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FLOW, ACCEPTABILITY AND PROMOTION OF INDUSTRIAL PREINVESTMENT STUDIES IN INDIA 1/

BY

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FLOW, ACCEPTABILITY AND PROMOTION OF INDUSTRIAL PREINVESTMENT STUDIES IN INDIA

A. DUAL CAPACITY OF INDIA

1. India presents two directional flows in the area of industrial pre-investment planning and documentation. She is both a lender and recipient of the content and expertise. India is a large — if not a massive — producer of pre-investment studies; in turn, she assimilates sizeable doses of technical expertise and assistance.

2. Because of the staggering size of the population (having crossed the 600 million mark in 1975), the relative intensity of industrialisation, in terms of per capita GDP emanating from the manufacturing sector — less than US $ 20 — is still low. She ranks, nevertheless, seventh in the world by size of industrial output. The Indian industrial sector has attained reasonable degrees of diversification and sophistication.

3. Albeit on a relatively modest scale, India has launched a programme of exports of industrial capital, equipment and expertise with substantial, and in the very recent period, resounding success. The latest reports indicate that in the first six months of the 1976-77 fiscal year, the export orders for engineering products (including industrial plant and machinery) exceeded Rs 3,100 million in value. With the carry forward of the preceding period, the aggregate value of contracts on hand, at the end of September 1976, was of the order of Rs 7,000 million, equivalent of approximately US $ 800 million. Between 1970-71 and 1976-77, the value of exports of engineering products would have, there are indications, expanded four-fold.

4. Synchronising with an overall expansion in exports, India is emerging as a supplier of other manufactured goods. Despite the recessionary conditions experienced all over the world in the 1974-76 period, the exports registered a record expansion rate, in value, of over 50 per cent over the last two fiscal

years through March 1976. The gains have been broad-based and consistent over the time span. The trend has been accentuated during the current fiscal year. In other words, these are not a lop-sided result of an abnormal, occasional, favourable aberration.

5. Mr. Bradford Morse, the UNDP Administrator, described India, in the course of a UN day message, as a pace-setter among the Third World countries. India contributed over 500 experts to the UNDP programmes in 1975. The number excludes thousands engaged under bilateral agreements between governments or individually by foreign industrial and official organisations. India's vast pool of engineers, technicians and other experts has been drawn upon both as a part of her own sizeable bilateral assistance and through multilateral cooperative programmes. Mr. Morse observed that India has shown a remarkable talent for adapting available technology to developmental needs. The Indian research scientists and technologists have demonstrated their 'leadership' function in developing innovative, medium-level and sophisticated technolgies suitable to her and other relatively low-income countries.

6. In the realisation of the Lima Declaration target — raising the share of the developing countries in world industrial production to at least 25 per cent by the turn of the century — India will have to be a major contributor. India's role shall be multi-dimensional : as a direct contributor, as a co-partner and as a transfer agent (a) facilitating transfer of technology from the advanced to the developing countries, (b) stimulating growth in selected areas, and (c) pushing exports in the reverse direction.

7. Without going into the intricacies of the rationale of allocations of the increased industrial net output (valued added) projected at US $ 1,224 billion in the year 2000, the inflated annual growth of 10.5 per cent in the developing countries — against 4.0 per cent in the developed countries — would call for a massive effort on the industrial front. The effort would be greater for large countries like India, which have to fill in the gaps left open by smaller and unsteady economies. Granting India her deserved place in the contemplated global development pattern, the Indian industrial profile shall have to be transformed beyond

recognition by continuous injection of capital and technical resources. The opportunities for fresh doses of viable investments would call for a degree of ingenuity, expertise and analytical talent, which baffles normal forecasts. Incidentally, the Indian Fifth Plan (1974-1979) provides already for an average investment outlay of Rs 15 million (a little less than US $ 2 million) every hour, round the clock, throughout the tenure of the plan.

8. The manpower requirements for industrial identification and feasibility studies — let alone project engineering and implementation — would be staggering for the required level of the industrial development activity. At 1.5 per cent of total project investment, preinvestment studies would require an expenditure of Rs 2,500 million or approximately US $ 280 million for the industrial sector of the Fifth Plan. Translated in terms of manpower, assuming material cost component being 40 per cent, the total professional manpower requirement shall be of the order of 500,000 man-months or 40,000 man-years.

9. Even at a constant capital-output ratio, the investment size shall have to grow 6.9 times to maintain an 8 per cent compound rate of growth over the next 25 years. If the 10 per cent growth can be sustained over the quarter century, the doses of investment inflow shall have to be inflated to 10.8 times. This would demand annually, professional manpower of over a million man-months. This implies that an army of 80,000 professionals would be engaged on a whole-time basis for the preparation of pre-investment studies by the turn of the centruy.

10. It is in this context of a special position of India in the global setting of industrial and economic growth that an appraisal is made in section B of India's industrial performance. A later section attempts to evaluate her capability to undertake preinvestment project planning.

B. DIMENSIONS AND GROWTH OF INDIAN INDUSTRY

11. The industrial production quadrupled during the 25 years, 1951 to 1976. The rate of growth in the first 20 years (1951 to 1970) was steadily high, with minor fluctuations. It demonstrated signs of stagnation during the years 1972 to 1975. The Index

of Industrial Production (with base 1960 = 100) rose barely to 200.7 in 1973 against 199.4 in the preceding year. In 1974 and 1975, industrial output expanded by 2.5 and 5.7 per cent over the respective preceding years. Since the declaration of the new economic programme in 1975, the growth process has gathered momentum once again. In the first 6 months of the current fiscal year, the growth rate had reached a 13 per cent level. It is now generally admitted that, unless interrupted by abnormal factors, this rate is maintainable in the foreseeable future.

12. The employment in the public sector manufacturing undertakings rose from 0.37 million in 1960-61 to 0.81 million in 1970-71. By 1974-75, it had exceeded 1.10 million.

13. The employment in 'the organised private manufacturing sector' was estimated at 3.02 million in 1960-61. A decade later, it had expanded to 3.97 million. The year 1974-75 saw the crossing of the 4.0 million mark with the figure standing at 4.13 million.

14. In about a decade-and-a-half, there was thus a substantial increase in the manpower engaged in the manufacturing sector in India, from 3.39 million to 5.23 million or of approximately 2 million.

15. The revised Fifth Plan envisages an investment in industry of Rs 166.60 billion (approximately US $ 18 billion) — 96.60 billion in the public sector and Rs 70.00 billion in the private and cooperative sectors.

16. Translated into physical targets of output, the investments in the industrial sector are projected to secure, illustratively, the growth-dimensions indicated in Annex 1.

17. The growth in public sector investments was fairly remarkable during the past two-and-a-half decades as shown in Annex 2. Some of the core sector industries — such as steel, aluminium, sulphuric acid, fertilisers, electronics, electric equipment — are expected to register notable gains during the Fifth Plan.

18. The pattern of investment in industrial undertakings in the public sector, at the end of the Fourth Plan (1974), is set

set out in Annex 3. The industrial investments of the Central Government — excluding those by the State Governments — during the Fifth Plan period represent the composition as shown in Annex 4. A bulk of the investment flow is proposed to be diverted to heavy industry: steel, petroleum and fertilisers.

19. Several industrial undertakings in the public sector are of fairly large size and of sophisticated nature, using advanced technologies (or processes). The engineering group comprises of about 25 undertakings engaged in the production of machinery, equipment and tools and in fabrication activities. The output in the heavy engineering group in 1975-76 was valued at Rs 7.5 billion, or around US $ 0.8 billion.

20. The number of joint stock companies in India rose from 28,500 in 1951 to 41,808 in 1975. The increase in paid-up capital was more impressive. The paid-up capital of all companies aggregated to Rs 7,754 million in 1951. The figure rose to Rs 18,185 million in 1961 and to 43,014 million a decade later. In 1975, it had crossed the Rs 75 billion mark.

21. There was substantial growth recorded not only in the number of companies and their paid-up capital, but equally perceptible was the expansion in size. The average paid-up capital of all companies in 1951 was Rs 270,000, which rose to Rs 1,414,000 in 1971 and to Rs 1,817,000 in 1974. However, the increase in size was mainly due to the entry of a few giant government companies.

22. Of the 100 largest private sector companies operating in India in 1974, there were 7, the assets of each of which exceeded the value of Rs 1,000 million. There were only 3 companies with assets below the value of Rs 100 million. The turnover of 10 companies exceeded Rs 1,000 million.

23. During the first half of the present decade, the paid-up capital raised by the corporate sector aggregated to Rs 36 billion. The share of the private sector was a meagre 11 per cent. The annual growth is set out in Annex 5.

24. The Government granted in 1975-76, approvals for issue of fresh capital of Rs 2,935 million (equivalent of over US $ 300 million) to the non-government companies. It was a jump of Rs 950 million (or US $ 100 million) over the corresponding figure of the preceding year.

25. In addition to the issue of capital, industrial financing was reinforced by term lending financial institutions. The three major institutions operating on an all-India basis are the Industrial Development Bank (IDBI), the Industrial Finance Corporation (IFCI) and the Industrial Credit and Investment Corporation (ICICI). The assistance sanctioned by the three institutions aggregated to Rs 3,920 million in the last completed fiscal year (against the figure of Rs 3,150 million in 1974-75).

26. Indian industry has drawn considerably on the international pool of technical know-how to acquire and develop her own industrial and technological capability. The number of foreign collaboration agreements approved by the Government during the period 1957 through September 1975 exceeds 4500. The distributive pattern by countries is set out in Annex 6. This excludes a number of arrangements concluded with East European countries.

27. India follows under an industrial statute — Industries (Development and Regulation) Act 1951 — a fairly rigorous system of industrial licensing. In the recent years, and specially after the enunciation of the new economic policy, it has been liberalised a great deal since it was apprehended to procrastinate project development. Nonetheless, all substantial industrial projects are subject to industrial licensing. A provisional licence — styled as 'letter of intent' — is issued first. It is followed by a regular licence if specified steps are initiated to implement the project. The licences are issued for new investments under three categories: new units, new article, diversification and substantial expansion.

28. Annex 7 sets out the number of letters of intent and licences issued in the last fiscal year, 1975-76. For purposes of pre-investment studies, the figures relating to the letters

of intent are more relevant since the industrial licences are, by and large, a matter of conversion (of 'matured' letters of intent).

29. Over 600 provisional and approximately 700 final licences were issued over the span of one year (1975-76). These figures represent, nevertheless, a gross under-statement of the new industrial activity. Several industries are outside the purview of industrial licensing. Only the larger enterprises with project cost exceeding Rs 10 million are required to seek industrial licences unless certain basic conditions are not satisfied.

30. There are thousands of small and medium-sized industrial units established every year, which also are outside the scope of licensing and consequently of Annex 7. There were 36,000 small units registered — not licensed — in 1961. The figure for 1973, which is appraised as an under-estimate by 10 per cent, had catapulted to 409,000. In other words, some 30,000 to 40,000 small industrial units are established every year. Each one of these has to be supported by pre-investment studies in appropriate depth. Only a few, however, commission regular feasibility studies. Since most of the enterprises have to depend on assistance from financial institutions, some kind of pre-investment data are compiled. The data package, often called 'feasibility' or 'project' report, is not a rationally delineated programming document. The agencies preparing such documents possess limited competence as do most of those making the appraisal. The studies in this category commence with pre-empted conclusions, project characteristics and selection criteria. Many are intended only to comply with formal procedural requirements.

C. SCOPE AND DELIMITATIONS OF PRE-INVESTMENT STUDIES

31. With the size of the involvement generated by the absolute and relative growth-magnitudes of the industrial sector, the acquisition of a certain amount of capability by India in the area of industrial project planning, programming and monitoring is a foregone conclusion. The large investment doses — and the concomitant professional effort — would be wasteful unless the development activity can be planned with ingenuity, allocated priorities

objectively and monitored meticulously. However, before an appraisal of the institutional framework and capability may be attempted, it would be rewarding to have a recapitulation of the nature and coverage of pre-investment studies. A lack of precise understanding in this area has been responsible for considerable waste of effort, significant deficiencies in planning and resultant failures of industrial projects.

32. Industrial pre-investment studies cover a wide spectrum (see Exhibit I) of industrial analysis:

A. Identification or Opportunity Studies,

B. Model Plant and Profile Studies,

C. Pre-feasibility Reports,

D. Techno-economic Feasibility Reports,

E. Functional and Support Studies,

F. Project Evaluation Studies,

G. Project Reports -- which include project scheduling, capital budgeting and planning, basic process data, detailed engineering configurations and programmes for identified areas of project development.

33. Classifications A and B cover identification, C, D and F pre-investment and G investment phases of industrial projects. Classification E is a borderline case and the exercises under it belong to D or G.

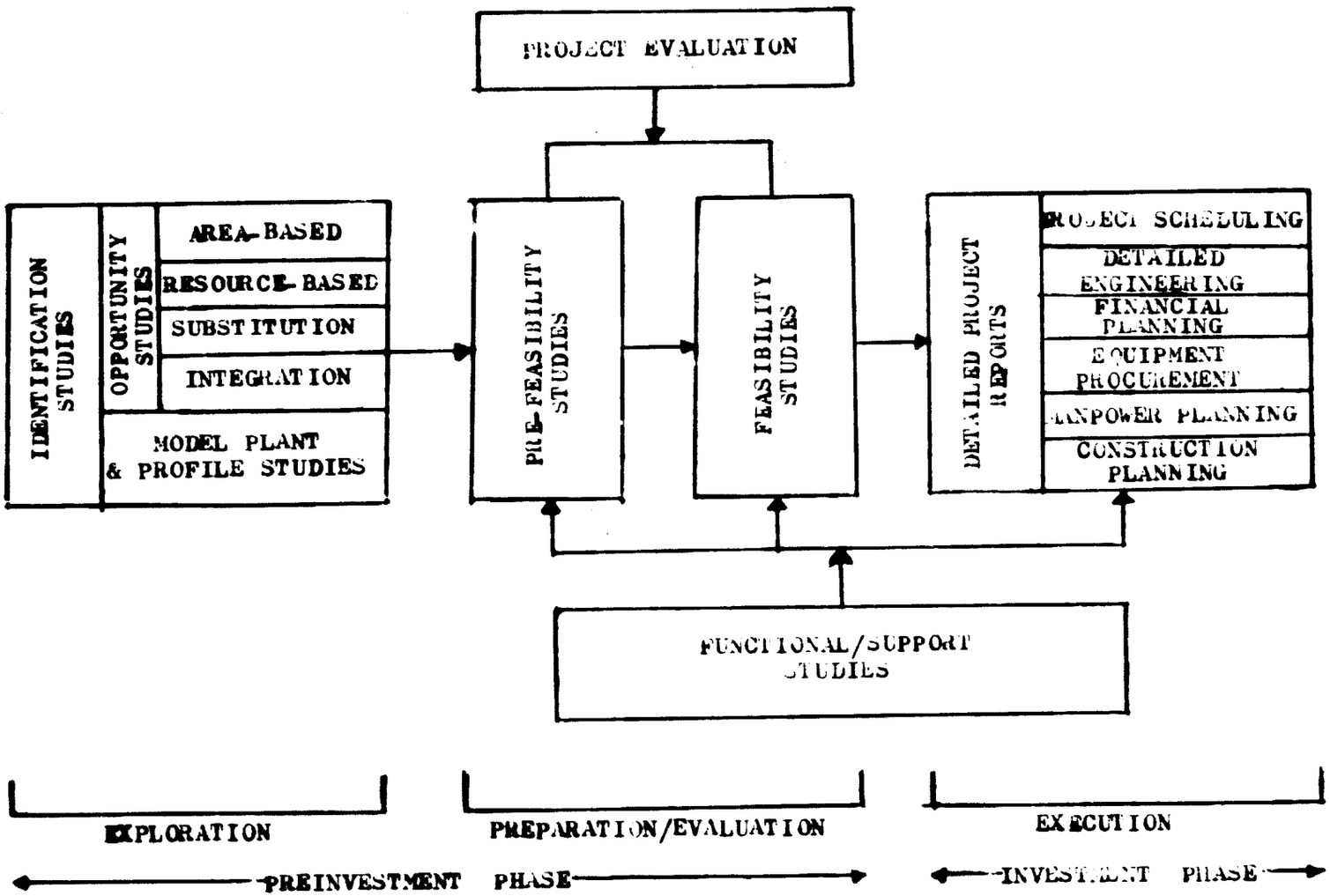
34. Classification A covers area, resource-based (e.g., wood-working, sub-sector (e.g., building materials) studies, import substitution and linkage (backward or forward integration) studies. Exploration and identification of new investment opportunities or expansion of existing industrial units are their basic goals.

35. Classification B studies are prepared in abstract not covering a specific project -- with reference to a specific location, size, market or technology. The model or profile studies are more of opportunity than feasibility studies. While most classification A studies cover macro and semi-macro levels, classification B exercises are essentially micro-level documents. These are meant for a project, although do not enquire into, analyse or establish the viability of the project. Both classifications, therefore, represent the exploratory phase.

EXHIBIT I

CLASSIFICATION OF INDUSTRIAL PROJECT STUDIES

CONCEPTION TO CONSUMMATION



36. By nature of their contents, approach and objectives, both classification A and B studies are not bankable documents. A major source of sub-standard utilization of investment resources is the prevailing misconception (in many developing countries and in some segments of the Indian industry) that profile type studies may be a substitute for full techno-economic feasibility studies.

37. Pre-feasibility exercises are only a variant of full feasibility studies. The major difference lies in the depth and definitive character of data. An investment decision based on a pre-feasibility study can be retrieved or altered without loss of substantial resources. The project activity gathers quick momentum after the investment decision is made following the completion of a feasibility study, and therefore, may involve substantial capital costs.

38. The risk indicated in para 36 is more real and highly accentuated when pre-feasibility studies are prepared. An industrial promoter is seldom willing to commit additional expenditure to commission a full techno-economic feasibility study once a pre-feasibility study has been carried out. Non-commissioning, therefore, of the latter is often a blessing in disguise for the simple reason that, in its absence, a full feasibility study would not be sacrificed.

39. With the financing pattern of new industrial capacity drawing heavily upon financial institutions* -- giving term loans and underwriting new capital issues, the preparation of some kind of a document styled variously as a feasibility or project report, has become almost ubiquitous. The coverage, the depth, the sophistication and the dependability of the analyses are, nonetheless, highly variable.

40. No development financial institution accepts a model scheme or a profile study as a final feasibility report; however, the probability of the acceptance of a pre-feasibility as a full feasibility report is very high. The distinction is, indeed, blurred and more often the documents termed or accepted as full techno-

* In India, the share of financial institutions in total project financing has gone in some cases to as high a level as 85 per cent.

economic feasibility reports are no more than pre-feasibility studies. This is another source of seemingly bankable projects turning into major corporate failures. At any rate, the projected results are not realised, which in effect means misallocation of resources as a result of distorted priorities.

41. The functional and support studies are predecessors or components of full feasibility studies. These, among others, include:

1) market surveys -- including market testing,
2) demand projections,
3) raw material surveys including mineral prospecting,
4) pilot plant reports,
5) studies for selection of process or technology,
6) location and site selection studies.

42. The functional and support studies are commissioned wh. (i) one of the phenomena of the candidate project is of critical significance to the project, (ii) it needs to be studied in depth requiring more than proportionate efforts, and (iii) the agency carrying out the study does not have the expertise or manpower to conduct the operation.

43. A functional or support study may precede or follow a techno-economic feasibility report. When it precedes, and if the results are negative, the contemplated project idea may be given up. When the results are positive, its basic analysis, findings and conclusions form an integral part of the techno-economic feasibility study. A follow-up functional or support study provides detailed bases for project planning after the investment decision has been made.

44. The project evaluation exercises are undertaken to appraise the results of a feasibility report for purposes of final investment decisions by the investor, local promoter and the collaborator, the financing agency, the planning organisation and the regulatory wing of the government. A comprehensive feasibility report obviates the need for a separate evaluation document. Most feasibility studies, however, do not make adequate appraisal in terms of social profitability (social benefit-cost analysis). In other cases, certain externalities and national policy parameters and projections make it

imperative to mount a separate project evaluation study. The evaluation study, documented or not, paves the way for the final investment decision and is the last step under the pre-investment phase.

45. A detailed project report is a blue-print for physical planning of the project and is outside the scope of the present paper and deliberations. It needs, nevertheless, to be recognised that a great deal of dovetailing is involved between the two phases — pre-investment and investment — and, as a consequence, the success of the project is inextricably interlinked between the two phases of project planning. A misdirected identification of the project characteristic does telescope into the investment and operational phases; with a great degree of car and caution, on the other hand, the earlier deficiencies can be rectified.

46. It is in this conceptual context that an appraisal may be attempted of the sources and acceptability of pre-investment studies. It would provide the backdrop for the efforts which can be designed to promote bankable pre-investment project documentation.

D. INSTITUTIONAL FRAMEWORK AND INDIAN CAPABILITY

47. In the field of identification and opportunity studies, the state governments, the Planning Commission and other developmental agencies have commissioned the services of research organisations like the National Council of Applied Economic Research, developmental financial institutions, such as the Industrial Development Bank of India and the consultancy organisations such as the National Industrial Development Corporation.

48. The agencies commissioned to undertake the preparation of feasibility studies are:

i) consultants (in the private and public sectors) including the affiliates of multi-unit industrial complexes;

ii) development organisations like the Industrial Development Bank of India, the State Industrial Development Corporations (in most cases, these

institutions commission the services of external agencies);

iii) industrial establishments, mainly the larger ones in the public sector;

iv) foreign collaborating firms (manufacturing process-owners, producers and engineering companies);

v) foreign consultants.

49. Curious though it may seem, some of the commercial banks have entered the field of preparation of what is termed as feasibility studies. This is done via the newly created 'merchant banking divisions', the major function of which is to assist new industrial enterprises in capital planning and specially public issues of capital. It is astonishing that some of the more enlightened international banks also have attempted to enter the fray. They do not have the requisite expertise. A half-hearted approach is made to compile an inventory of information routed through the sponsors of the project. Bearing the seal of a respectable bank, the semi-processed, untested, out-of-context data acquire the respectability of firm estimates and projections. The inadequate capability of apparently acceptable institutions is a greater risk than one of small, relatively unknown agencies.

50. Based on the National Register of Consultancy and Industrial Services 1975 (consisting of 301 consulting firms) and produced by the National Data Institute, New Delhi, the functional distribution of the industrial consultancy organisations was as follows:

	No. of Consultants
- Project Surveys/Reports	105
- Feasibility Reports	120
- Project Design	79
- Project/Process Engineering	84
- Construction Supervision/Commission	59
- Turn-key Projects	56
- Technical Know-how	69

51. Under project planning, development and allied services, the

activity and industry specialisations of the consulting organisations assumed the pattern set out in Annex 8. This is, however, based on a register of 159 consulting firms maintained by the Indian Investment Centre, New Delhi.

52. The specialisations of the management consultancy services present the following pattern:

	No. of Consultants
- Materials Management	52
- Inventory Control	49
- Production Management	60
- Work Study	50
- Personnel Management	55
- Training Programmes	51
- Financial Management (excluding a large number of accounting firms)	9
- System Designing & Implementation	10
- Data Processing & Computer Services	7
- PERT Management	6
- Project Development	63

53. In the field of structural and building construction, there is a large number of service units. The number of consulting organisations involved in plant layout and factory installations was 65.

54. Annex 9 presents the analysis of 34 leading consultants engaged in project identification and planning (including preparation of feasibility studies) classified by size of their professional staff.*

55. The National Industrial Development Corporation (NIDC) is a leading industrial consultancy organisation sponsored by the Government. There are several others such as Engineers India

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* This is based on a register prepared by the Federation of Indian Export Organisations, New Delhi: Consultancy Services from India.

Limited, Engineering Projects India Limited. Being more relevant to the subject under review, an analysis is presented in Annex 10 of the number of preinvestment studies undertaken by NIDC in different industries. It shows that out of the enumerated 239 studies, about half (to be precise 46 per cent) were feasibility reports. The overseas studies also showed a fairly high proportion (20 per cent).

56. In Annex 11, selected feasibility studies undertaken by NIDC have been tabulated by size of projects. Since only orders of magnitude are relevant, no inflation-linked discounting factor has been applied. The subject statement shows that the projects studied were spread over a wide-spectrum of size and some of these were fairly large.

57. Indian consultancy services have been active outside India. Several technical consultancy organisations have been commissioned by countries in the Middle East, Africa, Latin America and South East Asia for sophisticated engineering assignments. With the modest beginnings made in early 1970s, the growth is impressive. The total magnitude, however, has yet to catch up with the momentum commensurate with the expertise available in the country. The value of consultancy services exported averaged Rs 10 million (approximately US $ one million) during the 4-year period ending 1974-75. The figure for 1975-76 is placed at four times the previous average. These figures do not include the service content concealed in turn-key contracts and in exports of equipment.

58. India has, in the recent period, and in the face of severe international competition, secured large turn-key contracts and export orders for supply of equipment, some highly sophisticated. To mention but a few examples: power projects for Malaysia and Libya (valued at over US $ 100 million), metallurgical equipment for Yugoslavia and Bulgaria for aluminium and steel plants, cranes for Cuba, an integrated township in Kuwait (valued at over US $ 250 million).

59. A frequent cause for deficient or sub-standard feasibility studies stems from the fact that the teams — and in many cases the organisations sponsoring the teams— are heavily loaded in

favour of technocrats or economists, generally the former. India is no exception. In fact, the endeavour to carry out feasibility studies by an unbalanced task force is fairly pronounced — even with leading consultancy organisations. In some cases, an economic cell or unit is created for giving assistance to the project planner. In others, this unit is manned only by the engineers.

60. An optimum combination of a team charged with the preparation of a feasibility study of a project of substantial dimensions is:

- an industry-technologist,
- a project engineer (generally, a mechanical engineer),
- an electrical engineer,
- a civil engineer (covering environmental engineering aspects),
- a market researcher,
- a cost-evaluator,
- an industrial economist (covering also financial and social cost-benefit analysis),

61. Depending on the volume of work to be accomplished in the respective areas, the number of specialists in any one or more may have to be expanded correspondingly. It is not imperative that once included in the team, the incumbent has to allocate all working time, during the entire pendency of the final report, to a single project. The services, for example, of an electrical engineer may be required only on a part-time basis for a specified number of days. Similarly, once detailed market and demand studies have been mounted, the market research analyst can be released.

62. The genesis of un-balanced team carrying out feasibility studies in moored in the inadequate realisation of the comprehensive character of the studies.

63. To many, 'feasibility' is a matter mainly of technical viability. As a result of the national planning effort and the industrial licensing system, a convenient assumption is made that market viability of an 'approved project' is ensured a priori. In the matter of commercial profitability, a quick estimate is

made of realisable sales value and costs of production with reference to full capacity output. On the contrary, many other feasibility studies are over-loaded with market studies or projections of financial flows. The equally vital and more basic problems of technical viability are treated with scant attention. These exercises attempt to transplant technologies without recognising the need for adaptation to local conditions and constraints. Quite frequently, technological characteristics applicable to other more sophisticated and larger markets, are borrowed in an unadulterated form. In either case, the resultant output is unbalanced, and therefore, untenable, leading to wasteful use or mis-allocation of scarce resources, often both.

64. The conceptual problem on the delimitation of the scope and depth of pre-investment studies and the phenomenon of unbalanced teams lead to the location of an important action-centre for international promotional assistance. An agency like UNIDO should lay down internationally acceptable standardized norms and promote the idea of balanced feasibility studies and teams therefor.

65. A cause leading to deficient feasibility studies is their contrived and imposed demand. A majority of the promoters does not have an abiding faith or confidence in the studies. They consider it to be 'a necessary evil'. The work on industrial pre-investment studies have to take cognisance, in the coming years, of the flow of requisite entrepreneurial competence and capability. The recent experience during the recessionary market conditions have thrown up in bold relief deficiencies in this vital area. An effective assimilation of the complexities exposed by involved integrated industrial projects requires intensive absorptive capacity. Developed, sophisticated and mature industrial experience demands not merely the effectiveness of pre-investment documentation, but it also generates effective demand for it.

E. INFORMATION GAP AND INDUSTRIAL DATA EXCHANGES

66. A major bottleneck in the preparation of feasibility studies is the nonavailability of technological information. In projects sponsored by an existing company in its own production

line, the accessibility to such information is easy. The problem gets conveniently resolved when a collaboration is contemplated with a leading producer or a supplier of equipment or process know-how. On the contrary, the problem is accentuated if some sophisticated and developing technology is involved. Many consultants in developing countries are prone to depend on commonly known technologies/equipment with the latent risk of using obsolete know-how. The projects based on such technologies frequently face serious financial disappointments as a result of under-utilization of capacities and accumulation of inventories.

67. A further unstable element in project cost estimation stems from inflationary distortions in prices. It is not feasible always for project analysts to organise a continuous intelligence covering prices of all inputs and outputs and, in particular, of machinery and equipment and materials with inflexible specifications. Variations are divergent and, therefore, no uniform indexing can be adopted. The element invalidates historically retrieved industrial programming reference data.

68. In countries like India, the inflationary price disturbances are accentuated by the limited size of the markets, which give rise to price distortions as a consequence of the imperfections of the market structure, monopolistic or monopsonic. An information system, therefore, which can enable the project planner to have access to changing price magnitudes, would be of immense help. The information agency should not be a data bank in the accepted sense of the term, the basic function of which is to collate and store historical data.

69. UNIDO and other international and regional organisations and national development centres can play a very significant role in planning, gathering, processing, storing and disseminating technological and economic information, qualitative and statistical.

70. The profiles of manufacturing establishments compiled by UNIDO are productive reservoirs of operational data. On account, however, of obsolescence, insufficient analysis and the variable locational and size factors, the profiles have been found to be unsuitable documentation in this area. The Extracts of Feasibility

Studies come closer to the data demands for new feasibility studies; but these too need to be reinforced and extended in scope to be used effectively and extensively.

71. Enormous duplication of project planning has assumed staggering proportions despite the shortage of project planners. A typical and interesting example is provided by more than 100 so-called mini-steel plants (electric arc furnaces) in India promoted recently. These involved repetitive efforts in preparing studies covering the same characteristics and coverage: market estimation and projections, identification of technology, equipment, manpower and skills and commercial and economic evaluation. An exchange, which can collect, store, retrieve and disseminate programming reference data will help to save a tremendous amount of repetitive, and, therefore, wasteful effort.

72. The conventional data banks have been found to be inadequate sources of programming reference data for new industrial projects. In order to achieve minimisation of development effort to encourage repetitive use of available pool of technological and economic information, Industrial Development Data Exchanges should be designed to operate on national, regional and international levels. UNIDO can act as the fountainhead, as a recipient, a processor, a storehouse and a disseminating agency. The exchanges should create a strong documentation centre and establish an operational system by which it shall be able to absorb effectively massive data inflows. To establish the financial viability of the system, streams of inflows and outflows of developmental data dosages may be organised on a compensation basis. The compensation, like the insurance premium, shall be nominal since it will be shared by a large clientele -- sponsors of new investment activity, consulting firms, growth promotion centres, developmental financial institutions and government and quasi-official agencies.

73. The data should cover, at the respective area levels, a wide spectrum of existing and potential industrial activity: results of selected identification studies, government policies and regulations, factor endowments, infra-structural facilities and service costs, selected sources of know-how, technology, equip-

ment, consultancy and engineering services, raw materials and feedstocks, price structures (domestic and international) market segmentation, supply of skills and manpower costs.

74. The data-collection function, however, will present some seemingly insurmountable problems. The functions of processing, storage, retrieval and dissemination of information are relatively easy although these do call for high level expertise in data computation and dissemination. The agencies which subsist on generation of development information on processes, technology and market information may not be willing and responsive to part with their output. It is their business to profit from repetitive use of the same data-output. The pricing of the information, when agencies are willing to share it, will present a difficult but not an untractable problem.

F. AN ACTION PROGRAMME

75. The experience in India of the flow of bankable projects has been mixed. With the present low level (in relative terms) of industrialisation and rich natural endowments, the potential is large. Nonetheless, the flow of bankable projects has been constrained by several factors.

76. The causes leading to low velocity of bankable projects basically are:

- small and fragmented size of markets,
- deficiencies of capital and foreign exchange,
- low levels of exploited raw material resources,
- non-availability of high level specialised technologies,
- non-existence of large, broad-based, professionalised industrial entrepreneurship and management expertise,
- certain regulatory policies and procedures,
- a lack of infra-structural facilities, and
- inadequate pre-investment planning.

77. The flow can be accelerated substantially by:

i) a massive programme of industrial identification and opportunity studies,

ii) development and strengthening of infra-structure as a a physical follow-up of the identification studies,

iii) an expanding flow of project feasibility reports by extending support to consultancy organisations,

iv) supply of supplemented finances to aid promotional efforts of private capital by reinforcing the resources of financial institutions and a positive support to the joint sector,

v) the establishment of a more freely available foreign exchange fund,

vi) arrangement with regional and international organisations like UNIDO and World Bank to facilitate easier access to technical know-how which permits horizontal transfers of technology.

78. In the field of feasibility studies, the Indian experience may be summed up as follows:

<u>On the positive side</u>

a) India has built up a fairly dependable service mechanism to produce acceptable feasibility studies in a major segment of manufacturing industry.

b) There are not many industrial projects which are not followed up after the production of feasibility studies.

c) The rate of accumulation of feasibility studies has not been greater than the rate of investments.

d) The consulting organisations established by the government have played a significant role in supplementing the efforts of private consultancy organisations, specially in the case of overseas assignments.

e) The promotional agencies and incentive programmes have contributed substantially to the acceleration of the pace of production of feasibility studies and to their follow-up.

<u>On the negative side</u>

f) A lack of bankable projects has been a significant constraint on accelerated development.

g) All the agencies producing feasibility studies -- such as commercial banks -- are not adequately equipped to produce such studies.

h) Many consulting agencies depend on second-hand sources of information and obsolete data.

i) Many feasibility studies are inadequate as an effective tool for a definitive and quick investment decision-making process.

j) A cause for some infructuous feasibility studies is the lack of confidence of the first generation investors in the planning process and of the experienced investors in the social criteria which guide the decision-making of government authorities granting the licences and of financial institutions providing the bulk of finance.

k) Some feasibility studies are not implemented because the promoters' willingness to invest own capital resources does not match with sound financial criteria developed by promotional institutions.

l) The cost which the promoters are willing to pay for the feasibility studies is often too low and does not match with the standards of industrially advanced countries or of acceptable feasibility studies.

m) The investor tends to rely on freely retrievable or acquired economic and technological information.

79. On the pre-investment planning front, the Indian experience has highlighted the following action centres with a view to mobilise, develop, deploy and intensify the use of resources in the area of feasibility studies:

i) generate genuine demand for industrial feasibility studies;

ii) intensify efforts to locate viable areas which possess potential for development and investment;

iii) standardise conceptual content and scope of pre-investment studies;

iv) develop interactions among the agencies carrying out feasibility studies reducing to the minimum repetitive efforts;

v) develop and coordinate the expertise available in technical, economic and commercial areas to carry out

sound, balanced, complete and bankable feasibility reports;

vi) organise exchange of project development data at national, regional and international levels;

vii) plan, organise, coordinate, monitor, evaluate, reinforce and develop effort and resources at national, regional and international levels;

viii) organise training and professional development programmes for carrying out bankable feasibility studies.

INTERNATIONAL PROGRAMME

80. International assistance may be planned, designed and organised on an extensive scale. The technical assistance programme should be cooperation-oriented rather than assistance-motivated. Regional and multi-national consortia rather than integrated consulting engineering services and promotion centres would be more effective and successful.

81. A most important link in the international programme should be agencies, at different tiers, in the nature of industrial programming data exchanges. The function of these exchanges shall cover collection, processing, storage, retrieval and dissemination of live, updated information on resource endowments, identified investment opportunities, technical know-how and processes, machinery and equipment, raw materials and their sources, economic characteristics of products, market structure and operations, infrastructural facilities, consultancy and engineering services. Nothing, perhaps, will be more productive in the area of bankable feasibility studies, consistently with the new global development strategy, than active, pulsating, responsive data exchanges at the appropriate levels.

82. The establishment of a UNIDO Feasibility Analysis Centre should be most welcome. It can make a positive and wholesome contribution provided (a) its functions encompass a wide spectrum of project planning activities, and (b) it focuses its attention on the identified deficiencies.

83. Should it be found feasible to assign the functions of Data Exchanges to the UNIDO Centre, no separate data exchanges at the international level be constituted. However, such exchanges at the national and international levels would be highly productive.

84. In the information area, the UNIDO Centre should
i) compile, by industries, effective and live inventories of sources of know-how, equipment, engineering and consultancy services, and technical and engineering skills;
ii) analyse, by industries, project development experience and disseminate information thereon -- it will involve major research exercises in selected sets of countries;
iii) compute project norms by nature and size of industries in selected countries.

85. Other action centres for the international programme are:

i) production of manuals and guidelines incorporating norms and standards;
ii) organisation of workshops, seminars and symposia;
iii) organisation of training or fellowship programmes;
iv) provision of supervisory technical assistance for specific projects or series of projects;
v) publication of journals devoted to pre-investment, specially feasibility studies and case and model studies; and
vi) promotion of exchange programmes on bilateral and multilateral bases.

86. Each action centre involves a constellation of action programmes and calls for multi-centred and multi-directional effort. In order to realise an effective international programme, performing the twin functions of a contributor and a catalytic agent, the action programmes shall have to be identified, defined and developed with appropriate priorities and resource allocations.

ANNEX I

PHYSICAL TARGETS OF INDUSTRIAL GROWTH IN THE FIFTH PLAN

1974-1979

INDUSTRY	UNIT	1973-74	1978-79	INCREASE Absolute	INCREASE %
Steel (ingots)	m.t.	6.32	11.32	5.00	79
Aluminium	m.t.	0.15	0.3	0.16	107
Cement	m.t.	14.67	20.80	6.13	42
Refractories	m.t.	0.71	1.02	0.31	44
Petroleum Products	m.t.	19.70	27.00	7.30	37
Sulphuric acid	m.t.	1.34	2.70	1.36	101
Industrial Oxygen	$m.m^3$	60.7	100.0	39.3	65
Fertilisers (N)	m.t.	1.06	2.90	1.84	174
Plastics	m.t.	0.11	0.17	0.06	55
Rubber(Synthetics)	t.t.	23.30	40.00	16.70	72
DMT	t.t.	4.20	24.00	19.80	471
Synthetic fibres	m.t.	0.14	0.21	0.07	50
Detergents	t.t.	72	125	53	74
Penicillin	MMU	248	520	272	110
Sugar	m.t.	3.95	5.40	1.45	37
Cotton textiles	m.m.	7946	9500	1554	20
Art silk	m.m.	840	1435	595	71
Jute fabrics	m.t.	1.07	1.28	0.21	20
Paper	m.t.	0.82	1.13	0.31	38
Footwear	m.p.	53.40	68.00	14.60	27
Bicycle tyres	m.no.	24.03	30.00	5.97	25
Automobile tyres	m.no.	4.66	8.00	3.34	72
Turbines	m.Kw	2.10	3.90	1.80	86
Transformers	m.KVA	12.42	20.00	7.58	61
Motors	m.H.P.	3.24	4.50	1.26	39
Conductors	t.no.	46.40	90	43.60	94
Dry batteries	m.no.	654	800	146	22
Storage batteries	m.no.	1.29	1.50	0.21	16
G.L.S. Lamps	m.no.	121	180	59	49
Fans	m.no.	2.11	2.5	0.39	18
Consumer electronics	Rs.m.	615	1990	1375	224
Medical electronics	Rs.m.	40	140	100	250
Other electronics	Rs.m.	962	3023	2061	214
Wagons	t.no.	12.2	15	2.80	23
Shipbuilding	t.GRT	30	130.2	100.2	334
Motored 2 wheelers	t.no.	150.7	320.0	169.3	112
Bicycles	m.no.	2.57	3	0.43	17
Ball/roller bearings	m.no.	24.4	34	9.6	39
Sewing machines	m.no.	0.25	0.41	0.16	64

m.t. = million tonnes
m.m. = million meters
m.no. = million numbers
t.no. = thousand numbers
M.H.P. = million horsepower.
m.p. = million pairs

t. GRT = thousand gross reg.tonnage
Rs. m = Rupees million
MMU = million units
M.KVA = million kilo volt amperes.
m.Kw = million kilo watt

ANNEX 2

GROWTH IN PUBLIC SECTOR INVESTMENTS IN INDIA

1950 - 1975

YEAR	Undertakings		Investment		
	No.	Quinquennial Increase (%)	Rs billion	$ million	Quinquennial* Increase (%)
1950	5	-	0.3	64	-
1955	21	320	0.8	180	167
1960	48	129	9.5	2,118	1,088
1965	74	54	24.2	5,367	155
1970	91	23	43.0	5,735	78
1975	122	34	62.4	7,796	45

* There is a distortion due to variable exchange rates In 1966, the Indian rupee was devalued. There has been further dollar value depreciation of the rupee since the floating of the currencies.

ANNEX 3

INVESTMENTS IN THE PUBLIC SECTOR IN INDIA

1974

SECTOR	Rs million	US $ million	%
A. Manufacturing Enterprises			
- Steel	20,289	2,536	49.8
- Minerals and metals	8,725	1,094	21.4
- Heavy engineering	6,748	844	16.6
- Medium and light engineering	1,462	183	3.6
- Transportation equipment	2,274	284	5.6
- Consumer goods	674	84	1.7
B. Service Enterprises			
- Contracts and construction services	158	20	0.4
- Industrial development and technical consultancy services	46	6	0.1
- Rehabilitation of sick industries	337	42	0.8
Total	40,713	5,089	100.00

ANNEX 4

COMPOSITION OF CENTRAL GOVERNMENT INDUSTRIAL INVESTMENTS DURING THE FIFTH PLAN PERIOD

INDUSTRY	Rs billion	US $ million
Steel	16,750	1,861
Fertilizers	15,330	1,703
Petroleum (including exploration and distribution)	15,750	1,750
Petro-chemicals	3,490	388
Machinery and engineering	3,650	406
Non-ferrous metals	4,680	520
Shipbuilding	1,470	163
Paper	2,030	226
Cement	1,020	113
Textiles	1,040	116

ANNEX 5

GROWTH IN PAID-UP CAPITAL OF COMPANIES BY SECTORS (1971-75)

YEAR	Public Sector (Rs million)	Private Sector (Rs million)	Total (Rs million)
1970-71	2,771	576	3,347
1971-72	3,027	555	3,582
1972-73	6,293	690	6,983
1973-74	16,440	917	17,357
1974-75	3,450	1,230	4,680
TOTAL	31,981	3,968	35,949

Due to variable exchange rates over the period, the dollar values have not been computed.

GOVERNMENT APPROVED FOREIGN COLLABORATION ARRANGEMENTS

IN INDIAN INDUSTRY

1957-1975

COUNTRY	No.	Per cent
U.K.	1,094	24.3
U.S.A.	845	18.7
West Germany	760	16.9
Japan	724	16.0
Switzerland	246	5.5
France	195	4.3
Italy	129	2.9
Others	514	11.4
Total	4,507	100.0

ANNEX

INDUSTRIAL LICENSING CLEARANCES*

1975-76

INDUSTRY	INDUSTRIAL LICENCES			LETTERS OF INTENT●		
	NU	DS	SE	NU	DS	SE
Food Processing	44	6	3	21	6	2
Sugar	3	-	7	1	-	1
Textiles	42	4	145	26	3	12
Chemicals	30	32	29	78	45	20
Dye Stuffs	1	5	1	1	-	2
Drugs & Pharmaceuticals	8	36	7	18	43	12
Fertilizers	2	1	1	-	-	-
Soaps, Detergents and Cosmetics	-	1	-	1	-	-
Paper & Pulp	10	-	4	41	-	4
Cement & Gypsum-based	4	-	1	15	1	2
Ceramics & Glass	3	-	3	3	-	1
Metallurgical Industries	23	12	10	26	10	4
Industrial Machinery & Tools	15	27	19	17	27	14
Agricultural & Earth Moving Machinery	1	-	1	-	-	-
Transportation Equipment	16	2	2	12	7	2
Electrical Equipment	32	23	10	46	30	15
Miscellaneous Equipment	6	6	4	16	6	4
Instruments	2	3	1	4	4	2
Leather & Rubber Goods	12	4	4	7	3	2
Miscellaneous Industries	12	1	4	6	-	3
Total	266	153	266	339	185	102

* Excludes capacity regularisation licences

● Provisional clearances issued by the Government

NU New Unit

DS Diversification

SE Substantial Expansion

SPECIALISATION OF INDIAN CONSULTANCY ORGANISATIONS BY FUNCTIONS AND AREAS

FUNCTION	Chem.& Petro-Chem.	Electric Power	Electronics	Mechanical Engg.	Metallurgical Ferrous	Metallurgical Non-Ferrous	Textiles & Machinary	Leather & Products	Drugs & Pharmaceuticals	Miscellaneous
1. Project Identification & Feasibility	91	40	33	68	47	31	10	1	4	17
2. Market Survey & Research	99	40	32	68	47	30	10	1	4	17
3. Detailed Project Reports & Evaluation	90	40	33	68	47	31	10	1	4	17
4. Process & Technology Engineering	78	34	21	58	46	30	9	1	4	-
5. Industrial Plant Installations	85	39	29	65	47	31	9	1	3	5

Data analysis is based on the register maintained by the Indian Investment Centre, New Delhi.

The numbers in different rows and columns naturally involve duplication as each consultant provides services in more than one area.

SELECTED LARGE CONSULTING ORGANISATIONS

IN INDUSTRY AND ALLIED FIELDS

SIZE BY NUMBER OF PROFESSIONAL STAFF	NUMBER OF CONSULTANTS	TOTAL NUMBER OF PROFESSIONAL STAFF
Up to 50	4	127
51 to 100	12	864
101 to 500	13	2,413
501 to 1000	2	1,260
1001 to Over	3	5,771
Total	34	10,435

Based on Consultancy Services from India, a directory published by the Federation of Indian Export Organisations, New Delhi, 1976.

CONSULTANCY ASSIGNMENTS UNDERTAKEN BY THE NATIONAL INDUSTRIAL DEVELOPMENT CORPORATION

INDUSTRIES	Identification Studies	Feasibility Studies	Design & Engg.	Other Engg. Studies	All Studies	Of which Overseas
Agro-based, Food and Beverages	1	8	2	2	13	3
Paper, Board & Pulp	1	23	6	3	33	1
Forest-based	1	10	2	2	15	4
Petro-Chemicals & Synthetics	3	1	-	-	4	3
Other Chemicals	2	23	8	5	38	7
Textiles	-	5	4	4	13	-
Non-metallic Mineral-Based	1	1	-	2	4	2
Mining & Metallurgy	5	12	5	6	28	8
Engineering	1	17	7	11	36	8
Electrical & Electronics	-	11	2	1	14	-
Environmental Engineering & Industrial Townships	1	-	14	11	26	2
Others	15	-	-	-	15	12
Total	31	111	50	47	239	50

DISTRIBUTION OF FEASIBILITY AND ALLIED STUDIES*
CONDUCTED BY NATIONAL INDUSTRIAL DEVELOPMENT CORPORATION
BY INDUSTRY AND SIZE CLASSIFICATIONS

(Outlay in million Rs)

INDUSTRIES	PROJECTS WITH OUTLAY SIZES					
	Upto 10		10 to 50		Over 50	
	No.	Outlay	No.	Outlay	No.	Outlay
1. Agro-based & Food Processing	2	2	1	14	1	61
2. Paper, Board & Newsprint	1	5	4	60	2	291
3. Petro-chemicals & Other Synthetics	1	4	-	-	1	92
4. Other Chemicals	1	5	2	55	1	77
5. Non-metallic Mineral Products	-	-	3	61	-	-
6. Metals	2	15	1	33	2	486
7. Engineering Industry	11	68	4	106	6	1506
8. Electrical & Electronic Products	4	15	1	19	-	-
9. Other Forest based & Leather Products	2	14	2	47	-	--
Total	24	128	18	395	13	2314

* A selected sample of 55.

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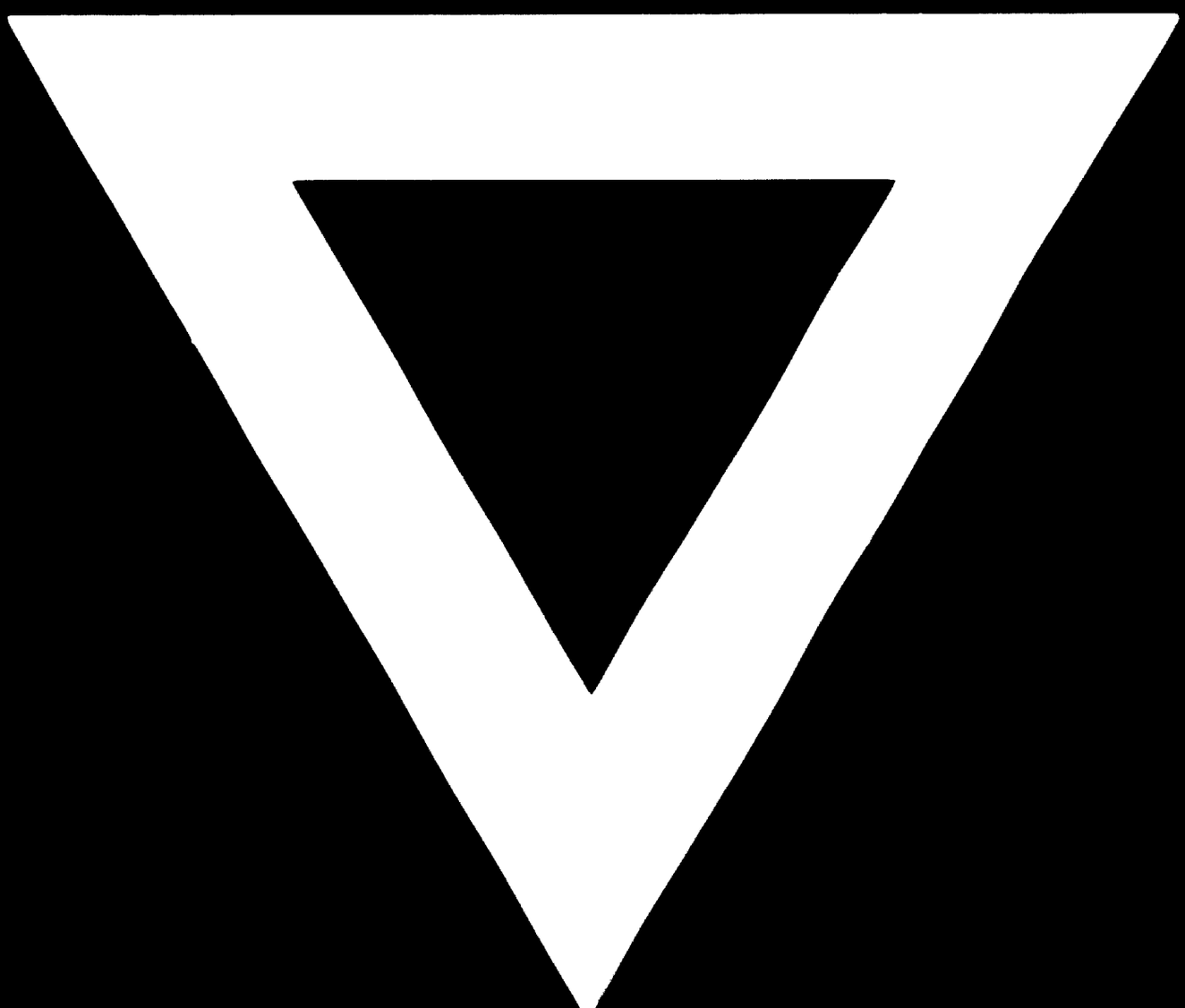

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