

Annexure-2  
Annexure-P  
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EXTRACT FROM THE MINUTES OF THE MEETING OF THE CABINET HELD AT 1030 HOURS ON TUESDAY, THE ~~10TH NOVEMBER 1986~~ IN THE CABINET ROOM (NO. 9), PARLIAMENT HOUSE, NEW DELHI.

Case. No. 528/44/86

Item. 5

\* Institution of a Technology Information, Forecasting and Assessment mechanism under the Government.

The Cabinet considered the Note dated the 6th November, 1986 from the Planning Commission (Yojana Ayog) and approved the proposals contained in para 9 thereof subject to the modification that the Institute should be under the Department of Science & Technology.

\*KKK\*  
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SECRET

\*Department/Ministry concerned may endorse a copy of the orders issued in this behalf to the Cabinet Secretariat.

No. 30013/70/85-S&amp;T

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PLANNING COMMISSION

Subject: Institution of a Technology Information, Forecasting and Assessment mechanism under the Government

NOTE FOR THE CABINET  
(Revised)

Introductory:

'Technology Forecasting' (TF) deals with the prediction of future characteristics of useful machines, procedures or techniques, on a scientific basis. 'Technology Assessment' (TA), on the other hand, is concerned with the assessment of the impact (both favourable and otherwise) of technologies on man, society, environment and the economy. The conduct of technology forecasting and assessment studies also necessitates the maintenance of an appropriate scientific and technological information base.

2. The main object of carrying out TF studies is to ensure that the technologies which we import and the technologies we develop are not, ab initio, obsolescent nor do they become so within a short span of time after their import/development. TF studies involve a survey of the on-going developments in the concerned areas of science and technology within the country and abroad and their correlation to the existing or future socio-economic, industrial, security and other needs of the country. They help in acquiring contemporary technologies from outside and in determining meaningful R&D priorities for the country with the object of developing imperative and feasible technologies on a futuristic basis.

3. TA represents the process by which one seeks to establish an early warning system to control and direct

technological development, so as to maximise the beneficial effects of such developments and minimise their harmful effects; it differs from the usual cost-benefit analysis in that, in the TA process, not only the intended first-order effects of the introduction of the new technologies, but more importantly, the unintended second and higher-order effects thereof on man, society and environment are taken into account. TA thus becomes an additional\* input in the process of rational decision-making for purposes of acquisition of relevant imported technologies and/or for investing scarce resources on the development and utilisation of indigenous technologies.

4. An extract of para 4.5 of the Government of India's Technology Policy Statement(TPS), which highlights the need for undertaking technology forecasting and assessment studies on a systematic and continuing basis and makes it mandatory for the Ministries or agencies concerned with BIG INVESTMENTS OR LARGE VOLUMES of production to provide a technology forecast covering their requirements over a 10 year or longer period and for evolving suitable strategies for development based on priorities, is enclosed at Annexure-I.

5. The subject of instituting an appropriate TF mechanism under the Government in terms of the TPS was discussed in detail by the Technology Policy Implementation Committee(TPIC) between January-April, 1985 and later by the Committee of Secretaries (on 15th October, 1985). The views of the Economic Administration Reforms Commission (EARC) on this subject were also taken into account.

e.g., in USA, the Technology Assessment Act, 1972 stipulates that in view of the rapid expansion and changes in technology and the increasingly extensive, pervasive and critical nature of its impact, beneficial and adverse, on the natural and social environment, it is essential that, to the fullest extent possible, the consequences of technological applications be anticipated, understood and considered in determination of public policy on existing and emerging national problems.

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Based on these deliberations, a broad consensus was reached in respect of various issues relating to the institutional structure required to be set up to undertake and facilitate TFA studies at the 'national', 'industry' and 'corporate' levels; composition, status and terms of reference of the Central Group on Technology Forecasting and Assessment envisaged in the TPS and its Sectoral Groups; methodology of their functioning and related organisational details; financial requirements; and linkages required with perspective planning process and various policy making and implementation bodies; etc.

6. A proposal formulated by the Planning Commission in the light of the above was considered by the Cabinet on 14th April, 1986. The Cabinet referred the matter to the Science Advisory Council to the Prime Minister (SAC-PM) for its views. After considering the views of the SAC-PM on the Planning Commission's proposals as well as those on the DST's proposals relating to "Identification, Acquisition and Application of High Technology from abroad for use in the country - Setting up of Technology Information and Analysis Cell (TIAC) in DST", the Prime Minister has approved the following suggestion:

"Establishment by the Planning Commission of an autonomous body to carry out the technology information, forecasting and assessment tasks (TIFAC). To be headed and staffed by appropriate specialists but using as widely as possible experience from outside including academic institutions, R&D organisations and industry. Should produce an annual technology report for the Prime Minister. To start with, such a body could be constituted by using existing infrastructure and specialists in existing institutions".

The earlier proposals prepared by the Planning Commission on the "Institution of Technology Forecasting Mechanism under the Government" have accordingly been appropriately modified in the light of the Prime Minister's decision and the following revised proposals are submitted for consideration and approval of the Cabinet. The matter has also been discussed with the Chairman, SAC-PM, who has concurred with the revised proposals.

oposals for consideration and approval:

The revised proposals concerning the establishment of the Planning Commission of an autonomous body to carry out the technology information, forecasting and assessment tasks are furnished below:-

i) Establishment of an autonomous body by the Planning Commission:

With a view to maintaining appropriate informational base in the relevant areas of technology; organising, coordinating and providing overall guidance for the conduct of R&A studies in the country on a systematic basis; commissioning such studies in important cross-sectoral areas like micro-electronics, bio-technologies, renewable energy sources and new materials, etc.; and promoting the utilisation of the results of such studies with a view to improving the quality of decision-making in relation to major investment proposals, technology choices, selection of R&D projects, etc., a 'Technology Information, Forecasting and Assessment Council' (TIFAC) shall be established as an autonomous entity by the Planning Commission. The Planning Commission would act as the nodal agency for this purpose, since it deals with all disciplines/areas and major policy issues of socio-economic relevance; planning and investment decisions in all sectors of the economy and their inter-relationship; and perspective planning, etc. An autonomous status initially that of a registered society, but with the possibility of being converted into a Corporate Undertaking in due course, if found necessary) would help the Council in achieving a certain amount of thinking independent of the current policies and programmes of the Government; to provide meaningful and critical analytical inputs to the planners and policy makers; and to maintain continuity of work coupled with in-depth analysis of the long-range issues involved. The terms of reference of this Council shall be as suggested

ii) Composition of TIFAC:

The Council shall consist of the Chairman, a whole-time Member-Secretary and Members to be drawn from various Central Government Ministries/Depts, scientific agencies, industries' organisations, academic institutions, voluntary agencies and individuals possessing knowledge, expertise or experience in relevant fields. The composition of TIFAC shall be as at Annexure-III. The Council (TIFAC) may be constituted by the Planning Commission initially for a period of three years, after obtaining the approval of the Minister of Planning/Prime Minister and it would be reconstituted thereafter at periodic intervals.

iii) Secretarial Support:

In view of the importance attached to the proposed TIF&A activity and the width and depth of the studies involved, it will be necessary to provide for a separate, small technical secretariat for the Council, although it will make fullest use of the existing infrastructure and specialists in existing institutions to start with. Initially, this Secretariat may consist of a Member-Secretary (of the rank of an Adviser/Joint Secretary to Government) with four Principal Scientific Officers (in the pay scale of Rs.1500-2000) and their supporting staff and related facilities. The structure and size of the secretariat would need to be suitably altered and/or expanded, as the activities of the Council increase with time. The average annual expenditure on this Secretariat will be about Rs. 6 lakhs (Annexure-VI).

iv) Sectoral TIF&A Groups - Their terms of reference, composition and secretarial assistance.

Terms of Reference:

The proposed TIF&A mechanism would be a multi-level network, involving all economic/technical Ministries and scientific agencies of Government. It is essential that

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at all levels where technology forecasting and assessment are to be carried out, the relevant information base needed for this purpose is maintained and updated in a form which is readily available. Thus, in addition to the proposed centralised structure of TIFAC under the Planning Commission, individual Ministries/Departments/Scientific Agencies would be required to constitute their own Sectoral TIF&A Groups (in consultation with and in the light of the guidelines to be issued by TIFAC) for commissioning relevant studies in individual sectors; for receiving and analysing TIF&A Reports; and recommending measures for action based thereon to the TIFAC/concerned Ministries, etc. The terms of reference of the sectoral TIF&A Groups are enclosed at Annexure-IV.

#### Composition:

The composition of the Sectoral TIF&A Groups will be decided by the respective Ministries/Departments/Scientific Agencies, subject to the observance of TIFAC's guidelines. However, in cases where the Standing Scientific Research Committees (SSRCs) or other similar committees have already been or are being set up by the Ministries/Departments/Agencies, they would first examine whether these committees could (with appropriate modifications in their composition, if required) themselves function as Sectoral TIF&A Groups, before constituting Independent Groups for this purpose. Such Groups shall maintain close coordination with the Council in all matters relating to TIF&A studies.

#### Secretarial Assistance:

The nature and extent of the secretarial assistance to be provided to the Sectoral TFF&A Groups would be decided by the concerned Ministries/Departments/Agencies, who will also provide necessary funds in their budgets for this purpose.

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v) Methodology of functioning:

The methodology of functioning of the TIFAC and of various Sectoral TIF&A Groups is described in Annexure-V. Ministries/Departments/Agencies of the Central Government, Planning Commission, Public Sector Undertakings/other industries and Scientific Research Institutions, etc. in the country would be making use of the results of TIF&A studies for investment decisions, making choices between alternative technologies, selection and funding of R&D projects etc. TIF&A studies would also be useful for taking appropriate corrective action in the case of planning and implementation of Plan programmes and projects. However, the TIF&A mechanism would function only in an advisory capacity and not as a compulsory intervening agency in respect of investment, imports and other decisions.

vi) Financial requirements:

It is estimated that the requirement of funds for instituting and operating the proposed TIF&A system during the Seventh Plan period would be around Rs. 5 crores(Annexure-VI).

A major portion of the above provision would be spent on funding an average of 10-15 TIF&A studies per year. A part of the above funds would also be required on the provision of essential equipment and other facilities for the TIFAC office and for supporting training programmes in the field of technology forecasting and assessment in IITs, IIMs etc. The Secretarial expenditure in respect of the TIFAC's office would also be accommodated within the same ceiling. As regards the funds required for the provision of staff support and other facilities to the Sectoral TIF&A groups, the Ministries/Departments/Agencies concerned would be asked to accommodate the same within their existing Plan provisions.

vii) TIF&A at 'Industry', 'Agency' and 'Corporate' levels:

The existing sporadic efforts at conducting TIF&A studies at 'Industry', 'Agency' and 'Corporate' levels would be strengthened and organised on a more systematic basis. While scientific agencies and corporate undertakings would be requested to take up such studies as a part of their normal activities and finance them from their existing/internal resources, Government would encourage and assist the Industry Associations to take up such studies and subsidise their costs in cases where the results of such studies are considered to be of wider public interest and benefit.

viii) Linkages:

Apart from the internal linkages to be established between the Sectoral TIF&A groups and the TIFAC as already described, "backward" linkages of the proposed TIF&A mechanism (at its various levels) would be provided with the PP Division in the Planning Commission (which should provide the needed basic socio-economic data, demand forecasts and other relevant inputs in its possession to the Council and to the Sectoral TIF&A Groups, as and when requested by them), the 'Technology Bank' (to be set up as a national facility in fulfilment of the Government mandate in the TPS), and all concerned Ministries/Departments/Scientific Agencies of the Government as well as autonomous institutions like the NCAER, ISI, ICSSR, etc. which are engaged in long-term planning and research in areas of importance to the social, economic and industrial needs of the country. "Forward" linkages would be built up not only between the TIFAC and the Planning Commission and the concerned Ministries/Departments/Agencies of the Government, but also with other actual users in the country. Similar linkages between the Sectoral TIF&A groups and their

8. Ministry of Finance, Department of Expenditure has been consulted with regard to the above proposals and their concurrence has been obtained.

9. Approval of the Cabinet is requested to the proposals made in Para 7(i) to (viii) which, in brief, are as follows:-

i) Establishing by the Planning Commission of an autonomous body (registered society) to be known as the "Technology Information, Forecasting and Assessment Council" (TIFAC) and to its terms of reference as proposed in Annexure-II.

ii) Constituting the Council, initially for a period of three years, with the approval of the Minister of Planning/ Prime Minister, in accordance with the composition suggested in Annexure-IIA, and re-constituting it thereafter at periodic intervals;

iii) Providing necessary secretarial support to the Council as proposed in Para 7(iii) of this Note;

iv) Constitution of Sectoral Groups by individual Ministries/Departments/Scientific Agencies in accordance with the guidelines to be prescribed in this regard by the Council to undertake TIF&A studies, etc., as per the terms of reference suggested in Annexure-IV;

v) Adoption by the Council and the Sectoral TIF&A Groups of the methodology of functioning suggested in Annexure-V;

vi) Making a financial provision of Rs. Five crores under the Seventh Plan to support the proposed technology information, forecasting and assessment mechanism in the country;

vii) Providing support to promote TIF&A activities, at 'Industry', 'Agency' and 'Corporate' levels as suggested in para 7 (vii); and

CERTIFICATE OF REGISTRATION

SOCIETIES ACT, XXI OF 1860

No. 5/18632.

OF 1988

I hereby certify that "TECHNOLOGY  
INFORMATION, FORECASTING AND ASSESSMENT COUNCIL"

has been registered under the SOCIETIES REGISTRATION  
ACT, XXI OF 1860.

GIVEN UNDER MY HAND AT DELHI ON THIS 10<sup>th</sup> day of  
FEB., One thousand nine hundred and  
eighty-eight.

Registration fee  
of Rs. 50/- paid.



REGISTRAR OF SOCIETIES  
DELHI ADMINISTRATION  
DELHI

DSC

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viii) Building up linkages in the manner proposed  
in para 7 (viii).

10. This note has the approval of the Prime Minister.

J.S. Bajaj

(J.S. Bajaj)

Secretary

Planning Commission.

Date: [redacted]

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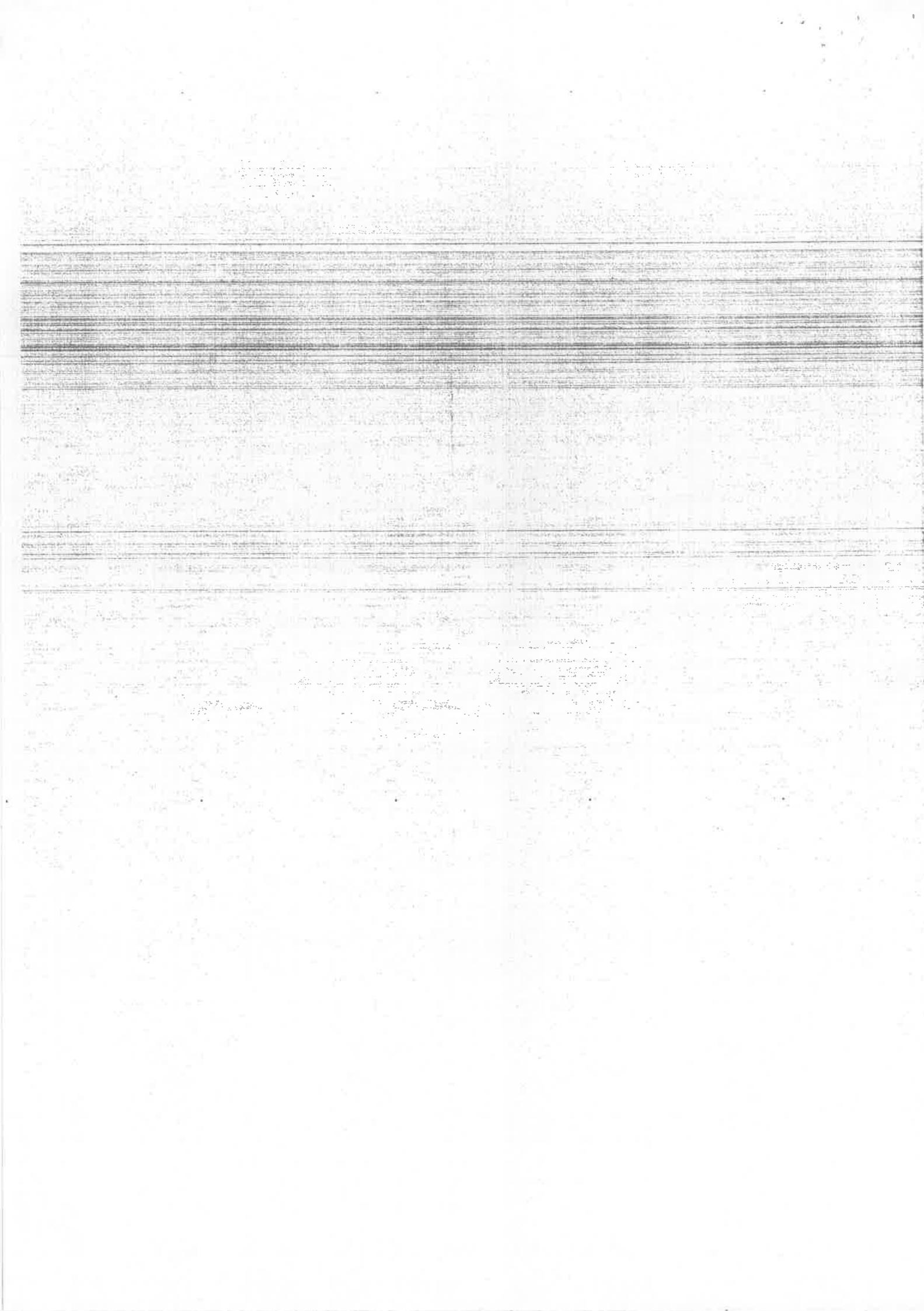
ANNEXURE-I

Extracts of para 4.5 of the Technology Policy Statement relating to Technology Forecasting & Assessment.

UPGRADATION TO PREVENT OBSOLESCENCE

Technology is constantly on the move. The base of indigenous technology should be capable of utilizing world-wide advances and adapting them to local needs. The creation and strengthening of institutional structures for keeping track of international developments will receive urgent attention.

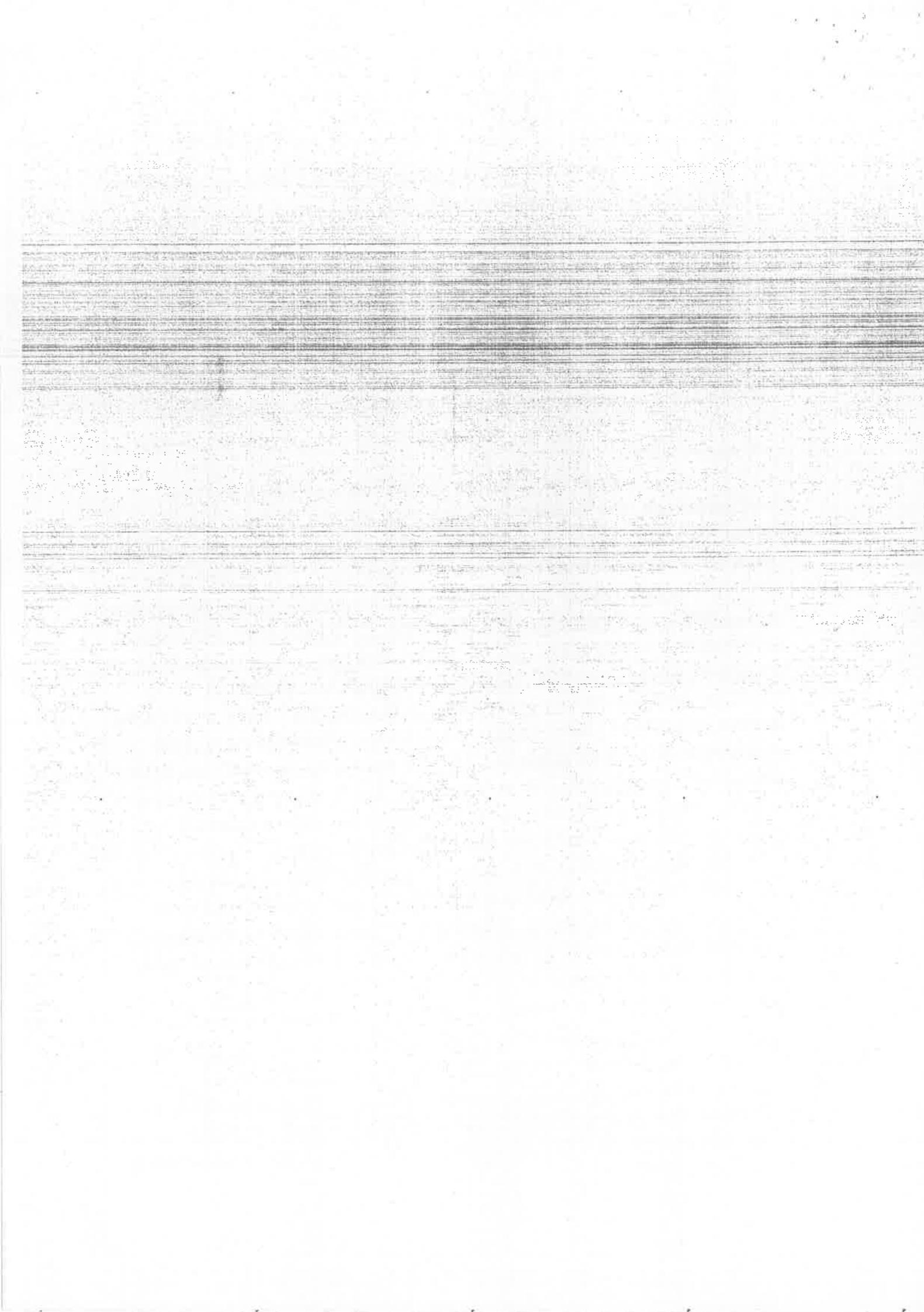
2. A strong central group will be constituted to undertake technology forecast and technology assessment studies and will inter-alia draw up programme of purposeful research. Arrangements will be made to provide high-level scientific advice in major sectors of the economy. Where big investments are involved or a large volume of production is envisaged, it will be incumbent on the Ministry or agency concerned to provide a technology forecast covering its requirements over a ten year or longer period and evolve a strategy for development based on priorities.



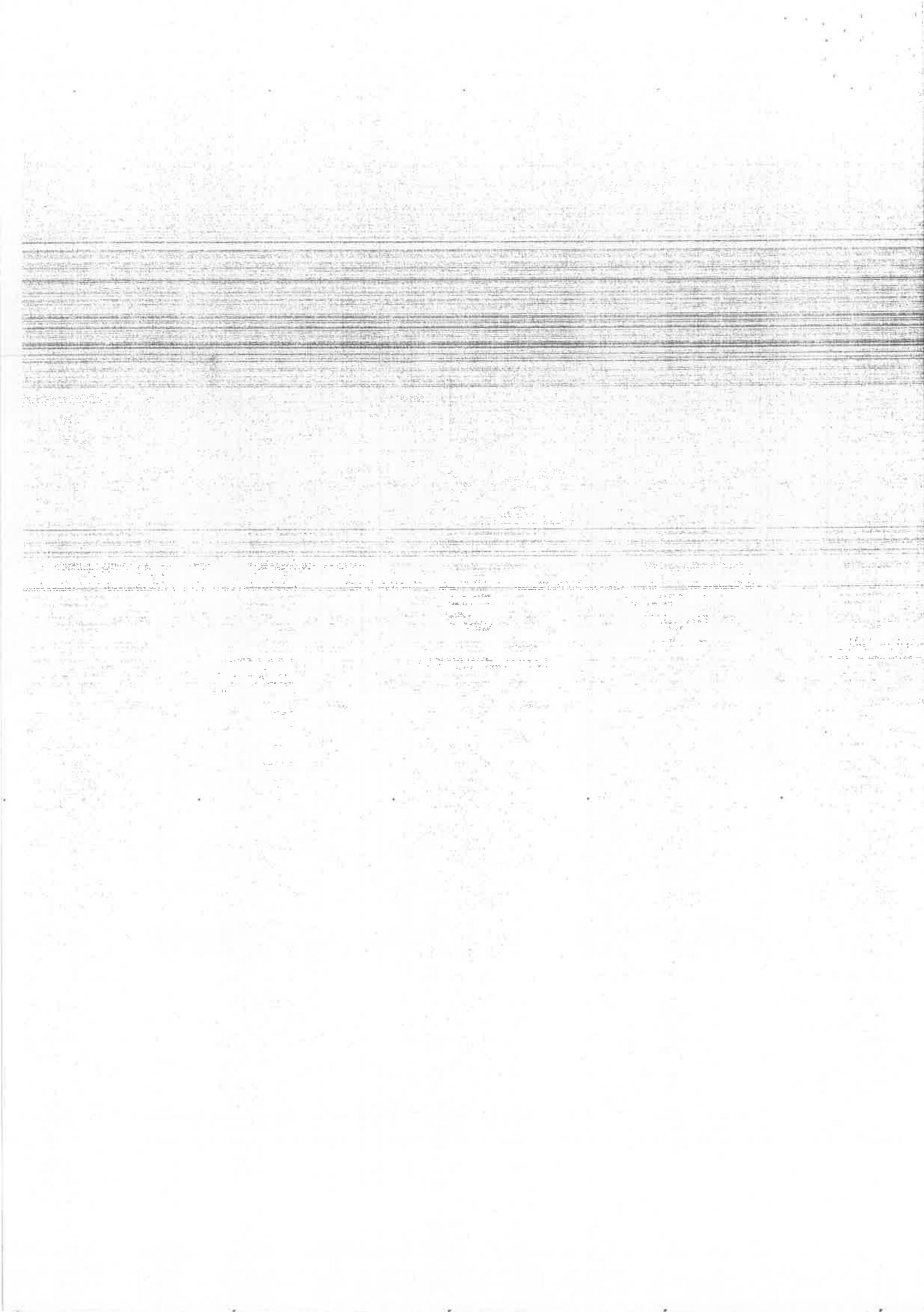
ANNEXURE-II

Terms of Reference of the proposed "Technology Information, Forecasting and Assessment Council" (TIFAC).

- i) To set up specialised sub-groups for examining and evaluating the existing state of art of technology and direction of future technological developments in various cross-sectoral areas as well as in other sectors of the economy, both in India and abroad, and to prepare technology forecasting reports, covering 10 years or longer periods, specially in production areas involving (a) substantial investments of financial resources and (b) a large volume of production;
- ii) To obtain from appropriate sources and project the estimates of the nature and quantum of the likely demands of goods and services in various sectors of the economy against 10 & 25 years' time-frames on the basis of (a) 'normative' and (b) 'exploratory' approaches and to suggest the direction and extent of technological changes that might be considered necessary in order to fulfil these demands in the light of the existing or anticipated resource base of the country;
- iii) To prepare Technology Impact Statements, with a view to uncovering the likely implications and consequences, both desirable and un-desirable, of the existing as well as newly emerging technologies upon society, indicating to decision-makers, through generation of future-oriented scenarios, their short-term and long term implications;
- iv) Based on the T.I.F.& A. Studies and with a view to (a) ensuring timely availability of requisite technologies relevant to the needs of the country on a futuristic basis and minimising the time gap between the development of new technologies and their utilisation & (b) establishing a purposeful linkage between technology development and technology import policies, to identify priority areas of research in relation to the socio-economic, environmental and security needs of the country; to evolve and suggest strategies for technological developments based on such priorities; and to draw up programmes of purposeful research in various sectors;



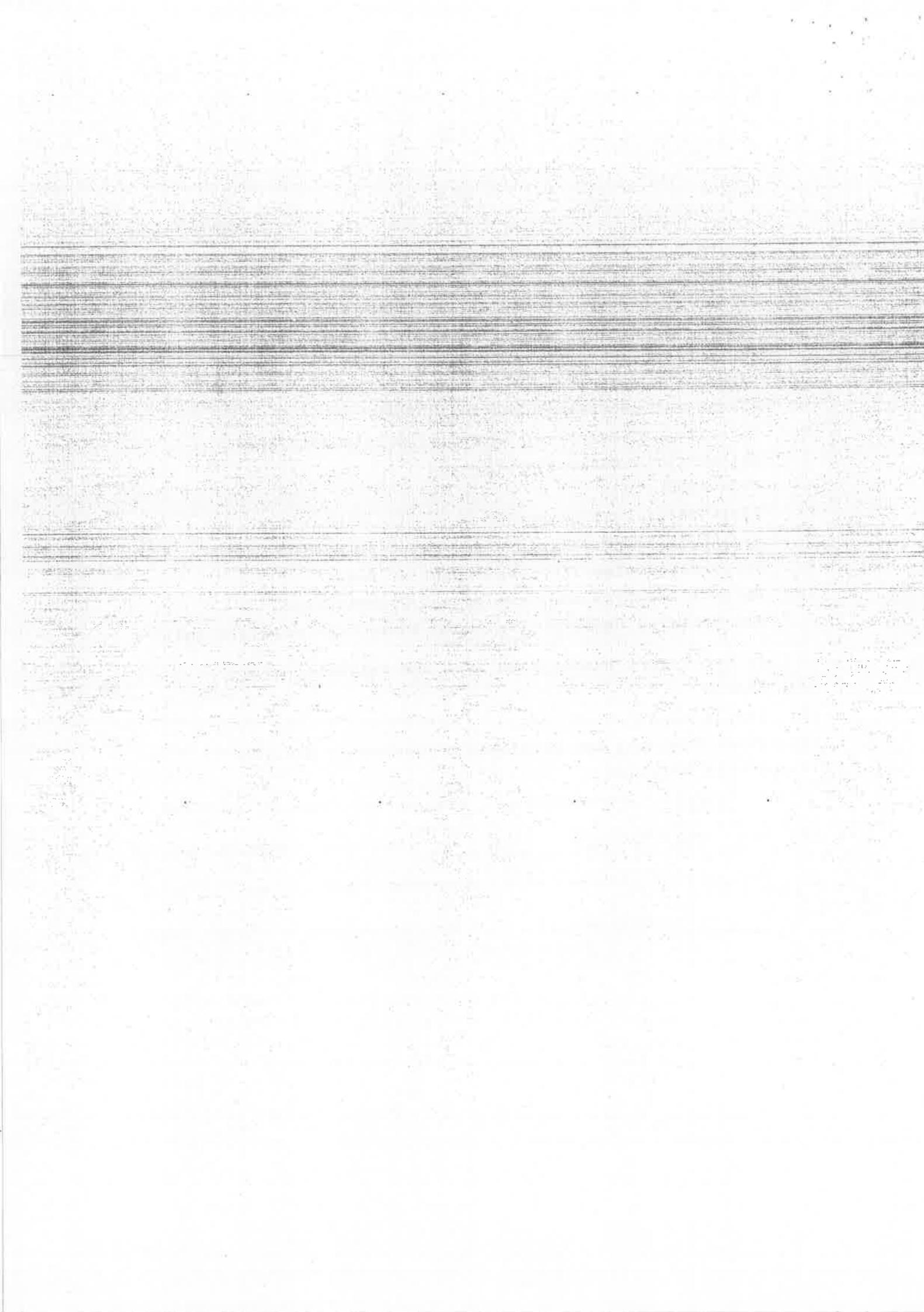
- v) In order to fulfil the above objectives, to devise and set up suitable Information Collection, Analysis and Programming groups;
- vi) To produce an Annual Technology Report for the Prime Minister; and
- vii) Any other matters, incidental or ancillary to the above.



ANNEXURE III

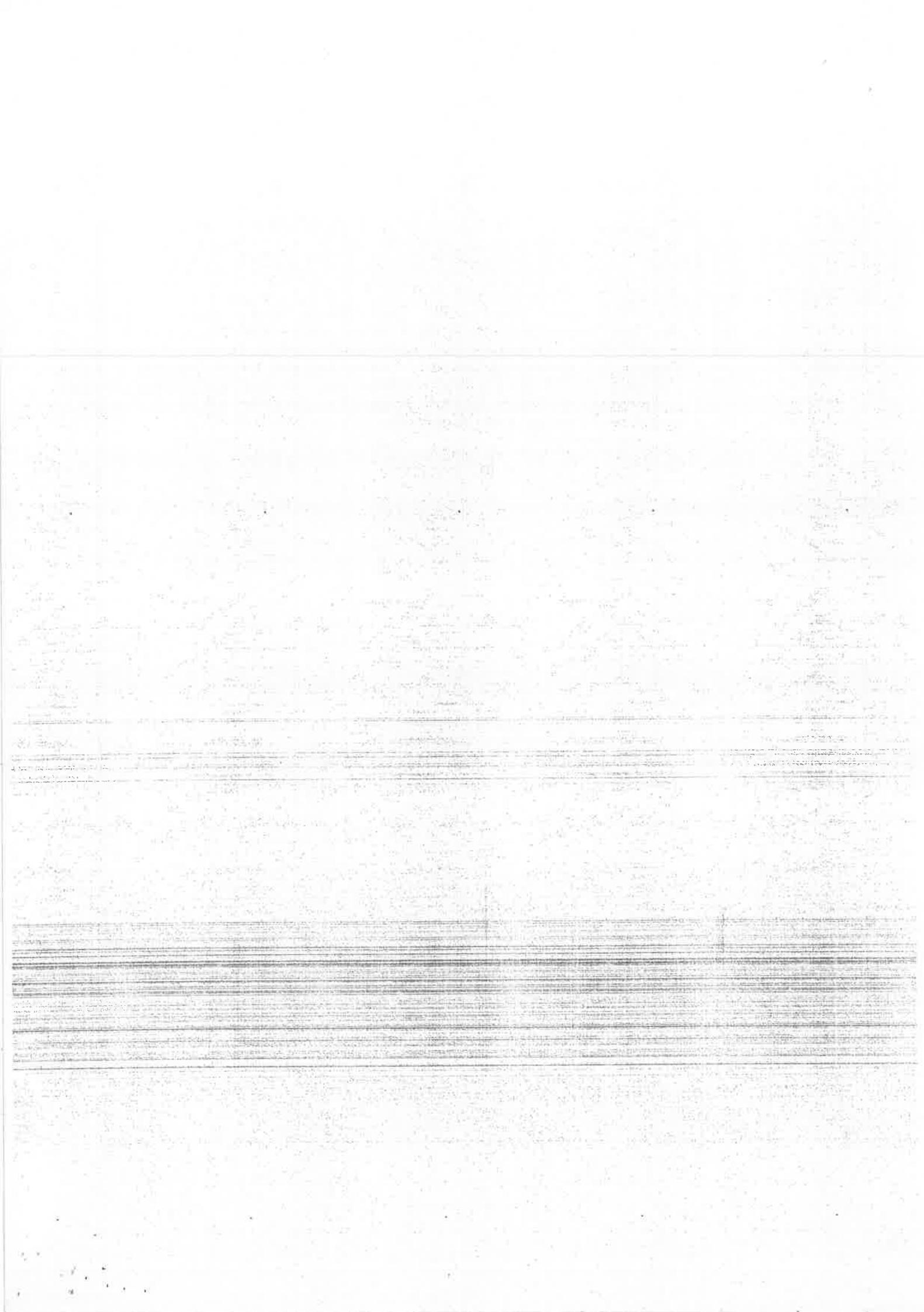
Composition of TIFAC

- |   |                      |
|---|----------------------|
| 1. Chairman   | Part-time/Whole-time |
| 2. Member-Secretary/Director of the Council   | Whole-time           |
| Member at a senior level from Central Government  |                      |
| Ministries/Departments/Agencies   |                      |
| 3. Planning Commission  |                      |
| 4. Department of Science and Technology   |                      |
| 5. Directorate General of Technical Development (DGTD)                                    |                      |
| Scientific Agencies/Departments   |                      |
| 6. CSIR/DSIR  |                      |
| 7. Electronics Commission/DOE   |                      |
| 8. Atomic Energy Commission/Department of Atomic Energy                                   |                      |
| 9. Space Commission/ISRO/Department of Space  |                      |
| 10. Defence Research and Development Organisation   |                      |
| Non-official Members (including those from academic institutions)                         |                      |
| A. One Expert member each from the following areas -                                      |                      |
| 11. Energy  |                      |
| 12. Transport   |                      |
| 13. Urban Planning and Development (including Housing)                                    |                      |
| 14. Social Sciences   |                      |
| B. Members representing industries/institutions/other centres                             |                      |
| 15. One representative from an important organisation of industries at the national level |                      |
| 16. One representative of a progressive public sector undertaking                         |                      |
| 17. One representative of a progressive private sector undertaking                        |                      |



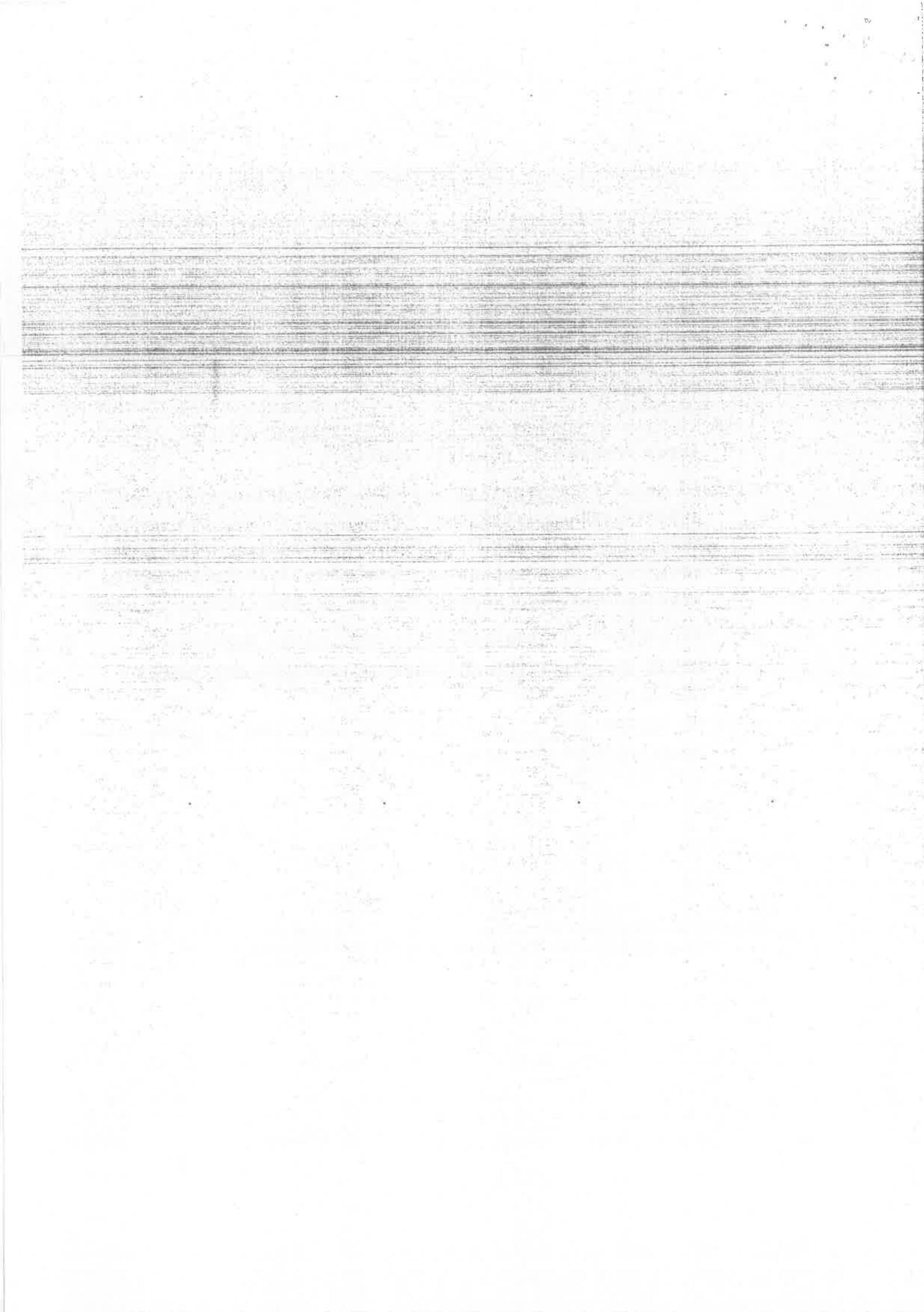
18. Four persons nominated in their individual capacities  
to on the basis of their knowledge/expertise/experience in the  
21. area of Technology, Forecasting/Assessment/Perspective  
Planning/Futurology etc., for a period of 3 years. (Such  
persons could be picked up from any of the Government/Quasi-  
Government/Private Sector organisations or academic/research  
institutions in the country).

22. JS(F)/IFA of DST (Administrative Ministry) - Member



Terms of Reference of the Sectoral TIF&A Groups

- (i) To commission sectoral TIF&A studies for individual socio-economic/industrial sectors;
- (ii) To analyse the reports on Technology Forecasting & Assessment prepared by specialist sub-groups/panels & submit the same to the Ministry/Department/Agency concerned and to the Central Group, along with their comments;
- (iii) To prepare Technology Impact Statements for the various areas covered by the T&F studies;
- (iv) To identify priorities for undertaking indigenous R&D activities/acquisition of technology in various areas covered by the sector, keeping - of course - the inter-sectoral relationships and the overall socio-economic, environmental, and security needs of the country in view;
- (v) To suggest strategies for technological development based on priorities and draw up specific programmes for research; and
- (vi) To submit Annual Reports to the TIFAC and to concerned Ministry/Department/Agency, etc.



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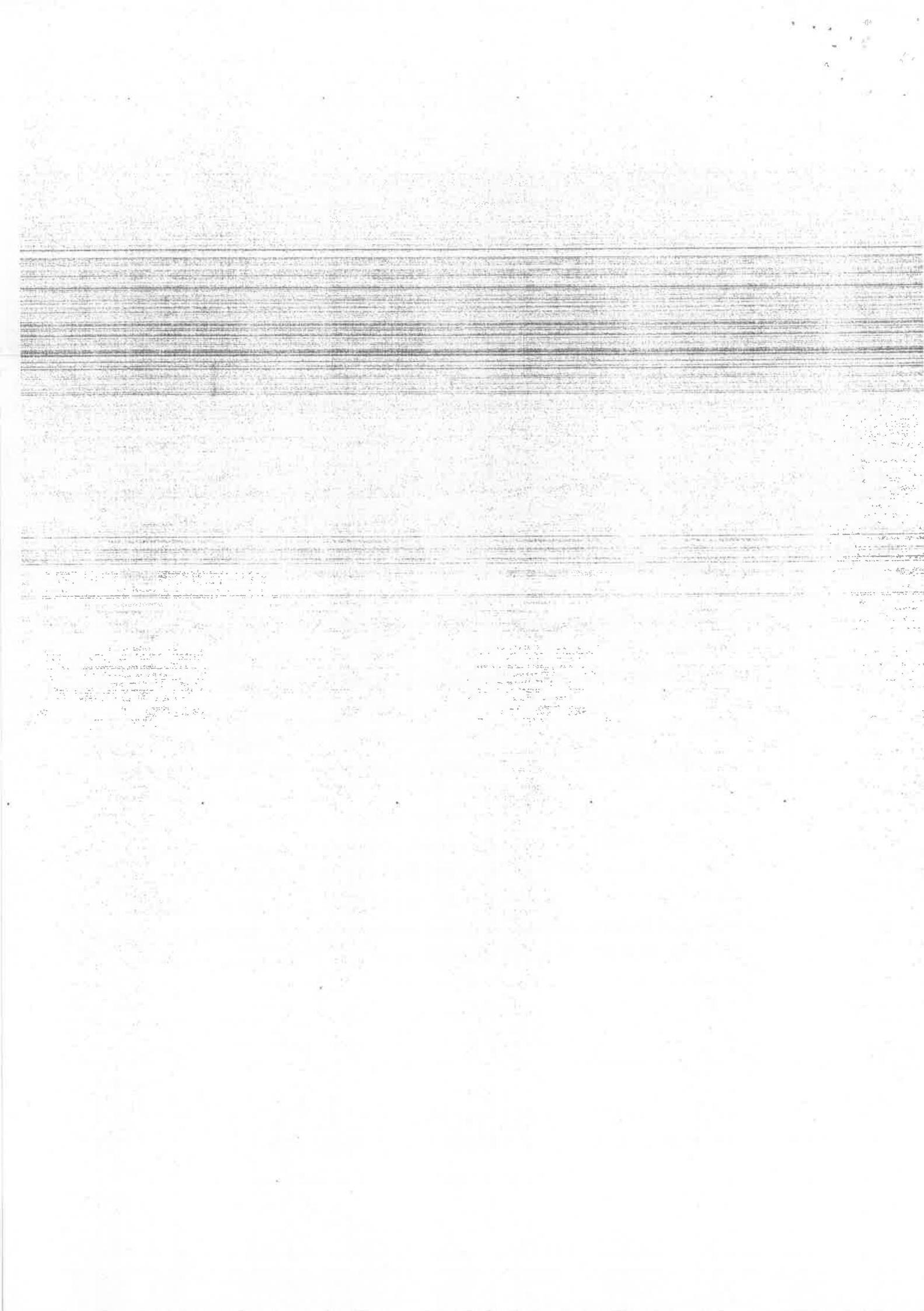
ANNEXURE-V

Methodology of Functioning of the TIFAC and the Sectoral TIF and A Groups:

As mentioned in the Cabinet Note, the TIF & A studies in cross-sectoral areas would be commissioned by the Council and those in individual sectors would normally be commissioned by the Sectoral Groups. As such, studies would involve considerable amount of investigation, analysis and evaluation of technical information and other data in related fields (both from within the country and outside) as well as discussion with experts, it would not be possible to undertake the same through individual members of the Council/Sectoral Groups. It would be required to constitute specialist panels or commission consultants from within or outside the Govt. or adopt other appropriate methodology for undertaking such studies, as might be found suitable by them for the purpose. The expenditure to be incurred on such studies would be met from the budgetary allocations to be made to the TIFAC or the Sectoral Group concerned. The TIF & A reports to be received would be analysed by the respective secretariats and presented with their comments to the concerned Sectoral Groups or the Council as the case might be. The recommendations of the Sectoral Groups/Council, which would include the future plans of action, would be presented by the Sectoral Groups concerned to their administrative Ministries/Departments/Agencies (under a copy to the Council) and by the Council to the Planning Commission. The Council would also make available copies/gists of all studies/reports (other than those which may be considered to be of classified nature) that are commissioned/received by it, alongwith its own views, to the PP Division/other Divisions concerned in the Planning Commission. These Divisions shall, in turn, make available relevant information from these reports to the various working Groups in the Commission as well as to other policy making bodies/groups.

2. The TIFAC may, in keeping with the practice adopted elsewhere and with the approval of the Minister incharge of Planning, release or supply copies/gists of the studies

~~representative bodies of industries in industrial units and non-representative bodies of industries in individual units~~



ANNEXURE-VI

Financial Outlay giving activity-wise break-up

(Rs. in crores)

1. Commissioning of 10-15 TIF & A studies per year	3.25
2. Training programmes and Consultancy	1.00
3. Equipment and computation facilities	0.50
4. Secretarial support for the Council and TA/DA expenses.	0.25
Total (for four years)	5.00

