLE COLOR LED KIT with PCB and wires as kit with switches	170
4	BATTERY RECHARGABLE Li Ion	80
5	STICKER for read out	20
6	LABOUR for 1 PC AT 1 MAN HOUR	80
TOTAL		550

For sales and service a profit of Rs 200/ pc (Approximately 36%) can be added with the above price and the sale price can be **Rs. 750/- (Rupees Seven Hundred and Fifty Only).**



9. Knowledge and Skill Development on Bio-fertiliser Production

**Extraordinary potential
exists in all of us.**

**With the right environment,
resources, skills and
knowledge,
'ordinary' people can
produce extraordinary
results.**

- Kevin Eikenberry, Leadership expert

Theory and Practical:

Manufacturing Bio-Fertiliser	To be Competent the respondent/trainee must able to: PC10. Know and identify various components of Biofertiliser PC11. Explain the working principles of Biofertiliser manufacturing process PC12. Prepare the raw materials required for the manufacturing of Biofertiliser PC13. Manufacturing/preparation of Bio-fertiliser
-------------------------------------	---

Knowledge and Understanding(K) and Development of Skills

Professional Skills(S)	Using Tools and Machines Practical (TM) TM.1 Hands on training through practical skill training for preparing Biofertiliser TM.2 Hands on training for testing the Biofertiliser under field conditions
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TECHNOLOGY AND BUSINESS PLAN FOR MASS PRODUCTION OF BIO-FERTILIZERS

THE OBJECTIVE/ AIM OF THE PROPOSAL

Biofertilizers have shown great potential as a supplementary, renewable and environmental friendly source of plant nutrients and are an important component of INM and organic farming.

Quality is one of the main constraints of popularization of biofertilizer technology among the farmers. In order to reveal its potential, high-quality inoculants are to be produced. So the major objective of this project is to empower the young agricultural graduates with the production technology of high quality standard biofertilizers.



Concept for Mass Production of Biofertilizer

Bioagriculture is an emerging scientific area which is useful for breeding nutritious, high-yielding and less resource input demanding crops. Bio-fertilizers

are the formulations of living microorganisms which are able to supplement the major essential nutrients in available form for plants either by living freely in the soil or in association with plants. It is necessary that biofertilizers play a more significant role in the production systems and maintain ecological equilibrium and sustainability as well.

Rhizobium, *Azospirillum*, *Phosphobacteria* are the commonly produced biofertilizers. They are produced as a carrier based inoculants. Biofertilizers containing these microorganisms provide various benefits like improving soil fertility, help in carbon sequestration, and healthy food. No adverse effects on health of humans but help in reducing pollution and save water.

Biofertilizers containing Nitrogen fixers is the largest product segment, accounting for over 75% of global revenue share, followed by Phosphate solubilizers with 15% share in global revenue. Phosphate solubilizers are also expected to be the fastest growing at a CAGR of 13.9% till 2022.

Also, the widening demand – supply gap of food crops, increasing demand of organic food and the government focus on conserving the environment is expected to drive the growth of biofertilizers and biopesticides industry in India. GoI is giving a strong push to the organic farming by providing subsidies for new biofertilizer.

Commercial Manufacturing process of Biofertilizer

The technology of biofertilizer production involves the following steps :

Diagrammatic view provided.

1. Selection / purchase of Mother culture
2. Inoculum development for mass production
3. Mass multiplication of bacterial cultures in fermentor / larger vessels
4. Preparation of carrier based inoculants
5. Packaging in bags

1. Strain Selection for inoculum development

The source of strains for the mass production may be purchased from the authentic mother culture banks.

2. Inoculum development for mass production

The mother culture is inoculated into 50/100ml of the respective broth and allowed to grow in a shaker for a period of 35 days depending upon the nature of growth. This is called **starter inoculums**. Then for inoculating the fermentor starter inoculums is to be multiplied in bigger size flask about 1-5 litres or in a small sized fermentor based on the requirement of the inoculums. This is called **seed inoculums** or primary inoculums.

The inoculums should contain 10^6 - 10^7 viable cells /ml of broth at the time of inoculation into the fermentor.

3. Mass multiplication of bacterial cultures

Once the seed inoculums is ready, it has to be inoculated into the larger scale fermentor under aseptic condition at the rate of 1-5%.

Mass multiplication of biofertilizers is an important step in commercial production. It involves the following steps

- i. Culturing of micro organisms
- ii. Preparation of carrier material
- iii. Preparation of carrier based inoculants

4. Large scale culturing

Large scale culturing is carried out in a bigger size culture vessel known as Fermentor. Fermentor is the vessel which maintains the controlled environmental conditions for the growth of micro organisms and provides access for inoculation, sampling, aeration and cleaning.

It should be made of stainless steel to withstand high pressure and also to resist corrosion. High quality fermentor will have smooth surfaces inside. The commercial size steel fermentor has the working capacity of 100 litres or more. The culture is grown in the fermentor until it attains the maximum cell count of about 10^9 cells/ ml. Batch fermentation is often followed in inoculums production.

The common carriers used are peat soil, lignite, vermiculite, charcoal and pressmud. Before using the carrier material, it should be ground to a fine powder and the pH should be neutralized using CaCO_3 .

Appropriately grown bacteria culture suspension is mixed with the processed carrier material to the moisture content of 35 to 45% on wet basis. The carrier and broth are mixed either manually or mechanically and left in trays for curing. Curing improves the cell count to 10^9 to 10^{10} cells /g. After curing it is then packed in low density polythene bags. The inoculants may be allowed for curing even after packing for 3 – 4 days at room temperature.

5. The polythene bags should have the following specifications as per the quality standards:

- The polythene bags may be of low density grade (promotes diffusion of gases)
- The thickness may be around 50 -75 micron
- Each packet should be marked with name of the product, strain number, the crop to which recommended, method of inoculation, date of manufacturing, batch number, date of expiry, price & address of manufacturer.

After filling the inoculate, the bags are thoroughly sealed using a electric sealer / automatic sealing machine.

Project components

Types of biofertilizers that could be manufactured in the unit

Rhizobium

Azospirillum

Phosphobacteria

Potash releasing bacteria and any newly introduced bacterial biofertilizers

Bacterial biopesticides

I. Sourcing of Raw Materials

- ▶ Mother cultures
- ▶ Ingredients for growth medium for the production of broth and glasswares
- ▶ Carrier material - lignite or bentonite or peat of desired quality in powder form
- ▶ Packing materials like polythene packets, HDPE bags, cardboard cartons

II. Equipment and Machinery Requirement

Vertical Autoclave 600x350 mm

pH Meter(Micro Processor based)

Hot air Oven 24x24x24"

Small oil free air compressor

Refrigerator 300 lit

Stainless steel fermenters

Binocular microscope

Weighing balances

Laminar air flow work station,

Working table size 3' x 2' G

Rotary shaker (capable of holding 25no., flasks of 100-500 ml capacity)

glassware and plastic ware aids

Total estimate for setting up a biofertilizer production unit with the capacity of 150 metric tonnes/annum.

S. No.	PARTICULARS	Amount (Rs.in lakhs)
I.	EXPENDITURE*	
A.	CAPITAL INVESTMENT (FIXED COST)	
i.	Building including cost of site (App. 1200 sq. ft.)	12.00
ii.	Equipment and apparatus	41.00
B.	Operational cost (variable cost)	
i.	Working capital (Raw materials)	10.00
ii.	Staff salary	2.04
iii.	Labour	2.50
iv.	Electricity	0.50
v.	Travelling expenses	0.50
vi.	Administrative expenses	0.50
vii.	Interest on loan and depreciation	0.70
viii.	Miscellaneous expenses	0.26
	Total (variable cost)	17.00
	Total investment	70.00
	Actual initial investment	50.00

*** The expenditures does not include the marketing expenses**

Expenditure details**(Rupees in lakhs)**

S.No.	EQUIPMENT AND APPARATUS	Qty (Nos.)	Amount (Rs.in lakhs)
1.	FERMENTOR (200 LIT. CAPACITY)	4	26.00
2.	SHAKER	2	1.50
3.	Laminar air flow chamber	1	0.60
4.	Autoclave	2	0.30
5.	Hot air oven	1	0.10
6.	Incubator	1	0.10
7.	Refrigerator	1	0.30
8.	Microscope	1	0.75
9.	pH meter	1	0.15
10.	Physical balance	1	0.10
11.	Electronic balance	1	0.75
12.	Counter-poise balance	5	0.25
13.	Sealing machine	5	0.25
14.	Work benches	4	0.30
15.	Plastic trays	50	0.25
16.	Trays (Zinc/Aluminium)	10	0.20
17.	Trolley	1	0.10
18.	Automatic packing machine (optional)	1	9.00
		Total	41.00

Working capital

1.	cost of mother culture	0.05
2.	Glassware	0.70
3.	Chemicals	2.50
4.	Polythene bags	3.50
5.	Carrier materials	3.00
6.	Miscellaneous items	0.25
Total		10.00

Staff salary

Technical staff (1 No.)	9000 x 12	1,08,000
Laboratory staff (2 Nos.)	4000 x 2 x 12	96,000
Total		2,04,000

II. Production

60% capacity	90 MT per year
75% capacity	112.5 MT per year
100% capacity	150 MT per year

III. Receipts

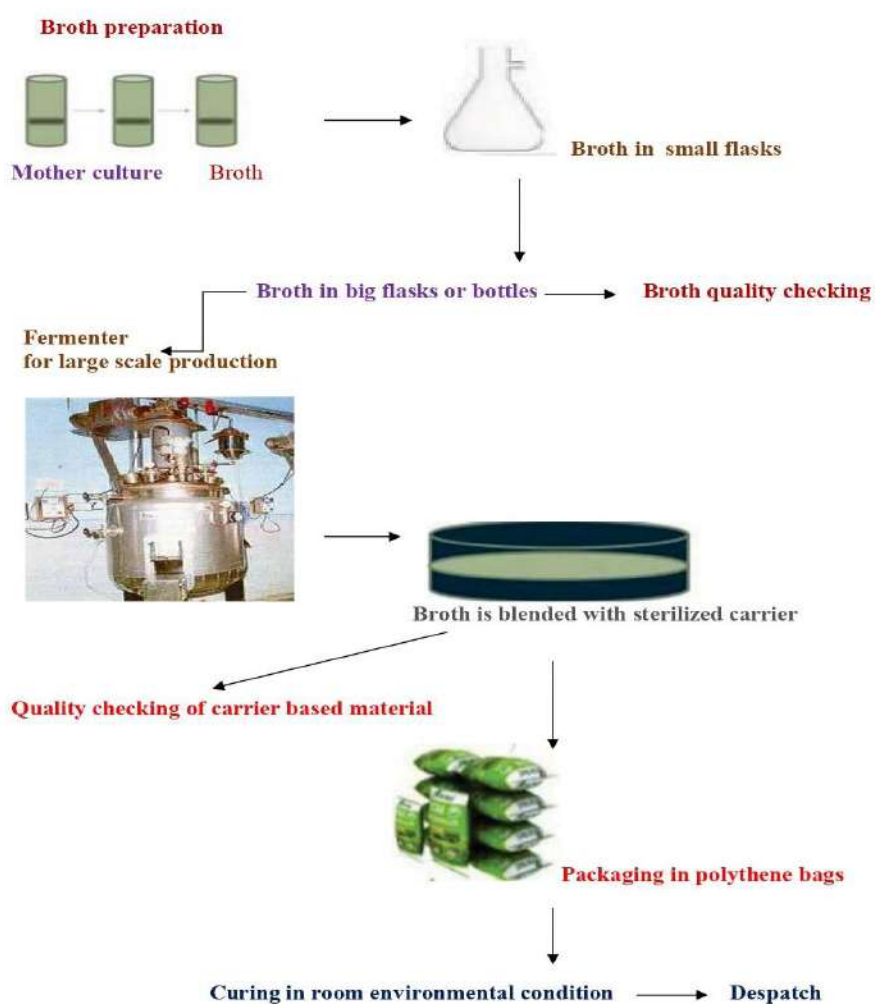
Cost of 1 kg of biofertilizer (present Govt./University rate)	Rs.30/-
Cost of 90 MT (60% capacity)	27.00 lakh rupees
112.5 MT (75% capacity)	33.75 lakh rupees
135 MT (90% capacity)	40.50 lakh rupees
150 MT (100% capacity)	45.00 lakh rupees

IV. Profitability

Year	Production	Receipt (Lakh Rs.)	Expenditure (Lakh Rs.)	Gain (Lakh Rs.)
I	60%	27.00	50.000	-27.50
II	75%	33.75	18.700*	15.05
III	90%	40.50	20.570*	19.93
IV	100%	45.00	22.630*	22.37

* Every year 10% increase in the expenditure is calculated to balance the price escalation

Manufacturing process of biofertilizers



10. Knowledge and Skill on
Assembling of Settling Transplanter

“The one who utilizes
all resources and
opportunities at hand
is an efficient
entrepreneur and
nothing is impossible
to achieve for him.”

- Sage Tiruvalluvar

எய்தற் கரியது இயைந்தக்கால் அந்நிலையே
செய்தற் கரிய செயல்

Theory and Practical:

Assembling of Settling Transplanter	To be Competent the respondent/trainee must able to: PC10. Know and identify various components of Settling Transplanter PC11. Explain the working principles of Settling Transplanter PC12. Prepare the components required for the Settling Transplanter PC13. Assemble the Settling Transplanter
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Knowledge and Understanding(K) and Development of Skills

Professional Skills(S)	Using Tools and Machines Practical (TM) TM.1 Hands on training through practical skill training for assembling the Settling Transplanter TM.2 Hands on training for testing the Settling Transplanter under field conditions
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Functional Attributes: Functional attributes are learned attributes essential for an entrepreneur before starting an enterprise. They are management tools and techniques, understanding and practicing skills related to making business plans, economics, banking and finance, the product manufacturing, marketing etc.

Objective: Our nation is an agricultural based country and contains of huge share of unemployed youth in villages. So, the main object of this project is to empower the rural youth to grow the villages and support the farmers in large with modern technology by implementing modern tools in agriculture.

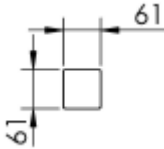
Need of Settling Transplanter: Manual planting of sugarcane bud chip settling is very tiresome and laborious as the operation is done in a bending posture. This

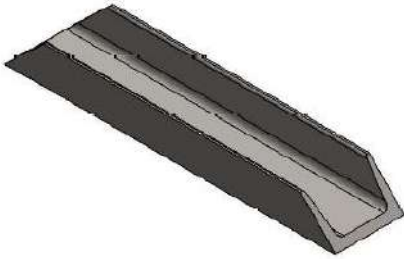
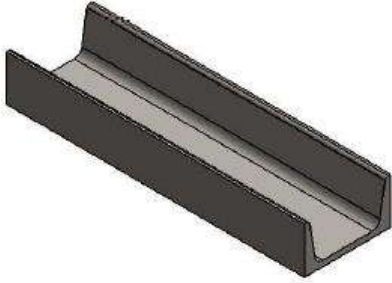
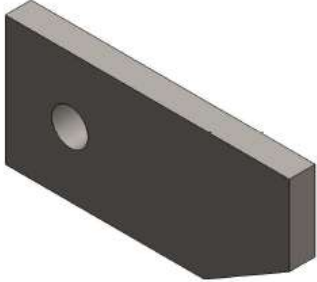
requires labour for pulling the settlings and planting them in the field. The studies on manual planting of bud settlings plants have requires high labour requirement in a short period of time, weather hazard often causing farmers to miss the best planting period and resulting in low yield. Hence, mechanical seedling transplanter is essential to reduce the labour intensity and drudgery involved in the operation.

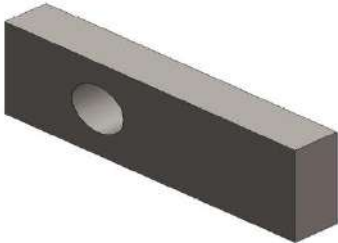
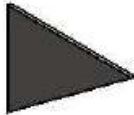
Working Principle of Settling transplanter: A two row tractor drawn mechanical planter consists of mainframe attached to standard three point hitch arrangement of a 40 hp tractor with adjustable arrangement for altering three different row to row spacing viz., 90, 120 and 150 cm. Indexing mechanism is provided for metering the settlings with adjustable arrangements for altering plant to plant spacing of 30, 45 and 60 cm. Furrow openers open the furrow, in which the settlings with soil/portray mixture are to be planted with adjustable arrangement for altering depth of planting 2 to 6 cm. The furrow closer, which follows the soil opener, closes the soil thereby giving stability to the settling plants. Two operators who are seated behind the equipment can drop Bud chip settlings through the metering mechanism. The furrow opened by furrow opener is used for irrigation after the settlings have been planted for better establishment.



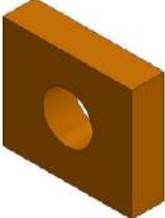
Recommended Project components: -

C.No.	Name	Image
SCT001	MAIN FRAME FRONT	
SCT002	MAIN FRAME END CAP	
SCT003	MAIN FRAME REAR	
SCT004	MIDDLE FRAME	
SCT005	MIDDLE SUPP LEFT 1	
SCT006	MIDDLE SUPP LEFT 2	

C.No.	Name	Image
SCT007	MIDDLE SUPP RIGHT 1	
SCT008	MIDDLE SUPP RIGHT 2	
SCT009	MAIN FRAME REAR GUSSEST2	
SCT010	MAIN FRAME FRONT GUSSEST 1	
SCT011	TOP HIGH SUPP.	

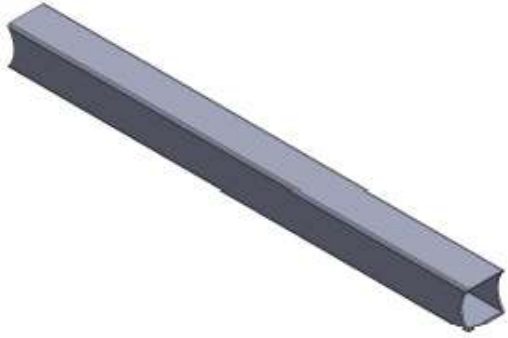
C.No.	Name	Image
SCT012	MAIN HICTH SUPP	
SCT013	MAIN HICTH GUSSET	
SCT014	LH TOP HITCHING	
SCT015	RH TOP HITCHING	
SCT016	LH HITCHING	
SCT017	RH HITCHING	

C.No.	Name	Image
SCT018	HICH PIN - hardened	
SCT019	TOP HICH PIN- hardened	
SCT020	HICH BUSH	
SCT021	1" DOUBLE CHAMBER NUT	
SCT022	LEG 1	
SCT023	LEG 2	
SCT024	LEG END	

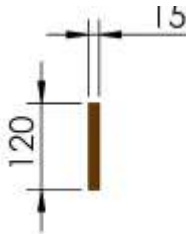
C.No.	Name	Image
SCT025	LEG END CAP	
SCT026	END CAP 1	
SCT027	END CAP 2	
SCT028	END CAP 3	
SCT029	REAR END CAP 1	
SCT030	REAR END CAP 2	
SCT031	REAR END CAP 3	
SCT032	SCREW ROD SUPP.	
SCT033	LH G.WH SUPP.1	

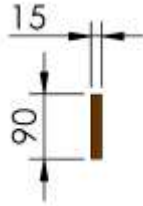
C.No.	Name	Image
SCT034	LH&RH G.WH SUPP.2	
SCT035	G.WH. SPRING SUPP.	
SCT036	BEARING SUPP.	
SCT037	RH G.WH SUPP.1	
SCT038	WHEEL	
SCT039	WHEEL SUPP.	

C.No.	Name	Image
SCT040	GR.WHEEL BUSH 1	
SCT041	GR.WH. LEG	
SCT042	CHAIN WHEEL 1 - links	
SCT043	GR.WHEEL BUSH 2	

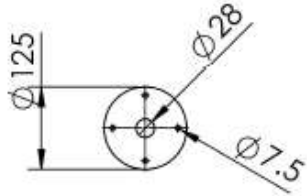
C.No.	Name	Image
SCT044	SIDE GR. WHEEL SUPP.	
SCT045	GR.WHEEL SPRING TIGHT SUPP	
SCT046	SPRING	
SCT047	CHAIN WHEEL	
C.No.	Name	Image

C.No.	Name	Image
SCT048	GR.WHEEL BUSH 3	
SCT049	GR.WH. BEARING BUSH	
SCT050	GR.WH. BEARING SUPP	
SCT051	GR.WH. BEARING SUPP DUMMY	
SCT052	GR.WH. SHAFT 1	

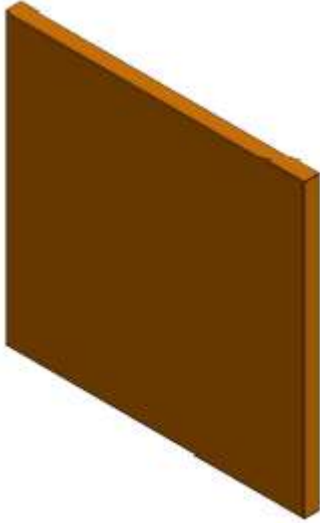
C.No.	Name	Image
SCT053	GR.WH. SHAFT 2	
SCT054	LH FRAME 1	
SCT055	LH FRAME 2	
SCT056	RH FRAME 1	
SCT057	RH FRAME 2	
SCT058	FRAME FRONT SUPP.1	
SCT059	FRAME FRONT SUPP.2	
SCT060	FRAME FRONT SIDE SUPP.1	

C.No.	Name	Image
SCT061	FRAME FRONT SIDE SUPP.2	
SCT062	REAR SUPP 1	
SCT063	REAR SUPP 2	
SCT064	REAR SIDE SUPP 1	
SCT065	REAR SIDE SUPP 2	
SCT066	SOIL OPENER FRAME 1	
SCT067	SOIL OPENER FRAME 2	

C.No.	Name	Image
SCT068	DIGGER FRAME 1	
SCT069	DIGGER FRAME 2	
SCT070	CHAIR FRAME 1	
SCT071	CHAIR FRAME 2	
SCT072	CHAIR FRAME CROSS	
SCT073	CHAIR FRAME TOP SUPP.	

C.No.	Name	Image
SCT074	CHAIR HAND SUPP.	
SCT075	CHAIR LEG	
SCT076	SOIL CLOSER DRUM 1	
SCT077	SOIL CLOSER DRUM SIDE SHEET 1	
SCT078	SOIL CLOSER DRUM SIDE SHEET SUPP.	
SCT079	SOIL CLOSER DRUM MAIN SHAFT 1	

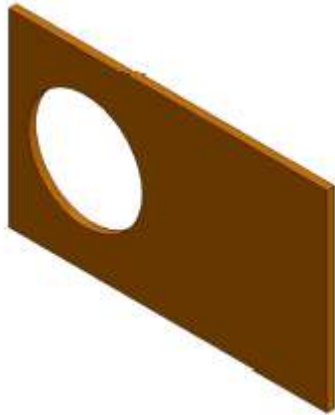
C.No.	Name	Image
SCT080	SOIL CLOSER DRUM MAIN SHAFT 2	
SCT081	SOIL CLOSER DRUM BUSH	
SCT082	SOIL CLOSER DRUM END PLATE	
SCT083	WASHER	
SCT084	S.C BEARING FLAT	
SCT085	S.C BEARING BUSH	

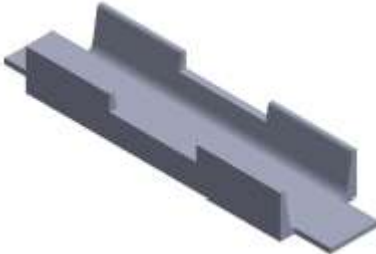
C.No.	Name	Image
SCT086	S.C BEARING SUPP	
SCT087	TRAY FRAME 1	
SCT088	TRAY FRAME 2	
SCT089	TRAY	

C.No.	Name	Image
SCT090	TRAY LEG 1	
SCT091	TRAY LEG 2	
SCT092	TRAY LEG SUPP.	
SCT093	FEEDER PLATE BUSH	
SCT094	FEEDER PLATE	

C.No.	Name	Image
SCT095	FEEDER PLATE SUPP.	
SCT096	SEED DROP PIPE	
SCT097	FEEDER BOTTOM PL	
SCT098	FEEDER FRAME 1	
SCT099	FEEDER FRAME 2	

C.No.	Name	Image
SCT100	FEEDER FRAME LEG REAR LH	
SCT101	FEEDER FRAME LEG REAR RH	
SCT102	FEEDER FRAME LEG FRONT	
SCT103	FEEDER FRAME LEG SUPP.	
SCT104	FOOT SUPP. LH	
SCT105	FOOT SUPP. LH SUPP	

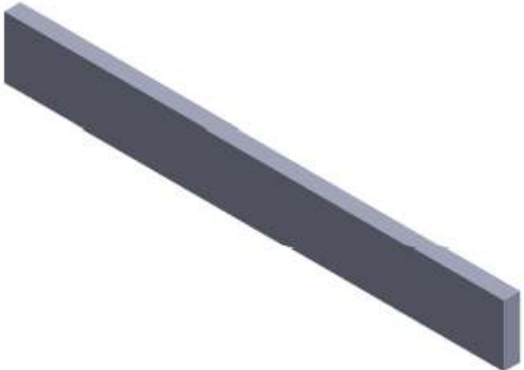
C.No.	Name	Image
SCT106	FOOT SUPP. LH	
SCT107	FOOT SUPP. LH SUPP	
SCT108	SCREW ROD NUT	
SCT109	SCREW ROD SUPP. SHEET	

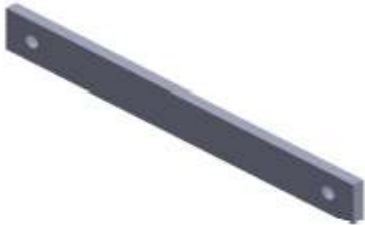
C.No.	Name	Image
SCT110	SCREW ROD	
SCT111	SCREW ROD HANDLE	
SCT112	MAIN FRAME SUPP.1	
SCT113	MAIN FRAME SUPP.2	
SCT114	MAIN FRAME TRAY SUPP.	

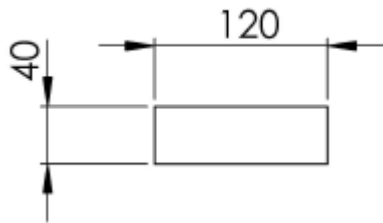
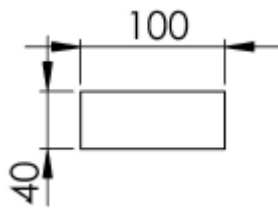
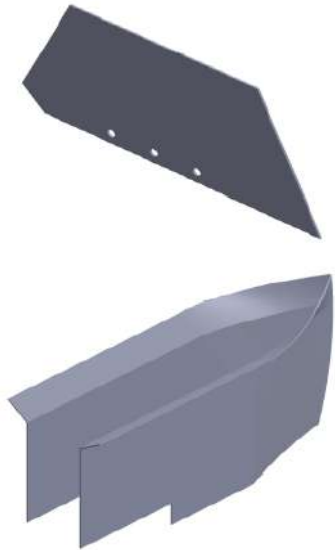
C.No.	Name	Image
SCT115	SOIL CLOSER SUPP. ANGLE	
SCT116	MAIN FRAME MARKER SUPP.	
SCT117	MARKER SUPP ROD	
SCT118	MARKER BUSH	
SCT119	MARKER SHEET	

C.No.	Name	Image
SCT120	MARKER ROD	
SCT121	FEEDER SUPP. BUSH	
SCT122	FEEDER SUPP. PLATE	
SCT123	FEEDER SUPP. MOUNTING	
SCT124	FEEDER SUPP. MOUNTING SUPP	
SCT125	FEEDER TRAY SUPP.	

C.No.	Name	Image
SCT126 SCT127	GEAR BOX STAND 1 GEAR BOX STAND 2	
SCT128	GEAR BOX MOUNTING PLATE	
SCT129	GEAR BOX STAND SUPP.	
SCT129 A	GEAR BOX SUPP. PIPE DUMMY	

C.No.	Name	Image
SCT130	DIGGER MAIN SUPP.	
SCT131	DIGGER SUPP.1	
SCT132	DIGGER SIDE SUPP.	
SCT133	DIGGER SHOVEL	
SCT134	FORMING BOARD FRONT SUPP1	

C.No.	Name	Image
SCT135	FORMING BOARD FRONT SUPP2	
SCT136	FORMING BOARD SUPP.	
SCT137	MOULD BOARD /FORMING BOARD RH	
SCT138	MOULD BOARD /FORMING BOARD LH	

C.No.	Name	Image
SCT139 A	MP SUPP.1	
SCT139 B	MP SUPP.2	
SCT139	DIGGER SUPP.1	
SCT140	DIGGER SUPP.2	
SCT141 SCT143	DIGGER PLOUGH LH DIGGER PLOUGH RH	

C.No.	Name	Image
SCT142	DIGGER PLOUGH F	
SCT144	FO SUPP 1	
SCT145	FO SUPP 2	
SCT146	FO SUPP 3	
SCT147	FO SUPP 4	
SCT148	GEAR BOX FLANGE 1	

C.No.	Name	Image
SCT149	GEAR BOX FLANGE 2	
SCT150	GEAR BOX FLANGE 3	
SCT151	GEAR BOX SHAFT 1	
SCT152	GEAR BOX SHAFT 2	

C.No.	Name	Image
SCT153	GEAR BOX PLATE RH	
SCT154	GEAR BOX PLATE LH	
SCT155	GEAR BOX PLATE TOP	
SCT156	GEAR BOX PLATE BOTTOM	
SCT157	GEAR BOX END PLATE FRONT	

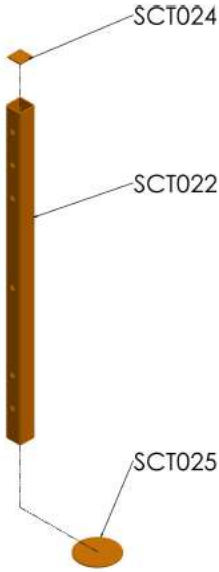
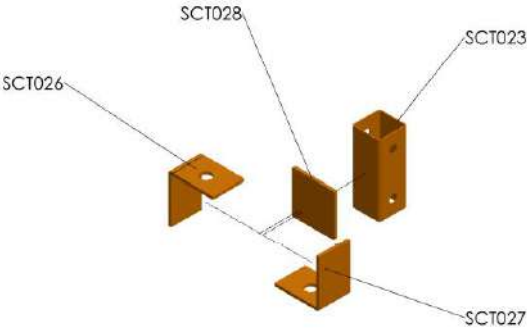
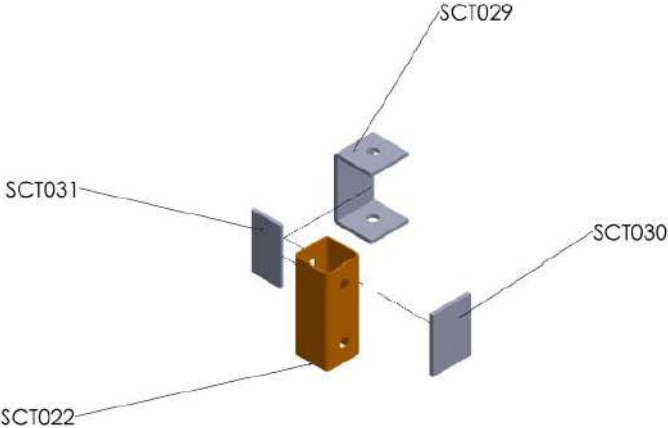
C.No.	Name	Image
SCT158	GEAR BOX END PLATE REAR	
SCT159	BEVEL GEAR WHEEL 28	
SCT161	LOCK HANDLE 1	
SCT162	LOCK HANDLE 2	

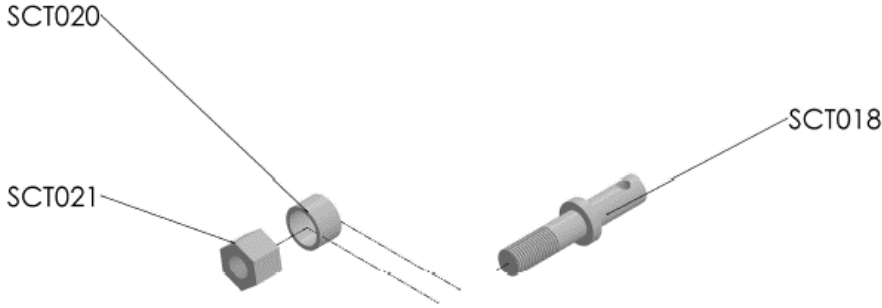
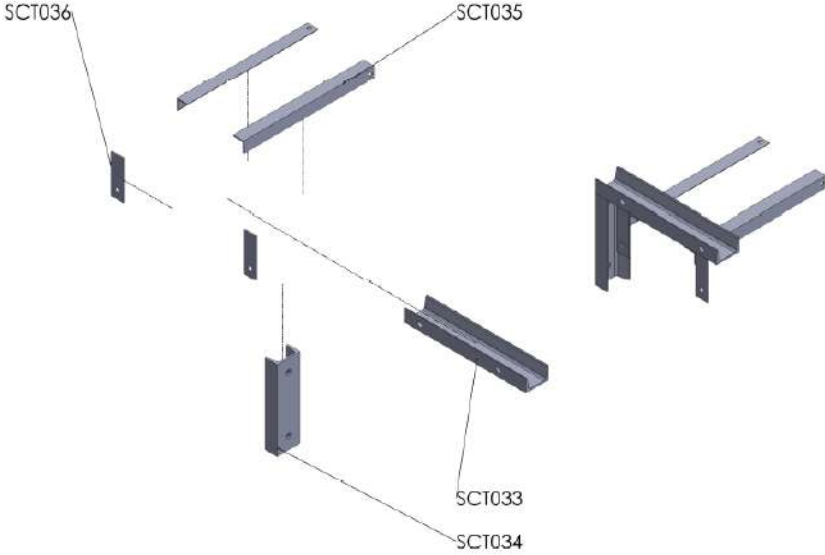
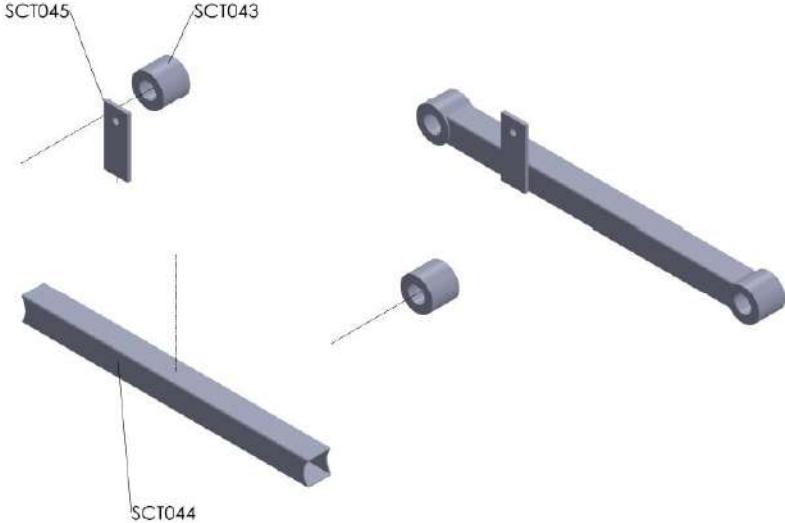
Construction and assembling of settling transplanter:-

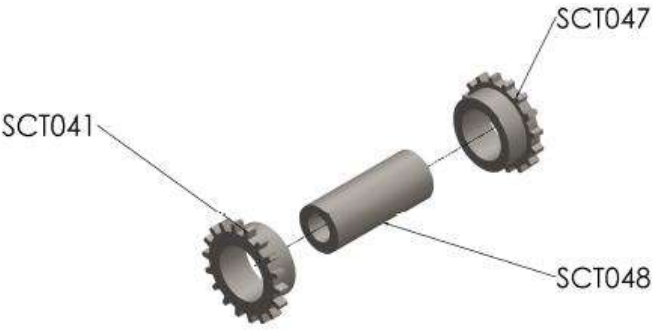
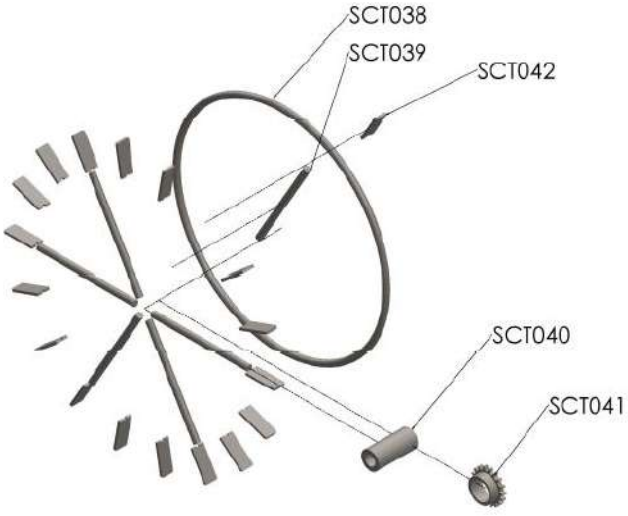
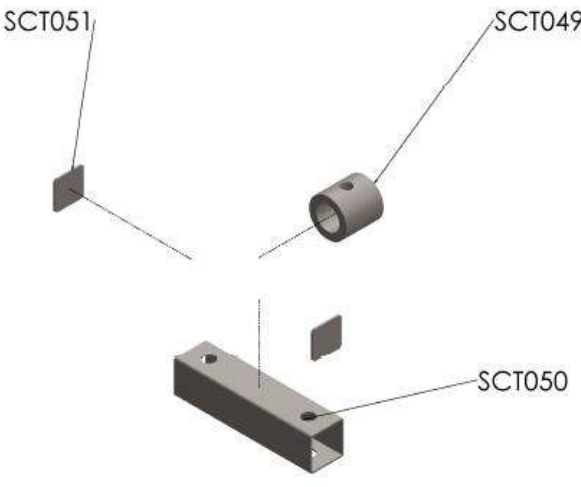
Assemble the subassembly components with fasteners and welding method as per the detailed drawing of assembly as detailed below.

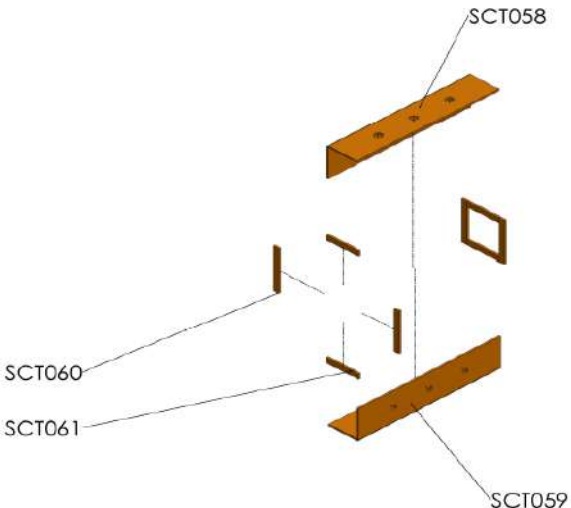
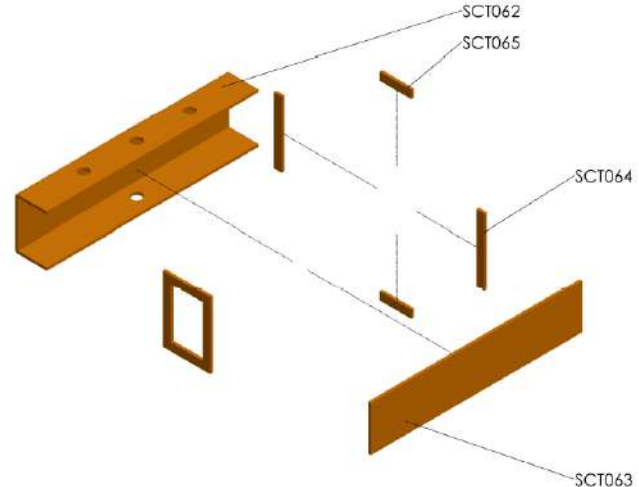
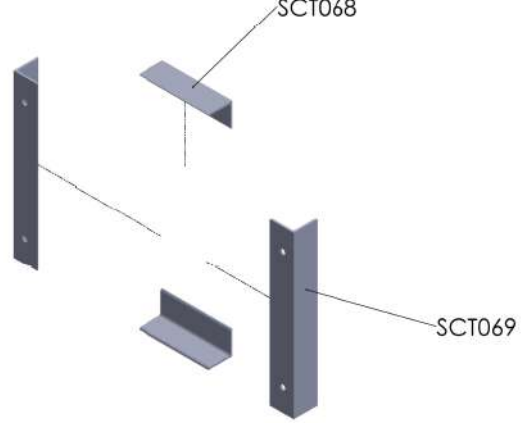
Sub Asseblly assembling

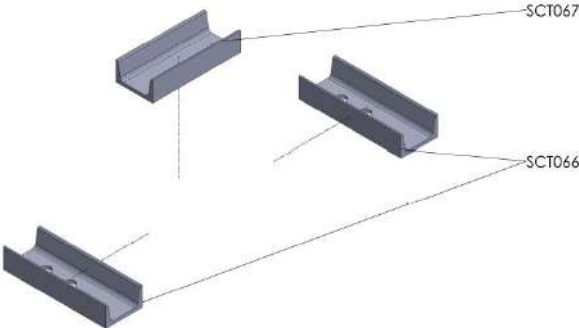
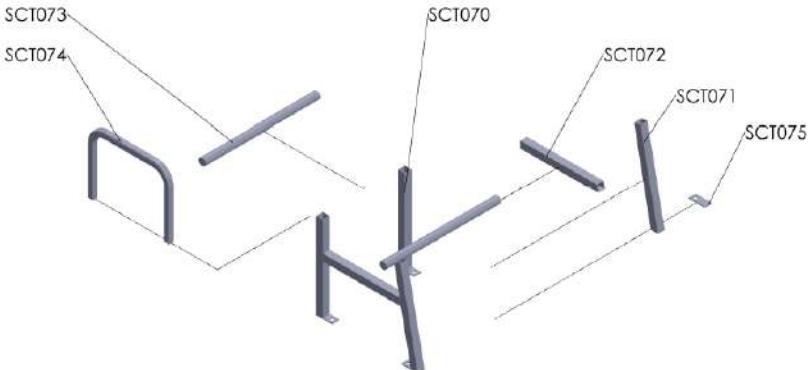
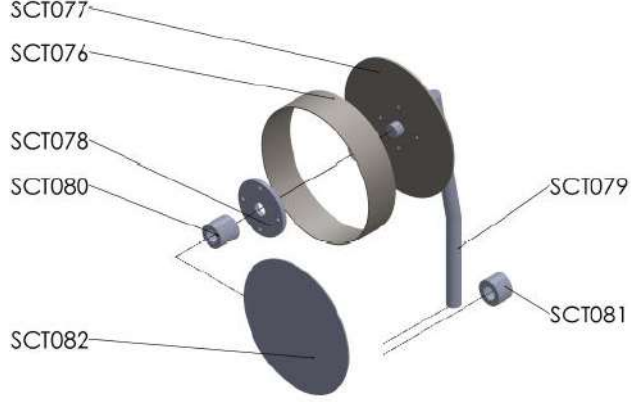
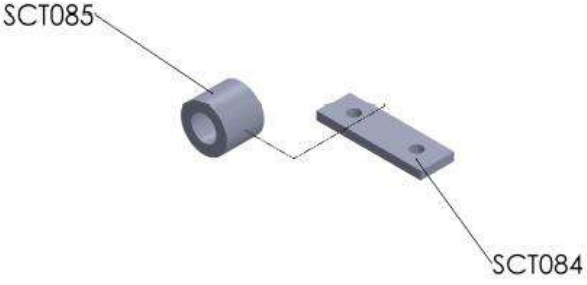
Name	Image
Sub Assembly 1	
Sub Assembly 2	
Sub Assembly 3	

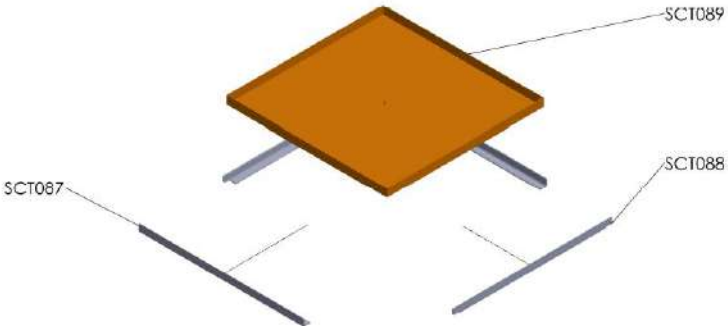
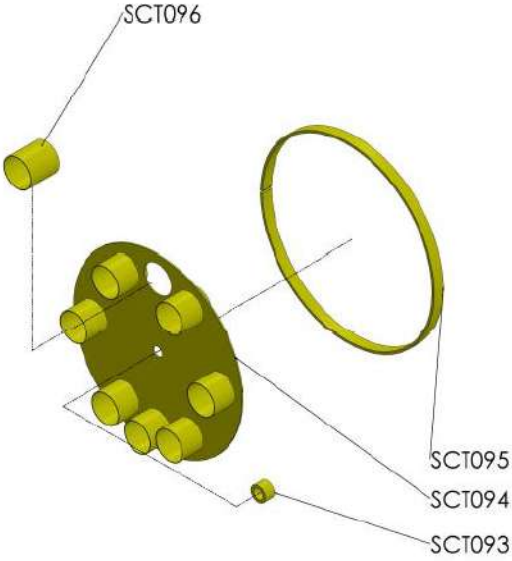
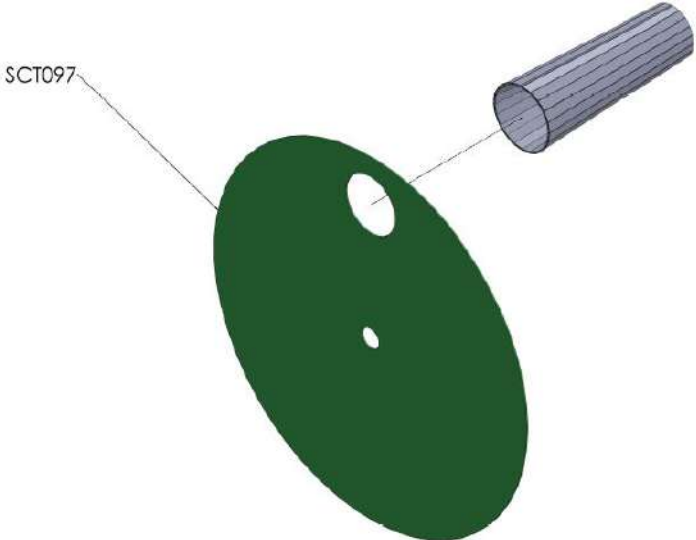
Name	Image
Sub Assembly 4	 Exploded view of Sub Assembly 4. The assembly consists of three components: a small diamond-shaped part (SCT024) at the top, a long vertical rectangular part (SCT022) in the middle, and a small circular part (SCT025) at the bottom. The components are shown in a vertical alignment, with lines indicating their assembly relationship.
Sub Assembly 5	 Exploded view of Sub Assembly 5. The assembly consists of four components: a small rectangular part (SCT026) on the left, a small rectangular part (SCT028) in the top center, a small rectangular part (SCT023) on the right, and a small rectangular part (SCT027) at the bottom. The components are shown in a cluster, with lines indicating their assembly relationship.
Sub Assembly 6	 Exploded view of Sub Assembly 6. The assembly consists of four components: a small rectangular part (SCT031) on the left, a small rectangular part (SCT029) in the top center, a small rectangular part (SCT030) on the right, and a small rectangular part (SCT022) at the bottom. The components are shown in a cluster, with lines indicating their assembly relationship.

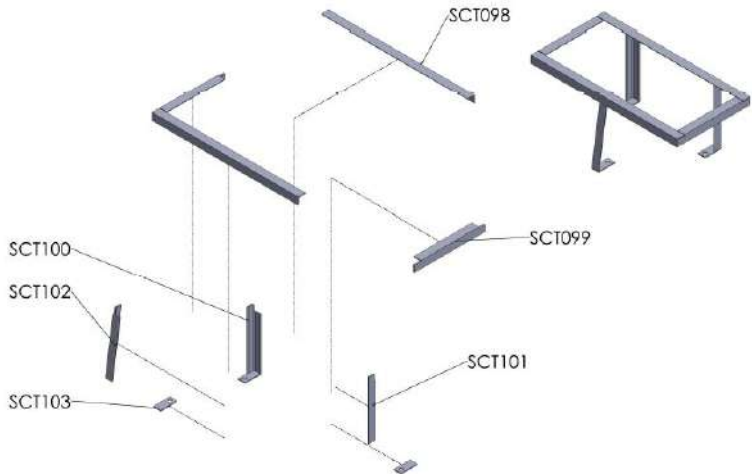
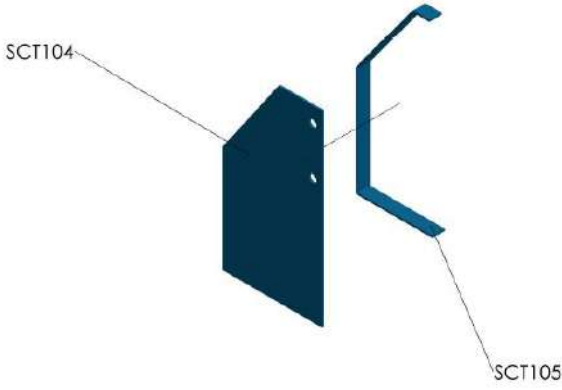
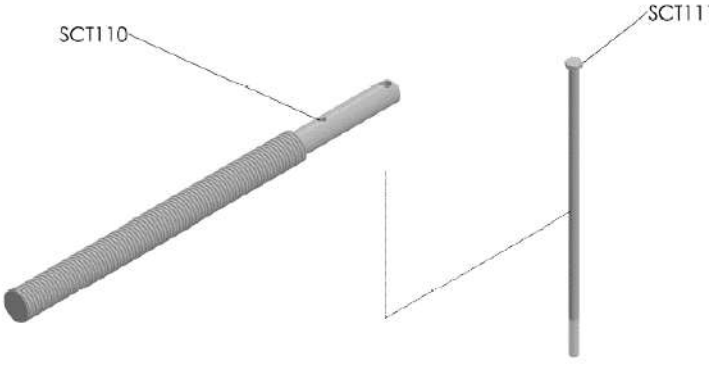
Name	Image
Sub Assembly 7	 Exploded view of Sub Assembly 7. The assembly consists of three main components: a small hexagonal nut (SCT021), a cylindrical roller (SCT020), and a long threaded rod with a hexagonal head (SCT018). The roller is positioned between the nut and the rod.
Sub Assembly 8	 Exploded view of Sub Assembly 8. The assembly includes several L-shaped brackets and a long horizontal bar. The components are labeled: SCT036 (a small vertical bracket), SCT035 (a horizontal bracket), SCT033 (a vertical bracket), SCT034 (a horizontal bracket), and SCT043 (a long horizontal bar). The brackets are shown in various orientations, suggesting they are used to secure the bar.
Sub Assembly 9	 Exploded view of Sub Assembly 9. The assembly features a long horizontal bar (SCT044) and a vertical bracket (SCT045). A cylindrical roller (SCT043) is shown positioned between the bar and the bracket. Another cylindrical roller (SCT046) is shown separately, likely for the other end of the bar.

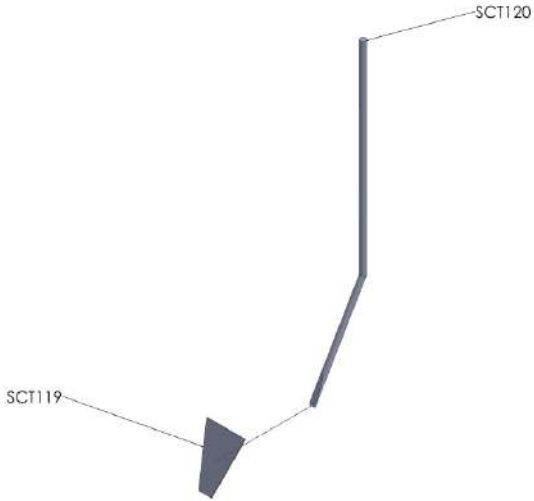
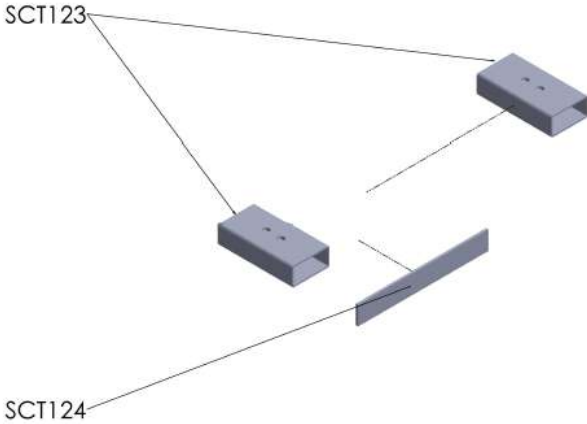
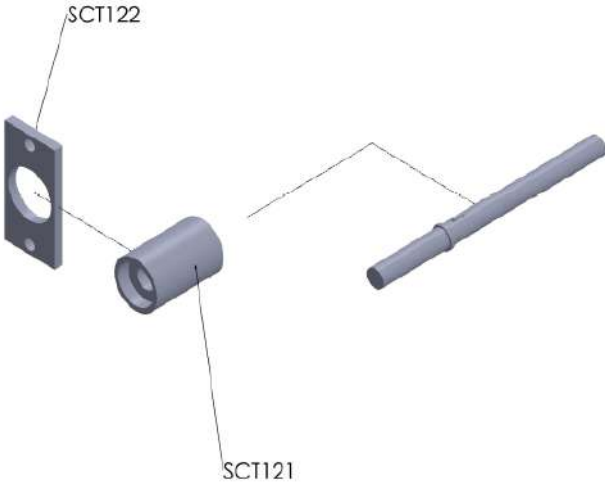
Name	Image
Sub Assembly 10	 Exploded view of Sub Assembly 10. The assembly consists of three main components: a gear (SCT041) on the left, a central shaft (SCT048) in the middle, and another gear (SCT047) on the right. The shaft is shown passing through the center of both gears.
Sub Assembly 11	 Exploded view of Sub Assembly 11. The assembly features a circular component with multiple blades (SCT038, SCT039, SCT042) on the left, a central shaft (SCT040) in the middle, and a gear (SCT041) on the right. The shaft is shown passing through the center of the circular component and the gear.
Sub Assembly 12	 Exploded view of Sub Assembly 12. The assembly includes a small square component (SCT051) on the left, a cylindrical component (SCT049) in the middle, and a rectangular component (SCT050) on the right. The components are shown in an exploded state, indicating their relative positions in the assembly.

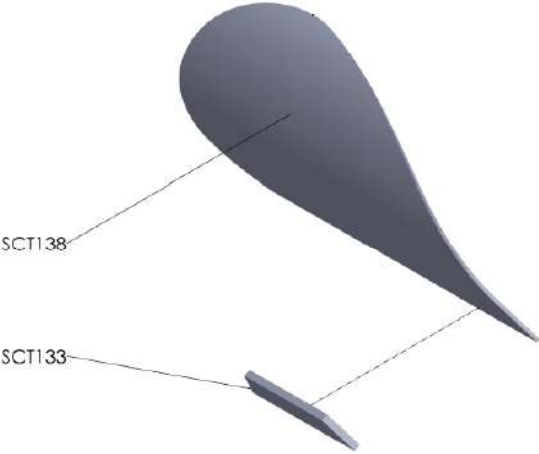
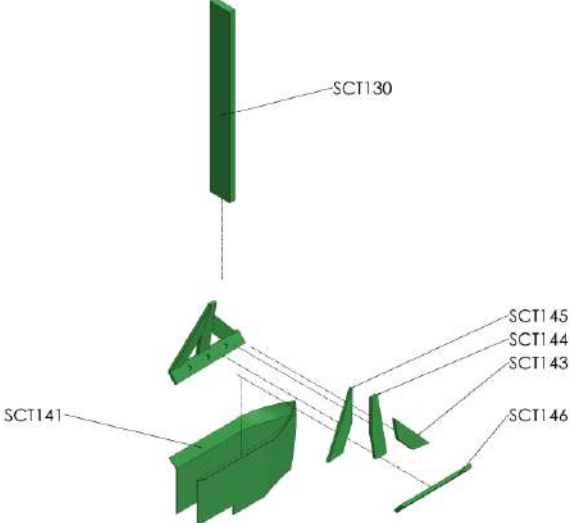
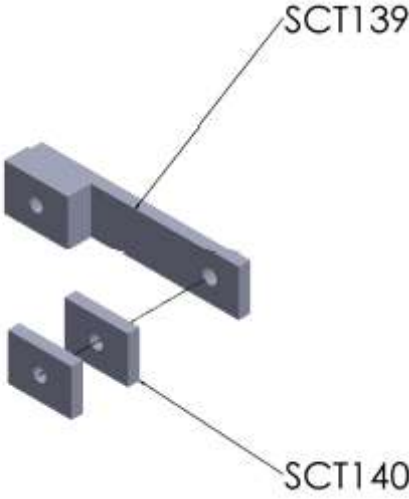
Name	Image
Sub Assembly 13	 Exploded view diagram of Sub Assembly 13. The assembly consists of two long orange rectangular bars, SCT058 (top) and SCT059 (bottom), connected by four vertical orange pins. Two square frames are positioned on the sides. Two small orange rectangular components, SCT060 and SCT061, are shown near the bottom bar.
Sub Assembly 14	 Exploded view diagram of Sub Assembly 14. The assembly consists of two long orange rectangular bars, SCT062 (top) and SCT063 (bottom), connected by four vertical orange pins. Two square frames are positioned on the sides. Two small orange rectangular components, SCT064 and SCT065, are shown near the bottom bar.
Sub Assembly 15	 Exploded view diagram of Sub Assembly 15. The assembly consists of two long blue rectangular bars, SCT068 (top) and SCT069 (bottom), connected by four vertical blue pins. Two small blue rectangular components are shown near the bottom bar.

Name	Image
Sub Assembly 16	 Exploded view of Sub Assembly 16 showing three U-shaped metal components. Two are labeled SCT067 and one is labeled SCT066.
Sub Assembly 17	 Exploded view of Sub Assembly 17 showing a complex arrangement of metal bars and brackets. Labels include SCT073, SCT074, SCT070, SCT072, SCT071, and SCT075.
Sub Assembly 18	 Exploded view of Sub Assembly 18 showing a circular component with a central hub and several smaller parts. Labels include SCT077, SCT076, SCT078, SCT080, SCT082, SCT079, and SCT081.
Sub Assembly 19	 Exploded view of Sub Assembly 19 showing a cylindrical component and a rectangular plate. Labels include SCT085 and SCT084.

Name	Image
Sub Assembly 20	 Exploded view of Sub Assembly 20. It consists of a blue square plate (SCT089) supported by two grey rods (SCT087 and SCT088).
Sub Assembly 21	 Exploded view of Sub Assembly 21. It consists of a yellow circular plate (SCT095) with six yellow pins (SCT096) and a yellow ring (SCT094) with a yellow pin (SCT093).
Sub Assembly 22	 Exploded view of Sub Assembly 22. It consists of a green oval plate (SCT097) and a grey cylindrical pin.

Name	Image
Sub Assembly 23	 Exploded view diagram of Sub Assembly 23. The components shown are: SCT098 (a long horizontal bar), SCT099 (a shorter horizontal bar), SCT100 (a vertical bar), SCT101 (a vertical bar), SCT102 (a vertical bar), and SCT103 (a small horizontal bar). The diagram shows how these components fit together to form a rectangular frame structure.
Sub Assembly 24	 Exploded view diagram of Sub Assembly 24. The components shown are: SCT104 (a dark blue rectangular plate) and SCT105 (a blue L-shaped bracket). The diagram shows the bracket fitting into the plate.
Sub Assembly 25	 Exploded view diagram of Sub Assembly 25. The components shown are: SCT110 (a long threaded rod) and SCT111 (a vertical rod). The diagram shows the rod passing through a hole in the vertical rod.

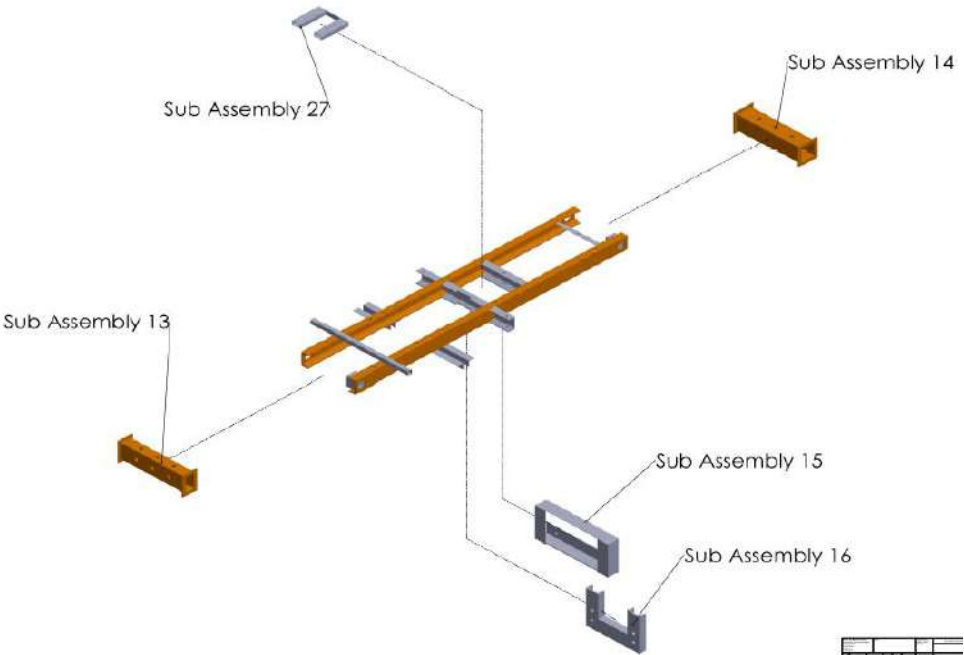
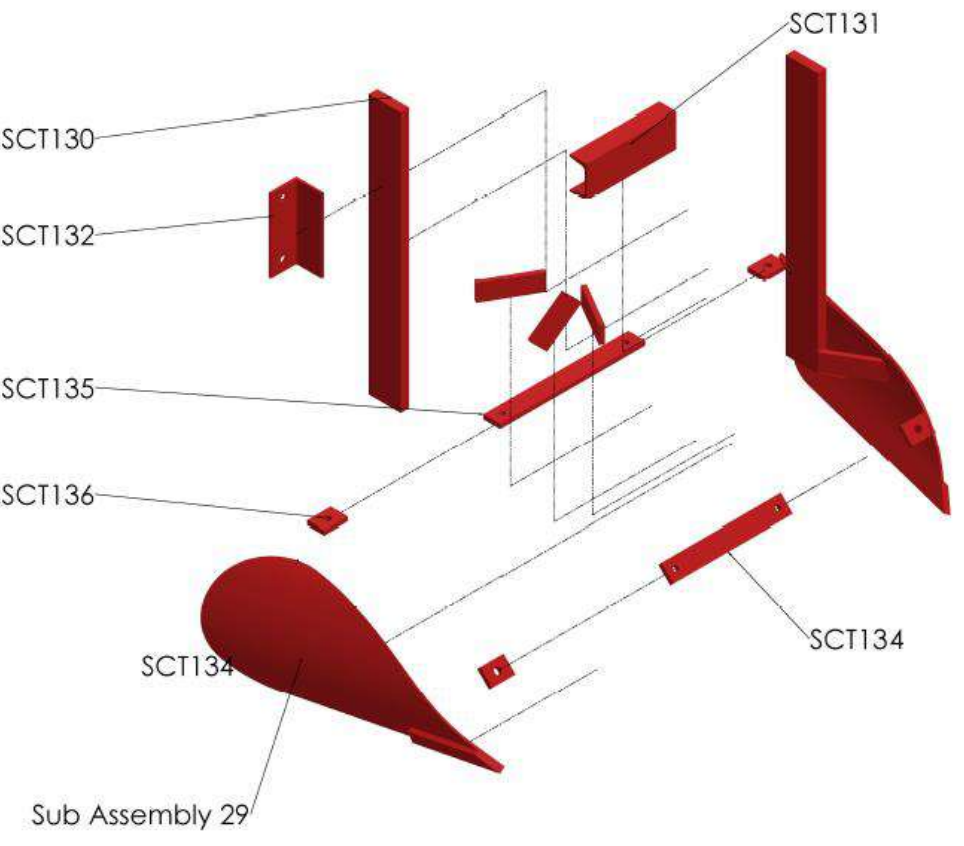
Name	Image
Sub Assembly 26	 Exploded view of Sub Assembly 26. It consists of a triangular bracket (SCT119) and a long L-shaped rod (SCT120). The rod is positioned to be inserted into the bracket.
Sub Assembly 27	 Exploded view of Sub Assembly 27. It consists of two rectangular blocks (SCT123) and a thin plate (SCT124). The blocks are positioned to be joined by the plate.
Sub Assembly 28	 Exploded view of Sub Assembly 28. It consists of a square plate (SCT122), a cylindrical sleeve (SCT121), and a long rod. The sleeve is positioned to be inserted into the plate, and the rod is positioned to be inserted into the sleeve.

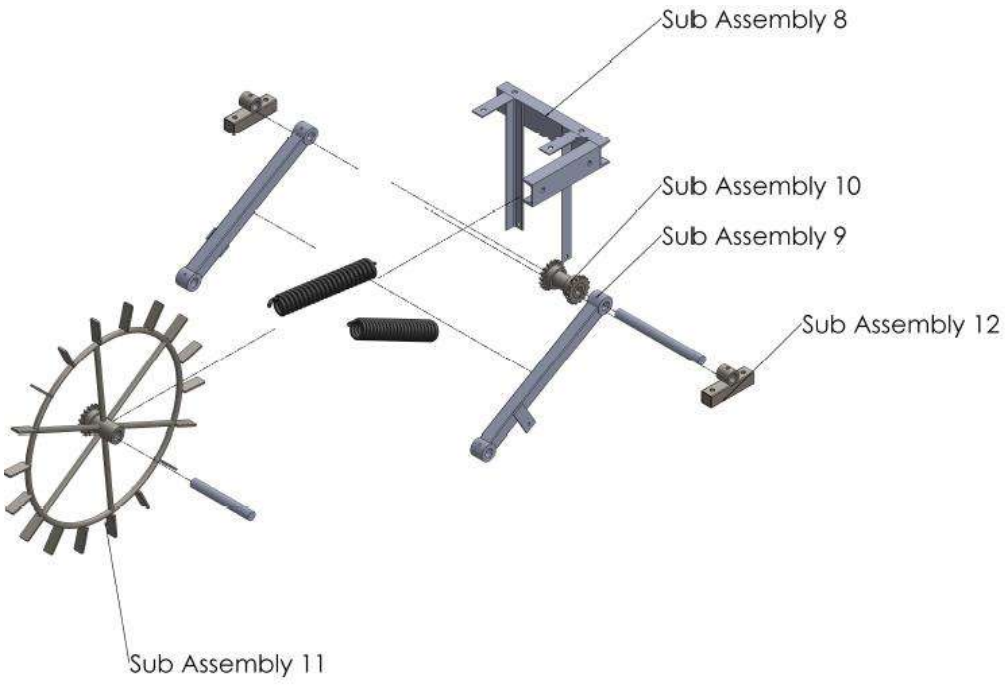
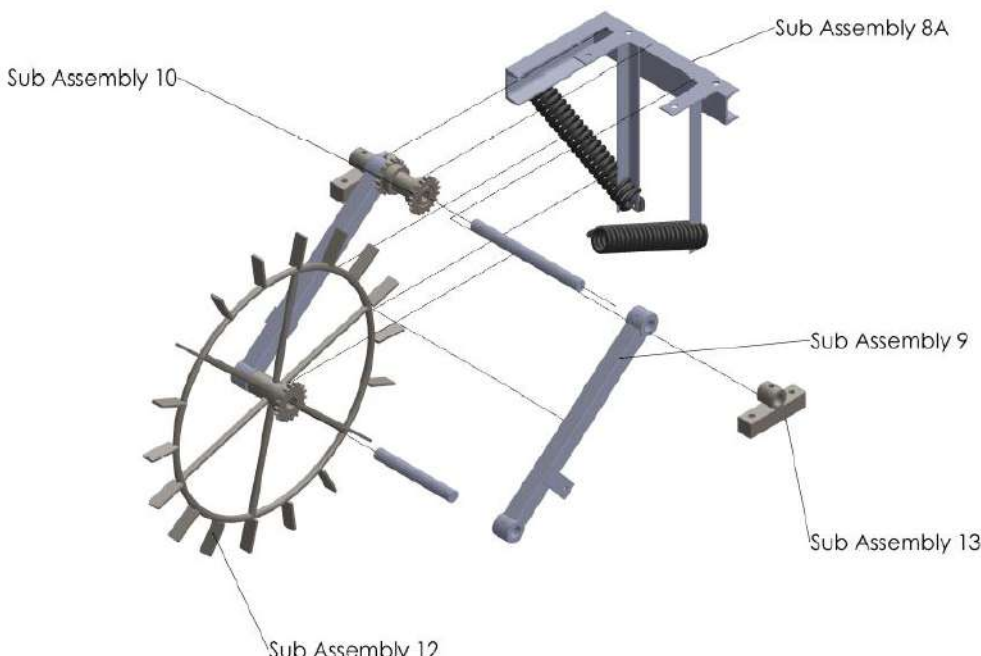
Name	Image
Sub Assembly 29	 3D exploded view of Sub Assembly 29. It consists of two parts: a large, dark blue, teardrop-shaped component labeled SCT138, and a smaller, dark blue, rectangular component labeled SCT133 positioned below it.
Sub Assembly 30	 3D exploded view of Sub Assembly 30. It features a vertical green rectangular part labeled SCT130 at the top. Below it is a base assembly consisting of several green parts: a large L-shaped part labeled SCT141, and a cluster of smaller parts labeled SCT145, SCT144, SCT143, and SCT146.
Sub Assembly 31	 3D exploded view of Sub Assembly 31. It shows a horizontal grey L-shaped part labeled SCT139 at the top. Below it are two smaller grey rectangular parts labeled SCT140, positioned one above the other.

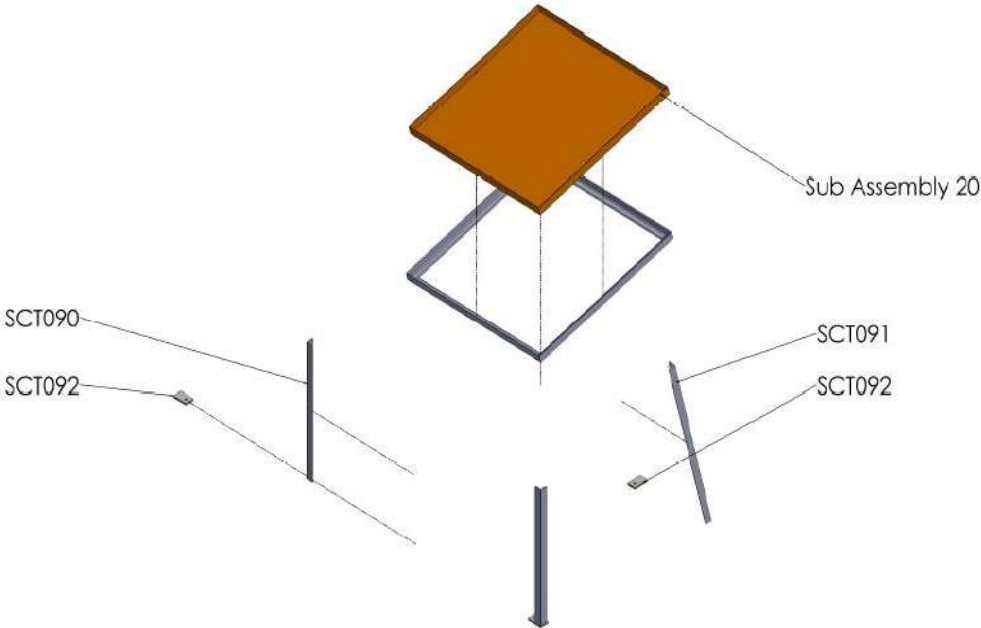
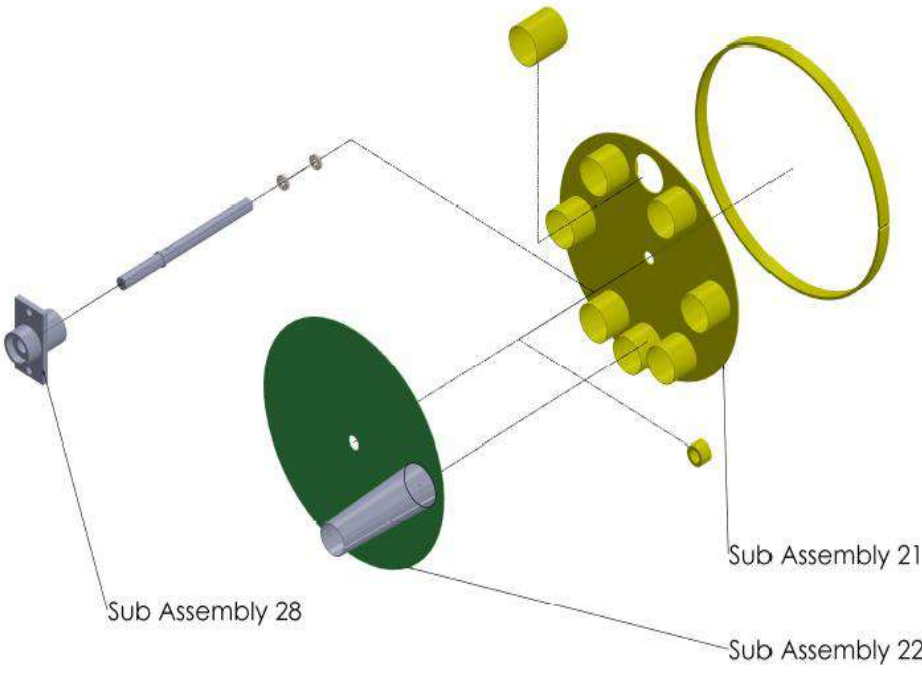
Name	Image
Sub Assembly 32	

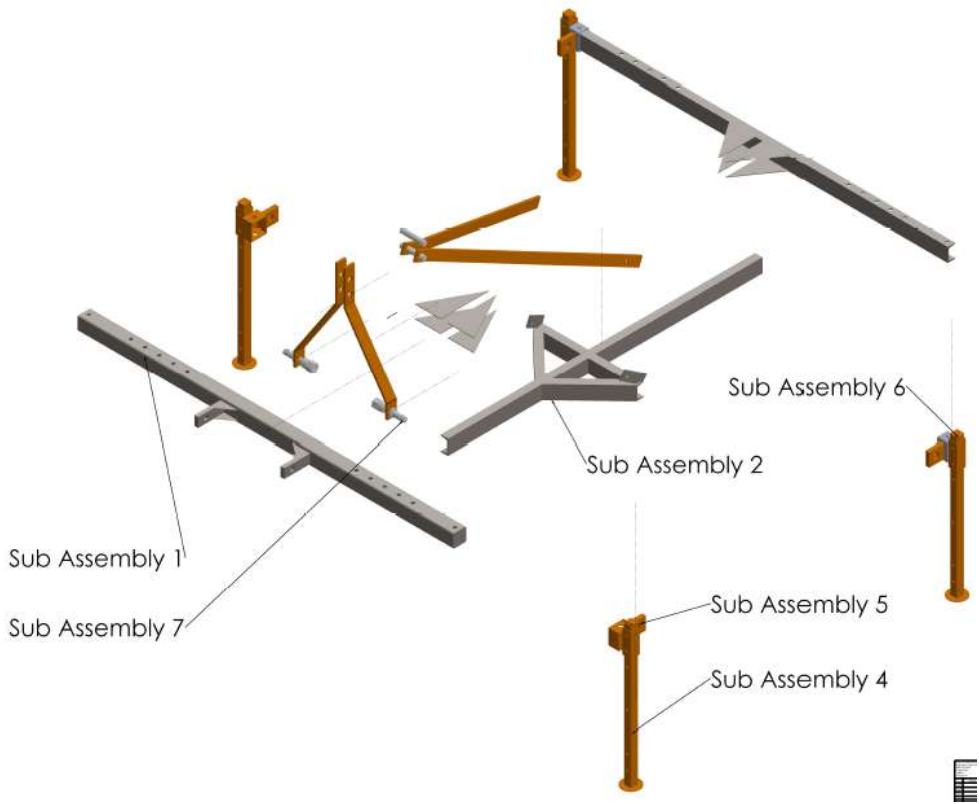
Final Assembly

Name	Image
Main Assembly 1	

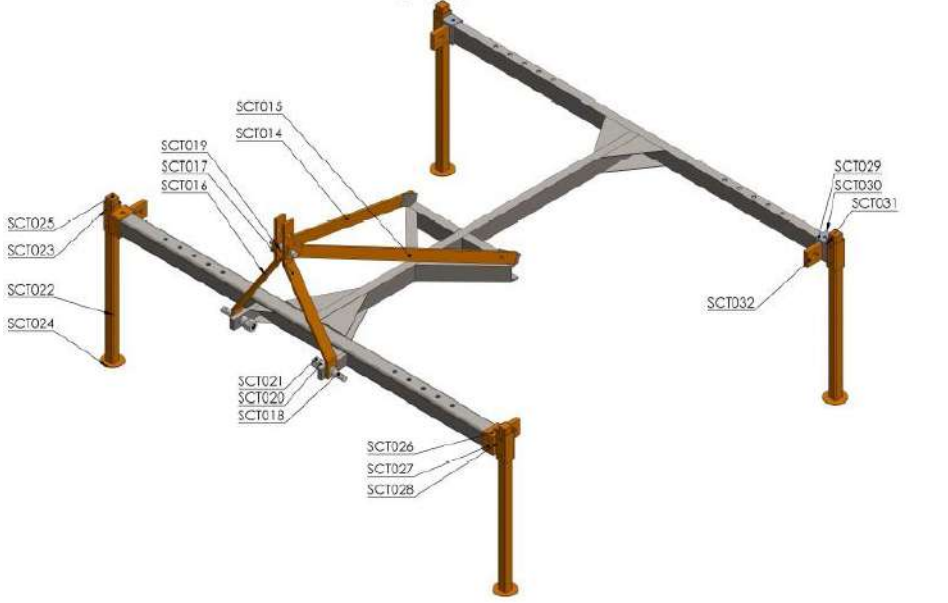
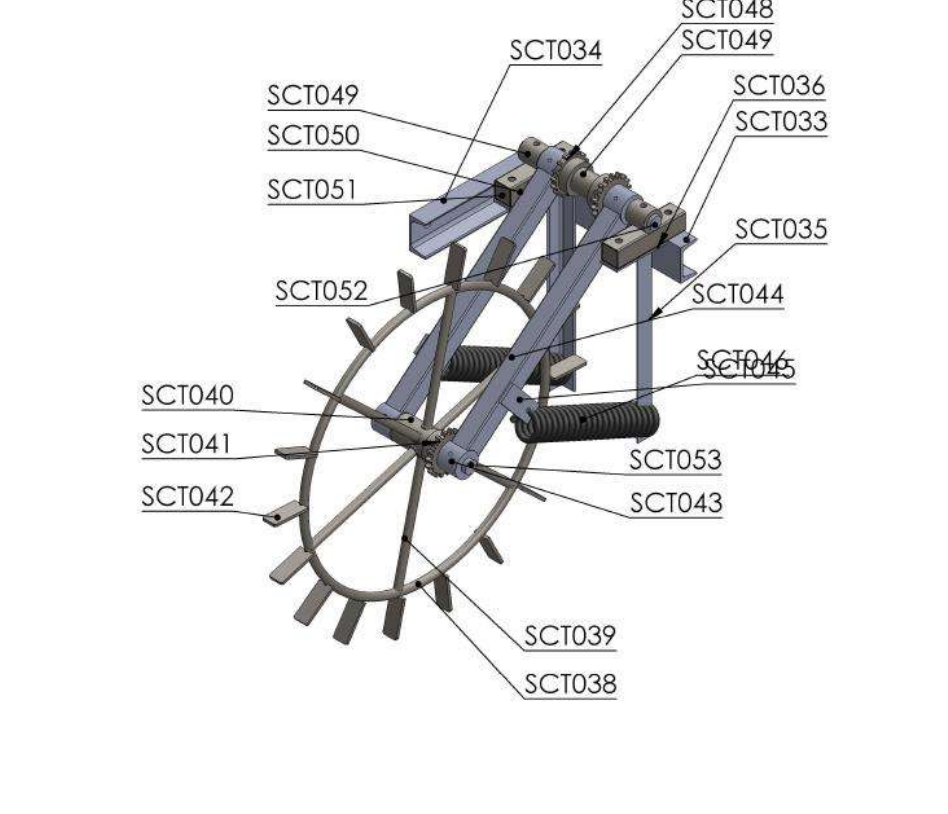
Name	Image
Main Assembly 2	 An exploded view diagram of Main Assembly 2. The assembly consists of several sub-assemblies: Sub Assembly 13 (a long orange bar), Sub Assembly 14 (a small orange block), Sub Assembly 15 (a blue U-shaped bracket), Sub Assembly 16 (a blue L-shaped bracket), and Sub Assembly 27 (a blue T-shaped bracket). The diagram shows how these components are assembled together. A small table is visible in the bottom right corner of the image area.
Main Assembly 3	 An exploded view diagram of Main Assembly 3. The assembly consists of several sub-assemblies: SCT130 (a red vertical bar), SCT131 (a red vertical bar), SCT132 (a red vertical bar), SCT135 (a red vertical bar), SCT136 (a red vertical bar), SCT134 (a red vertical bar), SCT134 (a red vertical bar), SCT134 (a red vertical bar), and Sub Assembly 29 (a red teardrop-shaped component). The diagram shows how these components are assembled together.

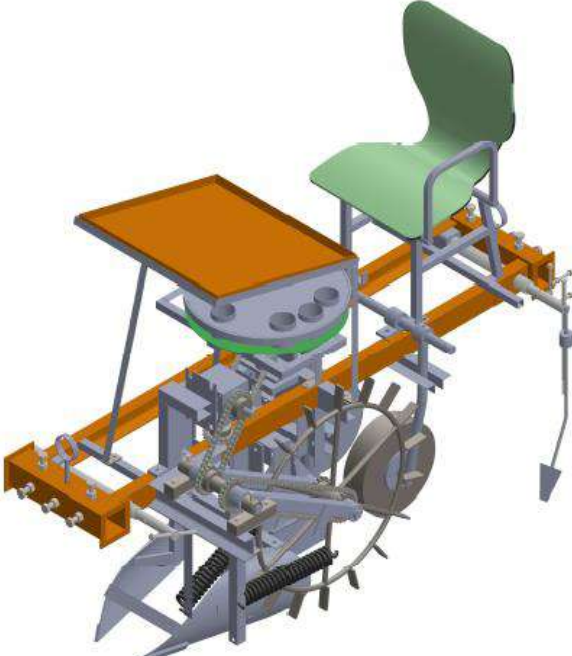
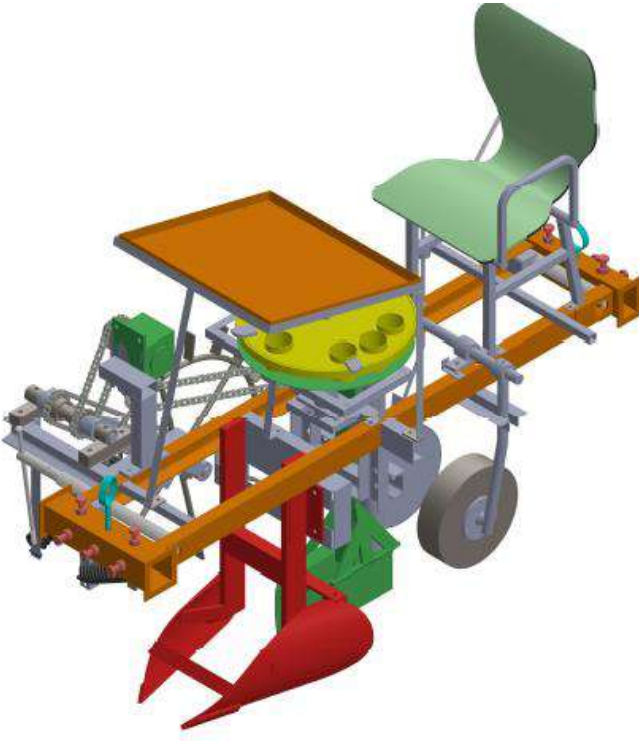
Name	Image
Main Assembly 4	 Sub Assembly 8 Sub Assembly 10 Sub Assembly 9 Sub Assembly 12 Sub Assembly 11
Main Assembly 5	 Sub Assembly 10 Sub Assembly 8A Sub Assembly 9 Sub Assembly 13 Sub Assembly 12

Name	Image
Main Assembly 6	 An exploded view diagram of Main Assembly 6. It features a central orange square plate labeled 'Sub Assembly 20'. Below it is a grey rectangular frame. To the left, a vertical grey bar is labeled 'SCT090', and a small grey component is labeled 'SCT092'. To the right, a vertical grey bar is labeled 'SCT091', and a small grey component is labeled 'SCT092'. A vertical grey bar is also shown below the frame.
Main Assembly 7	 An exploded view diagram of Main Assembly 7. It shows a grey bracket labeled 'Sub Assembly 28' connected to a grey cylindrical component. A green circular disc is labeled 'Sub Assembly 22'. A yellow cylindrical component is labeled 'Sub Assembly 21'. A yellow ring is also shown. Various other yellow and grey components are visible, including a yellow cylindrical cap and a yellow ring.

Name	Image
Main Assembly 8	 Sub Assembly 1 Sub Assembly 7 Sub Assembly 2 Sub Assembly 6 Sub Assembly 5 Sub Assembly 4 A small icon of a document with a list, likely a table of contents or index, is located in the bottom right corner of the image area.

Full Assembly

Name	Image
Main Frame Assembly	
Ground Wheel Assembly	

Name	Image
LH Frame Assembly	
RH Frame Assembly	

Name	Image										
Tractor Operated Two Row Seedling Transplanter	<table border="1"> <thead> <tr> <th>Ref</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Main Frame Assembly</td> </tr> <tr> <td>2</td> <td>Ground wheel Assembly</td> </tr> <tr> <td>3</td> <td>LH Frame Assembly</td> </tr> <tr> <td>4</td> <td>RH Frame Assembly</td> </tr> </tbody> </table>	Ref	Description	1	Main Frame Assembly	2	Ground wheel Assembly	3	LH Frame Assembly	4	RH Frame Assembly
Ref	Description										
1	Main Frame Assembly										
2	Ground wheel Assembly										
3	LH Frame Assembly										
4	RH Frame Assembly										

Cost estimation of settling transplanter

Sl.No.	Description	Rate/Qty	Total Qty	Total Rate
1	Main Frame Assembly	30,000	1	30,000
2	Ground Wheel Assembly	15,000	2	30,000
3	LH Frame Assembly	35,000	1	35,000
4	RH Frame Assembly	35,000	1	35,000
Total Cost				1,30,000

For sales and service a profit of Rs 26000/ number (Approximately 20%) can be added with the above price and the sale price can be **Rs. 156000/- (Rupees One lakh fifty six thousand Only).**

Note 2: The exact dimensions can be referred from the manufacturing drawing available at ICAR-Central Institute of Agricultural Engineering, Regional Coimbatore-641007.

Summary

Farmers Commission report emphasised the promotion of agri-preneurship through income generation activities in the rural areas through appropriate technologies. NAIP also envisaged the promotion of entrepreneurship through the establishment of BPD units. NARP-NATP-NAIP-NAEP continuum of ICAR for technology for income generation and livelihood security. ITMU –BPD units and ZTM. Most of the income generation activities are technology and skill based requiring adequate technology and methodology backstopping-ICAR policy report on Agricultural Science, Research and Development.

Keeping in view of the contemporary requirements of providing appropriate technologies and skill development for promoting rural entrepreneurship the present project has been designed and implemented to develop the rural entrepreneurship in selected technologies namely Soil Moisture Indicator(SMI), Bio fertilizers and Settling Transplanters. The project also develop tests to identify entrepreneur qualities and skill development protocols.

The project developed technology products like evaluation of entrepreneurship qualities, attitude and knowledge level for identification of a potential entrepreneur and conducting capacity development programme. The project also identified various personal and functional criterion required for an entrepreneur. Business plans for the identified enterprises namely soil Moisture Indicator, Bio-Fertiliser and Settling Transplanter have been developed for the entrepreneurs. Content for developing capacity development programmes for the entrepreneurs have been developed.

BIBLIOGRAPHY

- Bernadas, C.N.Jr. 1991. Lessons in upland farmers' participation: The case of enriched fallow technology for income generation in Jaro, Leyte, Philippines. Forest Trees and People news Letter.14;10-13
- Chambers, R and Jiggins, J 1986 Agricultural research for resource poor farmers: A parsimonious paradigm.IDS Discussion paper 220.University of Sussex, Brighton, England.
- Edwards, A.L. 1969 Techniques for Attitude Scale Construction. Vakils,Feffer and Simans Pvt Ltd., Mumbai.
- Garret,H.E. 1966 Statistics in Psychology and Education, International Book Bureu, Hyderabad.
- Harvey, W.R., 1979 Least Squares analysis of Data with unequal sub-class numbers. USDA, Washington.
- Lindquist, E.F (ed)., 1951 Educational Measurement, Part Ii, American Council of Education, Washington.
- Nunally, J.C., 1967 Psychometric Theory, Mc Graw Hill Book Co. New York
- Premalata Singh, Sharma,J.P., Burman,R.R., Kumbhare,N.V., and Sujit Sarkar, 2014, Extension Education: A Hand Book, Post Graduate School, IARI, New Delhi.
- Venkatasubramanian, V 1999 Introduction to Research Methodology, National Book Trust of India and NCBH, Chennai.
- Venkatasubramanian, V 2000 Technology Communication and AV Aids, National Book Trust of India and NCBH, Chennai.
- Venkatasubramanian, V Sudhakar, R and Singh, K.D 2004 Banana Fibre extractor- A need based user friendly technology, Journal of Rural Technology, Vol 1(5);217-220.
- Venkatasubramanian, V, Sajeev, M.V and Singha, A.K. 2010 Concepts, Approaches and Methodologies for Technology Application and Transfer, ICAR-ZPD-III, Barapani.



Dr. V. Venkatasubramanian, Principal Scientist (Agricultural Extension), ICAR-Sugarcane Breeding Institute, Coimbatore belongs to the 1991 batch of ARS (Agricultural Research Service). His past experience includes Assistant Director General (AE), ICAR Headquarters, New Delhi, Zonal Project Director of North Eastern Region and Managing Director/CEO of Vijaya Dairy, Andhra Pradesh. His academic achievements include University topper in M.Sc. and PhD with six research fellowships awarded during the period. His work has been recognised nationally and internationally with more than 25 awards and honours such as Young scientist award from NAAS, meritorious invention award of NRDC, NBT awards, Industrial Excellence award, National Award for Corporate leadership and National best Entrepreneurship award 2005. In recognition of his meritorious contribution to science and development admitted to fellowships like FIAVR, FIASC and FUWAI. He also acted as member in several academic/research and policy making bodies such as ASCI, National Bio Diversity Authority, and DBT. There are 243 publications to his credit which includes 30 books, seven book chapters and 58 research articles.



Dr. P. Murali, Senior Scientist (Agricultural Economics) belongs to the 2007 batch of ARS (Agricultural Research Service) and has over 14 years of service. He has carried out substantial work in the area of impact assessment in sugarcane and presented papers in several international conferences. He has about 14 years of research experience in sugarcane economics. He has four joint design registrations for soil moisture indicator. He has published over 10 research papers in international journals. He has visited Brazil and Italy for handling technical sessions in Conferences and for presenting research papers. Currently, he serves as National facilitator for National Institute of Agricultural Marketing, Jaipur.



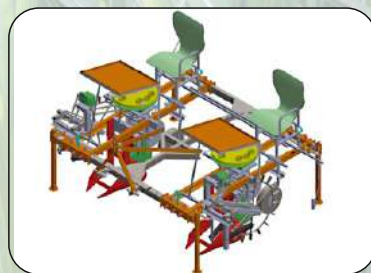
Dr. D. Puthira Prathap, Principal Scientist (Agricultural Extension), ICAR – Sugarcane Breeding Institute belongs to the 1995 batch of Agricultural Research Service (ARS) and has had a remarkable career spanning over 23 years involved in transferring agricultural technologies, and bringing rural development & knowledge empowerment to the farthest reaches. He was awarded the 'Jawaharlal Nehru Award for Outstanding Postgraduate Research of ICAR in 2005. He has developed and employed various ICT tools in sugarcane technology transfer, including the dynamic, free- to-access, user-centered website – Cane Info..all about sugarcane, for the benefit of sugarcane growers and cane development personnel of the country. Dr. Prathap is the Joint Design registration holder of 'Soil Moisture Indicator and delivers talks /handles sessions in various fora on using ICT tools for agri-preneurship. Dr Prathap is currently the Chief Editor of two NAAS-rated journals viz., Journal of Extension Education and Journal of Sugarcane Research.



Dr. T. Arumuganathan, Principal Scientist (Farm Machinery and Power), ICAR-Sugarcane Breeding Institute belongs to the 2001 batch of ARS (Agricultural Research Service) and has over 18 years of professional experience. During his stint in ICAR-DMR, he developed technology for the production of value added mushroom products and three different types of low-cost mushroom growing rooms. He has designed and developed five indigenous machineries for reducing the drudgery of farm women and farm workers. During his tenure at ICAR-CPCRI, Kasaragod, technology for production of value-added coconut products, technology for preserving coconut sap in ready-to-serve stand-up pouches and coconut processing equipments were developed. During his tenure as Programme Coordinator, Krishi Vigyan Kendra, Kozhikode was awarded ICAR-Best KVK Award-2011. He has published several research and technical articles in National and International journals. He has guided UG, PG and Ph.D students in the area of post-harvest technology, food science and technology and sugarcane technology. He has handled several external funded projects and inter-institutional projects. He has received several awards including Junior Scientist of the Year Award (2004), ICAR-Best KVK Award, Achiever Award and recently he was awarded with Australia Award - Endeavour Research Fellowship -2018 for undergoing PDF in Australia.



Dr. K. Hari, Principal Scientist (Microbiology – Agriculture), ICAR-Sugarcane Breeding Institute, Coimbatore belongs to 1991 batch of ARS (Agricultural Research Service). He completed his PhD in Microbiology at IARI, New Delhi. He has identified *Gluconacetobacter diazotrophicus* and developed biofertilizer formulations. He has developed an innovative process to produce juice powder from sugarcane. He was involved in the identification of a new *Bacillus thuringiensis* strain processing a novel cry gene *cry8Sa1*, a holotype gene toxic against White grub. He has filed six patents and obtained 4 design registrations. Has published more than 40 research articles and over 170 technical papers. He is the recipient of Sir T.S. Venkataraman award for outstanding research in sugarcane agriculture. He has invented the soil moisture indicator which is a simple handy device used for scheduling irrigation based on moisture status of the soil. ICAR and DAC&FW, New Delhi has supported inclusion of soil moisture indicator in the scheme of PMKSY / Nation Mission for Sustainable Agriculture, while the Agriculture Skill Council of India and National Skill Development Corporation have included the skill viz., how to schedule irrigation using devices such as Soil Moisture Indicator in the National Occupational Standard of a Sugarcane Cultivator.



The institutions/functionality of BPD Units and PME cells created under NAIP in ICAR needs a sustainable transformation to enable them to function as a single window business models in each institution and this needs to be ensured. With the increasing role of private sector in commercialisation of agricultural products, the public system needs to redefine its niche in the entire spectrum of activities starting from identification of problems, basic research and discovery, proof of concept, technology incubation and dissemination. This needs an innovative transformation both in terms of structure and function.

Unlike invention, innovation also concerns putting ideas into use, with innovation being something new to a particular situation and in this project it is oriented towards the business and entrepreneurship development environment component of agricultural research and organisations. This publication is an outcome of a scientific study conducted at ICAR-Sugarcane Breeding Institute which assessed the feasibility to promote entrepreneurship activities with respect to three sugarcane based technologies namely Soil Moisture Indicator, Biofertilizer production and Settling Transplanter having the income generation potential.



हर कदम, हर डगर
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भारतीय कृषि अनुसंधान परिषद

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