Module 4

Modern Small Business Enterprises

4.1. Roles of Small-Scale Industries:

- Today the small-scale industry (SSI) constitutes a very important segment of the Indian economy.
- The small-scale sector has emerged as a dynamic and vibrant sector of the economy.
- It is a well-recognised fact that a vibrant small-scale sector holds the key to economic prosperity in an economy like India, characterised by abundant labour supply, unemployment and underemployment, capital scarcity, growing modern large industrial sector providing scope for ancillarisation and so on.
- The small-scale sector accounts for about 35 % of the country's industrial production, 40% of exports and 60 % of employment opportunities.
- The small-scale industry (SSI) sector has over the past six decades acquired a prominent place in the socio-economic development in the country.
- The sector has exhibited positive growth trends even during the periods when other sectors of the economy experienced either negative or nominal growth.

4.2.Importance of small-scale industries:

- Provide increased employment through labour-intensive process.
- Require lower gestation period.
- Easy to set up in rural and backward areas.
- Need small/local market.
- Encourage growth of local entrepreneurship.
- Create a decentralised pattern of ownership.
- Foster diversification of economic activities.
- Introduce new products particularly to cater to local needs.
- Influence the standard of living of local people.
- Provide equitable dispersal of industries throughout rural and backward areas.

4.3.Impact of globalisation on SSI in India:

- With globalisation, the SSIs are now more exposed to severe competition both from the large-scale sector –domestic and foreign-and from MNCs.
- The poor growth rate in the SSI sector during the post-liberalisation period cane be attributed to various factors such as the new policies of the government towards liberalisation and globalisation without ensuring the interests of priority of the sector.
- Globalisation has resulted in the opening up of markets, leading to intense competition.

- The members of world Trade organisation (WTO) is required to remove import quotas, restrictions and reduce import tariffs.
- The process was initiated for small-scale units.
- This opens up the possibility of direct competition in the domestic market with the imports of high quality goods from developed countries.
- Competition in the domestic market has further intensified with the arrival of multinational companies.

4.4.Impact of WTO on SSIs:

- The main outcome of WTO stipulated requirements will be brought about through reduction in export subsidies, greater market access, removal of non-tariff barriers abd reduction in tariffs.
- There will also be tighter patent laws through regulation of intellectual property rights under the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement which lays down what is to be patented, for what duration and on what terms.
- Increased market access to imports will mean opening up the domestic market to large flows of imports.
- Increased market access under WTO means our industries can compete for export markets in both developed and developing countries.

4.5.Concepts and definitions of SSI:

- ***Small-scale Industrial Unit (SSI)***: an industrial undertaking in which the investment in fixed assets in plant and machinery whether held on ownership terms or on lease or by hire purchase does not exceed Rs.100 lakh.
- ***Ancillary unit:*** this is a sub-class of SSIs. An industrial undertaking which is engaged or is proposed to be engaged in
  - i) The manufacture of parts, components, sub-assemblies, tooling's or intermediates
  - ii) Rendering of services or supplying or rendering not less than 50 % of its production or its total services

To the other units for production of other articles and whose investment in fixed assets in plant and machinery, whether held on ownership terms or on lease or on hire purchase does not exceed Rs.1 crore.

- ***Export-oriented Unit (EOU)***: an industrial undertaking in which the investment in fixed assets in plant and machinery, whether held on ownership terms, or on lease, or by hire purchase, does not exceed Rs. 100 lakh and an obligation to export 30 % of production.
- ***Tiny unit:*** the investment limit in plant and machinery in respect of tiny enterprises is Rs.25 lakh irrespective of the location of the unit.
- ***Women entrepreneurs:*** a small-scale industrial unit /industry related service or business enterprise , managed by one or more women entrepreneurs in proprietary

concerns, or in which she/they individually or jointly have a share capital of not less than 51% as partners/shareholders/ directors of private limited company/ members of cooperative society.

- ***Small-scale service and business enterprises (SSSBEs)***: industry related service and business-related enterprises with investment in fixed assets, excluding land and building up to Rs. 10 lakh are to be treated as SSSBEs.
  List of services under SSSBEs:
  - ✓ Advertising agencies
  - ✓ Marketing consultancy
  - ✓ Industrial consultancy
  - ✓ Equipment rental and leasing
  - ✓ Typing centres
  - ✓ Photocopying centres
  - ✓ Tailoring
  - ✓ X-ray clinic etc
- Activities not recognised as SSIs and SSSBEs:
  - ✓ Transportation
  - ✓ Storage
  - ✓ General merchandise stores
  - ✓ Sale outlets for industrial components
  - ✓ Legal services
  - ✓ Educational services

4.6.Government policy and development of the small-scale sector in india

- Various measures taken by the central and state governments for the development of the SSI have included product reservations, fiscal concessions, preferential allocation of credit and interest subsidy in a credit-rationing framework, extension of business and technical services by institutions such as National Small Industries Corporation, Small Industries Development Organisation, Handicrafts and Handloom Promotion Corporation and Khadi and Village Industries and so on.
- India's SSI sector is divided into 7 industry groups.

Traditional sector	**Modern sector**
1. Handicrafts	6. powerlooms
2. Handlooms	7. residual small-scale industries
3. Khadi, village and cottage industries	
4. Coir	
5. sericulture	

- The first five sectors are collectively called the traditional sector and the last two are known as the modern sector.

Industrial policy 1991:

- The industrial policy measures announced laid special emphasis on promotion and strengthening of small, tiny and village industries.
- Besides affecting changes in investment limits and equity participation to 24 % by other undertakings, a new scheme of integrated infrastructure development for SSIs with the participation of State government and financial institutions was initiated.
- The policy also proposed to encourage and support industry associations to establish counselling and common testing facilities and to pursue a reoriented programme of modernisation and technological up gradation aimed at improving productivity, efficiency and cost effectiveness in the small scale sector.

Policy initiatives since 1991:

- In the post-reforms period, the government took a number of steps including partial de-reservation, change in investment limits, facilities for foreign participation, establishment of growth centres and so on.
- The more important steps among these are:
    1. To better focus the attention on the problems of the SSI sector, a new ministry of small-scale industries and Agro and Rural industries was created.
    2. A new credit Insurance Scheme was announced for SSI security to banks and to improve the flow of investment credit to SSI units.
    3. Banks on the basis of 20% of their annual turnover determine the working capital limit for SSI units. This turnover limit has been enhanced.
    4. A national programme to boost rural industrialisation has been announced with a mission to set up 100 rural clusters every year.
- To coordinate the latest development with regard to the WTO ,a cell has been formed to prepare policies for the SSI with WTO agreements and organise WTO sensitisation seminars and so on.
- Steps are being taken to accelerate the programme of SSI branches to ensure that every district and SSI cluster within a district is served by at least 1 specialised SSI bank branch.
- To further help SSI entrepreneurs; the National Equity Fund Scheme was introduced under which equity support is provided for projects upto a limit of Rs. 15 lakh.
- The single window scheme of Small Industries Development Bank of India is also being extended to all districts.

4.7. Growth and performance of small scale industries in India:

Pre-and post-liberalisation periods:

- The level of output by the SSIs went up from Rs. 28,060 crore in 1980-81 to Rs.5,78,470 crore by the end of 1999-2000, showing an increase of nearly 20 times over a period of 20 years.

- Exports have also gone up by nearly 40 times over a period of two decades.
- The contribution of SSI in exports was high during the period, especially up to the year 1995.
- The trend reversed during the period 1995-2000 when the growth rate recorded a declining trend.
- The growth rate in employment in the SSI sector over the years had been on the decline.
- An all-time decrease was seen between 1995 and 2000.
- In the post-liberalisation period, there was increase in production and exports than that of the number of units and employment.
- The pace of growth during the 1990s was relatively lower compared to that of the pre-liberalisation period.

Performance of small-scale industries in India:

- as per the census of registered and unregistered units held for the year 2001-02, there were 105.21 lakh SSI units in the country , out of which 13.75 lakh were registered working units and 91.46 lakh unregistered units.
- It is estimated that during 2003-04, the number of SSI units has increased to 115.22 lakh from 110.10 lakh in the previous year, registering a growth of 4.7 %.
- The value of production at current prices by the SSI units also increased to Rs. 3,48,059 crore from Rs. 3,11,993 crore during 2002-03.
- The sector is estimated to have grown at the rate of 7.5 % at constant prices over the previous year.
- Employment is estimated to have increased to 273.97 lakh persons from 261.38 lakh persons in the previous year.

4.8.Problems for small-scale industries:

- The problems of small industries are divided into two groups-external and internal.
- External problems are those which result from factors beyond the control of the industrialist, such as availability of power and other infrastructure facilities required for the smooth running of small-scale industries.
- Internal problems are those which are not influenced by external forces and relate to organisation, structure, production channel, distribution channel and so on.

Internal problems	External problems
i. Choice of idea	a) Infrastructure
ii. Feeble structure	1. Location
iii. Faulty planning	2. Power
iv. Poor project implementation	3. Water
v. Poor management	4. Post office and so on
vi. Poor production	5. Communication
vii. Quality	b) Financial

viii. Marketing	1. Capital
ix. Inadequate finance	2. Working capital
x. Labour problems	3. Long-term funds
xi. Capacity utilisation	4. Recovery
xii. Lack of vertical and horizontal integration	c) Marketing
xiii. Inadequate training in skills	d) Taxation
xiv. Poor and loose organisation	e) Raw material
xv. Lack of strategies	f) Industrial and financial regulations
	g) Inspections
	h) Technology
	i) Policy
	j) Competitive and volatile environment

Box 1.8 Problems Faced by Small-scale Industries

- Difficulty in obtaining credit from commercial banks because of their general inability to provide security.
- Inability to offer liberal credit terms in the sale of their products.
- Absence of management expertise. Often managed by one person who performs a number of functions usually with no formal training.
- Difficulty in competing with imported products due to high production costs.
- Competition from other local entrepreneurs in the same line of business competing for the limited local market.
- Difficulty in obtaining industrial land in towns and cities. The shortage of industrial land is giving rise to more and more backward operations.
- Under capitalisation.
- Difficulty in identifying appropriate technology and technical assistance.
- The manner in which both the needs of the economy and linkage with the existing industry can best be served.
- Bureaucratic red tape and regulations.

- Surveys of material and human resources of the countries are not available to identify the regions or areas for the development of small-scale and medium-scale industrial enterprises.
- Identification of industrial projects for development.
- Project preparation and evaluation.
- Financial or credit support and investment promotion.
- Consultancy and counselling services.
- Technology development and applications such as the designing of prototype machines for products identified according to country resources and requirements.
- Development of infrastructure of various kinds in the appropriate areas.
- Entrepreneurship development.
- Industrial training and skill formation.
- Linkages between large industries and small industries and the creation of subcontracting facilities at the national, regional, and international levels.
- Quality control and testing facilities.
- Market promotion, both domestic and export.
- Procurement of raw materials and equipment.
- Scientific and industrial research; information collection and dissemination on technology, markets and so on.
- Identification of and assistance to enterprises, which are experiencing difficultics.
- Management and reorganisation or restructuring of small- and/or medium-scale enterprises through various schemes.
- Productivity increases through modernisation.

- Incentive measures, by industry and by area.
- Local initiative.
- Creation of institutions and changes in prevailing institutional arrangements.
- Regional and international technical and financial assistance.
- Cooperation among developing countries.

4.9.Sickness in SSI sector:

A small-scale industrial unit is considered sick

- If any of the borrowal accounts (profits or interest) of the unit remains substandard for more than 6 months and if the borrowal accounts has remained overdue for a period more than 1 year.
- When there is erosion in the net worth due to accumulated losses to the extent of 50 % of its net worth during the previous accounting year
- When the unit has been in commercial production for atleast 2 years.

Institutional Support for Business Enterprises

4.10. Introduction:

The implementation of policies and various programmes/schemes for providing infrastructure and support services to small enterprises is undertaken through attached office namely the Small Industries Development Organisation (SIDO), other organisations like Khadi and Village Industries Commission (KVIC) and Coir board, a Public Sector Undertaking, National Small Industries Corporation (NSIC) and three training institutes- National Institute of Small Industry Extension Training (NISIET), National Institute of Entrepreneurship (IIE) and National Institute for Entrepreneurship for Small Business Development (NIESBD).

Strong institutional network has been evolved for the promotion of small industries in the country.

The institution network can be broadly classified as under

1. Central level institutions/ agencies
2. State level institutions/ agencies
3. Other agencies

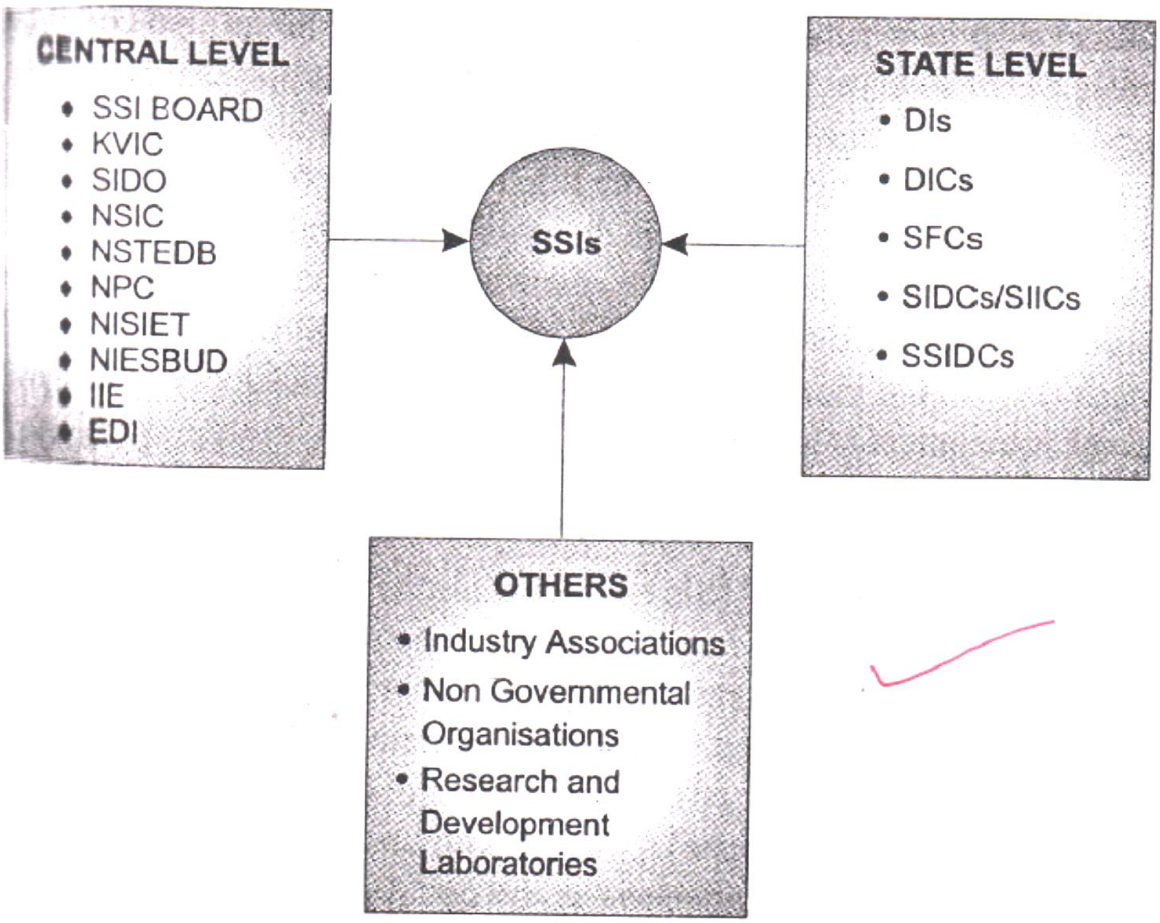


Figure 4.1 ■ Institutions supporting small-scale industries

4.11 Central level institutions:

1. *Small-scale Industries Board (SSI Board)*
    - The SSI board was constituted to facilitate the coordination and inter-institutional linkages for the development of the SSI sector.
    - The Board is an ape advisory body constituted to render advice to the government on all issues pertaining to the SSI sector.
    - The Board broadly operates in the following areas
        - ✓ Policies and programmes
        - ✓ Development of industries in a specific region such as North East
        - ✓ Ancillary development, quality improvement and marketing assistance
        - ✓ Credit facilities, taxation and modernisation
        - ✓ Industrial sickness
2. *Khadi and Village Industries Commission (KVIC)*
    - It is charged with planning, promotion, organisation and implementation of the programme for the development of khadi and other village industries in the rural areas in coordination with other agencies engaged in rural development wherever necessary.

- KVICs functions also comprise building up a reserve of raw materials and implements for supply to producers, creation of common service facilities for processing of raw materials as semi-finished goods, and provision of facilities for marketing of KVIC products apart from organisation of training of artisans engaged in these industries and encouragement of cooperative efforts amongst them.
- KVIC is entrusted with the task of providing financial assistance to institutions or persons engaged in the development and operation of khadi and village industries and guide them through supply of designs, prototypes and other technical information.

3. *Small Industries Development Organisation (SIDO)*
    - It functions as the nodal development agency for small industries.
    - It provides a wide spectrum of services to the small industries sector.
    - These include facilities for testing, tool mending, training for entrepreneurship development, preparation of project and product profiles, technical and managerial consultancy, assistance for exports, pollution and energy audits an so on.
    - It provides economic information services and advices the government in policy formulation for the promotion and development of SSIs.

Box 4.1 The Main Services Rendered by the DC(SSI) Office

- Advising the Government in policy formulation for the promotion and development of small-scale industries.
- Providing techno-economic and managerial consultancy, common facilities and extension service to small-scale units.
- Providing facilities for technology upgradation, modernisation, quality improvement and infra structure.
- Developing Human Resources through training and skill upgradation.
- Providing economic information services.
- Maintaining a close liaison with the Central Ministries, Planning Commission, State Government Financial Institutions and other Organisations concerned with development of Small-scale Indu tries.
- Evolving and coordinating Policies and Programmes for development of Small-scale Industries ancillaries to large and medium scale industries.
- Monitoring of PMRY Scheme.

Services provided by SIDO:

a. **Entrepreneurship Development and Management Training**:
    - A variety of entrepreneurship development programmes (EDPs) and management training programmes are run.

- These programmes aim at identifying entrepreneurial capabilities and motivating and training entrepreneurs to enable them to set up their industrial units with confidence.

b. Extension and training services:

- SIDO provides guidance and assistance on technical, economic, managerial and other matters.

c. Skill development:

- Training in technical skill development os provided to technciians and workers.

d. Entrepreneurship development institutes (EDIs):

- This was aimed at strengthening the training infrastructure in the EDIs.

e. Preparation of project profiles:

- Project profiles contain detailed information on the product manufacturing process, market potential, quality and standards, investment requirements and so on.

f. Plant modernisation studies:

- Detailed in-plant studies are undertaken for particular small-scale units in dense industry clusters to identify the present use of process/ technology and prepare programmes for modernisation.

g. Marketing support:

- The marketing promotional scheme involves 2 main activities: imparting training in packaging technology and promoting participation of SSIs in domestic and international trade fairs.

h. Collection of data:

- SIDO updates its database by organising sample surveys, industrial censuses and other field studies.

i. Prime Minister Rozgar Yojana (PMRY):

- It aims at providing employment to more than 1 million people through the setting up of 0.7 million micro enterprises by educated youths. The scheme also seeks to associate reputed NGOs in its implementation throughout the country.

Salient features of PMRY programme:

- Reservation for SC/ST/OBCs.
- Preference for weaker sections and women.
- No collateral guarantee required. Only assets created under the scheme would be hypothecated to the bank.
- Each entrepreneur whose loan is sanctioned is provided training for 15 to 20 working days and a stipend of Rs.300/- for the industry sector and training of 7 to 10 working days and a stipend of Rs. 150/- for the service and business section.

j. National Awards:

- The objectives of the awards are to encourage small entrepreneurs to innovate, upgrade quality, expand market and modernise.

k. Prototype Development and Training Centre:

The objectives of these centres are

- To impart practical and classroom training in several industrial trades with special training programmes for rural artisans and weaker sections of the society.
- To develop prototypes of machines, tools and import substitutes,which passed on to manufacturing units for commercial production.
- To provide common facilities in areas such as testing, machining, casting and so on.
- To take up production of machines, partially or fully as per market acceptability.
- To design tailor-made crash programmers for entrepreneurs and industrialisation to keep them up with the latest in technology.

4. *National Small Industries Corporation Ltd (NSIC)*

- Provides vital services for the promotion of SSIs.
- Its main objective is to promote, aid and foster the growth of SSIs in the country.
- Some of the main services provided by NSIC are

(a) Machinery and Equipment (Hire-Purchase Scheme)

- Supply of indigenous and imported machinery (the value of which would not exceed Rs 30 million inclusive of the value of machinery and equipment already installed) on easy financial terms, mainly targeted at first-generation entrepreneurs, women entrepreneurs, weaker sections, physically challenged, and ex-servicemen

(b) Machinery and Equipment (Lease Scheme)

- 100 per cent finance to facilitate SSIs in diversification and technology upgradation
- Tax rebate on full-year rentals

(c) Financial Assistance Scheme

Five financial centres in operation at New Delhi, Mumbai, Ahmedabad, Bangalore, and Goa provide finance to SSIs for the following activities.

- Marketing
- Bills discounting
- Raw material purchases
- Exports

(d) Assistance for Procurement of Raw Material

- Supply under the off-the-shelf basis scheme
- Import of raw materials
- Providing scarce materials on priority basis
- Supplies through NISC depots/godowns

(e) Marketing Assistance

The objectives of the marketing programme of NSIC are the following.

- Ensure fair margin to producers of goods
- Standardisation and quality control with testing facilities
- Market products under a common brand name
- Provide publicity to SSI products
- Upgrade technology by supplying sophisticated machinery and equipment

(f) Government Store Purchase Programme

Eligible SSIs (those competent to execute government orders) are registered under the Single Point Registration Scheme of the NSIC. Bonafide SSI units registered with the Directorate of Industries/District Industries Centres are enlisted under this scheme and become an important source of supplies to Central and State governments, public sector undertakings, and others.

g. **Technology transfer centre (TTC)**

- To upgrade technology in the changed economic scenario following reforms, NSIC has established a TTC.
- At the enterprise level, the primary concern is to assist small scale enterprises in technology acquisition, adoption and upgradation through its technology information and promotion services.

The services offered to industries include the following.

- Information dissemination on technology, business, and investment opportunities
- Matching of business partners and search for technology worldwide
- Training, consultancy, and technology evaluation
- Technology transfer programmes, such as technology missions/delegations and expositions
- Facility for a reference library publications (periodicals/catalogues)
- Setting up a network to access database

5. *The National Science and Technology Entrepreneurship Development Board (NSTEDB)*

- It helps promote knowledge-driven and technology intensive enterprises.
- The board aims to convert "job seekers" into "job generators" through science and technology interventions.
- The main Objective are
  - To promote and develop entrepreneurship and self-employment.
  - To facilitate and conduct various informational services relating to promotion of entrepreneurship.
  - To network agencies of the support system, academic institutions and R&D organisations to foster entrepreneurship and self-employment.
  - To act as a policy advisory body with regard to entrepreneurship.

- The programme and schemes evolved by NSTEDB have created awareness among S&T persons to take to entrepreneurship as an alternate career.
- The programmes are classified as
  - Training programmers
  - Institutional mechanisms for entrepreneurship development
  - Information dissemination.

6. *National Productivity Council (NPC)*

- The primary objective of NPC is to act as a catalyst in enhancing the productivity of all sectors of the economy including industry and agriculture.
- It is called in to take up sensitive assignments like manpower assessment, wage fixation and so on.
- It plays host to a number of conferences, seminars and workshops of APO and also nominates suitable persons for APO training courses abroad.

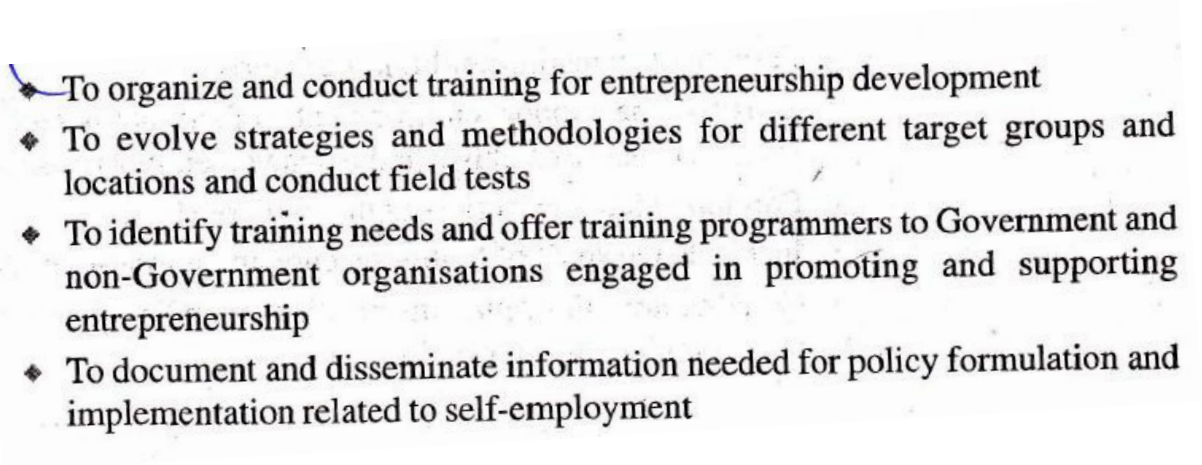
7. *National Institute for Small Industry Extension and Training (NISIET)*
    - It has been imparting training to entrepreneurs, managers and various development functionaries of state governments, financial institutions and other agencies.
    - It also acts as an important resource and information centre for small units and undertakes research and consultancy for small industry development.
    - It's the institution for the promotion, development and modernisation of the SME sector.
    - Carries out operations ranging from training , consultancy, research and education , to extension and information services.

8. National Institute for Entrepreneurship and Small Business Development (NIESBUD)

- It was established for coordinating, training and overseeing the activities of various institutions/agencies engaged in Entrepreneurship Development Particularly in the area of small industry and small business.

9. Indian Institute of Entrepreneurship (IIE)

- With an aim to undertake training, research and consultancy activities in the small industry sector focussing on entrepreneurship development was established.
  Objectives:



- To identify, design and conduct training programmers for existing entrepreneurs
- To prepare and publish literature related to entrepreneurship and industrial development
- To organize seminars, workshops and confer conferences for providing a forum for interaction and exchange of views by various agencies and entrepreneurs
- To conduct research for generating knowledge to accelerate the process of entrepreneurship development
- To act as a catalyst for development of self-employment/entrepreneurship. industry/business.

10. *Entrepreneurship Development Institute of India (EDII)*

- The objectives of the EDII are as follows:
  - Augment the supply of trained entrepreneurs through training.
  - Generate a multiplier effect on opportunities for self-employment
  - Improve managerial capabilities of small-scale industries
  - Contribute to the dispersal of business ownership and thus expand the social base of the Indian entrepreneurial class.
  - Contribute to the creation and dissemination of new knowledge and insight into entrepreneurial theory and practise through research.
  - Augment the supply of trainer ,motivators for entrepreneurship development
  - Participate in institution building efforts
  - Help the potential as well as existing entrepreneurs to establish and manage their enterprises.
  - Promote micro enterprises at the rural level.
  - Inculcate the spirit of 'entrepreneurship' amongst youth
  - Collaborate with similar organisations in India and other developing countries to accomplish the above objectives.
- The EDII has designed and successfully implemented several national and international training programmes and workshops for the academic community and for youth.
- EDII organises training programmes on Informal Micro Credit Delivery Systems (IMCDS) and management for strengthening the participating NGOs in the area of informal credit.
- It provides a platform to NGOs and bankers with the objective of facilitating the access of the poor to credit.
- EDII has supported the creation of centres for entrepreneurship development and institutes of entrepreneurship development in various states to achieve institutionalisation of ED activities.

4.12. State level institutions:

1. *Directorate of industries (DIs)*
    - Implements policies for the promotion and development of small-scale, cottage, medium and large-scale industries.
    - They oversee the activities of field offices, i.e. the District Industries Centres (DICs) at the district level.
2. *District Industries Centres (DICs)*
    - In order to extend the promotion of small-scale and cottage industries beyond big cities and state capitals to the district headquarters, the DIC programme was initiated.
    - They were established with the aim of generating greater employment opportunities especially in the rural and backward areas in the country.
    - These centres provide support facilities/concessions/services in rural areas and other small towns.
    - DIC extend services of the following nature.
        - Economic investigation of local resources
        - Supply of machinery and equipment
        - Provision of raw material;
        - Arrangement for credit facilities
        - Marketing
        - Quality inputs
        - Consultancy and extension services.

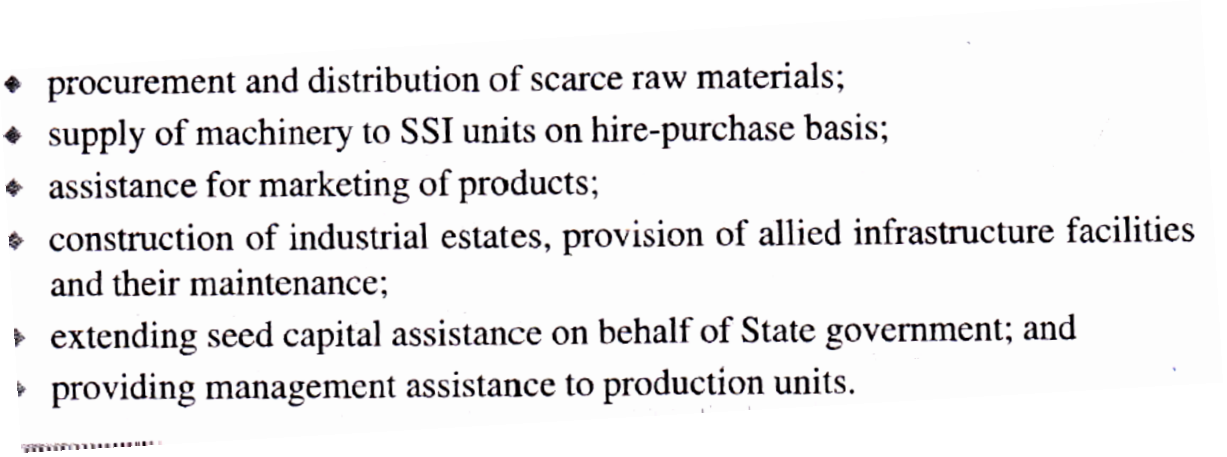
3. *State financial corporations (SFCs)*
    - They play an important role in the development of small and medium enterprises.
    - The main objectives are to finance and promote small & medium enterprises in their respective States for achieving balanced regional growth, catalyse investment, generate employment and widen the ownership base of industry.
    - SFCs operate a number of schemes of refinance of IDBI and SIDBI and also extend equity type assistance.
    - They have tailor-made schemes for artisans and special target groups such as SC/ST, women ex-servicemen,physically challenged and so on.
    - Under the single Window Scheme of SIDBI, SFCs have also been etending working capital along with term loans to mitigate the difficulties faced by SSIs in obtaining working capital limits on time.

4. *State industrial development/investment corporation (SIDCs/SIICs)*

- They act as catalysts for industrial development in their respective states.
- They play an important role by developing land providing industrial infrastructural facilities in the form of ready-made factory sheds and or developed plots together with facilities like roads, power etc.

- They extend assistance to the small-scale sector by way of term loans, subscription to equity and promotional services.

5. *State small industrial development corporations (SSIDCs)*
    - They cater to the needs of the small, tiny and village industries in their respective state/union territory.
    - Some of the important activities undertaken by SSIDCs include



- procurement and distribution of scarce raw materials;
- supply of machinery to SSI units on hire-purchase basis;
- assistance for marketing of products;
- construction of industrial estates, provision of allied infrastructure facilities and their maintenance;
- extending seed capital assistance on behalf of State government; and
- providing management assistance to production units.

Module 5

Project Management

5.1. Introduction:

- Industrialisation is widely recognised not only as one of the important means to usher in socio-economic transformations and achieving industrial self-sufficiency but also for the accelerated development of agriculture, transport and other sectors.
- It is a process which accelerates economic growth, effects structural changes in the economy and induces social change.
- It is brought about by well-trained entrepreneurs.

5.2. Choosing an idea:

- As an entrepreneur, when you are searching for an idea, don't pursue one idea at a time.
- Develop five to ten in parallel until one emerges so appropriate that it begins to dominate your thoughts and fantasies.
- Choosing an idea is quite difficult and the entrepreneur has to weigh objectively his intrinsic capabilities in finalising an idea.
- In the idea stage, suggestions for new products are obtained from all possible sources: customers, competitors, R&D, distributors and company employees.
- Frequently, one of the creative problem-solving techniques are used to develop marketable ideas.
- The suggested idea needs to be carefully screened to determine which are good enough to qualify for a more detailed investigation.
- Established objectives and defined growth areas provide a basis for developing these criteria.

5.3. Selection of product:

- At this stage, the entrepreneur is concerned with identifying a particular product that he hopes to market successfully at a reasonable profit.
- Therefore, the selection of the right product is essential for being successful.
- Various factors influence the entrepreneur in selecting the right product.
    i. Whether import restrictions or the items selected are banned items would considerably weigh favourably or otherwise on the selection of the products.
    ii. If the entrepreneur himself or his partners have gathered, substantial amount of experience in the manufacture and marketing of certain products, then the selection of such a product would be to their advantage.
    iii. The selection of the product will also be based upon the degree of profitability that generally rules in the market.

iv. Many concessions are available from the government for producing a product which serves as an import substitute or even essential item. Hence if a particular product enjoys a substantial amount of incentives, concessions, obviously the entrepreneur will select that item to enjoy these advantages.

v. Many products belong to the priority industries or small-scale sector also, certain products are listed by the government for purchasing exclusively from the small-scale sector.

vi. The market for the product also plays a significant role in the selection of a product.

vii. Certain products are permitted for production only if the licence is obtained from the appropriate authority while others belong to the de-licensed category.

viii. Many products enjoy specific advantages in regard to the scale of manufacture or carry locational advantages.

ix. If a product belongs to an ancillary unit and serves as a major component for the parent industry, it provides a ready demand, hence selection of this type entails easy marketability.

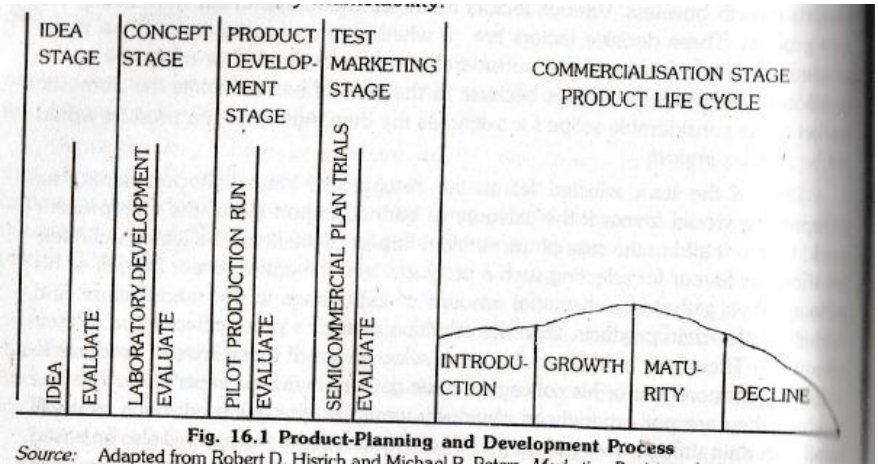


Fig. 16.1 Product-Planning and Development Process

Source: Adapted from Robert D. Hisrich and Michael P. Peters, ...

- Finally at this stage, the selection of product would also be weighed in favour or against depending upon whether or not the machinery and the raw materials required would be imported or not.
- Similarly the section would also be based upon the skill and unskilled labour position as well as the technical know-how which is available indigenously or would require foreign collaboration.

5.4. The adoption process:

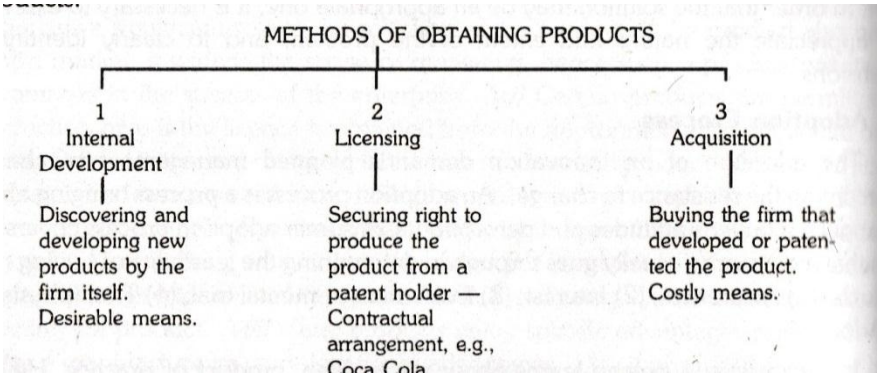
- An adoption process is a process bringing about a change in a buyer's attitudes and perception.
- Consumer adoption process covers the steps that a consumer usually goes through in determining the feasibility of buying new products :
  I. Awareness

II. Interest
III. Evaluation or mental trial
IV. Trial (physical)
V. Adoption

- ✓ **Awareness**: a person learns about a new idea, product or practise. He has general information about it, e.g. through advertisement. He has limited knowledge about special qualities, usefulness, performance etc regarding the innovation. He merely knows its existence.
- ✓ **Interest**: he now develops an interest in the innovation. He demands more detailed information about the new product, its utility, its performance and so on.
- ✓ **Evaluation:** the accumulated information and evidences are weighed by the person in order to assess the basic soundness or worth of the innovation. He tries to weight the value of the new product and the extent to which it is good for him. In a sense, he conducts mental trial.
- ✓ **Trial:** the person is now ready to put the idea into practise. Competent personal assistance is necessary to put the innovation to use.
- ✓ **Adoption**: he makes a decision to buy. The person now decides to adopt the new idea, product or practise for continued use.

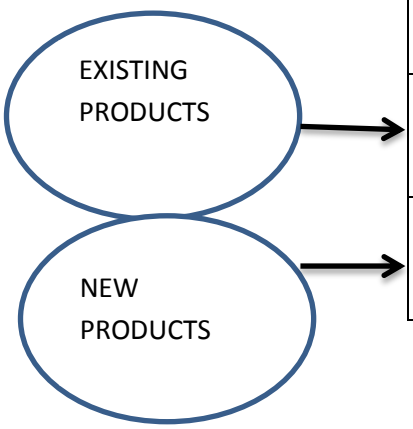
5.5. Product innovation:

- P. Drucker said "because it is its purpose to create a customer, any business enterprise must have only two basic functions: marketing and innovation".
- Innovation alone assures growth and survival while customer's orientation assures survival.
- The evolution of new products is a practical business function and it is described as a process product management.
- The process of product planning and development is always adopted for product innovation.



5.6. Product planning and development strategy:

- Marketers have four alternative ways of bringing about an increase in sales and profits:



EXISTING MARKETS	NEW MARKETS
MARKET PENETRATION A	MARKET DEVELOPMENT B
PRODUCT DEVELOPMENT C	DIVERSIFICATION D

Fig: four basic types of opportunities for sales growth

1. *Market penetration*: it involves the expansion of sales of the existing products in the existing markets by selling more to present customers or gaining new customers in the existing markets. The firm can market its present products to existing markets.
2. *Market development*: a present product is introduced to a new market or segment. It is the creation of new markets by discovering new applications for existing goods. The firm can offer its existing products to new markets.
3. *Product development*: it occurs when a firm introduces new products into a market in which it is well established. It is the introduction of new products in the present market e.g. new synthetic fibres for known textile products. The firm may decide to create new products for the existing market.
4. *Diversification:* it occurs when a firm seeks to enter a new market with a completely new product. Such a firm has neither market expertise nor product knowledge. The firm may adopt a daring strategy by creating new products for entirely new markets.

5.7.Product planning and development process:

There are 7 steps:

1. *New product ideas*: detailed features of a model product is visualised. Ideas may be contributed by scientist, professional designers etc.
2. *Idea screening*: all ideas and inventions are evaluated. Poor or bad ideas are dropped and through process of elimination, only the most promising and profitable ideas are picked up for further detailed investigation and research.
3. *Concept development and testing*: all ideas that survive the process of screening will be studied in detail. They will be developed into mature product concepts. Concept testing the company to choose the best among the alternative product concepts.

4. *Business analysis*: once the best product concept is picked up, it will be subjected to rigorous scrutiny to evaluate its market potential, capital investment, rate of return etc. business analysis is a combination of marketing research, cost benefit analysis and assessment of competition.
5. *Product development programme*: there are 3 steos in this stage when an idea is converted into a physical product.
   A) prototype development- giving a visual image of the product
   B) consumer testing of the model or prototype
   C) branding, packaging and labelling
   consumer testing of the model product will provide the ground for the final selection of the most promising model for mass production and mass distribution.
6. *Test marketing:* the entire product marketing programme is tried out for the first time in a small number of well selected test markets. Test marketing is necessary to find out the viability of a full marketing programme for national distribution.
7. *Commercialisation*: once the test marketing gives the green signal for product with or without expected modifications, the company can proceed to finalise all features of the product.

5.7.Meaning of projects:

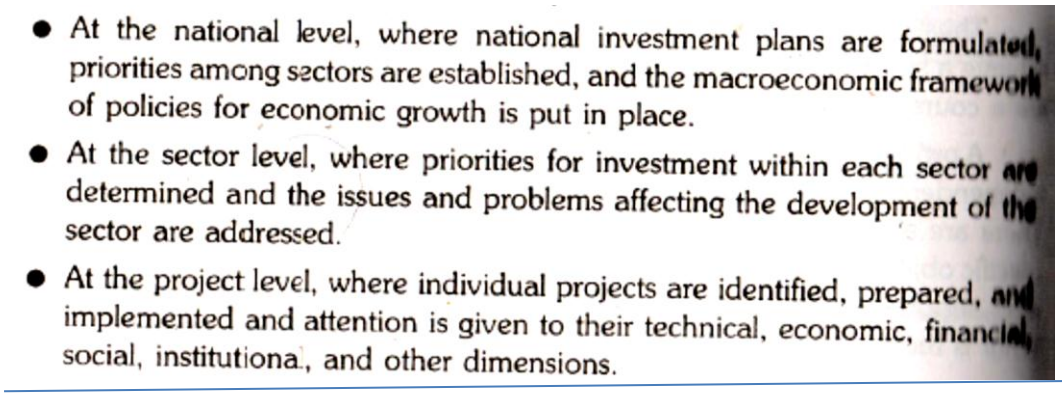
- It may be defined as a scientifically evolved work plan devised to achieve a specific objective with a specified period of time. The three basic attributes are a *course of action, specific objectives and definite time perspective.*
- A project is a productive activity which can be analysed, appraised and monitored independently.
- A project has specific objectives in terms of geographic location, specific starting and end point and to serve a target population by achieving good investment returns.

5.8.Characteristics of a project:

- They have 4 basic characteristics:
  1. Investment pattern
  2. Benefits or gains
  3. Time limit
  4. Location
- In short, project is an economic activity with well-defined objectives and having a specific beginning and end.
- It includes a correct consideration of alternatives, identification of key issues, broad participation, compactness and enforceability.
- A project can be considered as a proposal involving capital investment for the purpose of developing facilities to provide goods and services.
- A project will involve allocation and consumption of resources, on the one hand and generation of resources, goods or services, on the other.

5.9.Project levels:

Project work takes place at three levels:



- At the national level, where national investment plans are formulated, priorities among sectors are established, and the macroeconomic framework of policies for economic growth is put in place.
- At the sector level, where priorities for investment within each sector are determined and the issues and problems affecting the development of the sector are addressed.
- At the project level, where individual projects are identified, prepared, and implemented and attention is given to their technical, economic, financial, social, institutional, and other dimensions.

5.10.Project classification:

1. *Quantifiable and non-quantifiable projects*

- Quantifiable projects are those in which a plausible quantitative assessment of benefits can be made. ex. Industrial development, power generation, mineral development .
- Non- quantifiable projects are those where such an assessment is not possible.ex. Health, education, defence.

2. *Sectoral projects*

- A project under this classification may fall into any one of the following sectors:

a. Agriculture & allied sector
b. Irrigation and power sector
c. Industry and mining sector
d. Transport and communication sector
e. Social service sector
f. Miscellaneous

3. *Techno-economic projects*

- Three main groups of classification can be identified here:

a. *Factor intensity-oriented classification*: projects may be classified as capital-intensive or labour-intensive depending upon whether large-scale investment in plant and machinery or human resources is involved.
b. *Causation-oriented classification*: here projects are classified as demand-based or raw materials based projects- depending on the non-availability of certain goods or services and consequent demand for such goods or services or the availability of certain raw materials, skills or other inputs as the dominant reason for starting the project.
c. *Magnitude-oriented classification:* basis of classification is the size of the investment. Projects may thus be classified as large scale, medium-scale or small scale projects depending upon the total project investment.

4. *Financial institution classification:*
    a. New projects
    b. Expansion projects
    c. Modernisation projects
    d. Diversification projects

5. *Services projects*

- The services oriented projects are classified as :
    a. Welfare projects
    b. Service project
    c. Research and development projects
    d. Educational projects

5.11. Aspects of a project:

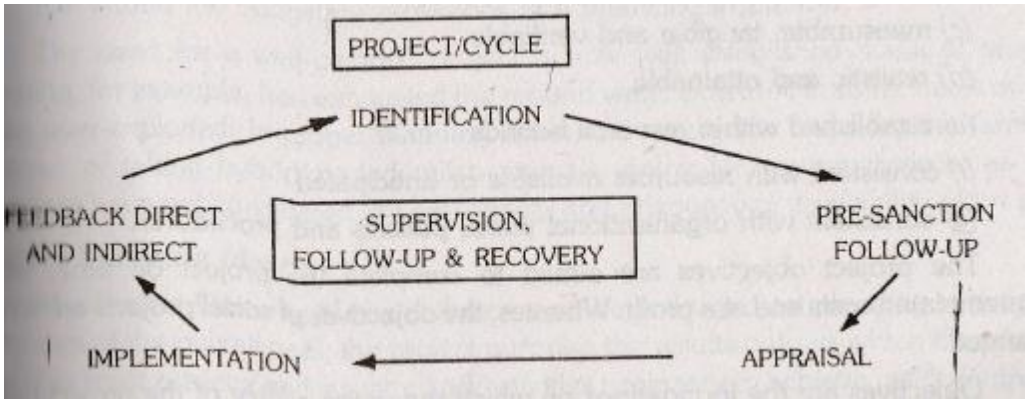
- There are two aspects of a project.
- First, a preliminary aspect of analysing the product, its marketing, technical, financial and economic aspects.
- Second, the feasibility aspects. It contains adequate information for decision making and implementation.

Aspects	Concerned with
	I. Preliminary
Product/service	• choice if a product/service • technical characteristics of the product/service • uses of the product/service
Marketing	• Consumer preference • Nature of competition • Potential aggregate demand • Likely share of the project
Technical	• Location • Scale of operation • Manufacturing process • Plant and machinery • Plant layout • Work schedule
Financial	• Outlay on fixed assets • Current assets • Working capital • Short and long term finance • Bills etc

Economic	• Utility to society • Employment generation • Ancillary development • Scope for area development • Social benefits
	II. Feasibility
Financial viability	• Costs and benfits • Risk characteristics • Viability • Internal rate of returns(IRR)
Profitability	• Revenues, earning • Costs • Profits • Break-even level of operations
Financial projection	• Proforma balance sheet • Sources and use of funds
Socio-economic desirability	• Social goals • Desirability of the project from the larger social angle • Maximum returns

5.12.The project cycle:

- The project work consists of several distinct stahes commonly referred to as the project cycle.
- The principal stages of the cycle are the identification of a project, its design, preparation and appraisal, its implementation and its evaluation.
- The project cycle is illustrated in the diagram



i. Project identification :

- The project cycle begins with the identification of project ideas to achieve important development objectives.

ii. Project preparation:

- At the next stage, a feasibility study should be taken in its principal dimensions- technical, economic, financial, social and so forth to establish the justification of the project.

iii. Project implementation:

- All project identification and preparation work is directed toward facilitating project implementation and helping to ensure its success. Implementation is a critical stage of project work.

iv. Ex-post Evaluation:

- The project cycle doesn't end when implementation is completed and the project goes into operation.
- Ex –post evaluation should provide a comprehensive and detailed review of the elements of success and failure of the project for enhancing the development impact of project work.

5.13. Project features:

a. Simplicity and clarity
b. Availability of attractive technology to promote the project
c. Integration of basic production services, especially those of input supply, credit, marketing and extension.
d. Compatability of the project within the existing administrative mix.

5.14. Project management:

- It is a specialised branch of management capable of differentiation from others based on a variety of factors which include the organisation structure, process of planning and control, human relation etc.
- It is two-fold: financial and administrative. It is therefore imperative to understand these two aspects.

5.15. Phases of project management:

The process of project management may be divided into 6 broad phases- identification, formulation, appraisal, selection, implementation and management of projects.

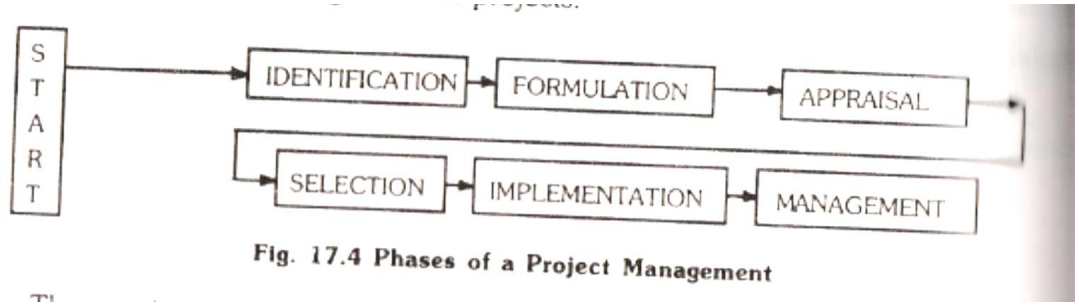


Fig. 17.4 Phases of a Project Management

Requirements:

PHASES OF A PROJECT

Phase	*Requirements*
1. Identification	Selection of a project after a careful scanning of the environment of investment opportunity and its likely return.
2. Formulation	Translation of the idea into a concrete project with scrutiny of its important preliminary aspects. Preparation of feasibility reports.
3. Appraisal	Searching scrutiny, analysis and evaluation of market, technical, financial and economic variables. Assessing the profitability, return on investment and break-even points.
4. Selection	Rational choice of a project in the light of objectives and inherent constraints.
5. Implementation	Expenditious completion within the allocated resources.
6. Management	Judicious operation of a project/enterprise with objectives like maximisation of netpresent value, maximisation of return, and increase in the rate of return at low risk.

5.16.Project management processes:

The common project management processes can be categorised into the following:

Operational management processes: these activities are seen as on-going activities with neither a clear beginning nor an expected end.

- Planning: identifying objectives and devising a workable scheme to accomplish them.
- Executing: co-ordinating people and other resources to carry out the plan.
- Controlling: ensuring that the objectives are met by measuring progress and taking corrective action when necessary.

Additional project management processes: projects are temporary in nature , they have both an identifiable starting point and an emphasis on timely future termination. The additional processes are:

- Initiating: recognising that a project should begin and committing to do so.
- Closing: formalising acceptance of the project and bringing it to an orderly end.

Technical processes:

- These vary by application areas and are to be identified and handled by application experts.
- These processes are not discrete and in an actual project there will be many overlaps.

- Basic process interactions occur within each phase such that closing one phase provides inputs for initiating the next.
- Thus the planning process must not only provide work done in the current phase for successful completion, but must also provide some preliminary description of or to be done in later phases.

5.17.Project indentification: Feasibility Report

- Before starting a small-scale industry, it is mandatory for entrepreneurs to consult the Director of Industries Service Institute (SISI) located in one's state.
- The SISI guides entrepreneurs as to the type of industry to start, where to start and how to start it.
- The SSI help them odd select the various items of manufacture which have scope for development in different areas.
- It suggests the lines on which project reports for the proposed units should be prepared for the consideration of various financial institutions with a view to securing financial assistance.
- Technical guidance in the selection of raw materials and type of machinery is also provided.
- Information on various incentives is also given by SSI.

5.18.Project Feasibility analysis:

- A project feasibility analysis includes market analysis, technical analysis, financial analysis and social profitability analysis.
- Feasibility analysis goal is to identify the existing strengths and weakness of the project.

Market analysis:

- A market analysis is a method of screening project ideas as well as means of evaluating a project's feasibility in terms of the market.
- A market analysis should cover the following areas:
  i. A brief market description like the market area, methods of transportation, existing rates of transport, channels of distribution and general trade practises.
  ii. An analysis of past and present demand, determination of quantity value of consumption and identification of the major consumers of the product.
  iii. An analysis of past and present supply as well as information like selling prices, quality and marketing practises of competitors.

Technical analysis:

- It establishes whether the project is technically feasible or not , and whether it offers basis for the estimation of costs.
- It provides an opportunity for a consideration of the effect of various technical alternatives on employment, ecology etc.
- It should incorporate

i. product description including specification relating to its physical, mechanical and chemical properties as well as uses of the product.
ii. A description of the selected manufacturing process with flow charts and presenting alternatives.
iii. Plant size and production schedule which includes the expected volume for a given time period on the basis of start-up and technical factors.
iv. Selection of machinery and equipment including specifications, equipment to be purchased and its origin, quotations from suppliers, delivery dates, terms of payment and a comparative analysis of alternatives in terms of cost, reliability performance and spare parts availability.
v. Identification of plant's location and as assessment of its desirability in terms of its distance from raw material sources and markets.
vi. A design of the plant layout and an estimate of the cost of the proposed buildings and land improvements.
vii. A study of the availability of raw materials and utilities including a description of physical and chemical properties, quantities needed, current and prospective cost, terms of payment, location of sources of supply and continuity of supply.

Financial analysis:

- The emphasis is on the preparation of financial statements, so that the project may be evaluated in terms of the different measures of commercial profitability followed by the magnitude of financing which requires the assembly of the market and also technical cost.
- It should include
  i. for projects that involve new companies, statements of total project cost, initial capital requirements and cash flows relative to the project schedule. For all projects, financial projections for future time periods, including income statements, cash flows and balance sheets.
  ii. For all projects, supporting schedules for financial projection , stating the assumption made as to the collection period of sales, inventory levels, payment period of purchases and expenses and the element of production cost, selling, administrative and financial expenses.
  iii. For all projects, a financial analysis showing return on investments and price analysis.
  iv. For all projects, if necessary, a sensitivity analysis to identify items which have a substantial impact on profitability or possibly a risk analysis.

5.19. Project formulation: Meaning

- It is defined as taking a first a look carefully and critically at a project idea by an entrepreneur to build up an all-round beneficial to project after carefully weighing its various components.

- It is assessment of the feasibility of a proposal or a scheme of a borrower based on the examination of factors like the capacity of the unit or farm to produce, the repaying capacity generated by the funds asked for, the assets and so on.

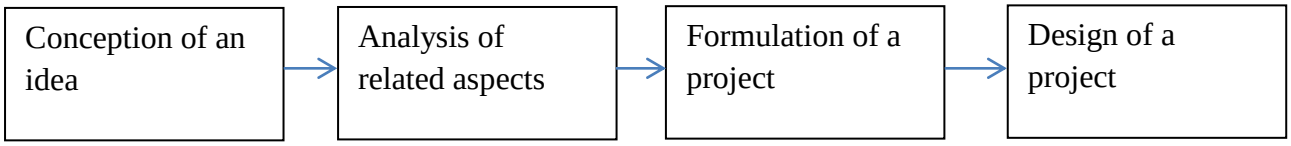


Fig:Phases of project formulation

5.20. Steps in project formulation:

- Objectives of the project should be defined as precisely as possible.
- Objectives can be categorised as general objectives and operational objectives.
- General objective states in broad terms the achievements expected whereas an operational objective specifies results expected from the implementation of the project or scheme.
- The next strategy concerns with the location and size of the project.
- Examination of availability of resources and the infrastructural facilities decides the location of the project.

5.21. Sequential stages of project formulation:

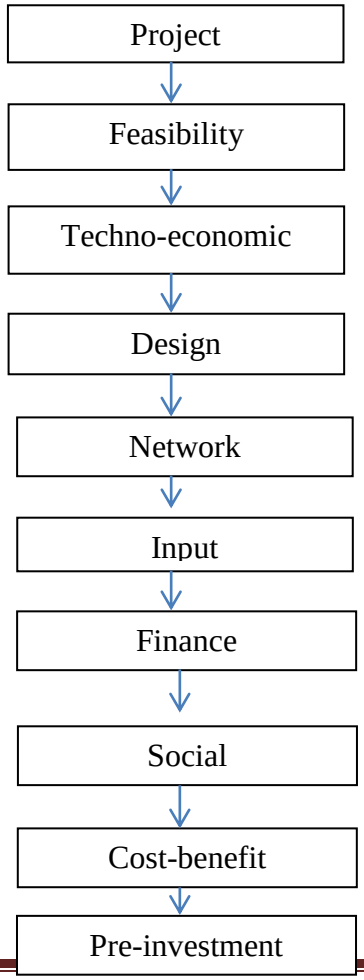


Fig: sequential stages of project formulation

They are:

1. Feasibility analysis
2. Techno-economic analysis
3. Project design and network analysis
4. Input analysis
5. Financial analysis
6. Social cost-benefit analysis
7. Pre-investment analysis

Feasibility analysis: at this stage, the project idea is examined from the point of view of whether to go in for a detailed investment proposal or not. If the idea is feasible, we proceed to the second step, if not feasible, we abandon the idea and if sufficient data are not available, more efforts to collect the required data is done.

Techno-economic analysis: in this step, estimation of project demand potential and choice of optimal technology is made. as the project may produce goods or services, it is imperative to know the market for such goods or services produced.

Project design and network analysis: this step defines individual activities which constitute the project and their inter-relationship with each other. The sequence of events of the project is presented.

Input analysis: the step assesses the input requirements during the construction of the project and also during the operation of the project.

Financial analysis: this stage mainly involves estimating the project costs, estimating its operating costs and fund requirements. Financial analysis also helps in comparing various project proposals on a common scale thereby aiding the decision-maker.

Cost-benefit analysis: the overall worth of a project is the main consideration here. While financial analysis will go to justify a project from the profitability point of view, cost-benefit analysis will consider the project from the national viability point of view.

Pre-investment analysis: the project proposal gets a formal and final shape at this stage. All the results obtained in the above steps are consolidated and various conclusions arrived at to present a clear picture.

5.22. Project evaluation:

- It is necessary to consider the total impact of the project on the economy of the nation.
- To evaluate the project, the social cost-benefit analysis is used.
- Social cost-benefit analysis is not just an investment proposition.
- It is taken into account as the existing equilibrium of the economy.

- All costs and benefits can be classified into 3 categories- *primary costs and benefits, secondary costs and benefits and tertiary costs and benefits.*
- Primary costs and benefits is a category which will be exclusively incurred and which will accrue to the project-implementing body respectively.
- Secondary costs and benefits accrue to parties other than the project-implementing body.

Project Design and Network Analysis

5.24.Introduction:

- The first and foremost aspect of a project is the project design.
- It defines the individual activities which go into the corpus of the project and their interrelationship with each other.
- Project design enables to identify the flow of event which must take place for the successful implementation of the project.
- Network techniques help the management of an organisation in performing these functions efficiently and effectively.

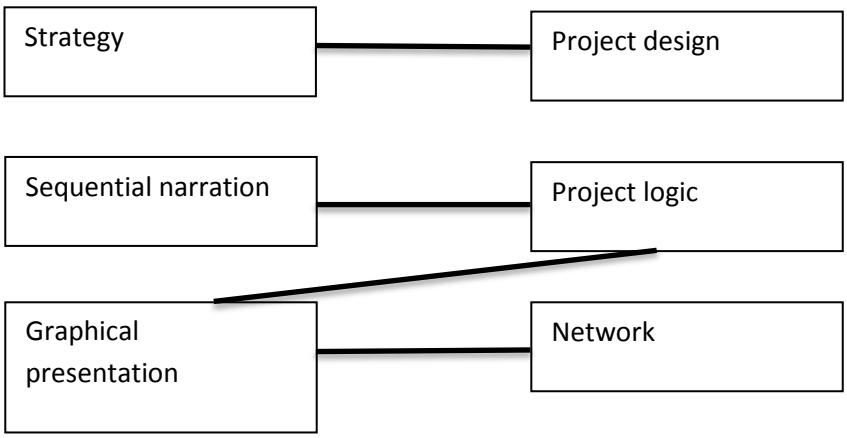


Fig: relation between project design and network

5.25.Importance of network analysis:

- The network analysis has the potential of unfolding unknown snags involved in project estimates which when detected, may provide management not only to improve on the ongoing project estimates but also to take serious lesson for future application.

5.26.Origin of PERT and CPM:

- PERT and CPM techniques were developed in the US independently while CPM came into focus about 1957 as an offshoot of collaboration between Du Pont and Remington Rand.
- CPM emphasizes on the activities themselves, the cost associated with completion of each activity and optimum plan for the project as a whole.

- PERT emphasizes on the events rather than activities leading to events.
- PERT was applied to help solve problems of producing the Polaris Missile System to a very tight schedule.
- Application of PERT has been based on probability estimates covering those pessimistic, those optimistic and those considered normal.

5.27.Network :

- A network comprises a set of exponents connected with each other in a sequential relationship with each step till the completion of a project.
- Network analysis is a system which plans both large and small projects by analysing the project activities.
- Projects are broken down into simple activities which are then arranged in a logical sequence.
- It is also decided as to which task will be performed simultaneously and which are others sequentially.
- A network diagram is shown below.

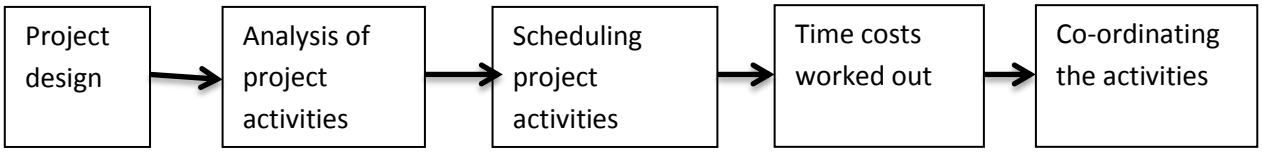


Fig: network design

5.28.Network techniques

- In a project, there may be two categories of jobs or activities- which can be taken up concurrently and which can be taken up only after completing some other activities- either completely or partially.
- The scheduling of construction and identification of potential causes of delay form an important part of a project appraisal.
- Timing and sequencing of various activities involved in project implantation are reviewed, keeping in view the conditions regarding the availability of construction materials etc.
- Several techniques of project scheduling and control such as Bar Charts, Programme Evaluation And Review Techniques (PERT) , Critical Path Method (CPM) etc are used.

5.29. Need for the network techniques:

- Network analysis helps in designing, planning, coordinating, controlling and decision –making in order to accomplish the project economically in the minimum available time with the limited available resources.

5.30.Programme Evaluation And Review Techniques (PERT)

- It is one of the management techniques which is considerably more useful to some managers than to others.
- It is of the tested tools of management in industrially-developed countries.
- It is based on the method of minimising production delays, interruptions and conflicts, of coordinating and synchronising the various parts of the overall job and of expediting the completion of projects towards scheduling and budgeting resources so as to accomplish a predetermined job.
- PERT is concerned with two concepts:
  1. **Events**: an event is a specific accomplishment that occurs at a recognisable point of time and does not call for either the need of time or resources.
  2. **Activities:** an activity is the work required to complete a specific event.
- In PERT, the activities, the events, require time, money and resources for its completion.

Steps in PERT:

1. Establishment of objectives : There will be a major objectives to be accomplished , linked by supporting objectives. When these are identified, they must be linked together so as to enable to planner to see the project in its true perspective and also see the relationships between and among all the steps.
2. Schedule work breakdown.
3. Both technical and managerial persons should begin to work together.
4. Each person who participates in the application of PERT to the control of the project should have some basic familiarity with general nature work and with the ultimate objective desired.

- PERT deals with the problem of uncertain activity time by the application of statistical analysis to the determination of estimated time for each activity of the project .
- It defines and coordinates what must be done to successfully accomplish the objectives of a project on time.
- It aids the decision maker but does not make decisions for him.
- In PERT, time is basic measure. It is usually expressed in calendar weeks the project should be completed within the stipulated time.
- Three time estimates usually employed under this technique are
  - ✓ The optimistic time : it's the shortest time possible if everything goes smoothly with no complications.
  - ✓ The pessimistic time: it is the longest time conceivable.
  - ✓ The most likely time: it would be the best estimate of what normally would occur.

5.31.Advantages of PERT:

- This technique gives the management the ability to plan the best possible use of resources to achieve a given goal within the overall time and cost limitations.
- It helps management to handle the uncertainties involved in programmes.
- It presses for the right action, at the right point and at that right time in the organisation.

5.**32.Limitations of PERT:**

- Basic difficulty in the way of time estimates for the completion of activities because activities are of non-repetitive type.
- This techniques does not consider resources required at various stages of the project.
- Use of this technique for active control of a project requires frequent updating and revising the PERT calculations and this is costly.

5.32. Critical Path Method (CPM)

- Next to PERT, CPM for planning and controlling projects has enjoyed the widest use among all the systems that follow networking principles.
- It has two time-cost estimates for each activity (one time-cost estimate for normal situation and other estimate for the crash situation) but does not incorporate any statistical analysis in determining such time estimates.
- CPM operates on the assumption that there is a precise known time that each activity in the project will take.

5.33.Advantages of CPM:

- It helps in ascertaining time schedule
- With its aid, control by management is made easy
- It makes better and detailed planning possible
- It provides a standard method for communicating project plans, schedules, time and cost performance.
- It identifies the most critical elements and thus more attention can be paid to these activities.

5.34. Limitations of CPM:

- It fails to incorporate statistical analysis in determining the time estimates.
- It operates on the assumption that there is a precise known time that each activity in the project will take but this may not be true in actual life.
- It is difficult to use CPM since one must repeat the entire evaluation of the project each time when changes are introduced into the network.

5.35.Differences between PERT and CPM

PERT	CPM
1. The origin is military (naval)	Origin is industrial
2. It is an event-oriented approach	It is an activity-oriented system
3. There is allowance for uncertainty	No such allowance
4. It has three time estimates	There is only one single estimate of time and the emphasis in on cost
5. It is probabilistic model with uncertainty in activity duration	It is a deterministic model with well-known activity time based upon past experience
6. It does not demarcate between critical and non-critical activities	It marks critical activities
7. It is especially suitable when high precision is required in time estimates e.g. defence projects	It is suitable when reasonable precision is required e.g. civil construction projects etc
8. Time is averaged	No averaging of time is involved
9. The concept of 'crashing' is not applied	Concept of crashing is applied
10. It lays emphasis on reduction of the execution time of the project without too much cost implications. It is time based.	10.It lays emphasis on reduction of the completion with least increase in project cost. It is cost based.