

IV. Industrial potentialities and plans for future development

A systematic survey of the industrial potentialities of the Territory was carried out for the first time in 1958 by the Small Industries Service Institute, Madras, at the request of the Pondicherry Administration. The findings of the survey were submitted in the form of a report to the Government on 10 March 1959, i.e., at the fag end of the third year of the Second Five Year Plan.

The analysis of resources, markets and the industrial climate showed that there were good prospects for light engineering, brick making industries and moderately good prospects for soap, radio components, domestic utensils, coir products, mat weaving and wood based industries in the Territory.

The survey revealed that Pondicherry had many important locational advantages for industrialisation and referred to the availability of capital and a network of good marketing channels extending throughout the country. The survey, however, pointed out the need to simplify the procedural formalities governing the regulation of new industries and to declare certain localities as 'industrial areas' where industries could be started without much procedural formalities. The need to pass legislation for providing financial assistance to industries was also emphasised. 101

According to the survey new industries which offered scope were :

1. Cycles, cycle parts and accessories.
2. Agricultural implements.
3. Electrical accessories.
4. Electric motors and
5. Starch and sago manufacture.

In 1964 the National Council for Applied Economic Research was requested to conduct a comprehensive techno-economic survey of the Territory to identify all the resources available for economic development of the Territory.

In the normal course its recommendations should have guided the formulation of the Fourth Plan schemes under the various sectors. But in the context of the three Annual Plans covering the period from 1966 to 1969 the adoption of the recommendation of the survey and their application was limited to the scope of Annual Plans.

At the request of the Administration, a survey to study the scope for setting up salt and salt based industries in the Territory was conducted in December 1971 by the Salt Department, Government of India. All the four regions were inspected and areas suitable for salt cultivation were identified. The report which was submitted in January 1972, discussed the economic feasibility of recovery of marine chemicals like magnesium chloride, basic magnesium carbonate, potassium chloride and boromine from bitterns and explained various schemes for the production of such chemicals in the Territory. The survey drew pointed attention to the natural advantages of Yanam for the development of salt industry.¹⁰²

In September 1971 the entire Union Territory was declared as an industrially backward area. As a corollary to it, new industries became eligible for further incentives. This opened up better prospects for further industrialisation of the Territory. The Development Commissioner for Small Industries also suggested the need for a fresh survey of the industrial potentialities of the Territory. Accordingly a survey was conducted by the Small Industries Survey Institute, Madras, in the year 1972. The findings of the survey were expected to determine the scope and establishment of industries in the Territory during the Fifth Plan period.

Yet another survey of the Territory was sponsored jointly by the Industrial Development Bank of India, the Industrial Credit and Investment Corporation of India, the Reserve Bank of India and the Agricultural Finance Corporation to identify the Territory's industrial potential and to indicate projects which could possibly be undertaken so as to facilitate the formulation of specific industrial projects for assistance by the financial institutions. The survey pointed out that institutional assistance to industries in the Territory was very insignificant. The survey team, therefore, felt that such assistance could be stepped up only by identifying viable projects.

According to the survey, the economy of the Territory can be given a boost only by the establishment of some new industries. In the words of the team, "these are a cement plant, a paper mill, alcohol based chemical and pharmaceutical industries, oil extraction (from fish), plants and ancillary industries to the large-scale industries within the Territory as well as in the neighbouring states." The team also felt that there was room for expanding the existing cotton textiles and sugar industries and the Government distillery. According to the team's report, tourist traffic to Pondicherry can be increased by the establishment of an airport at Pondicherry and the construction of first class hotels. 'Declaration of Pondicherry port as a free port area', the team said, 'will greatly increase the economic activity in this area.'¹⁰³

Although the Territory has no major impediments to pass through to reach a break-through in industrialisation, an awareness of the handicaps will add to the present study for a better understanding of the realities facing the economy.

The Territory is provided with few resources capable of exploitation for industrial purposes. Most of the raw materials required for running the industries have to come from outside the Territory. Hence the question of procurement of scarce raw material and their equitable distribution commensurate with the capacity for utilisation assumes great importance.

The small size of the population with a limited working force does not provide the necessary manpower required for large-scale industrial development unless technological alternatives are worked out. The Territory does not also generate power to meet its requirements. In fact its entire requirements are met from the neighbouring states. Another pertinent fact is that industries in small territories will grow or decline in the measure in which they are able to market the products outside the Territory. This has to be viewed in the context of the hurdles that lie in inter-state movement and sales of goods and the divergent taxation policies pursued by the states.

This study of the industrial potentialities of the Territory is based on :

1. Agricultural resources,
2. Marine resources,
3. Livestock resources,
4. Mineral resources,
5. The demand for products,
6. The availability of cotton waste and
7. The requirements of public sector projects.

Potential for agro-based industries :

Agriculture is the most important economic activity in the Territory, although agricultural production alone is not so abundant as to induce a very high standard of industrial development. Rice, oil-seeds, sugar-cane and coconuts are the important agricultural products of the Territory.

Rice milling : The production of rice was expected to cross 60,000 tonnes by 1975-76. The 1965 survey found that except for a small quantity exported outside the Territory in husk, the entire production of paddy was milled within the Territory and pointed out that there was sufficient justification for setting up two modern rice mills, one in Pondicherry and another in Karaikal, each with an installed capacity to dehusk annually 20,000 tonnes of paddy.¹⁰⁴

Oil milling : Oil-seeds production was expected to double by 1975-76.* In 1961 there were seven oil mills (registered) and 60 oil *ghanis* located mostly in Pondicherry. Oil milling capacity was expected to reach 7,000 tonnes before 1975-76 providing further scope for the expansion of oil milling industry in the Territory.¹⁰⁵

Solvent extraction of oil-cake and rice bran : The availability of oil-cakes and rice bran from the oil and rice mills provide scope for solvent extraction of additional quantities of oil. A plant with a daily capacity to process 25 tonnes of oil-cake and rice bran is said to be feasible for the Territory.¹⁰⁶

Activated carbon and dessicated coconuts : Coconut shells could be utilised for the manufacture of activated carbon and the kernels for producing dessicated coconuts in the Territory.¹⁰⁷

Coir and coir products : The 1965 survey indicated that with increased availability of coconut husks the coir processing industry can be expanded both in Pondicherry and Karaikal.¹⁰⁸

* During 1961-62, the estimated production stood at 4,447 tonnes of ground-nut and 254 tonnes of gingili.

Sugar : The only sugar mill in the Territory had a daily crushing capacity of 800 to 1,000 tonnes of sugar-cane in 1963-64*. The performance of the mill during 1960-64 is given below :—

	1960-61	1961-62	1962-63	1963-64
Cane crushed (in tonnes)	2,73,000	1,14,000	1,12,000	1,99,000
Sugar production (in tonnes)	19,572	10,269	9,744	5,462
Sugar recovery (in percentage)	7.19	8.98	8.66	7.66
Duration of the crushing season (in days)	304	164	128	218

In 1972 the crushing capacity was 1,500 tonnes per day on a single shift basis. The annual production of sugar-cane was expected to reach 4,00,000 tonnes by 1975-76. The 1965 survey pointed out that the increase in sugar-cane production should provide scope for increasing the daily crushing capacity of the existing mill from 1,500 tonnes to 2,000 tonnes.¹⁰⁹ In the alternative the setting up of another sugar mill in the Territory could also be considered.** This in turn would provide scope for developing a sugar complex in the Territory.

Sugar-cane wax : About 6,000 tonnes of filter press mud which is available in the form of waste is sold to farmers as manure. There is scope for the manufacture of sugar-cane wax through solvent extraction of the press mud.

Mineral wool : The 1972 survey also pointed out that the residue from solvent extraction when suitably blended with clay and sand, can be used in the manufacture of mineral wool useful for hot and cold insulation. The report, however, called for ensuring the market for the products before developing the industry.¹¹⁰

* There were also a few sugar-cane crushers, both power and bullock driven. Of the 14 crushers in 1961 three were power-driven crushers.

** The setting up of a sugar mill in the co-operative sector in the Territory was under active consideration.

Ethyl alcohol : Molasses is the chief by-product obtained in the manufacture of sugar. The available molasses-about 8,000 tonnes per annum-from the New Horizon Sugar Mill is consumed by the Government distillery at Pondicherry. Molasses contains a good percentage of sugar which can be converted into other desired ethyl alcohol products by fermentation.

Paper : In the absence of any kind of forest resources, bagasse and waste paper are considered good enough for starting a paper factory in the Territory. A licence was also issued for a paper factory with an annual capacity of 7,500 tonnes. The factory did not, however, come through. The Techno-Economic Survey also recommended the setting up of a paper plant with an annual capacity of 18,000 tonnes on the basis of its assessment that about 1,20,000 tonnes of bagasse would be available. This was subsequently found impractical. The entire quantity of bagasse is used as fuel by the sugar factory itself as the boilers of the mill are so designed that the unit cannot use furnace oil instead. The Industrial Potential Survey (1972) pointed out that there was little scope for the utilisation of bagasse for the manufacture of paper or strawboards in the Territory. 111

Strawboard : In all about 50,000 tonnes of paddy straw are said to be available in the Territory for industrial utilisation. The annual demand for strawboard in the Union Territory of Pondicherry and Tamil Nadu being placed at about 6,000 tonnes and production in the two Tamil Nadu units being inadequate to meet the requirements, the 1972 survey found that there was scope for an additional unit which could be set up in the Territory. It was considered feasible either to assist the existing unit in Karaikal to commence production or to set up a new mechanised unit in the Territory. 112

Processing of ragi malt food : Ragi is the second important food crop of the Territory with an annual yield of about 5,000 tonnes. The 1972 survey indicated that as weaker sections of the community switch over to the consumption of rice, ragi would increasingly become available for the manufacture of ragi malt food. This, according to the survey, would facilitate the setting up of a unit with a production capacity of 500 kg. per day in the Territory. 113.

Balanced poultry feed : With the implementation of the plan schemes for poultry development in the Territory, the demand for poultry feed is bound to increase. It would then be feasible to start one unit for the manufacture of balanced and synthetic poultry feed as most of the ingredients for this item viz, bran, ground-nut cake, molasses, limestone, etc., are available locally. 114

Starch and sago : Ariyankuppam and Bahur are considered suitable for setting up starch and sago manufacturing units as tapioca can be grown in those areas.

Marine based industries :

Fisheries are relatively well developed in the Territory. Nevertheless, the 1972 survey pointed out that a comprehensive survey of the potentialities of deep sea-fishing has not been conducted and emphasised the need for conducting such a survey in the Territory.¹¹⁵

A substantial portion of the fish caught in the Territory (9093 tonnes valued at Rs. 182.00 lakhs) is at present consumed locally and the rest is sent to Tamil Nadu and Kerala. The de-shelled shrimps are iced and transported to Madras and Cochin for processing to be eventually exported to foreign countries.

There is said to be good scope for freezing and canning of fish in the Territory itself, provided berthing and landing facilities are improved in all the regions.

Freezing and canning of fish and prawns : Important varieties of fish suitable for freezing and canning like sardines, pomfrets, mackerels, seer fish, tunnies and prawns are available in large quantities with great potential for commercial exploitation. According to the 1972 survey at least a few units for freezing and canning of fish and prawns can be set up in the Territory.

Fish meal : Fish wastes made available from the processing industries would in turn offer scope for the production of fish meal to be used as organic manure. The 1972 survey indicated that this unit could preferably be located near the fish canning and freezing unit if it should materialise.¹¹⁶

Chanks : The lease of right of Pondicherry chank fisheries bring an annual income of about Rs. 19,000 approximately and that of Karaikal Rs. 10,000. The chanks are sold to merchants who take them to Ramanathapuram District for further processing and disposal.

The chanks in Pondicherry and Karaikal are also utilised for making shell grips, bangles, rings, decorative table lamps, etc. There is scope for starting a unit in the Territory for manufacturing such articles for which there is a good market.¹¹⁷

Mattee : There are two mattee shell fisheries, one at Uppanar and the other at Chunnambu Ar. The mattee shell fishery of Chunnambu Ar was auctioned for Rs. 8,951 per annum for three years (1968-1970). The mattee shell fishery of Uppanar was not auctioned during the year 1969-70 due to the poor fishery on account of water pollution caused by drought.¹¹⁸

Salt : The survey conducted by the Salt Department, Government of India, in 1971, identified three sites in Pondicherry region, six sites in Karaikal region and two composite sites in Yanam for the development of salt industry in the Territory. The details of the sites are given below :

				Area		Production capacity		
				H.	A.	C.	(in tonnes)	
Pondicherry								
1.	Olandai (Pondicherry Commune)	..	..	20	40	50	2,000	
2.	Nallavadu (Ariankuppam Commune)	..	..	28	36	62	1,750	
3.	Uchchimedu (Bahur Commune)	..	..	18	68	40	1,250	
Karaikal								
1.	Oduturai (Niravi Commune)	..	..	..	47	08	24	3,000
2.	Akkaravattam (Niravi Commune)	..	..	..	44	34	49	2,800
3.	Vanjiyur East (T.R. Pattinam Commune)	..	..	..	14	88	57	1,000
4.	Vanjiyur West (T.R. Pattinam Commune)	..	..	..	32	02	67	2,200
5.	Keezhaveli (Karaikal Commune)	..	..	..	23	10	00	1,500
6.	Ammankovilpathu (Karaikal Commune)	..	..	..	24	97	60	1,500

Yanam	Area			Production capacity (in tonnes)
	H.	A.	C.	
1. Isukatippa islands No. 1	..	..	..	213 50 00
No. 2	..	..	..	143 50 00
No. 3	..	..	..	42 70 00
No. 4	..	..	..	6 22 00
No. 5	..	..	..	32 48 00
Total	..	..	..	438 40 00
2. Adivipolam	..	..	..	150 00 00
				(approx.)

According to this survey, salt production can be increased in the Union Territory from the present 200 tonnes to 60,000 tonnes by 1976.¹¹⁹

The report, however, called for the industry's inclusion in the list of recognised industries eligible for financial assistance and recommended that the lands should be leased out at least for a minimum period of 20 years. The survey further stressed the need for connecting the sites with good roads and to ensure prompt supply of power.¹²⁰

Industries based on livestock resources:

The livestock population of the Territory as revealed by the Livestock Census 1966 was 1,23,440 of which 78,227 were found in Pondicherry region, 40,303 in Karaikal region, 2,491 in Mahe region and 2,419 in Yanam region.¹²¹ The number of poultry as per the same census was 1,07,139 of which 60,969 were found in Pondicherry region, 37,173 in Karaikal region, 4,241 in Mahe region and 4,756 in Yanam region.

Tannery: About 10,000 hides and 20,000 skins are available per annum from the slaughtered and fallen animals. They are being taken to the neighbouring state of Tamil Nadu for processing. There is said to be enough scope for setting up a small tannery for utilising the available hides and skins. Livestock products like milk, milk products and meat are locally consumed.

Poultry dressing plant/egg powder : According to the 1972 survey the total poultry population in and around Pondicherry region was placed at about 10,000 improved birds. As marketing facilities for the culled birds posed a problem, the survey suggested that it would be feasible to set up a poultry dressing plant in Pondicherry with a capacity of 30 birds per day. With the various schemes envisaged for the development of poultry and the production of eggs, the survey pointed out that there was also scope for setting up a unit for the manufacture of egg powder in the Territory.¹²²

Mineral based industries:

According to the Techno-Economic Survey of 1965, the limestone deposits were the only mineral reserves "based on which industrial development can be envisaged" in the Territory in the near future.¹²³ (For details of reserves, etc. vide Chapter—I under 'Mineral Wealth').

Lime burning : Lime burning is carried out on a limited scale in the Territory for meeting the requirements of house construction and white washing. The sugar manufacturing process also involves the use of lime for the clarification of cane juice. It is also used in the manufacture of paper for recausticizing the cooking liquor with a view to recovering and reusing the process chemicals. The Techno-Economic Survey pointed out that, in view of its varied use, there was scope for a plant with a lime burning capacity of about 50 tonnes of limestone per day.

The Industrial Potential Survey (1972) stated that the limestone available was sufficient to sustain a small cement factory in the Territory. As it is, the low grade limestone is not suitable for the manufacture of cement. It can, however, be used for the manufacture of lime through modern kilns.¹²⁴

Precipitated calcium carbonate : Limestone is also used for the manufacture of items like precipitated calcium carbonate which finds use in rubber industry especially in the manufacture of tyres. It is also used as filler in paints, crayons, pencils, creams, etc. According to the Industrial Potential Survey of 1972, there was scope for the manufacture of this item in the Territory as there was no such unit even in Tamil Nadu.¹²⁵

Brick making : The availability of good quality clay had given rise to brick making industry in the Territory. According to the Techno- Economic Survey of 1965, there were about 30 brick kiln owners in the Territory producing annually about 150 lakh bricks. With further increase in demand, the survey indicated, there was scope for two modern brick kilns each with an annual capacity of 50 lakh bricks.

Industries based on demand:

In view of the small size of the Territory, its market for industrial products is limited. In order, however, to accelerate the process of industrialisation, the Territory has necessarily to take into account the demand for products in the neighbouring states as well as in the country.

The Industrial Potential Survey of 1972 identified some of the industries that could be established in the Territory purely on the strength of the prevailing demand for the products.

Insecticide and pesticide formulations : According to the survey, there was good scope for a unit to undertake the manufacture of insecticide and pesticide formulations like D.D.T., B.M.C. and Entrin in the Territory.

Mechanised fishing boats : The long stretch of coast-line and the availability of commercially important species of fish and the schemes envisaged under the plans for the growth of fisheries in the Territory are said to offer scope for setting up one unit for the manufacture of mechanised fishing boats in the Territory.

Nylon fishing nets : With the gradual mechanisation of the fishing industry and the increasing use of nylon yarn, the demand for nylon fishing net was bound to increase. This, the survey pointed out, may justify the setting up, of a unit for the manufacture of nylon fishing nets in the co-operative sector.

Monofilament from high density polyethylene : The yawning gap between demand (450 tonnes) for monofilaments and its actual production (280 tonnes) in the country is said to offer scope for setting up one such unit in the Territory.¹²⁶

Sodium bichromate : The annual consumption of bichromate by the textile mills in Pondicherry is placed roughly at 700 tonnes. The 1972 survey pointed out that the entire requirement was then procured from other states. Hence there was good scope for establishing one unit to take up the manufacture of sodium bichromate in the Territory.¹²⁷

Sodium sulphide : According to the same survey, there were encouraging prospects for a unit to take up the production of sodium sulphide in the Territory, particularly so because 240 tonnes of sodium sulphide would become available from the sodium bichromate unit once it started production.

Corrugated paper and board : The requirement for corrugated paper and board by the local pharmaceutical industry and the gap between demand and supply at the national level is said to underscore the need for setting up such a unit in the Territory.

Absorbent cotton : The local demand for absorbent cotton, known otherwise as surgical cotton wool, is roughly placed at 60,000 kg. per annum. In the absence of any unit manufacturing this item in the Territory and its requirements being met entirely from outside the Territory, there is scope for one unit for the manufacture of absorbent cotton.

The easy availability of staple Indian cotton and other raw materials such as caustic soda, bleaching agents, sulphuric acid, etc. favours the establishment of such a unit in the Territory.

Surgical bandages : The total value of surgical bandages required for the hospitals in the Territory, now largely met from outside sources, is placed roughly at Rs. 2 to 2.50 lakhs per annum. On the basis of the prevailing demand, there is adequate scope for setting up one such unit in the Territory.¹²⁸

The Industrial Potential Survey also suggested that it would be feasible to set up units for the manufacture of builders hardware, black insulating adhesive tapes, bicycle tyres and tubes, rigid P.V.C. pipes, etc. in the Territory.

Electronic and electrical industries : Viewed against the background of the fantastic growth of the electronic industry in the world and the growing demand for electronic items in the country, there is vast scope for further development of the electronic industry in Pondicherry. Already a wide range

of electrical and electronic items like chokes, small transformers, handswitches, battery chargers, rectifiers, induction motors, emergency lights, etc. are being manufactured in the Territory. Proposals are also underway for the manufacture of such items as time switches, volt meters, miniature electric motors, etc. With the present level of skill and the anticipated flow of skilled personnel from the technical institutions, it is considered feasible to undertake the manufacture of carbon resistors, loudspeakers, electrolytic condensers, polystyrene condensers, aluminum capacitors, etc. in the Territory. According to the Industrial Potential Survey of 1972, the manufacture of heating, cooling and motorised appliances is another prospective line of enterprise. The survey also considered feasible the setting up of a Functional Industrial Estate exclusively for electronic and electrical items in the Territory. (For more details about the proposed 'Functional Industrial Estate' vide page 587).

Industry based on cotton waste :

It is roughly estimated that in the five mills in the Territory about 350 tonnes of cotton go waste while processing. A small unit which exists at present in Pondicherry collects a portion of such waste cotton from the textile mills to be sent to Madras after processing. The remaining cotton waste is sold by the mills directly.

Low count yarn : The low count yarn that can be manufactured by blending cotton waste with raw cotton is in great demand for the manufacture of blankets and carpets. There is, therefore, scope for setting up a unit for the manufacture of low count yarn in the Territory. 129

The Techno-Economic Survey also indicated that the handmade paper unit which at present manufactures good quality drawing and artists papers could expand production. Manufacture of cement blocks, flooring tiles and pre-fabricated concrete structures are some of the lines which offer better prospects for development.¹³⁰ There is scope for further expansion of the production of soaps, paints, varnishes, handmade paper, cement blocks, flooring tiles and pre-fabricated concrete structures in the Territory.

The products of the engineering industry in the Territory are either durable consumer goods or intermediate products. Hence it is difficult to assess the scope for developing the engineering industries in the Territory.

The survey, however, pointed out that some specialised industries such as the manufacture of machinery for chemical, pharmaceutical, printing and cement industries, besides ball and roller bearings, air compressors, machine tools, electric motors and instruments can be developed in the Territory with a view to catering to the regional demand.¹³¹

The requirements of public sector projects:

The 1972 survey also studied the stores and by-product requirements of some important public sector projects to evaluate the feasibility of starting new small-scale units in the Territory. The report spelled out the various items required by the Neyveli Lignite Corporation Ltd. The study also showed that there was scope for the manufacture of polythene woven sacks in the Territory.¹³²

According to the same report, some other units could also be set up in the Territory even though the required raw materials were not available within the area. Once the Neyveli complex undertakes the manufacture of lignite briquettes, phenol will be one of the important by-products which will be available for industrial use. Technical grade urea will be available for use in chemical processing industries. Should the petro-chemical complex recommended by the Working Group of the Planning Commission take shape, the resultant methanol may facilitate the manufacture of formaldehyde in the region. The availability of all the raw materials in the region will enable the manufacture of P.F. and U.F. moulding powders used in the manufacture of a variety of electrical and other industrial products.

At present moulding powders are not made in the region. It is possible to consider setting up a unit for the manufacture of 2,000 tonnes of moulding powders annually.

Another important line along which industrial development in the Territory can proceed is the manufacture of components for various industrial products required not only for units in Pondicherry but also for projects like the Heavy Boiler Plant, Tiruchchirapalli.

Some of the industrial activities of the Territory are connected directly or indirectly with Sri Aurobindo Ashram which has as its adherents men and women with specialised skills. The industrial activities of the Ashram which were initially organised to utilise the skill of its inmates and to meet the requirements of the Ashram have grown into industrial enterprises.¹³³ The scope for utilising the talent available in the Ashram for the industrial development of the Territory was also stressed by the survey.

The Techno-Economic Survey of 1965 made a ten-year perspective study and recommended programmes for implementation during 1966-76 requiring a total investment of Rs. 35.29 crores. An analysis of the pattern of investment showed that the largest portion of the total investment (74 per cent) was allocated for industries. A part of this investment provided for the expansion of sugar and textile industries and for new capacities in agro industries.¹³⁴

The National Council for Applied Economic Research estimated that the total investment required for implementing the various programmes and recommendations outlined in its report at Rs. 3,529 lakhs for the decade 1966-76. But it must be noted that the years 1966-69 turned out to be the period of Annual Plans. The Territory's plan outlay on industrial schemes stood at Rs. 49.124 lakhs for the Fourth Plan. At the end of the Fourth Plan, the Territory's industrial sector stood as if poised for another forward leap into the future.

For details about 'Labour Welfare' see Chapter—XVII. Other Social Services.

V. Power

Pondicherry:

The first decade of this century witnessed the advent of electricity in Pondicherry. The Municipality in Pondicherry was authorised by the *arrêté* of 6 June 1908 to raise a loan of Rs. 64,000 from the *Caisse de Secours Mutuels des Macouas* so as to enable it to take steps to provide electricity to the town.¹³⁵ The 524 KW—D.C. power house set up by the municipality went into operation in the year 1909. Provided with diesel motors, it produced an uninterrupted current at 220 V and the town received its supply from 14 July 1909. The D.C. power produced by this unit was sufficient