

Policy Formulation in India : A Study of Telecommunications Policy

Dissertation submitted to the Jawaharlal Nehru University
in partial fulfilment of the requirements
for the award of the Degree of
MASTER OF PHILOSOPHY

SUBHRA MOHANTY

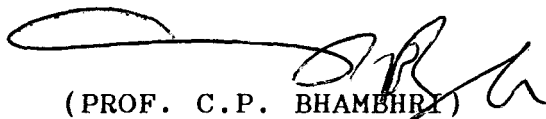
**CENTRE FOR POLITICAL STUDIES
SCHOOL OF SOCIAL SCIENCES
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI-110 067
INDIA
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CERTIFICATE

Certified that the dissertation entitled "*POLICY FORMULATION IN INDIA: A STUDY OF TELECOMMUNICATIONS POLICY*" which is being submitted by SUBHRA MOHANTY for the award of the DEGREE OF MASTER OF PHILOSOPHY is her own work. It may be placed before the examiners for evaluation. This dissertation has not been submitted for the award of any other degree of this University or elsewhere.



(PROF. C.P. BHAMBHRI)
CHAIRPERSON



(PROF. KULDEEP MATHUR)
SUPERVISOR

*dedicated to my
loving parents*

ACKNOWLEDGEMENT

The very conception of the idea of taking up for my M.Phil. research work a topic like that of 'The Telecommunications', an area not yet very familiar to the field of political science, owes its origin to the overwhelming fascination of my father, a physicist by profession, for the C-DOT and its creator Mr. Sam Pitroda. It was he who inspired me a lot to pick up this topic without a second thought. In linking up this topic to the field of policy analysis and giving it a concrete shape, I acknowledge my indebtedness to my supervisor Prof. Kuldeep Mathur. I am tremendously obliged to him for all his kind help in supervising me and his patience in bearing up with all my irregularities and delays in writing chapters.

I am also vehemently thankful to my two brothers and cousin Debasish for their constant encouragement and my friends Aradhana, Bhaswati, Jaya, Alpana, Nandini, Renu, Munishwar and Pradeep Nayak for all their supportive help in various ways. I am specially thankful to Mani for doing my proof-reading at a moment of extreme tension, the Librarians of C-DOT library and last but not the least Mrs. & Mr. Muralidharan for their efficient typing.

PLACE : NEW DELHI

Subhra Mohanty
(SUBHRA MOHANTY)

DATED : 21ST JULY 1992

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CHAPTER I

TELECOMMUNICATION FOR DEVELOPMENT - AN INTRODUCTION

With the world going through a process of communication revolution, telecommunications has come to occupy a place of extreme importance as the 'link' connecting a whole gamut of communication channels like T.V., computers, satellites etc. "Telecommunications are the 'electronic highways' of the future which will influence the geography of economic opportunity in the emerging 'information economy', as much did railways in the earlier periods of profound structural change in the 'industrial economy'"¹ - observed J.B. Goddard, Professor of the Centre for Urban and Regional Development Studies, University of New Castle. So preached Kochen, Hudson, Barker, Hardy; scholars who opened up the telecommunication and development field, a new subfield that emerged from the ashes of the older and broader paradigm of the 'communication and development'.² The subject matter of this new field is the relation between telephones and associated interactive communication technologies and

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1. J.B. Goddard and A.E. Gillespie, "Advanced telecommunication and regional economic development", Geographical Journal (London), vol. 152, no. 3, November 1986, p. 383.
 2. For further elaboration see R. Samarjiva and P. Shields, "Integration, telecommunication and development: Power in the paradigms", Journal of Communication, (Philadelphia), vol. 40, no. 3, Summer 1990, pp. 84-96.

development; and it views telephone with its potential for interaction as to symbolise a new and more humane approach to communication in development against technologies involved in one-way communication, such as radio.³ The views of these western proponents of the 'potentiality of telecommunications for development of mainly the third world countries' have generally been regarded as propaganda mechanisms for dumping western technologies in the developing countries. Historically speaking, though it is so, yet what shouldn't be lost sight of is the real potentialities of telecommunication for facilitating the socio-economic development of the developing nations, though not in a manner or within the parameters set by the western techno-messiahs.

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Though Daniel Bell once contrasted the industrial society with the post-industrial one on the basis of 'finance capital' being the strategic resource of the former while 'the harnessing of knowledge in the form of information' as the strategic resource of the latter⁴, but at present there can hardly be any two opinions about the 'importance of building an information society and economy as a catalyst for widespread socio-economic development of the developing nations' among the intelligentsia and policy-planners of

3. Ibid. p. 84.

4. D. Bell, The coming of post - industry society New York: Basic Books, 1973.

these countries, irrespective of the fact of their relatively lower levels of industrial development. To quote Rogers and Singhal:

The cause of recent optimism about development communication is the realisation that communication technologies can become something more than just a delivery system for development messages. They also represent, at least potentially, a new type of industry, one that some enthusiastic observers claim can allow a third world nation to leapfrog the industrial era and become an information society. So microelectronics can provide jobs and create taxable wealth, and thus contribute to development.⁵

So in the context of ushering in the information society, the important role that telecommunications can play in bringing about widespread developmental changes, has been perceived to a great extent by most developing nations and especially India in recent years. Even more recent is the understanding of the development of rural telecommunications as an important tool for agricultural and rural industrial development.

Way back in the sixties, Vikram Sarabhai, the pioneer Indian space scientist had envisaged an important role for telecommunication along with T.V., Satellites and other improved technological means of communication to bring about qualitative changes of great social implications by providing

5. A. Singhal, and E.M. Rogers, India's information revolution, New Delhi: Sage Publications, 1989, p. 26.

widespread developmental services.⁶ But it was not until the beginning of the eighties that telecommunications came to be seen in a developmental role in any significant way. Specially in the eighties, with telecommunications to play a significant role in the development field, much academic, intellectual and policy attentions have come to be focussed in this field.] Consequently, the advantages and benefits of an extended telecommunication scenario, pointed out by its proponents are many. In general, taking a dominant western point of view, it is pointed out that reasonably well-managed telecommunication entities can generate financial surpluses in local currency. Furthermore, many of the telecommunication entities will make substantial net transfer of funds to the government for use in other sectors less able to mobilise domestic resources. The proponents of investment in telecommunications sector further contend that, with a reliable telecommunication system, new communication is generated, and stronger, more complex and more productive communication patterns built up, partly through direct and indirect interaction with numerous production and distribution functions. It is argued that with accessible and reliable telephone service, some of the physical constraints on organisational communication are removed in various sectors

6. For Vikram Sarabhai's views on science and technology see V. Sarabhai, Science policy and national development, Kamla Chowdhury, ed., New Delhi: MacMillan, 1974, pp 50-60 and 169-176.

of the economy, permitting increased productivity through better management in both public and private sectors. Markets gain in effectiveness with improved communications.⁷ A particularly timely argument, based on the fact that telecommunication can partly substitute for transport and can bring about the more efficient use of transport facilities, emphasises that telecommunication can reduce the energy input required to sustain a given level of communication. This assumes special significance in the present national and international energy-starved scenario, where the developing countries have to bear the main brunt of rapidly depleting natural energy resources like coal and oil. So, as economic development takes place, telecommunication gradually becomes the most cost-effective means of communication and is often more effective and efficient than other forms in terms of time, energy, materials and quality of environment. It also contributes tremendously to individual and family welfare.⁸ With the gradual merger of computers with the telecommunications service, what assumes special significance for the developing countries, is the fact of rapid and easy transfer of large scale digital data from one place to another and promotion in the process of distant learning. 'The core impact which information technology can make on

7. For elaboration see R.J. Saunder, J.J. Warford and Bjorn Telecommunication and economic development, Baltimore: John Hopkins University Press, 1983, pp.15-24.

8. Ibid.

development is the use of integrated computer-cum-telecommunication systems to convert data into information and use/manipulate/control such informations for : planning and decision making, efficiently managing large economic assets, enhancing productivity and safety and in improving the availability, quality and access to new services in areas like telecommunication itself, education and health.⁹ So telecommunication is important not only for faster commercial, industrial and other economic activities thereby facilitating the overall economic development of a country, but also it contributes to the development of a shared communication environment reaching the country's most remote areas, thereby promoting political, cultural, social and economic integration of the country¹⁰. Of recent focus of attention is the utility of telecommunications for rural development.

In a country like India, where 80% of the people live in rural areas, mostly under dismal socio-economic conditions, our policy planners and technocratic intelligentsia eulogize on the developmental impact of a network of rural telecommunication exchanges that can, according to them , keep the local producers in touch with

9. A. Parthasarathi, "Information for Development: The Indian Experience-I", Mainstream, vol. 26, no. 40, 16th July 1988, pp.15-19.

10. Saunder, Warford and Bjorn, 1983, op. cit., p 23.

the market developments and economic forces operating outside. It can facilitate the smooth flow of many other things like the information, investment, health and education services, etc. from the better off areas. Much of the indigenous thinking and attempt to validate the hypothesis that telecommunications permits improved rural social service delivery, improved cost-benefits for rural economic activities and a more equitable distribution of socio-economic benefits. The rosier picture that is painted about such an information economy, centered around a developed telecommunication network whose potential for interaction is seen to symbolise a new and more humane approach to communication in development, is that of one which is 'equitable and efficient'.¹¹ For if access to information becomes the key to economic success, then the new technologies could help to ensure that information is more widely disseminated and the benefits to be derived from its use more broadly spread. Most of the thinking and studies on 'telecommunication and development' that exist today in general and in India in particular, mainly rest on the 'parsonian assumption that integration is desirable as an objective and uncontested as a concept'.¹² What is generally assumed is that telecommunication channels are neutral

11. See for further description, Goddard and Gillpspie, 1986, op. cit., pp.383-384.

12. For further elaboration see Samarjiva and Shields, 1990; op. cit., pp. 92-98.

conduits, access to telecommunication is of value and the information carried through them are beneficial to all concerned. Telecommunication channels are presented as power-neutral conduits of "good" information.¹³

R.L. Katz in his The Information Society: An International Perspective¹⁴ criticises this type of approach for failing to consider how existing patterns of power, influence and resource allocation determine the diffusion of telecommunication technologies. Much can be said about the potential benefits of telecommunication in improving the well-being of the rural people; but without a systematic analysis of power, little can be said about the specific conditions under which these benefits may be fully realised. To illustrate this point more clearly we can say for example that, while most of the academic research and writings on 'telecommunication and development' recite such benefits as farmers receiving higher prices in city markets after obtaining information with newly installed telephones, what's left unstated is the strong likelihood that two-way communication between the city and the hinterland may ruin local traders in the short-term and incorporate hitherto relatively self-contained economic entities into the metropolitan economies in the long-term.

13. Ibid.

14. R.L. Katz, The Informations Society: An International Perspective, New York: Praeger 1988.

Such parsonian conception of integration also underlies technology choices made by the Third world governments.¹⁵ The most striking illustration of this distorted thinking can be found in our mad run for and obsession with the latest technologies leaving aside any concern for the contextual factors and socio-economic parameters within which these technologies have to operate. Third world states tend to be of centralising types. The dominant development models assign a pre-eminent role to the state and not to the local communities. All useful informations are assumed to be located in the city, and the only useful communication links are assumed to be those connecting rural areas to the metros. This kind of an approach leads to specific technology choices that bias the allocation of resources to those sectors of the rural economy that are integrated with urban-based market system. In such a situation, with both academic research and incentive structure of the third world policy makers biased towards satellite and distance technologies, it is no surprise that 'island' rural digital exchanges have been discussed only hypothetically. So a correct approach has to recognise the asymmetrical nature of power relations between the 'developed' and the 'less developed' areas, which a thoughtless application of communication technology can very well accentuate. If we accept the rights of small and powerless groups and communities to exercise some control

15. Samarjiva and Shields, 1990, op. cit., p. 97.

over their destinies, then telecommunication resource allocation must help strengthen local communication networks as links are established with outside. Maintaining this balance will help realise participation, equity and equality. The first step in an alternative scenario would be to study the networks and economic relationships of the rural areas, as well as telecommunication needs.

The developments in telecommunication, within the context of an emerging information society and economy, have important implications. 'While most argue that developed telecommunication technologies, by removing friction of distance and reducing local constraints lead to an economic convergence between the developed and the less-developed areas thereby reducing regional disparities, yet as can be seen, the possibility of the converse to happen is equally strong as new services are unlikely to be introduced uniformly across space and are likely to favour investments in the existing concentration of economic activity and areas of current politico-social and economic advantage. So what assumes to be of utmost importance in such a case is the necessity of a conscious policy intervention, to ensure that the existing socio-economic disparities aren't exacerbated by these developments.'¹⁶ There is an urgent need to develop clear objectives and a comprehensive communication

16. For further details see Goddard and Gillespie, 1986, op. cit, pp. 384,392-396.

philosophy. A comprehensive, co-ordinated and well thought out policy, formulated on the basis of research, scientific policy analysis and wide discussion and participation is required to help the less favoured regions and to see that adoption of technologies and informatics services introduced are relevant to the total socio-economic context of the concerned country. In the interest of equity and efficiency, it is important to ensure that the opportunities associated with the information economy are shared between different cities and regions which make up our society. At this juncture, it is worth mentioning another point that "technology certainly and communication technology in particular is too serious a business to be left in the hands of a handful of technocrats alone....The most important thing to understand in this regard is that technology is one thing and innovation through a shift in the techno-economic paradigm quite another. What is needed for development isn't just technology or new technology but appropriate technology.¹⁷ In India, so far we can see that modern communication technologies have been introduced without evolving a communication philosophy, approach and policy, relevant to Indian conditions and needs.

So in summing up, it can be said that though telecommunications has tremendous potentials to bring about

17. K.L., Sondhi, Beyond Mass Communication, Delhi: B.R. Publishing Corporation, 1991, pp. 193-206.

socio-economic transformations in developing countries like India, yet with a thoughtless persual of extending telecommunication network and adoption of latest hi-techs, can culminate in distortions. So what is needed is a proper policy framework, judiciously pursued, in order to ensure that the 'electronic highways' of the future don't become associated with predominantly 'one-way' traffic in which the unequal relations of present regional interdependency and other forms of inequalities become entrenched.

So in this context, what assumes a place of utmost importance, is a process of policy-making where decisions are not vitiated by partisan politics or short-term selfish considerations, but are rather made on the basis of 'well-considered' measures reached through the optimum utilisation of specialisations and mental and material resources existing in the field. It is here that the issue of 'optimality' assumes special significance in the policy process, specially taking into consideration the specific socio-economic conditions prevailing in most developing nations like resource crunch, low level of economic growth, excessive dependence on the outside world for aid and technology, predominantly rural and traditional societies, etc. This criterian of 'optimality' becomes a matter of further significance in areas having a predominantly technological and scientific buyers like that of the telecommunication sector. Its newly emergent character makes the issue of a

judicious persual of a rational, consistent and scientific policy framework a matter of added importance even within the science and technology sector itself.

* * *

So taking all the above things into consideration, the present study tries to analyse the patterns and trends in policy-making within the telecommunications sector on the backdrop of a general policy-making trend characterising the entire policy process of the Government of India. It also attempts to have a clear insight into certain issues like 'Being different from the rest in terms of its inception and nature, does the arena of telecommunications reflect a different pattern of policy-making?', 'Is there a consistent, coordinated and coherent approach, which is necessary for achieving optimality which a sector like telecommunications demands?', "What are the hurdles on the way and chances of achieving optimality in this sector?" etc.

Accepting 'the achievement of optimality' as crucial in both the formulation and implementation of policies, due to time and space constraint, the study however tries to focus only on the 'POLICY-MAKING' aspect and not the 'POLICY-IMPLEMENTATION' aspect. This concentration on the policy-making aspect is taken on the basis of the assumption, as is taken by Aqueil Ahmad in his article 'The making of Science and Technology Plan', that "the further we go on in

identifying the parameters of a 'good policy or plan', the closer we come to understanding the relationship between good policy and good policy-making -- the axiomatic relationship between process and the product."¹⁸

The study also refrains from going into an evaluation of the various policy-measures taken by the government of India to see their 'rightness' or 'wrongness', only except to a certain extent while showing the contradictions characterising many policy measures. However in conclusion, it takes into consideration some tentative suggestions and parameters that policy-makers should take into consideration in order to have proper perspective and be effective in the telecommunication sector.

To keep the work within manageable size, a further limitation has been adopted, i.e. a focus primarily on the telephone service, though telecommunications doesn't mean telephones alone. Telecommunications is one form of channel like that of sound broadcasting, T.V., computer system and data banks, satellite communication, electronic industry (as support), marketing and advertising channels, film etc. which taken in holistic term can be called information technology. Telecommunication is something which links all of them'.¹⁹

18. See A. Ahmad, "The making of Science and Technology Plan", in Ganapathy, Maru, Ganesh, Paul and Rao, ed., Public Policy and Policy Analysis in India, New Delhi: Sage Publications, 1985, pp. 178-192.

19. See Sondhi, 1991, op cit., pp 78-79.

Besides telephones it also consists of telex, fax, teleconferencing, etc. But despite the dramatic growth of telex (which, with the advent of modern electronic word processing and text communication, may become obsolete within the foreseeable future) and the probable great importance of innovative telecommunication services in the long-term, telecommunication in the developing world (as well as in industrialised countries) are dominated by telephone service and use of telephone network for text image, and data transmission; this typically accounts for more than 90% of telecommunication investment, traffic and revenues. Although electronic mail, electronic information system, teleconferencing, and other new services are well established, they still operate on a very small scale compared with telephone services. More important, however, most of the essential issues and concepts surrounding the voice, text, image and data transmission aspects of telecommunication policy can be understood through a discussion and analysis of telephone service.²⁰ Same holds good for Indian telecommunication. (telecom).²¹

20. Saunder, Warford and Bjorn, 1983, op. cit., pp.27-28.

21. From henceforward in most places 'Telecommunications' will be written in the abbreviated form 'Telecom'.

CHAPTER II
PUBLIC POLICY-MAKING

Despite detailed planning & policy formulation, the over all socio-economic development in many of the developing countries has been much below the desired level. This makes many scholars like T.B. Smith to think that the consideration of the question of 'policy - success' and 'policy-failure',¹ are of tremendous importance in any policy analysis, especially in the context of the developing countries. Though a judgement of success and failure can always give a more comprehensive and appealing touch to any policy analysis yet it isn't absolutely necessary for academic purposes. One can examine public policies equally effectively without researching to making judgements of success and failure. The present work precisely intends to do so without going to an explicit judgement on the success and failure of the telecommunication policy. This study is mainly going to emphasise on that aspected policy analysis which Thomas Smith characterises as policy design² which includes two important issues of appropriate perspective and consensus and agreement.

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1. For details see, T.B. Smith, "Analysis of policy failure : A three dimensional framework", The Indian Journal of Public Administration, (New Delhi, vol. XXXV, no. 1, January-March 1989, pp. 1-13.
 2. Ibid., p.4.

An analysis of a policy is to be necessarily done against the backdrop of optimal policy making which assumes special and added significance in the context of developing countries where the widening scope of government responsibility has brought into existence many trends of a very complex nature, acting and interacting with each other and with the state giving rise to problems of a very peculiar character. The assumption of enormous responsibility by the state for bringing about positive changes in all spheres of life, has expanded the interaction between government and the people which has resulted in the emergence of contradictory perception: 'government is perceived to be present everywhere, and yet it is perceived as increasingly ineffective. In other words, images are formed of a steady decline in performance capabilities leading to a situation where needs and demands are confused with one another and pressures for performance get generated on a structure straining to maintain itself. The result is that politico-administrative systems tend to lose their credibility, while the legitimacy of institutions and persons comes under critical review, saturating the situation with tension and suffusing expectations of the future with uncertainty' ³

Problems of this nature compel state to accept guided

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3. K. Saigal, "The possibility of optimal policy making in India" in Madan, Dishes, Pradhan and Sekharan, ed., Policy making in Government, New Delhi: Ministry of Information and Broadcasting Publication, Govt. of India, 1982, pp. 105-106.

national change in the form of planning which inevitably transforms the earlier understanding of the term 'policy' by demanding of it not only a statement of intents and purposes, but something greater, i.e. internal consistency, rationality and a wholistic or systematic approach. Now taking into consideration the rate and nature of change, it has become imperative to move from a conception of policy which focusses on corrective or stopgap measures to a conception which anticipates emerging confirmations, and provides for active intervention in the social process.⁴ However, such a thing assumes special significance as policy making in India has to take place in the context of a complex and variegated society. 'Rising expectation and the goals set for itself by the state, when viewed in the context of the lack of resources, underline the need for attaining optimality in both the formulation and implementation of policy'.⁵ Though the constraints to optimal policy making are many like the norms of democracy, dynamics of a developing country, its poverty, size, population, underutilisation of resources etc., yet through proper policy analysis and rational policy formulation within the parameters of a consistent, judicious and wholistic approach, these constraints can be reduced to the manageable minimum. Here it is important to mention that

4. Ibid., p.106.

5. Ibid, p. 108.

this criterion of 'achieving optimality in policy-formulation' becomes more important in case of policies having technological bias like the telecommunications policy, science and technology policy etc., where any compromise on optimality for the sake of acceptability or any other criteria can create havoc.

In the above context, it is important to mention the two major approaches to policy development in government. 'One approach is represented by those who believe that policies are made through the process of political bargaining and represent adjustments and accommodations among competing demands and pressures. Therefore, policies can neither be anticipated nor drastically changed, but only modified in limited ways. The second approach to policy development is presented by those who believe in the possibility of discerning patterns and trends in human affairs and advocate injection of greater rationality in the management of national affairs so as to be able to steer national systems in desired directions. Such a course would require anticipation of events as well as policy planning to meet emerging eventualities. The Indian government with its ambitious goals, low resource base and slow historical rates of change has no option but to adopt the second approach and to accept the validity of policy analysis and development to strive for the maximum possible degree of optimality in

policy formulation and implementation'.⁶

But if we look at the policy formulation process of the Indian government which involves extensive advice and consultation revolving around the committee system, we can clearly see the balance tilted in favour of the first approach, thereby putting the issue of optimality to a ridiculous low. As found out by Dayal, Mathur and others from their studies of 6 cases, the basic policy choice is invariably given by a committee appointed for the purpose. After reviewing the policy formulation process in government of India, Dayal and his colleagues sum it up as follows: "the style of policy formulation involves extensive advice and consultation. The outstanding feature of policy making is characterised by accommodation and settlement involving the political, administrative and specialist groups as far as possible."⁷ Such a system is regarded by them as a major strength as the pooling of knowledge, experience and expertise in a committee situation can result in sound, realistic recommendations; the reputation and public standing of the chairman and the members would also enhance the acceptability of the recommendations thereby facilitating its implementation; public administration being an open system, credibility of a decision and appearance of impartiality by

6. Ibid., pp.109-110.

7. I. Dayal, K. Mathur, Datta, etc. Dynamics of formulating policy in Govt. of India, Delhi: Concept Publishing Company, 1976, p.65.

the government are important for administrative action, government becomes able to gauge public reaction to recommendation on vital issues before taking a decision etc.⁸ Side by side with these advantages, the authors weren't far behind in pointing out the weaknesses of such an approach.

According to them, "the system however has certain inbuilt shortcomings in policy formulation which cause, on occasion, sub-optimal policy recommendations. By its very nature a committee has to seek compromises among its members especially when its composition is diverse and the problems complex. The recommendations must be acceptable to its members. There may be other solutions that would perhaps yield better approaches. While acceptability among members may be an essential condition it may not be a sufficient condition in policy formulation".⁹ So seeing the way our committee system works, radical policies become difficult to formulate, nor do they easily attract acceptance. Radical policies seem to come out of the initiative of top political leadership and not through the formal machinery that is set up for the purpose, as will be evident from our study on the creation of C-DOT, a unique organisation and R&D innovation. However at this point it is worth mentioning that, while taking up policy initiative, the political leadership

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8. Ibid, pp. 65,66.

9. Ibid, p. 66.

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should go on a logical, rational and scientific evaluation of the entire scenario and not give vent to partisan politics to fiddle with the process. If one looks at the story of C-DOT, as we'll be in the course of our analysis of the telecommunications policy, it can provide a splendid example of what political will can achieve and a sordid case of what political meanness can dismantle. The government decisions shouldn't be politically motivated and influenced. The political influence in the present consideration refers to something beyond what is contained in the party manifesto. The political motive here refers to special patronage, yielding to the pressure of various vested interests and taking a decision based on things other than national considerations. We will come to see in the course of our analysis how politically motivated decisions by the government has come to affect the working of the committee system. The appearance of impartiality and credibility that the appointment of special committees are supposed to give to government decisions have come to be affected seriously by such highly politically motivated and considered appointment of committees as will be evident from the case of the Nambiar Committee.

Again, committees invariably try to seek agreement among its members and attempt to find a common basis among them which tends to perpetuate the existing difficulties rather than offer new policy options. According to Ishwar

Dayal, the tendency on the part of members toward compromise and accommodation has cultural relevance as in our relationships, social and work roles are rarely distinguished. Disagreements in specific work situations are often extended in all other areas of social interaction. In meetings, unless for other specific reasons, a member ordinarily tries to minimise anything that gives the impression of being "difficult" or "hostile" unless his role justifies it. In such situations the member often withdraws either by writing a minute of dissent or resigning from his membership. However, it is also not unusual to find serious disagreements eroding the committee's process resulting in the submission of separate reports. It has also often been noticed that members who seem to be difficult, are dropped from membership¹⁰ of other committees and even sometimes follow-up actions are taken against them as will be evident from the meemamsi affair. At times committees give recommendations that are unrealistically "radical"; as often seen in international gatherings, saying, as if, that effect is more important than substance. Thus the dynamics of committee functioning is complex and the quality of their outcome depends upon a number of factors. In a developing country such as India, where radical approaches are necessary to tackle serious social and economic problems, the

10. I. Dayal, "Organisation for policy formulation" in Madan, Diesh, etc., ed., 1982, op.cit., pp. 147-150.

prevailing strategy for policy formulation isn't always satisfactory. Again, 'the committees set up to provide basic policy choice don't provide operational details but generally give a detailed rationale of the recommendations or alternative solutions that they might have considered. Rarely does a committee discuss alternatives and why they were rejected in preference to what the committee had recommended. It is only when the recommendations are accepted by the concerned ministry that it works on the operational details',¹¹ A committee by its very nature functions within the defined boundaries of the subject matter assigned to it. Partly due to this and partly due to the way it functions, public policy suffers from lack of a clear holistic perspective, a systems view.

Besides all the above shortcomings of the committee system, another interesting factor which can be taken note of is that many times committees are appointed just to buy time to enforce decisions at a more convenient time or as face-saving measures. So decision to appoint a committee becomes political and many times the committee's recommendations never see the light of the day if it is not politically suitable.

As pointed out by Dayal, the dynamics of policy formulation in India has in brief the following

11. Dayal, Mathur, Datta, etc., 1970, op.cit, pp. 67-68.

characteristics:¹² (i) planning commission has the responsibility for development policies and for review of what is achieved. (ii) Sectoral policies, programmes and projects are mainly the responsibility of ministries and attached officers of that government. (iii) The most dominant style of policy making is by appointing committees or commissions for direction on important public matters. The interlinkages between the sectors and among ministries are often achieved through the appointment of such bodies. At times the recommendations are reviewed among the ministries and changes are made to suit the practical problems of administering the recommendations.

Besides the committees, the political system plays its role in various ways like (i) in the formulation and acceptance of 5-year plan objectives, (ii) discussion by the concerned minister who keeps the Prime Minister in touch with such aspects of the programmes as he may consider important. The draft also is discussed by the cabinet and suggestions are made by the cabinet for changes where necessary and (ii) in operationalising plans and programmes.

Besides this individual ministers, the prime minister plays important role in initiating as well as reacting to various proposals.¹³ However in case of a clash of opinions,

12. I. Dayal, 1982, op.cit, p. 157.

13. Dayal, Mathur, Datta etc, 1976, op.cit., p.68.

it is the prime minister's decision which always prevails. In our discussion of the telecommunication sector, it would be found how most of the initiatives emerged at the PMO level and were sent as directives to the concerned ministries. Besides the government, another dominating factor seems to be the role played by a single individual or a group of individuals, whether they are politicians or technicians in influencing policies by either their personal knowledge, or fascination, or interest or prejudices. However besides these, we can find a substantial role played by public opinion, mainly that of the press in influencing policy decisions to a great degree. So can be found the influence of trade unions, interested groups and specially multinationals. All these multifarious and sometimes not-so complementary influences lead to the formulation of short-term plans on crash basis which may or may not take notice of long-term interests. In our discussion we will find how such complex processes and influences create distortions in the policy-making process, mostly creating short-term and sometimes short-sighted plans. All these hamper optimal policy formulation.

However, besides the formulation, the implementation aspect of a policy process is equally important for judging the optimality of a policy as 'various factors often create imperfect correspondence between policies adopted and

services actually delivered'.¹⁴ However this study doesn't deal with the implementation aspect.

So in summing up, it can be said that though the achievement of optimality in both the formulation and implementation policies assume tremendous significance in the context of the developing countries, yet in practice this aspect is generally neglected and not taken care of in many of these countries thereby leading to sub-optimal policy formulation.

14. For elaboration see M.S. Grindle, "Policy content and context in implementation" in Grindle, ed., Politics and policy implementation in the third world, New Jersey: Princeton University Press, 1980.

CHAPTER III

TELECOMMUNICATIONS IN INDIA

The 'telecommunications - development nexus' was a factor realized quite late by the Indian planners and policy makers with the resulting consequence of the sector failing to get the requisite amount of attention in our successive plan priorities. Even today, very little appreciation exists for the role of telecom in rural development or in the development of education or comprehensive health plan etc... As a result, India reputedly has the world's worst telephone service, with only 0.4 telephones per 100 residents (at the beginning of the Seventh Five Year Plan) compared to 75 in the US, 65 in Japan, and 7 in Malaysia (Figure 1). On 31 August 1991, the telephone/population ratio in India was just 0.6 per 100, which is still much below the world average.¹ At any given point of time, 4 out of every 10 phones in Delhi and 7 out of every 10 in Calcutta don't work.² In the seventies and the eighties, telephones were perceived to be luxury goods meant for elite consumption. That telecom has a fundamental social and economic consequence was not an idea that popularly struck those who were responsible for the country's network. Even as an instrument for elite

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1. See R.C. Rastogi, "An Approach Towards Self-Reliance", Telematics India, vol.V, no.6, March 1992, p.62.
 2. A. Singhal and E.M. Rogers, India's Information Revolution, New Delhi: Sage Publications, 1989, p.177.

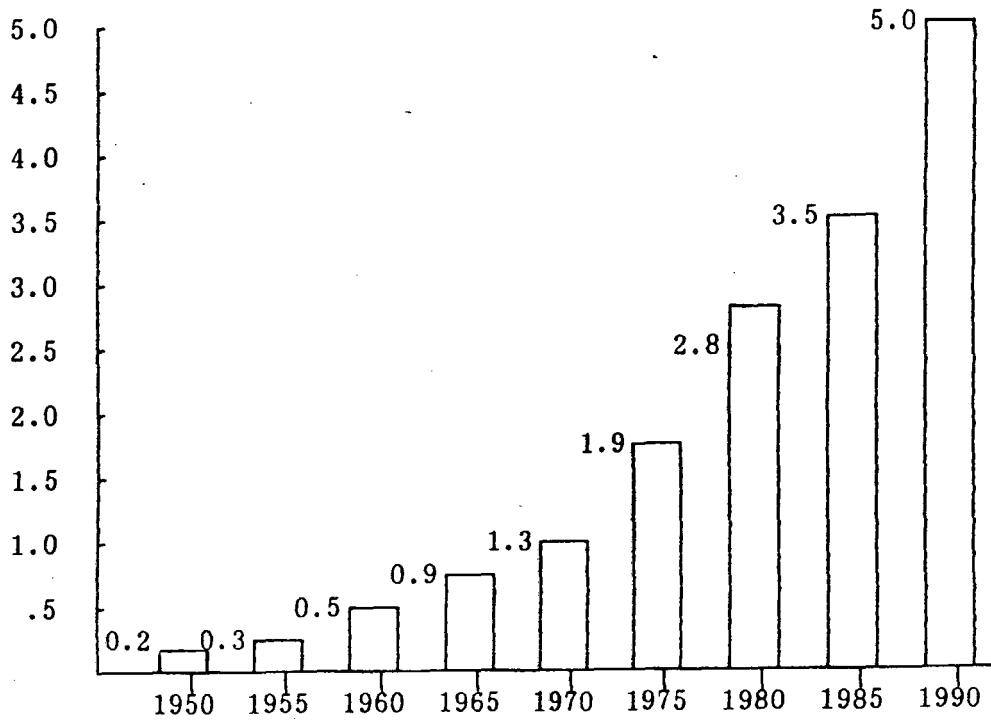


Figure 3.1: Growth of Telephones in India

Source: Statistical Abstracts of India, New Delhi,
Ministry of Planning, Government of India, 1985.

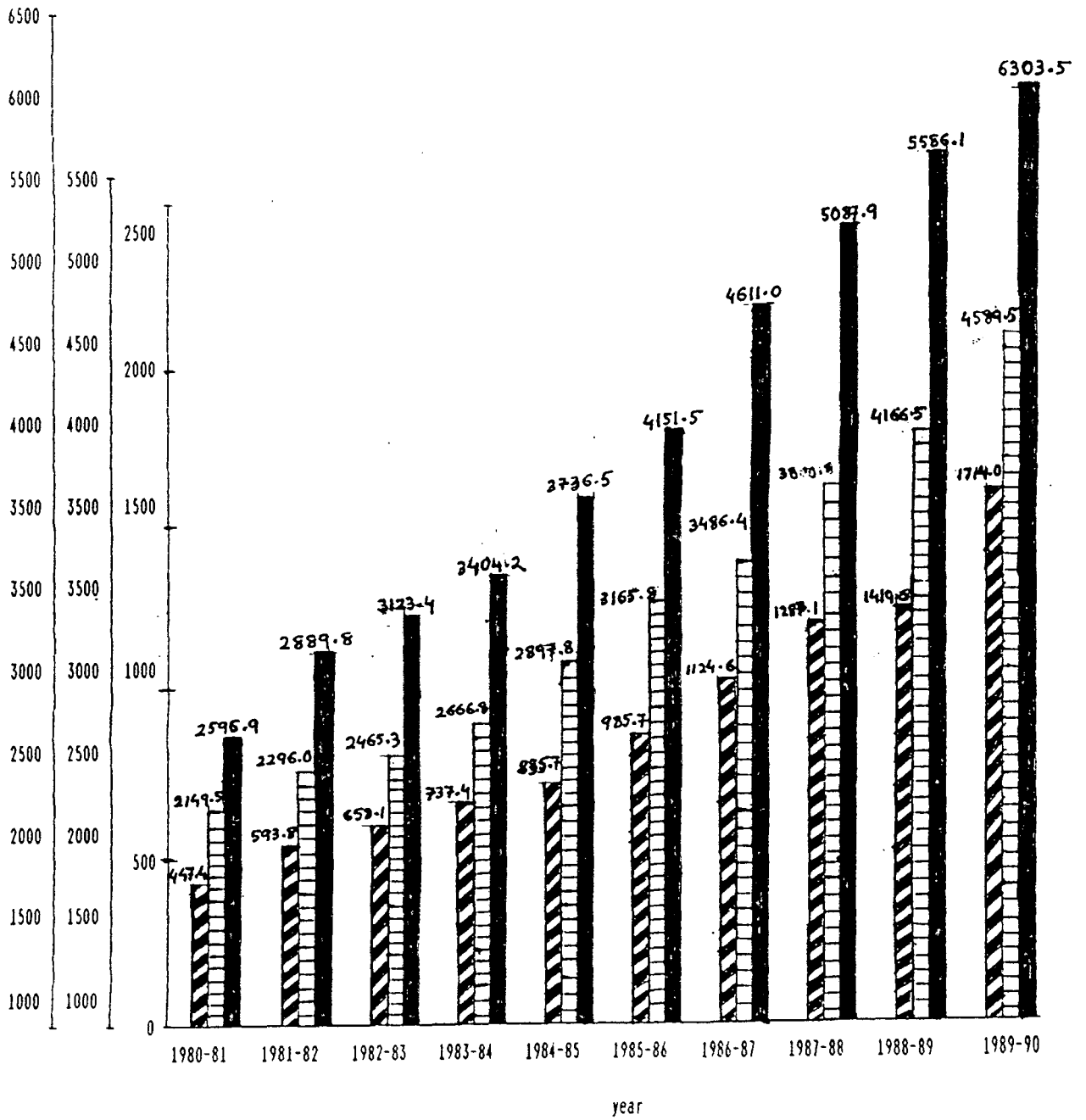
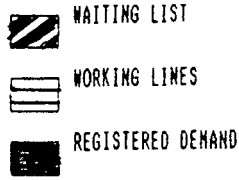
consumption, its working efficiency was very poor. Till the mid eighties, on India's pastoral landscape, the telephone seemed incongruously out of place to most urban Indians. Somehow, the need to communicate long distance was taken to be an inherently urban desire. The gross urban bias was evident from the assessment by DOT that 25 per cent of the population, living in urban areas, have the use of 90 per cent of the telephones in the country.³ Only 8,000 of India's 600,000 villages have a rural telephone exchange⁴ (1988). About 20,000 villages have long-distance telephone public offices, few of which function. Even within this urban biased approach, telecom sector in India has suffered from perpetual shortages. Demand has always been much more than supply. According to a report by Rastogi, Sr DDG (F) DOT, 'demand in the past has grown by 10 per cent to 13 per cent, while supply has been 9 per cent to 10.5 per cent. As a consequence, the waiting list has been increasing. At the beginning of the 7th plan, we had a waiting list of 843,000. during this plan 1.7 mn. new connections were given, but by the close of the seventh plan, we had a waiting list of 1.72 mn. This is in addition to the dormant demand which surfaces soon after availability improves. As on 31 August 1991, the

3. See Deccan Herald (Bangalore), 5th September 1987.

4. T.H. Chowdhury, "Telephones in Rural Areas: An Indian Experience", Telematics and Informatics, vol.3, 1988, pp.29-37.

Figure 3.2

TELEPHONE DEMAND AND WORKING CONNECTION (IN THOUSANDS)



waiting list stood at 2.2 mn'.⁵ The following figure depicts the same (Figure 2).

However, the above data does not project the whole picture. Here comes the question of the bias in the system. 'The bias in the system comes from the manner in which the "demand" for services has been defined. The waiting list for telephones, when the 7th plan began, was said to be more than 850,000 which was 25 per cent of the 3.3mn telephones in operation at the time. But this waiting list is known to be highly erratic in nature. Over a period of two decades, it has been observed that the size of the waiting list has contracted or expanded according to whether the Department of Telecommunications (DOT) increased or decreased the deposit money asked for with applications for telephones. This is an important question considering that few countries ask, as does India, for large deposits on application for the elusive telephone. This is only one aspect of the question of telephone demand. Planners recognise that since many do not apply for telephones at all, on the premise that they might not get one anyway, there is always a hidden demand which can only be guessed at'.⁶ But the issue being discussed widely among telecommunication planners is whether it is at all

5. Rastogi, March 1992, op. cit., pp.62.

6. See P. Majumdar, "Money is not Everything", Deccan Herald(Bangalore), 5th September 1987.

correct to estimate demand solely from the purely commercial aspect of telecom services. 'All economic and social activities require information inputs which are most easily and conveniently conveyed through telephone services. Modern technology, in fact, offers a wide range of communication modes between information storage and retrieval systems (computer communications for example) which can only be made use of through efficient transmission. How then, does one measure the demand generated by education and health services, agricultural extension and a whole range of other development activities generated at every point in the country where there is some habitation, no matter how small? Nevertheless, the commercial approach has continued leading to all kinds of distortions in investment priority. Though telecommunications has always been in the public sector, more often than not investment decisions have been taken on the basis of direct returns, like in any other commercial enterprise. But the problem with this approach is the general impression it has created that telephone services are meant only for the better off,⁷ and therefore deserve a low priority in the allocation of resources. This will be evident if we look at the successive plan investments on telecommunications.

The following data (Table 1) shows that the share of telecom in the total plan outlays has been very modest. The

7. Ibid.

percentage investments in telecom remained on an average around 2.5 per cent of the plan outlays. It is very less, compared to other sectors, particularly industry and energy. Upto the 6th plan, telecom in India could not be accorded priority by the government due to one reason or the other, which resulted in insignificant outlays in this sector. The planners expressed following views while finalising outlays for telecom sector in earlier plans:

TABLE 3.1

INVESTMENTS OVER THE VARIOUS PLAN AND NON-PLAN PERIODS

(Rs. crores)

| | Total National Plan Outlay | Telecom Outlay | Percentage of national plan Outlay |
|-----------------------|-------------------------------|----------------------------------|---------------------------------------|
| (1951-56) 1st Plan | 1960 (Actual) | 47 (Actual) | 2.40 |
| (1956-61) 2nd Plan | 4672 " | 66 " | 1.41 |
| (1961-66) 3rd Plan | 8755 " | 164 " | 1.91 |
| (1966-69) Annual Plan | 6624 " | 159 " | 2.40 |
| (1969-74) 4th Plan | 15779 " | 415 " | 2.63 |
| (1974-78) 5th Plan | 28653 " | 781 " | 2.73 |
| (1978-80) Annual Plan | 22950 " | 519 " | 2.26 |
| (1980-85) 6th Plan | 109646 " | 2722 " | 2.48 |
| (1985-90) 7th Plan | 180000 " | 4010 (approved) 8000 (likely) | 2.23 4.43 |

Source : DOT, Forty Years of Telecom in Independent India, (New Delhi) p.49.

The primary need of the people is food, water and shelter. telephone development can wait. "In place of doing any good, development of telecom infrastructure

has tended to intensify the migration of population from rural to urban areas. There is a need to cursh growth of telecom, infrastructure particularly in the urban areas. Telcom in any case, has no role to play in rural economy". "Telecom is a consumption items particularly of the rich. At rest, it deserves the same priority as five star hotels.⁸

It was only during the 7th plan that telecom was recognised as a basic infrastructure and its importance was acknowledged by including it as one of the technology missions along with such vital and basic necessities as "drinking water" and "communication" etc., for efficient expansion and management of the national economy.⁹ The 7th plan laid down an impressive list of objectives like, expansion to provide 16 lakh telephone connections to limit waiting list, automatisation of manual telephone exchanges at all the district headquarters with a capacity of 400 lines, bringing all the district headquarters on national subscribers dialling network, clearing all the demands in 4 metros registered upto 30 June 1986 by the end of the plan, provision of 15,000 long distance public telephone in rural areas, introduction of cellular telephone service, computers digital microwave and optical fibre system, new services like videotex, telex, electronic mail, modernisation of trunk

8. See Department of Telecom, Forty Years of Telecommunications in Independent India, New Delhi: Government of India, n.d., p.44.

9. Ibid.

automatic exchanges etc.¹⁰ It also says that "the development of the communication sector will be characterised by a five pronged strategy: balanced growth in network, rapid modernisation, a quantum jump in technology, increased productivity and innovations in organisations and management".¹¹ But the irony is that, despite this optimistic projection, when it came down to the allocation of resources essential for their realisation, the allocation fell drastically short of expectations and never exceeded the 3 per cent margin line of the total plan allocation that used to characterise the earlier plans. 'Though the planning commission recommended an outlay of Rs. 10,570 crores for telecom sector for the seventh plan for treating this sector as basic infrastructure for overall sound socio-economic development, the department has been allotted only Rs. 4010 crores (1984 prices) with the rider that borrowings from domestic market by way of bonds will be additional'.¹² the result was, being short of resources, the government chose an easy alternative, i.e. 'to hike telephone price which in the long run is unproductive', for generating resources as budgetary support for telecom was not forthcoming. This makes the ambivalence in government planning obvious.

10. For details see, Planning Commission, Seventh Five Year Plan (1985-90), New Delhi: Government of India, October 1985, pp.244-245.

11. Ibid., p.244.

12. DOT, op.cit, n.d., p. 45.

However, the proposed eighth plan of the Congress government in 1989, was all set to compensate for this neglect, by raising the share of the telecom sector to 7.4 per cent¹³ of the proposed plan outlay. But due to subsequent frequent changes at the centre and the resultant delay in the formulation and implementation of a final eighth five year plan, what came up ultimately were two annual plans for 1991-1992. Now under the latest draft 8th five year plan, which is part of the perspective plan for 1990-2000 A.D., outlay is Rs. 40,555 crores, (Table 2) 80 per cent of which is to be met from internal resources and 20 per cent from market borrowing.

TABLE 3.2

FINANCIAL OUTLAYS - 8TH FIVE YEAR PLAN PROPOSALS FOR 1992-93
(Rs. crore)

| | Central | Centrally sponsored | Total |
|----------------------------|----------|----------------------------------|----------|
| <u>Annual Plans</u> | | | |
| 1990-91 (Actuals) | 2886.97 | (includes Rs.600 cr. RE of MTNL) | 2886.97 |
| 1991-92 (Approved) | 3203.00 | | 3203.00 |
| 1991-92 (Anticipated) | 3500.00 | | 3500.00 |
| <u>VIII Five Year Plan</u> | 40555.00 | | 40555.00 |
| 1992-93 | 5200.00 | | 5200.00 |

Source : Ministry of Communications, Annual Plan RE 1991-92 and BE 1992-93, New Delhi: Government of India, 1992, Annexure II.

13. See Telecom plan II, The Economic Times, 4th November 1989.

Looking at the picture from another angle is to examine the annual investment in the telecommunications as a percentage of the GDP at current prices. It increased from just 0.24 per cent of the GDP in 1980-81 to 0.75 per cent in 1989-90. It is still very low.¹⁴ There is a marked under investment in telecom if we were to compare it with similar investments in other countries, as shown in Table 3.

TABLE 3.3

 INVESTMENTS AS PERCENTAGE OF GDP IN VARIOUS COUNTRIES

| Countries | Investments as Percentage of GDP |
|-----------------|-------------------------------------|
| Turkey | 11.62 |
| South Korea | 24.57 |
| Brazil (1984) | 4.44 |
| Portugal | 7.36 |
| Singapore | 8.00 |
| Italy | 6.62 |
| Spain | 7.06 |
| U.K. (1987) | 6.46 |
| Germany | 8.24 |
| France (1985) | 7.58 |
| India (1980-81) | 0.75 |

All figures are for 1986 unless otherwise stated.

Source: Telematics India, vol.5, no.6, March 1992, p.63.

And, since the allocation of plan investment has been far less than the requirements, the availability has never

14. Telematics India, vol.5, no.6, March 1992, p.62.

caughtup with the demand. 'Thus, though the 6th plan had begun with the promise by the then Post and Telegraph (P&T) department that telephones would be provided "practically on demand" by the year 1990, mid-way through the 7th plan, i.e. more than 7 years later, the DOT was holding out the promise that, provided the resources were made available, the demand might be fulfilled by the year 2000 A.D. But even for this to be fulfilled, the country has not yet started the kind of material planning that would be necessary'.¹⁵ It is not even clear by now whether the demand at the beginning of the 21st century would be satisfied by 6 new telecom equipment factories or more. In the meantime, the stress is to satisfy certain selective demands. Mahanagar Telephone Nigam Ltd. has been set up to exclusively look after the networks in Bombay and Delhi, with more financial autonomy than DOT, so that resources are less of a problem. The two cities also already have the privilege of a specialised service, the mobile radio telephone, installed in a car or other vehicle of whoever feels the Rs. 40,000 deposit required is worth the service. 'It is, of course, another matter that of the several thousand such telephones planned, not more than 150 have actually been sought in each of the two cities. The cost of importiing this equipment is Rs. 35 crores, which could have satisfied the telephone demand in 20 to 30 medium

15. P. Majumdar, 1987, op.cit.

sized cities in the country',¹⁶ The revenue approach has been carried to a ridiculous extreme in proposals like exclusive business network connecting important centres of the country through satellite etc. Though proposals like this look magnificent and are quite essential, yet the tragedy with such proposals are that they do not take into account the huge amount of equipment imports that will be essential, for very little of this is manufactured in the country itself. But, once again, it is relevant to ask whether, given the fact there is mostly no encouragement to produce such equipments in India, such kinds of proposals will be the cause of perpetual rounds of equipment imports, and at very high cost. If so, what are the alternatives? The issue is one of priorities. The view that telecom be looked at as a revenue earning activity (and it is paying, because the internal rate of return is as high as 20 to 26 per cent) can not be sustained if it is to be a primary input in development. On the other hand, the partial emphasis on revenue earning, on the ground that resources are needed for investment has clearly created a distortion in investment priorities. In almost every country where telecoms are developed in a planned manner, the very high cost of installations and networks is spread out over a large number of subscribers, so that almost every section of the population has access to some facility. The resources

16. Ibid.

question can be solved through numbers',¹⁷ but the emphasis in India seems to be the other way round. The solution to the resource problems lies somewhere else which the policy planners refuse to think. Unless the tax base is made broader, the tax burden will always bounce back to those who have already been taxed. If rural communication has to be developed which is the plea adopted to charge more on telecom facilities in urban areas, taxation of the agricultural sector has also to be thought of. This can provide the first step for the missing link.

However, the anomalies and distortions characterising the telecom sector do not stop here. They are many if one cares to consider various other measures of the government. Another suitable example can be that of the kind of liberalisation started under the leadership of Rajiv Gandhi. Thoughtless liberalisation totally confined to terminal equipment created a situation where the private sector invested heavily while the market remained controlled. The result was that there were more terminal equipment but not enough lines, not enough switches. There were more cables but nowhere to lay them. There was demand from the business community but government's response was laconic. In spite of the government's proposed policy of boosting the country's foreign trade, the international communication line have not been developed properly. Data transmission was a costly

17. Ibid.

affair and few business houses could get leased lines from VSNL. Optimistic projections coupled with liberalisation in the last few years led to a situation where the licensed capacity for various telcom equipments far outstripped actual demand. Result was an unique situation where on the one hand registered demands for telephones in the country was rising faster than supply, while on the other hand the various manufacturers of telecom equipments were struggling to survive in view of slackness of demand for their products'.¹⁸

Many other similar anomalies can be seen like constant look abroad for import of technology while capacities exist indigenously, constant look out for inducting more and more advanced and most often elite-oriented facilities like carphones while basic telecom facilities necessary for development are non-existent etc. The list can be non-ending. The question arises why these anomalies? Several factors have been identified as the reasons for the present state of affairs, like the lack of a national commitment to telecom development stemming from an inadequate appreciation of its role, the inability to develop the right kind of organisational structures and continuous imports of technologies which are basically unsuitable for Indian conditions, lack of resorurces etc. Almost continuous controversies have been taking place on each and every issue

18. See Telematics India, vol.3, August 1990.

whether it is finance, organisation or technology.¹⁹ However all these can be taken as the consequences of something deeper, i.e. a deeper malaise afflicting the system. Here lies the importance of finding out how the system works, i.e. mainly "how the decision are arrived at?", "who are the people involved?", "what are the influences?" etc. For that one needs to have a brief look at the history of developments in the telecommunications sector in India.

It was not until the beginning of the eighties that, anything significant had really happened in the telecom sector. Public sector was assigned a major role in the telecom sphere. The key impetus came from the industrial policy resolution, passed by the parliament in 1956, which reserved telecom, broadcasting and defence electronics for the public sector. In the beginning, no separate department existed for the telecom sector and it was placed under the post and telegraph department and was never treated as an important infrastructural sector. The production unit was the Indian telecom industries (ITI), a public sector public ltd. company which was granted monopoly to produce telephone systems. The R&D organisation was the telecom research centre under the purview of the department. As T.H. Chowdhary, the CMD of Andhra Pradesh electronics development corporation put aptly, "the grievous consequences of the department's management of ITI and the fact that ITI is a

19. Deccan Herald, 15 February 1987.

state owned monopoly producer of telecom equipment; resulted in imports of switching technology, first strowger, then crossbar, and now the digital E-10B. And after each import nothing was done by either TRC or ITI to develop indigenous technology for switching".²⁰ The result was a patchwork of technologies hampering service and being a drain on the resources. 'The telecom mission draft sums up the state of affairs in the following words: technology imports, product purchase, manufacturing plant and 'centralised administration'.²¹ DOT itself candidly admits such shortcomings.²²

So due to all these i.e. lack of planning perspective, centralised administration, indiscriminate import of technologies, lack of incentives to indigenous R&D, India came to the dire state of having the worst telephone service. The country's network suffered from the view point of data base, maintenance, administration, commonality and connectivity.

Taking into account all these above factors, the government under Mrs. Indira Gandhi appointed a 'committee on telecom' commonly known as 'Sarin committee' headed by H.C. Sarin, a former civil servant to recommend measures to improve the efficiency of the telcom system and its

20. See K. Colhando, "Worse for Confusion but not confounded", Telematics India, vol.2, March 1990, p.40.

21. As reported in The Patriot, 9th January 1988.

22. See DOT, n.d., op.cit., p.

modernization. The committee looked into the technological as well as the organisational aspects. After a lot of study, the committee prepared a report in 1981 on the future directions of telecom development and this report was adopted by the government forming the basis of the 7th five year plan of the DOT,²³ when government recognised telecom as a basic infrastructural sector. On the technological aspect, the committee recommended that India should go in for digital switching,²⁴ accepting which, the government established the centre for development of telematics i.e. C-DOT in 1984 as an autonomous scientific society to develop a family of digital switching systems required by the DOT to modernise the telecom system in India taking the typical Indian conditions into account in design and production, under the leadership of Mr. Sam Pitroda, a NRI technician and entrepreneur. On the technological front, the next few decades can be aptly characterised as the decades or story of C-DOT and its leader Pitroda, which is going to be dealt with under the Heading 'The C-DOT Story'.

'As far as the organisational aspect was concerned, the committee considered the issues involved in the alternatives of the telecom organisation being administered as (i) a governmental department or (ii) as a statutory corporation.

23. Patriot , 11th January 1990.

24. Source, Telecommunication Restructuring , The Economic Times 8th August 1985.

Although the corporation offers much easier day to day working and flexibility in its operation and introduces a needed commercial approach, keeping in view the issues of legislation, procedural problems in getting options from the employees and performance of many a corporation in the country at present, the committee expressed the opinion that at this stage of functioning as a separate government department would meet the needs of the telecom better than as a statutory corporation. With this observation it was expected that the final word on the subject had been said, at least for the time being. But one much lower level committee was appointed to examine the question and it was alleged that the committee worked in a sectarian way.²⁵ The Sarin committee, taking note of the modern requirements suggested the separation of the P&T department into 2 separate departments viz., the department of posts and the department of telecom. With the coming of Rajiv Gandhi to power, the Sarin committee reports were taken into consideration by the government. While the non-corporatisation recommendation was rejected, the bi-furcation recommendation was accepted by the government. Realizing the importance of advanced, widely accessible telecommunications, the Rajiv Gandhi government announced a new telecom policy in 1985, which permitted foreign collaboration with the Indian private sector in manufacturing indigenous telecom equipment;

25. Ibid.

created a department of telecommunications by bifurcating the Indian post and telegraph department; and going against the recommendations of the Sarin committee report established autonomous telephone corporations to serve Delhi and Bombay.²⁶ The corporatisation programme was given effect by the establishment of the high profile Mahanagar Telephone Nigam Ltd (MTNL) as a public sector unit under the ministry of communication on April 1, 1986. The mandate was given to run the telephone services in the capital and Bombay. How this hurried creation, created problems afterwards, will be discussed in course of our discussion. One newspaper report²⁷ gave an interesting report on the genesis of the idea of setting up the telephone corporations at the government level. According to this report government at the highest level being concerned with the none-too-satisfactory telephone service in the country as a whole and in the 4 metropolitan cities in particular, directed the DOT to draw up a time bound programme to improve the services in the 4 metropolitan cities of Bombay, Delhi, Calcutta and Madras. A crash 'upgradation programme to modernise the services in these 4 cities was drawn up by the department at a total cost of more than Rs. 900/- crore having a foreign exchange content of about Rs. 375/- crores. this crash

26. A. Singhal and M. Rogers, 1989, op.cit., pp.177-78.

27. The Economic times, 8th August, 1985.

programme crashed on the road of non-availability of funds as the planning commission and the ministry of finance were unable to spare such amounts because of resource constraint. Then the bright idea occurred that funds could be raised if Bombay and Delhi could be made corporations and allowed to raise the funds in the capital market. That such simplistic idea of converting Bombay and Delhi into corporations has far reaching consequences, had appeared to escape the notice of the protagonists. Out of 4 metros, only Bombay and Delhi have been selected because Bombay is the commercial and Delhi the political capital of India.

The manner and the hurry in which such an important organisation was created would be evident from its consequences. One such being the in-house feud that erupted between the postal and the telecom departments over the proposed telephone corporation for the metropolitan cities of Delhi and Bombay. While the postal department issued notice that the new company would not get any free services as the telecom department had in the past, The DOT retaliated by asking the postal department to make its telephone calls on payment of hard cash, which may prove to be costly for the postal department. Such a situation arose due to the fact that till January 1985 when the P&T department was bi-furcated, there was no indication of setting up of a separate corporation for the 2 metros and so

matters were not sorted out clearly.²⁸

The period from 1986 to 1988 was full of sudden lavish proposals from the ministry level, most of which just vanished into oblivion as speedily as they had appeared. Nothing was heard about proposals like 'telecom corporation for each state'²⁹ (1986), 'running of telephone exchanges by rural co-operatives'³⁰ (1988), 'split of ITI' (1987)³¹ etc., few days after they were reported by the government. The proposal for the split of ITI was dropped by the communication ministry on the face of serious opposition from some union ministers, vast section of telecom experts and trade unions as the move was highly misconceived and political and could have cost the sector dear.

From 1985 onwards, till his political demise by the National Front Government, since the day he was appointed as the scientific adviser to the Prime Minister, Mr. Sam Pitroda played an important role not only just in terms of C-DOT, but also in terms of other proposals and developments in the telecom sector. Under his influence, Mr. Rajiv Gandhi was quick to realise the significant of the telecom system and in

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28. For a full account of the situation see, The Economic Times, 13th March 1986.
29. This proposal was made by the advisor to the C-DOT, Mr. Sam Pitroda. For details see, The Economic Times 26th August 1986.
30. This proposal was floated by C-DOT. See The Telegraph 21 May 1988.
31. Deccan Herald, 25 July 1987.

January 1986, agreed to include telecom among the 5 national missions with the objective of 'customer satisfaction',³². "Mission: Better communications" was launched in April 1986. The first activity of the mission was to interact with representative sections of the customers and public to ascertain their views on the aspects of services which needed immediate attention.³³

Keeping in view the users' expectations and the national priorities, the following main components of the mission were identified³⁴ improvement in the quality of service to the existing and prospective customers.

- Improvement in accessibility within the existing network.
- Concentrated attention to the indigenous development of certain selected technology and product, so as to indigenise the equipment in the network.
- Possible component mission for provision of telephone on demand by the year 2000 A.D.

The various activities and items of these missions were included as a separate part in the annual action plan of the

32. Telecom Mission: Towards better communication, Patriot, 9th January 1988.

33. Department of 'Telecommunication, Forty Years of Telecommunications in Independent India, New Delhi: Government of India, n.d., pp.70-76.

34. Ibid. p.70.

department to facilitate better monitoring of these activities. A mid term appraisal of the mission was done and it was reported to have done a commendable job. Pitroda brought out a draft on the mission. While the activities of the mission continued as previously planned, it was decided in 1987 that for the period January 1988 to March 1990, attention would be focussed on 6 mini mission viz.³⁵

- Improve quality of service.
- Increase urban PCOs (Public Call Offices).
- Improve delivery of telegrams.
- Provide telex on demand.
- Improve rural communication and
- Build up a national digital network'.

With the government taking up such a gigantic task and in the process its responsibilities increasing, the bureaucratic structure of the telecom board was found to be unsuitable and reorganisation of the telecom set-up became imperative. The idea of the formation of a telecom commission evolved and the originator of the idea, was as generally reported, Mr. Sam Pitroda³⁶. However from its very inception the idea met with substantial opposition from the DOT as it meant its virtual redundancy. However, DOT proposed a 15 member telecom board having wide powers

35. Ibid. pp.70-76.

36. The Times of India, 8th October 1988.

including presentation of a separate budget on the lines of the Railway board and also powers to approve imports which was then enjoyed by the DOE (Department of Electronics). DOT's proposal encountered opposition from the finance ministry and the DOE. This proposal of DOT was dropped as it was felt that on its own a high powered board, which in any case is only a ministerial set -up, might not be able to manage this service well.³⁷ What was needed was a body with authority to co-ordinate interministerial developments in telecom and could take quick decisions, promote a faster growth of the telecom industry, advise on the induction of appropriate technology and muster a large quantity of funds. So Pitroda's proposal of a telecom commission was taken up for consideration. The matter of reorganisation was referred to a committee of secretaries. But as the committee of secretaries, after wide discussion, could not come to a conclusion, the Prime Minister's intervention was sought and the Prime Minister while giving guidelines for the proposed reorganisation, wrote to the minister for telecom. Mr. Vir Bahadur Singh to submit a comprehensive proposal on the suggested lines to be sent to the cabinet for a final decision (towards the end of 1988).³⁸ The union cabinet in its meeting on the 8th October 1988, deferred its decision on the setting up of the telecom commission as there was

37. Financial Express, 12th December 1988.

38. The Economic Times, 3rd October 1988.

opposition from the finance and personnel ministries. The matter was instead referred to a group of ministers.³⁹ The group met twice and the opposition this time was from the communication minister. A consensus was arrived at and the proposal was then submitted for the final approval of the cabinet. So due to consensus and compromises, the telecom commission that finally came into existence in April 1989 after a process of long vacillation, was quite different from the way it was originally proposed. A case in point is the debate over the issue of 'where the 4 permanent members of the commission should be drawn from'. This issue was the only hitch in the formation of the commission for the last few months before its establishment.⁴⁰ While DOT and the union ministry of communication held that these posts should be reserved for the officers of Indian telecom service (ITS), Mr. Pitroda argued for throwing open the posts to the best available talent in the telecom field in the country. As a compromise, in the latter proposal, it was envisaged that even while outside talent was drawn into the commission, the ITS cadres' career prospects would be protected and that ITS personnel could go upto the level of additional secretaries to the government although they may not be in the commission. The cabinet approved the formation of the commission on January 1989, but then the proposal could not materialise

39. The times of India, 8th October 1988.

40. The times of India, 27th January 1989.

immediately as there arose a controversy regarding who would be its chairman. Though the press was agog with the likelihood of Pitroda becoming the chairman of the commission, yet the fact was that there were serious problems with regard to his appointment to such a post as he was a businessman, still holding substantial stakes in a couple of American electronic companies.⁴¹ 'So the cabinet on 25th January 1989 decided that a person of secretary rank would be the chairman of the telecom commission. The minutes of the cabinet meeting had been signed and approved'.⁴² But the debate still continued according to the press reports. The main opposition to Pitroda's appointment came from the minister of communication, Mr. Vir Bahadur Singh⁴³. The matter seemed to go in favour of the minister as a resolution of the cabinet finally issued and laid before the parliament on 11th April 1989, announced the constitution of the telecom commission with the secretary in the department of telecom as the ex-officio chairman sidelining Pitroda as Mr. Satyapal was then the secretary. But finally on 30th April 1989, Pitroda was appointed the secretary of DOT and the chairman of the newly formed telecom commission, Mr. Satyapal was appointed member (services) in the commission. The

41. For details see The Telegraph, (Calcutta), 22nd March 1989.

42. Ibid.

43. As reported in The Telegraph, 11th April 1989.

commission came into existence in April replacing the then existing telecom board. It was given higher financial and administrative power than enjoyed by the board or any other department of the government, having 4 full time and 4 part time members with a full time chairman, all of the rank of secretary to the government. It took over responsibility for the development of the telecom industry and the regulation of telecom imports from the DOE. All R&D activities in the area of telecom was to be guided by it as a consequence of which C-DOT was placed under it and TRC was merged with C-DOT. A separate telecom finance corporation under it was also contemplated. Being endowed with such wide powers and enjoying the confidence of the Prime Minister, the commission drew up an action plan and started working to fulfil its mandate i.e. to boost the development of the telecom service and improve its efficiency.

But before it could enjoy even one year of survival, the change of government at the national level put a question mark on its validity. The game was political. 'The V.P. singh government and especially the communications minister Mr. K.P. Unnikrishnan, in the process of launching a tirade against Sam Pitroda due to his proximity to Mr. Rajiv Gandhi, launched an onslaught against C-DOT, as it was mainly a creation of Pitroda at his own initiative. This put out of gear an entire set of research efforts and initiatives directed towards the rejuvenation of the telecom sector. The

uncertainties created due to the appointment of the now infamous Nambiar committee put to a standstill all that Rajiv had initiated.⁴⁴ How it almost put the knell on an unique indigenous R&D experiment will be discussed in detail in chapter IV. Though the National Front government expressed its commitment to bring about widespread development in the telecom sector through a major emphasis on rural telecom and also to bring about a national telecom policy document in line with the industrial policy resolution to be put before the nation, what it did in practice spoke otherwise. The so-called and much talked about telecom policy document never saw the light of the day as there was a fall of the ministry before it could be formalised.

The Chandrashekhra government which came into power after the V.P. Singh government with the support of the Congress I party, tried to undo the wrongs done under the previous government by boosting the slowed down developmental process by declaring a 10 point plan to gear up DOT. The 10 point plan envisaged massive expansion of services, introduction of specified new technologies, overhaul of the vigilance system and generation of Rs. 100 crores through sale of surplus land. The programme also provided for massive hardware exports and implementation of the 100 day programme which was launched by the DOT on Dr.

44. For details see M. Chhaya, Sam Pitroda -A Biography Delhi: Konark Publishers Ltd., 1992, pp.151-189.

Sanjay Singh's advice on 1st January 1991. Another development that took place under the Chandrashekhar ministry was the re-emergence of the issue of restructuring the telecom organisational set up revolving around the issue of the proposed merger of the MTNL with the DOT. Now the question is how it re-emerged? 'The MTNL had been formed on 1st April 1986 through a presidential notification which had stipulated that the organisation was being set up on an experimental basis for 5 years. The period ended on March 31st 1991. In the normal course, the infrastructure of MTNL would have become part of the DOT and the organisational set up disbanded. However, MTNL sent a request to the ministry to extend its existence by another 6 months. The ministry sent it to the union cabinet, but before any decision could be taken, certain new developments took place. Interestingly, only a handful of the 80,000 odd employees of MTNL (both in Delhi and Bombay) were full time staffs of the public sector unit (PSU). Others were still on deputation from DOT and were governed by its personnel rules. They were also liable to be posted anywhere, being members of all India cadres. The uncertainty of this new organisation's fate led to several strikes in those 5 years of its existence, seriously hampering its work. MTNL employees were agitated over the fact that they were yet to be absorbed into the public sector unit which prevented them from enjoying several perks which their counterparts in other PSUs enjoys. A move

by the MTNL management to give them an adhoc increase (Rs. 100) in salary on October 1990 till they were absorbed into the organisation, sparked off a nation wide strike in the telecom sector by the DOT employees who demanded a similar increase since their work was no different from that of the MTNL staff. The government could not have agreed to this as it would have led to similar demands from all ministries. The MTNL management started lobbying for corporatising the entire sector so that all telecom employees could be given enhanced salaries.⁴⁵ However, the communications minister Mr. Sanjay Singh asked the DOT employees to call off their strike and promised to take a decision in this regard by December. Mr. Singh decided in favour of merging MTNL with DOT and 'in order to hasten the process sent the merger proposal straight to the Prime Minister instead of sending it through the union cabinet as is normal. Though the minister had not till then taken his ministry into confidence, a third mode of restructuring the telecom set up was being considered. Reportedly, Mr. Singh was toying with the idea of creating a holding company with several corporations under its gambit and ending the separate identities of MTNL, DOT and Telecom commission. A top foreign bank executive was entrusted with the job of preparing a feasibility report on the creation of a holding company by abolishing the various telecom departments. There was resistance to this kind of a

45. As reported in The Times of India (New Delhi), 11th May 1991.

suggestion from DOT and the Telecom commission.⁴⁶ The idea of a holding company concept was not new as it was suggested in the seventies though it did not find favour then. 'However the decision on the proposed merger of MTNL with DOT was postponed following the signing of an agreement between the DOT and the 3 recognised union of telecom employees over the issue under which DOT and MTNL were required to hold negotiations on this issue with the 3 recognised unions of telecom employees. Under this agreement the matter was supposed to be referred to a committee before any decision could be taken'.⁴⁷

So the Chandra shekhar government tried to buy time by appointing a high level 9 member committee on 19 December, 1990, headed by a management expert, Mr. M.B. Athreya, to advise on total restructuring of the telecom sector. However some official sources pointed out that the setting up of the committee was an attempt to buy time to implement the holding company concept.⁴⁸ The committee which was established for recommending the most appropriate organisation structure for management of telecom services in the country, keeping in view the operation and development requirements, was supposed to submit its report in February 1991. The committee appointed a '4 member working group

46. Reported in The Economic Times, 14th December 1990.

47. Financial Express, 20 December 1990.

48. The Economic Times, 16 th December 1990.

headed by Mr. A.K. Agarwal, joint secretary and financial adviser DOE, on telecom restructuring. The working group after studying the growth pattern in both MTNL and DOT and going through a process of comparing the two, in their report, punctured the MTNL's claims of being a super efficient organisation. It discredited what MTNL had always claimed: that because of its corporate structure, it could generate more revenue than DOT. The working group concluded that mere corporatisation of the telephone service is not likely to improve the financial and operating efficiency. Improving productivity and efficiency is highly dependent upon the management of an organisation and not on whether it is departmentally run or through the PSUs on the lines of MTNL, said the working group.⁴⁹ Besides Mr. Agarwal, the 3 other members of the group were Mr. P.D. Khemani, joint controller, general of accounts, Mr. L.K.S. Nayar, General manager MTNL and Mr.S.D. saxena, Deputy director general of DOT. The working group was constituted by Athreya committee to provide an independent assessment of the financial status of the two organisations.

In its earlier proceedings, 'the panel, after a series of meetings, had expressed the view that MTNL should be wound up and zonal corporations under DOT should be created in a phased manner and their purview should include rural areas. However, in a latter meeting, in a striking reversal of its

49. The Times of India, 6th March 1991.

earlier stand, the Athreya panel suggested that the MTNL should be made an apex holding company managing the other zonal corporations. It also wanted MTNL to continue to be entrusted with the task of borrowing from the market.⁵⁰ Highly placed sources pointed out that the reversal of the Athreya panel's stand was a big victory for the pro MTNL lobby which had been pushing for the creation of zonal corporations of the MTNL kind.⁵¹ However, finally the committee got divided over the issue, with 6 members favouring setting up of 4 regional telecom corporations and 3 specialised units to run the service. The other 3 members wanted gradual corporatisation leading to privatisation ultimately. Due to lack of unanimity, the committee submitted 4 separate reports (one by 6 who favoured corporatisation and 3 dissenting reports).⁵² The committee during its working process invited representatives of various consumer forums, industry associations, staff unions, and officers' associations.⁵³ The committee had however unanimously recommended that the present duality of structure i.e. part DOT and part MTNL should be ended. The committee's final report which was ready by March after a delay of nearly one month envisaged 'the creation of an Indian telecom

50. Reported in The Economic Times, 14th March, 1991.

51. Ibid.

52. The Times of India, 26th February 1991.

53. The Statesmen, (Delhi), 13th April 1991.

operating corporation (ITOC) as the holding company for DOT's field operations, including MTNL territories of Bombay and Delhi. Four other zonal telecom operating corporations would be set up with headquarters at Bombay, Madras, Calcutta and Delhi, while the 6th would be a long distance connector corporation. MTNL was to be renamed as Telecom Finance Corporation. Although all 6 corporations would be established as 100 per cent public sector enterprises, in line with recent government policies, the report suggested that 20-30 per cent of the equity might be sold to employees, public and financial institutions. However, the committee would like the telecom commission to continue with 3 more members with its regulatory and strategic roles and distance itself from field operations.⁵⁴

However, by the time these reports reached the ministry, the Shekhar government had become a care taker one and was not in a position to take a decision. However the telecom commission shelved the Athreya panel report on telecom sector for the time being on 6th May on financial ground.⁵⁵ However under the Narsimha Rao government, this report found favour with the communication minister Mr. Rajesh Pilot. The minister in an exclusive interview with The Economic Times on July 1991 hinted that he favoured the implementation of the Athreya committee report. However

54. The Economic Times, 25 March 1991.

55. Reported in The Economic Times, 30 May 1991.

newspaper reports in October reported the quite burial of the Athreya report with the top echelons of the ministry of communication virtually rejecting the report.⁵⁶ But now the government, as has been reported, has fully accepted the Athreya committee report and so it is more or less settled that MTNL will continue to exist as a full fledged corporation or a joint sector company to provide telephone and value added services.⁵⁷ However, under the new government, like other sectors the telecom sector is undergoing massive liberalisation. The new industrial policy, among other things, has liberalised the telecom sector also. Now foreign investments are welcome and switching equipment can be produced without a license. As far as technology is concerned India will have Alcatel OCB 283, which is an amalgamation of Alcatel E-10B and P-11 system. India has also decided to go for cellular mobile telephony, which in the past had been kept on getting postponed on the basis of cost effectiveness and has opted for GSM rejecting other offers from multinationals like Siemens and Motorola, etc.⁵⁸ Major achievement on the home front is that C-DOT has first commercially produced 10,000 line exchange which was inaugurated at Ulsoor in Bangalore.

56. Reported in Financial Express, 30 October 1991.

57. See the Editorial, Telematics India, vol.v, no.6, March 1992.

58. Ibid.

CHAPTER IV

THE C-DOT STORY

Being different to a great degree from the rest of the world in socio-economic, political and cultural terms, the choice of technology for communication in developing countries largely are to be determined by their own set of special requirements. Factors characterising most of the developing countries like varied climatic topography, i.e. extremes of climates from scorching heat to sub-zero temperatures, from deserts to highest average rainfall areas; paucity of resources; large concentration of population in rural areas etc. are to be taken special note of while either acquiring or developing the communication technologies. For instance, considering the fact that unit cost of providing service in rural areas is appreciably higher compared to that in the urban sector, the basic philosophy has to reach as wide a rural population as possible with low cost designs in small line configurations.¹ The telecommunication needs of the urban and rural segments being different, different approaches are to be chalked out, though under the banner of an integrated network approach. So keeping in view all these factors, the choice of technology for telecommunication for a developing country should be guided by considerations like :-

1. S.G.K., Pillai, "C-DOT technology for developing countries", Infotel (New Delhi), January-March, 1991, pp.64-70.

flexibility to cater to unforeseen demands, high traffic capacity, ease of maintenance and operations, local production, long life, i.e. being specially equipped to work in tropical climatic conditions without much servicing or input needs, over all reduction in network costs etc. Another basic issue involved is that of indigenous vs. imported technology. The imported technologies have many disadvantages for a developing country as they are developed in the advanced countries to cater to their environment, traffic, skills and general socio-economic conditions which are sharply different from those of the Third World countries.² To meet the long-term needs of telecommunications in a developing country, the technology chosen must be capable of local production and maintenance.

However, against the above backdrop, if one looks at the Indian telecommunication technology scenario from the point of view of self-reliance, cost-effectiveness and suitability to Indian conditions, it can be found that the system was characterised by frequent technology imports without any substantial indigenous Research and Development effort and without much consideration for their operational feasibility in the Indian scenario. The result was the purchase of mis-matching technologies, most of which had been

2. For details see S.G.K. Pillai, January-March 1991, op.cit., pp. 65-66.

obsolete by the time they were exported to India.³ A case in point is the crossbar switching system. Though the whole world was changing over to crossbar from the earlier step-by-step (strowger in India) exchanges, crossbar was found to be quite unsuitable for Indian conditions of heat, dust and humidity. It took nearly 20 years for an Indian version to be developed, and a few more for it to be productionised. By this time crossbar wasn't only obsolete, but all production lines abroad had been dismantled. India had to pay phenomenal sums just to buy obsolete dyes and tools for its brand new crossbar factory at Rae Bareli. But even before this factory has been able to achieve full production levels, plans have been drawn to phase it out.⁴ There were frequent technology transplants like initially strowger, then crossbar, then CIT-Alcatel's E-10B etc. with little reference to Indian conditions. Another thing that happened on this score was that the country's network got ignored from the view point of⁵*data base, *maintenance, *administration, *standards, *commonality, *connectivity. For instance, because of mismatching and varied kinds of borrowed technologies, there is no commonality of equipment among the telephone exchanges in the country. India became a patchwork of switching systems

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3. From the telecommunication mission draft as was reported in Patriot, 9th January 1988.
 4. See, Deccan Herald, 15th February 1987.
 5. Telecommission draft, op. cit.

which necessarily hampered the network's working capability. Due to lack of integrated approach, India has acquired the distinction of probably the only country which has built up substantial production capacity without the essential research and development back-up. All these proved to be not only a drain on the foreign exchange resource of a poor nation like India but also inhibited local talent.

Taking note of the above factors, the Indian government established a committee known as the Sarin Committee under the leadership of H.C. Sarin to look into telecom modernisation. It recommended the use of digital electronic Technology both for transmission and switching, for the future development of the Indian telecommunication network. So Indian government decided to go in for digital technology only. Till then Indian telephone exchanges had mainly electro-mechanical switching systems, whether it was strowger or crossbar. The switch is the heart of any telephone system. In electro-mechanical system, the switches move physically both vertically and rotationally and this physical constraint puts a limit on the system's flexibility in handling calls. In other words, they are blocking systems. Against this, the electronic switching system eliminates the physical motion of the switches through solid state devices. The response time of an electronic switch is one-thousandth of a mechanical

switch.⁶ In simpler language, electronic switch is faster than a mechanical one. In the Indian case when the Sarin Committee made its recommendations, till then the concept of developing digital switches indigenously was still largely in the realm of the unspeakable. Of course, Telecommunication Research Centre (TRC) had developed a lab-scale ESS (Electronic Switching System), but the effort was modest and nowhere near the scale as C-DOT, which was to be established later, had visualised.⁷

Actually by the end of 1974, India made a breakthrough in exploratory ESS development when calls were successfully put through the laboratory exchange of TRC and later was tried commercially at a telephone exchange in New Delhi. According to G.B. Meemamsi, the man most associated with ESS development in TRC,

By 1977, the multinationals started knocking at the Indian door. The telecommunication policy makers were made aware of their responsibilities of service before self-reliance... Eventually a global tender for the import of technology was floated. However, before the global tenders were evaluated, the government, on the recommendation of the Sarin Committee, decided to go in for digital technology. Then came the government to government offer from France which resulted in the acceptance of CIT-Alcatel's E-10B ESS. When the indigenous development was going through its going through its lowest ebb at DOT, the DOE took up the proposal made by Mr. Sam Pitroda, a non-resident Indian technocrat for the indigenous

6. See Mayank, Chhaya, Sam Pitroda - A Bibliography, New Delhi: Konark Publishers, 1992, pp.38-39.

7. Ibid, pp.111-112.

development of digital switching system"⁸.

As the testimony of a top telecommunications manager suggested, 'there was simply no one in India who thought the country had the engineering capacity to provide this complex system as only 13 companies had made switches in the world and that too at a tremendous cost. So quite naturally when Pitroda raised this possibility during his presentation before Mrs. Indira Gandhi (the then Prime Minister), Rajiv Gandhi and some Cabinet members, it was lost on most of them'.⁹ It was mainly Rajiv Gandhi who took special interest, but nothing happened for nearly 3 years till Rajiv himself came to power. In these 3 years Pitroda managed to establish some personal rapport with Mr. Rajiv Gandhi and when he came to power, the government decided to try out Pitroda and his proposal for establishing an indigenous R&D effort at developing electronic switching system.

As a result, the Centre for the Development of Telematics (C-DOT) came into existence as a registered scientific society under the leadership of Mr. Sam Pitroda, vested with authority and flexibility outside the government norms to ensure dynamic operation. It was established with the explicit objective of developing an indigenous switching system within 3 years of its inception with an amount of Rs.

8. G.B. Meemamsi, "The Great Indian Telecom, Saga-I", The Times of India, (New Delhi), 12th May 1991.

9. M. Chhaya, 1992, op.cit., pp.111-121.

36 crores. These were however self-imposed limitations. The objectives were to : develop sophisticated telematics technology indigenously, digitise India's telephone network to improve overall service and prepare for integrated service digital network for the future.¹⁰ The goals were : increase telephone accessibility, improve overall reliability and develop rural communication. DOT gave C-DOT a mandate to develop a large main exchange beyond 500 lines as the first priority because a tender for import of rural digital ESS technology had already been floated on global basis. Its real mandate was to develop a 16,000 port main automatic exchange (MAX) which could provide upto 40,000 phonelines to subscribers by 1987.¹¹

Keeping in view the special needs of the Indian telephone system in respect to environmental conditions, traffic parameters and maintenance skills, C-DOT set out to design the system with the following objectives¹²:

- development of a single family of digital switching systems for multiple applications.
- commonality in hardware and software.
- use of indigenous components without sacrificing reliability by resorting to measures like redundancy,

10. This is according to the project administration report of C-DOT. For details see M. Chhaya, 1992, op.cit., pp.125-127.

11. Ibid.

12. S.G.K. Pillai, 1991, op.cit., p.66.

resorting to measures like redundancy, automatic diagnostics etc.

- remote and centralised maintenance for economic operations.
- universal interface in interworking with different types of networks.
- incorporation of special subscriber features to meet the specific needs of Indian subscribers.

THE FAMILY CONCEPT - The technical design evolved by C-DOT works on the family concept - which means that the same "basic switching block" is used for different applications, namely PABX, RAX, MAX and TAX¹³. Unlike E-10B switching technology, C-DOT chose the modular design for the architecture of its technology. The working principle adopted by the organisation was a simple one. It focussed attention on one single unit, called a module, and worked out ways of linking it up with similar other modules in a manner that would linearly enhance the switching system's capacity by addition of more and more modules. In a sense therefore the C-DOT's main task was to ensure the design appropriateness of one single module capable of 'communicating' compatibly with similar 'brother' module. The first fruit of this endeavour was the development of rural automatic exchange (RAX), which was installed at Karnataka's Kittur. The small exchange of

13. Ibid., p.67.

128 lines became a big hit not merely because it worked out but because it was capable of withstanding the ambient conditions of dust and heat in a typical north Karnataka village. In a major sense, with the first 128-line module, the C-DOT had laid a strong foundation for its huge project. All it needed after that was to develop a configuration of similar modules and create a mechanism for their mutual communication, the so-called central module, which behaves somewhat like the central processing unit in a computer. In the subsequent years the centre developed a configuration whose line handling capacity was a linear function of the number of base modules (BM) of 512 ports each in the switching system.¹⁴ First it came up with a Main automatic exchange (MAX) with 2 base modules for handling 800 lines which was set up and commissioned at Ulsoor in August 1989. Within 2 months, the Ulsoor exchange was upgraded to 11 base modules of 2,400 lines. The further step envisaged for this exchange and what was integral to its work goals was a 16 BM design upto 5000 lines. But before that could be achieved an unsavoury controversy took toll of the entire effort which we'll be discussing after some time. At the beginning of 1990, though the C-DOT was two years late in the delivery of its main mandate i.e. MAX (16000 ports/40,000 lines), yet in its report card, it had an impressive list of achievements,

14. See M.K. Shannkar, "C-DOT A burntout phoenix", News Time (Hyderabad), 6th June 1990.

as has been already mentioned with the additional statement that 'the extralarge MAX (16000/40,000) which was the main objective of the C-DOT exercise was only a question of putting together, using the same technology.'¹⁵ The significance of C-DOT products is that they are developed to meet the specific requirements of India in particular and of most of the developing countries in general like low telephone density; hostile environmental conditions; unstable mains power supply, especially in rural areas; need for establishing local manufacturing and maintenance capabilities to save foreign exchange etc.¹⁶ They can function without air-conditioning and are generally low cost technologies in comparison to imported ones.¹⁷

PRODUCTIONISATION OF C-DOT PRODUCTS¹⁸- The most important element in the product philosophy of C-DOT is the 'family concept', which means that a factory set up for any C-DOT product can, with minimum additional investment, produce other products as well. Most of the hardware across various switching products like EPABX, RAX and MAX etc. is common. So is the case with transmission products. This not only helps

15. For details of the report card see M. Chhaya, 1992 op.cit, pp.148-150.

16. Matange and Hariharan, "A phone in every village", Infotel, October-December, 1990, pp.76-79.

17. For details see Chhaya, M., op.cit., p.180.

18. Mantange and Hariharan, 1990, op.cit.

in technology transfer and production, but also in telecommunication administration in terms of easier maintenance, training, mobility of personnel, spares inventory etc. It is mainly labour and capital intensive.

However, the major achievement of C-DOT has been the organisational set -up that it strove to create, away from the bureaucratic mind-set, imbued with performance oriented approach. It was Pitroda's leadership and motivating style that provided the impetus to young engineers to work to an impossible schedule of almost 12 to 13 hours a day.¹⁹ Pitroda's main emphasis was on getting young engineers as they were people not set in their ways and so could be moulded to the new working culture. "During the first 3 years C-DOT had 425 people working with an average age of 25 years. According to Mayank Chhaya in his biography on Pitroda:

The average age of 25 is a crucial point in any judgement on C-DOT. Among the unspoken purposes of C-DOT was to catch young engineers and give them a sense of participation in nation-building. To most bright young engineers, who were ready to migrate to US and elsewhere, C-DOT wanted to be an irresistible temptation.....On one level it was meant to design a family of electronic switches.....but on another and more important level, it was to inspire an entire generation of Indian scientists to perform at levels they weren't always known to in India. It wasn't just telematics, it was an exercise in national self-assurance²⁰

19. M. Chhaya, 1992, op.cit.

20. Ibid.

Though the above statement seems to be quite rhetorical, yet it can be taken as a representative statement characterising the feelings of most intellectuals, scientists and mainly young students of this country. According to M.K. Shankar, "Pitroda created an organisation where work and bonhomie didn't preclude each other. He was able to create an atmosphere where the best minds could work together without wanting to detract each other. This rather exaggerated sense of loyalty to one person has to be heard and seen to be believed."²¹ Mayank Chhaya, as he had related in his book, once while interviewing some students of St. Xavier's college in Bombay to know their opinion about C-DOT, asked one girl student about her opinion on Pitroda to which the girl promptly replied - 'He is the answer to our inefficiency.' This shows the kind of opinions that the Indian intelligentsia has had about C-DOT. A sense of exaltedness characterises their feelings about such an organisation which though quite common by the developed countries' standards, are hardly to be found in India, a society reeling under bureaucratic dominance in all spheres including science and technology.

However all these developments took place under the leadership of Mr. Sam Pitroda, enjoying the confidence of the Rajiv Gandhi regime. Towards the end of 1989, there occurred a

21. M.K. Shankar, op.cit.

change of government at the centre and with the new national front government taking power, came into picture the new minister for Communications, Mr. K.P. Unnikrishnan who made no secret of his animosity towards Mr. Sam Pitroda.²² Within a month of the formation of the national front government, in a statement in Lok Sabha on 29th December 1989, Mr. K.P. Unnikrishnan indicated the need to review C-DOT's performance and forming a committee of experts with detailed terms of reference. Both the chairman of the telecom commission and member of the commission in charge of C-DOT affairs came to know about this proposal only when the statement was made.²³ So a 13-member high level committee to look into the functioning of the C-DOT was appointed, headed by the former secretary to the DOT and former chairman of the ITI, Mr. K.P.P.Nambiar, who was widely perceived to be one who would not be sympathetic to Mr. Pitroda,²⁴ as he had once crossed sword with Pitroda, as the ITI boss. There were just two members from C-DOT in the committee - Mr. D.R. Mahajan, Director and Mr. G. Meemamsi, Executive Director. The ground for the need of a performance assessment was given as the delays in delivering its main product, i.e. the 16,000 port MAX. The hurried manner and the way the committee was

22. For details see M. Chhaya, 1992, op.cit.

23. Meemami, "The great Indian telecom, Saga-II", The Times of India 13th May 1991

24. See Deccan Herald, 15th April 1990.

appointed, created serious misgivings about such a move which was widely perceived as a political witch-hunt. However the launch of a massive attack against an organisation of such calibre and quality as that of the C-DOT, in order to discredit a single individual puts a question mark on the functioning of our entire institutional and political system. Though instituting a committee to assess the performance of a scientific institution, especially one totally funded by the government, isn't out of question, yet the ground, manner and the way it is appointed and functions are of tremendous importance. If a committee has to make an honest appraisal of work done by an organisation, the members should not only be selected in an impartial way and be impartial, but should also seem to be so. A perusal of the Nambiar committee's report gives one an impression that the simmering resentment against C-DOT by the ITI brass has somehow found expression in it. The report, which finds fault with C-DOT at every stage, is however very generous with its praise of ITI.²⁵ Even the manner of functioning of the committee was alleged to be totally partial by none other than G.B. Meemamsi himself.²⁶

The result was that the committee got split into two camps. The one led by Mr. Nambiar held that C-DOT would once

25. See The Indian Express, 25th April, 1990.

26. Meemami, 1991, op.cit.

again have to start from scratch while ITI go back to using the CIT-Alcatel technology. They accused C-DOT of being too slow and suggested instead that the country turn to multinationals so that no time is wasted in bringing upto-date telecommunication technology. Mr. Nambiar had 9 members with him. The other camp comprising 4 dissenting members acknowledged that there had been delays, but re-affirmed C-DOT's capability to develop the switching systems indigenously and within an internationally accepted time-frame.²⁷ As a consequence not one, but 2 reports were submitted to the government: one signed by 7 and another by 4. It was alleged by the dissenters that they had to submit a separate report as the chairman refused to include their dissent note in the main report. The main report also found to contradict itself. While in the earlier chapter it was stated that "the committee has found no evidence of malafide in the purchase made by C-DOT----The purchases procedures adopted by C-DOT is sound and on generally acceptable line, and that there is no need to change the present fast trade purchase procedure", in the concluding part it was mentioned that "the committee finds faults with the management of C-DOT in setting its target, in purchasing equipment by C-DOT as well as by ET&T from 2 companies in the USA and that propriety of such purchases be administrtionally examined."²⁸

27. Deccan Herald, 15th April, 1990.

28. Deccan Herald, 15th April 1990.

It also made many allegations which were refuted by the C-DOT scientists. What gave more credibility to the dissenting note was the fact that it included the opinion of Mr. V.M. Sundaram, who had earlier headed a committee set up to monitor C-DOT's activities and been critical about the organisation. The 2 reports with divergent views not only defeated the very purpose of setting up an expert committee but also brought to the surface the undercurrents of animosity and distrust among various experts in the field. The ministry translated only the main report for placement before parliament without going through the normal procedure of getting the report reviewed by the telecommunication commission and forwarding the recommendations of the ministry to the Union Cabinet. However, The Prime Minister's Office (PMO) intervened and directed the ministry to first send their recommendations on the report to the cabinet for approving action to be taken or before it could be placed in parliament.²⁹ Since the dissenting note took away much of the credibility of the main report and also because the PMO's office seemed to be getting interested in the matter, Mr. Unnikrishnan reacted quickly by sacking Mr. Mahajan and Mr. Meemamsi from C-DOT. Whether this was within the minister's powers is debatable, but it established that the minister was determined not to pull punches.³⁰ This became evident, when

29. Meemami, op.cit.

30. See Deccan Herald, 15th April, 1990.

when without waiting for the government to decide on the action to be taken on the findings of the technical report, the minister not only gave a press statement in which he not only justified the summary removals of the executive director, but also made allegations of financial irregularities including purchases by the C-DOT management and used very strong language to say that the C-DOT project meant for self-reliance, had been "used by some persons for self-aggrandizement? and there has been a loot of the exchequer,"³¹ This statement was in contradiction to an earlier statement made by him in April 1990, where in a reply to a question he had said that trade enquiries have been received from USSR, Jordan, Saudi Arabia, Nepal, Peru, Brazil and Vietnam for purchase of products and know-how developed by C-DOT and a memorandum of understanding has already been signed between India and Vietnam. However after levelling his allegations in November, though he declared that he had incriminating documents with him, yet he refused to divulge anything in public.

However these personal allegations against Pitroda without any concrete evidences made the entire science community raise their voice against it. There were massive protests not only from the C-DOT employees but also from the intelligentsia, the press and mainly the science

31. See M. Chhaya, 1992, op.cit., p.155.

community. However one most interesting thing that happened during 1990 was the figures tabled by the then Prime Minister, Mr. V.P. Singh's government before the parliament in April and May which knocked the bottom out of one of its own ministers claim. However this fact didn't get much publicised in the press. The figures quoted in parliament were shockingly short of what Unnikrishnan had so brazenly quoted in his press conference as being profitted by Pitroda.³²

However the nation-wide protest led the V.P. Singh government to change its communications minister, but the attitude towards C-DOT didn't change much. The National Front government directed that the chairman of the telecommunication commission wouldn't deal with C-DOT and announced a review of Nambiar committee report launching a CBI enquiry and a special audit on C-DOT, which remained headless for quite sometime. The immediate results were massive brain drain, loss of morale and motivation at the C-DOT, a set back to the export potential of C-DOT products to 15 developing countries and the delay of the project to deliver its mandate due to the uncertainty created over its existence. The ordering of CAG - audit was unnecessary as the statutory audit of the C-DOT had been carried out twice till 1989-end and there were no comments by the CAG on the C-DOT.

32. Ibid., pp.165-67.

The CAG took an audit and found no malafides or financial bunglings as charged by Mr. K.P. Unnikrishnan. Though the CAG criticised C-DOT for its failure to deliver the 'RAX a day', Trunk Automatic exchange, and keep proper records of its managerial matters, yet it made two positive statements which are very important. They are:- 1) "C-DOT has created a reservoir of young and talented scientists for research and activities in the field of digital switching system. There was high level of motivation and enthusiasm among scientists and other staff" it said, (2) "on a conservative basis", the CAG said of C-DOT's switches in the range of 500 to 10,000 lines, "these products will cover 50% of the requirements in the country".³³

However it is worth mentioning here that even multinationals like Alcatel, despite being competitors, have voiced approval for the C-DOT technology.³⁴

With the fall of the NF government and formation of the new government led by Mr. Chandra Shekhar with the support of Mr. Rajiv Gandhi's congress party, the crusade launched against C-DOT was stopped. However even under the NF government a committee was appointed under the ministership of Mr. Jnaneshwar Mishra to look into the C-DOT affairs. The

33. Ibid., p.169.

34. The Telegraph, 26th March 1990.

3-member committee consisting of Mr. B.S. Murthy, (Member production telecommunication), Mr. A.S. Wakhle (former Member services of telecommunication commission) and K.B. Rao (member finance of the telecommunication commission) gave its assent to the "dissenting note" of the Nambiar committee.³⁵ The new government under Chandra Shekhar placed orders for 512-port C-DOT exchanges with 8 manufacturers apart from ITI and then permitted these 8 manufacturers to produce C-DOT's MAX equipment of 2,000 to 10,000 lines.

However under the new Congress (I) government under Mr. Narasimha Rao, though Pitroda has got back some of his earlier stature again, yet the fundamental shift in the economy has put C-DOT in a cross road. But inspite of this, in December last, its first commercially produced 10,000-line exchanged was inaugurated at Ulsoor in Bangalore. C-DOT has been robbed of the last stage of its original brief: the development of 30,000-line exchanges.³⁶ C-DOT has been sucessful developing a string of small exchanges upto 10,000-lines. But the technologies for the big 30,000-lines exchanges will now be supplanted by MNCs. This means the taking away of government life support system which a venture like C-DOT anywhere in the world needs. Research requires coddling and nurturing. C-DOT is for all practical purposes

35. Reported in The Times of India, 7th August 1990.

36. See the The Economic Times, 9th February 1992.

being abandoned without having been taught to fend for itself. Then there is the loss of talent. What the politics under NF government did to C-DOT in term of losing talents, can never be justified and so can't be the mistrust that it has created of the government in the young Indian scientists' mind. In the past C-DOT held on to talent by offering a unique work atmosphere. But many brilliant scientists left it because of the way it was publicly maligned. It is no secret that while C-DOT still gets talented young engineers, it no longer attracts the best who prefer to go abroad. At present for its survival, equity for employees and insulation from the vagaries of the government's decision making can be a solution. For this C-DOT would have to earn its keep. The tragedy is that C-DOT hasn't prepared for this commercial independence and finds itself at a cross road just when it has got over most of the difficult hurdles that came in the way of a R&D organisation.³⁷

It is only in the densely populated metros that the 30,000-lines exchanges are needed. These are the exchanges which MNCs are being called in, to manufacture. Even these have to go through a process of adaptation and by the time that is through, C-DOT is expected to be ready with its own 30,000 line exchange. According to DOT data, during the 8th plan and even further ahead, over 90 per cent of the

37. The Economic Times, 9th February 1992.

country's requirement of exchanges can be met by exchanges of 10,000 lines and less. Now C-DOT will have to compete in the market place on unequal terms. And with every talented employee lost to a dollar salary, comes the humbling of an Indian technology initiative.

CHAPTER V
ANALYSIS AND CONCLUSION

Looking at the developments within the telecommunications sector, as has been described in the last two chapters, one can discern a visibly prominent pattern of decision making and policy formulation characterising the entire process in its decade long journey from a not-so-important sector to that of being an important infrastructural one. In this process, decision through the appointment of committee system with its corresponding structural strengths and weaknesses holds the centre stage, though sometimes the weaknesses seem to outgrow the strengths. As it is characteristic of the entire communication field, so is that of the telecommunication sector, where the absence of any single policy planning institute for research and recommendation of policy measures has resulted in no comprehensive, consistent and continuous policy measures and a corresponding heavy reliance on the committee system. Whether it is with regard to the introduction of new technology or organisational restructuring or assessment of previous policy measures, there have continuously been the appointment of high level ad hoc committees for recommendations, though the motives behind their appointment varies from time to time. While Sarin committee was appointed with a genuine concern to improve the

efficiency of the telecommunication system; the Athreya committee was established, as has been generally reported¹ in many newspapers, to buy time to implement the already decided holding company concept of the communications minister; and the Nambiar committee was established with not-so-ostensible purpose of a political witch-hunt.² The nature of the membership of the committees and their reports vary likewise. The strength of the committee system lies in its ability to pool together knowledge, experience and expertise available in the field, a fact which assumes special significance in a specialised field like the telecommunications which holds tremendous potential for the country's progress. Besides this, another important feature of the committee system is that, it provides a ground for negotiation and bargaining among various interests thereby leading to policy recommendations based on consensus. This enhanced its acceptability. However the composition of the committee assumes critical importance where the matter to be deliberated upon happens to be centred around a controversy cutting across the concerns of different interested groups. These bodies are set up to sort out knotty issues which may not be amenable to any clear-cut solution through the normal

1. The Economic Times, 16th December, 1990.

2. The Indian Express, 25th April 1990.

process.³ However if one looks at their actual operation as can be seen from the previous discussions, all these strengths seem to fade out once the political environment comes to interact with the system. Sometimes the supposed strengths of the system turn out to be their weaknesses. Assessing the working of both the Nambiár and Athreya committees, what we find is that, instead of solving the problems through consensus, they perpetuate the existing difficulties by failing to bring the totally antagonistic parties to a mutually agreeable solution. The issue of acceptability seems to have got a back seat in both. Though the issue of acceptability can always be compromised on the ground of achieving optimality, yet the manner in which the committees were appointed and functioned put a big question mark on the level of achieving optimality in case of both the antagonistic reports. Due to under-representation of certain interests and the high level of antagonism within the committees, when they are specially acting as political instruments as was the case with the Nambiar committee, the reports of the antagonistic parties seem to be quite exaggerated in order to justify their stands on the face of stiff opposition. The submission of different reports with divergent views by the committees like that of the Athreya

3. R.M. Rao, 'Some Recent Committees and Commissions', in Ganapathy, Maru etc., ed., Public Policy and Policy Analysis in India, New Delhi :Sage Pub., 1985, pp. 275-296.

and the Nambiar committees defeated the very purpose of settling up expert committees and complicated the situation. Public administration being an open system, credibility of a decision and appearance of impartiality by the government are important for administrative action, for which the committee system provides a viable instrument. But looking at the way the committees are established, the way their chairman and members are selected and the manner in which they function, provide no semblance of impartiality and their recommendations seem to be influenced by the dominant political considerations of the government of the day. Due to this they tend to lose their significance and many a times fail to be taken for even consideration if there is a change at the top. Sometimes, the committees go on a process of wide-spread consultation as was the case with the Arthey committee. But finally to quote R.M. Rao, "The overall impact of their work is dependent on the receptivity of the administration to new ideas and its sincerity to translate suggestions into policies. At the same time the task of ensuring such synchronisation does indeed take place rests largely on political leadership."⁴ In reality the committee reports are generally accepted when they suit the ideas and fancies of the political leadership or otherwise face a quiet burial.

4. Ibid., p.292.

The entire policy-making system seems to have been vitiated by the vagaries of corrupted politics, where rational and scientific considerations get a back seat against the narrow political considerations, personal whims and prejudices of the men in power. The C-DOT issue provides the most telling episode of an unique indigenous R&D endeavour which got grounded due to narrow political considerations and personal rivalries, pushing rational considerations like the issues of indigenous technology, self-reliance, etc. to the back seat.

INFLUENCE OF THE POLITICAL SYSTEM

From the previous discussion, the political system seems to play its role in many ways:

1. In the formulation and acceptance of 5-Year Plan objectives. The plans are discussed in various forums.⁵
 2. Initiation of policy proposals by the Communications Ministry, their discussions in the cabinet and their subsequent approval.
 3. The role of the Prime Minister in initiating as well as reacting to certain policy proposals.
 4. The role of parliament in acting as 'policy-influencer' than either 'policy-maker' or as 'policy-
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5. Also observed by Dayal, Mathur, Dutta and Banerjee in Dynamic of Formulating Policy in Government of India, Delhi: Concept Publishing Company, 1976, p.68.

transformer'.⁶ Its capacity in this respect is however further limited in scientific and technical areas and so is in telecommunications sector.

If we consider what Maru describes as the policy arena⁷ such as the PMO, parliament, bureaucracy, planning commission etc., we can find the dominant policy arena as far as telecommunication is concerned to be that of the PMO, the Ministry of Communications, specially the Department of Telecommunication (DOT) and the Cabinet. The DOT was established as the apex body to operate the telecommunication sector, taking major policy-decisions and being responsible for their operations. DOT has been coming up with many policy proposals like splitting the Indian telecommunications industries⁸, various schemes like Tatkal scheme⁹ etc., though the role of the Communications Minister remains more important. In initiating major policy proposals the Ministry of Communications and especially the Communications Minister

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6. For details see R.B. Jain, Electronics Policy and Indian Parliament, paper presented in the IPSA Panel on 'legislatures and economic policy' at XIIIth World Congress of The International Political Science Association held on July 15-20, 1985.
 7. For further elaboration see R.M. Maru, "Policy Formulation as Political Process", in Ganapathy, Maru, Ganesh, Paul and Rao, ed., Public Policy and Policy Analysis in India, New Delhi: Sage Publications, 1985, pp. 150-177.
 8. Deccan Herald, 25th July 1987.
 9. The Statesman, 5th June 1988.

plays a more important role. Whether it is with regard to appointing committees or initiating proposals like 'the merger of MTNL with DOT',¹⁰, 'going for cellular phones' or 'Tatkal scheme', it is the Communications Ministry headed by the Communications Minister, which plays the major role. However, most of the time it is the Communications Minister who plays a dominating role. Things also happen in such a way that, sometimes the minister takes the decision without taking his ministry into confidence as was the case with Mr. Sanjay Singh, the then Communications Minister under the Chandrasekhar government, who sent his proposal of the 'MTNL's merger with the DOT' directly to the Prime Minister, not just skipping the Union Cabinet but also without taking his ministry into confidence.¹¹ Even in case of the decision to put C-DOT to task for not developing the large size MAX in time, it was taken solely by the then Communications Minister, Mr. Unnikrishnan. However, the most dominating influence in the policy-making sphere seems to be coming from the PMO. Many proposals, whether they are that of DOT or the Communications Ministry, generally seem to be overridden whenever there is a clash between them and the PMO. Cases in point are that of the appointment of the Telecommunications Commission and the decision with regard to its chairmanship. The proposal to set up a commission for the Telecommunication

10. The Economic Times, 14th December 1990.

11. Ibid.

sector was first mooted informally in the PMO in January 1985¹². However, it met stiff opposition from the DOT and later from the Communications Minister¹³. The DOT's proposal of a Telecommunications Board was defeated finally and the Cabinet approved the establishment of the Telecomm Commission, of course not before considerable delay and vacillation at the Cabinet level. However, what ultimately turned out to be the Commission was not totally in the form in which it was initiated, but rather was one with considerable modifications taking into account DOT's proposals and various other recommendations. Though ultimately the PMO's proposal prevailed, yet DOT and the ministry imparted considerable influence. However, in case of the selection of the chairman of the Commission, it wasn't only just the Minister of Communications' proposal which was overridden, but also the Cabinet's decision, which was flouted by the PMO.¹⁴ Many other major proposals like 'the establishment of the C-DOT', 'initiation of telecommunication mission' etc. were initiated by the PMO. Though Cabinet seems to be playing a major role in discussing and approving various policy proposals initiated by either the ministry or

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12. Source The Times of India, 27th January 1989.
 13. For further details see Financial Express, 15th December 1988.
 14. For further elaboration see The Telegraph, 11th April 1984 and The Times of India, 2nd May 1989.

the PMO, yet sometimes authorities tend to bypass the Cabinet as can be seen in case of Mr. Sanjay Singh's proposal of the 'merger of MTNL with DOT' which he sent directly to the Prime Minister without submitting it to the Cabinet as is normally the case. The same seems to have happened when the Communications Ministry under the V.P. Singh government wanted to submit the Nambiar committee report directly to the parliament without putting it before the Cabinet for its approval. However, in that case ultimately the PMO intervened and directed the Ministry to send the recommendation first to the Cabinet. The Prime Minister initiates as well as reacts to certain proposals in the plans or policies at his volition. Cases like the Telecom Commission, C-DOT, etc. were launched at the initiative of the Prime Minister acting in consultation with his PMO. Even in case of the creation of C-DOT, there was stiff opposition from the DOT.¹⁵ The Telecom Commission after its creation was vested with the power to prepare policies relating to the development of telecommunication, but was rendered ineffective after a change in the government at the centre. As far as parliament is concerned, R.B. Jain's observation: "Indian parliament's capacity to influence public policy and hold the executive accountable in this respect is that given the environmental constraints, parliament's competence to make or initiate

15. G.B. Meemamsi, "The Great Indian Telecom. Saga - 1", The Times of India 12th May, 1991.

policy measures is extremely limited irrespective of the nature of policy areas. While the capacity of the India parliament to influence decision in scientific and technical areas is very little indeed, it has had only marginal impact in other areas of public policy----", can be taken to hold good.¹⁶ Another interesting feature is the contradiction in approach within the ministry itself. Under the V.P. Singh government, while the Communications Minister, Mr. K.P. Unnikrishnan declared at a press conference that Mr. Sam Pitroda had used his official position to make 23 million dollars for his two companies, but the figures that the V.P. Singh government tabled and the replies it gave to queries in parliament on this issue, had a different story to tell. It related that the total amount of imports from Pitroda's company was worth only 442,000 dollars, a figure much lesser than that accused by the minister.¹⁷

The above statement brings us directly to the question of the roles that individuals, whether politicians or technocrats play in influencing policy-decisions. This seems to be a prominent feature characterising the telecommunications sector in the eighties. Major policy decisions, initiatives and changes can be seen to have come

16. R.B. Jain, 1985, op.cit.

17. For further details see M. Chhaya, Sam Pitroda - A Biography, New Delhi: Konark Publishers Private Ltd. 1992, pp. 166-167.

due to the influence of individual politicians at the ministry level. Rajiv Gandhi's fascination for hi-tech made him try out a NRI technocrat Mr. Sam Pitroda, who promised digital technology for telecommunication within 3 years, thereby bringing into existence an unique R&D effort like the C-DOT. After a few years, under the V.P. Singh government, the personal prejudices of the Communications Minister, Mr. Unni Krishnan against Mr. Pitroda, put this whole effort to a standstill. Instances are many like the establishment of the Athreya Committee due to the fascination of the then Communication minister for implementing the holding company concept etc... Besides the politicians, how individual technocrats, enjoying the confidence of the highest executive authority, have come to be the potential initiators and implementors of many significant policy measures can be seen from the study of Mr. Sam Pitroda. During the Rajiv Gandhi regime and even afterwards under the Narasimha Rao ministry, all major policy decisions in the telecom sector seem to have emerged at his initiative. Starting with the creation of C-DOT to the idea of establishing a Telecommunications commission, inauguration of the telecomm mission to the selection of technologies, etc. the proposals seem to have come from Mr. Pitroda, enjoying the confidence of the then Prime Minister, Mr. Rajiv Gandhi.¹⁸ Though in retrospect, some of his initiatives were

18. See for further details, M. Chhaya, 1992, op. cit.

the right ones, yet this total reliance upon a single individual for all major policy decisions, whether technological or organisational, isn't a viable approach which created problems of its own as can be discerned from the C-DOT story. Heavy reliance on technocrats and bureaucrats seem to be a remarkable feature of the entire communications sector.¹⁹ However such total reliance on one or a few technocrats for all major policy decisions including even those having special social component, raises several questions about the possibility of reaching optimality in policy formulation and their implementation.

Influence of pressure groups, public opinion and MNCs -

Pressure groups, public opinions and MNCs also influence policy decision. How pressure groups influence the decision-making process can be seen from the entire Athreya committee episode and its reports as has been described in the third chapter. Public opinion also exerts considerable influence. Prime Minister, V.P. Singh had to change his communication minister due to mounting public pressure which went against the communications minister due to his onslaught against the C-DOT on some prejudicial ground.

According to people involved in policy-making at high-level, like G.B. Meemamsi, multinational corporations are

19. The view was also corroborated by K.L. Sondhi, in Sondhi, Beyond Mass Communication, Delhi: B.R. Publishing Corporation, 1991, PP. 129-233.

playing very important role in influencing the decision-making at the highest level. In a newspaper article in May 1991, Meemamsi reviewed the fight to repulse the many onslaughts on the electronic switching system (ESS) R&D programme in India before and after the establishment of C-DOT.²⁰ Even the technology mission on telecommunications, released on late 1986, had specifically stated that decision-making in telecommunications had been vitiated by a powerful import lobby playing into the hands of Multinationals.²¹

From the above analysis the major short-coming of the policy-making process in the telecom sector appears to be the lack of co-ordination and co-operation among the different decision-making bodies and so the consequent controversies and conflicts over each and every issue. The vagaries of politics and the personal whims, fancies and prejudices of the men at the helm of power vitiate this atmosphere further. the result becomes a set of arbitrary decisions, and hasty measures based on short-term considerations as was the case with proposal of MTNL's merger with DOT or appointment of the Artheya committee etc. and contradictions and distortions in policy decisions etc. All these factors combinedly harp hard at the prospect of optimal policy-making in the telecommunication sector which it demands seriously

20. See G.B. Meemamsi, "The Great Indian Telecom. Saga", The Times of India, 12th May 1991 and 13th May 1991.

21. Source: The Hindustan Times, 27th August 1987.

in a resource starved country like India embarking on a path of rapid socio-economic progress. Lack of policy-research and institutes for policy analysis on the basis of broad based participation (i.e. participation by experts from various fields, social scientists, knowledgeable people involved at grassroot levels etc.) stunts the growth of well-considered policy perspectives and so a comprehensive, cohesive and integrated approach. Neither do we have any well considered, widely debated and consistent policy perspectives, nor have we any sound and continuous policy formulations process. What exists as policy in the telecom sector is nothing but a conglomeration of ad-hoc, short-term, stop-gap and corrective measures which change frequently with change in the ministries at the centre. There is no document which may be termed as a telecom policy document, there are only telecom plans. Though undoubtedly there has been a perceptible change in attitude among planners and policy-makers with regard to its importance in the developmental process, yet there can be found no corresponding improvements at the institutional, planning, research and policy-analysis level which a technological sector like telecommunication demands. This explains why inspite of our preoccupation with telecom planning for atleast the last one decade it has not yet yielded any significant results.

What makes matters worse is the lack of organisational framework and institutional mechanisms to carryout such

policy analysis which is necessary for the formulation of any sound policy. Though expert committees and task forces are set up from time to time for suggesting policy measures, yet problems beset their adhoc nature and questionable effectiveness.

So what is needed urgently is much more thinking on not only the whole area of policy analysis but also the kind of organisational set ups to be created at the national level to allow for appropriate institutional mechanisms to be operative for policy formulation in the field of telecommunication.

The question to be ultimately answered is: What makes a good policy/plan as opposed to a bad one? Public policy can't be and isn't an end in itself. It is to be judged in terms of its social objectives, in terms of its short and long-term impact on society; in short, in terms of its values. The other criterion is that of practicality: Is it implementable? Is it realistic enough in terms of human condition and resource constraints? and so on. The further we go on identifying the parameters of a 'good policy or plan', the closer we come to understanding the relationship between process and product. If the axiom that 'process determines the product' is to be held valid in the realm of public policy, we must ensure sound policy-making procedures, allowing a careful and critical examination of the criteria

of values and practicability in order to ensure a good public policy.²² The present study is intended to be a pointer to the telecommunication planners and policy makers toward identifying the lacunae in our policy making/planning procedures and improving them for the future.

So while urging the need for a proper telecom policy formulated on the basis of extensive policy research, wide discussion and participation of persons with comprehensive developmental foresights at various level, it is very important to draw attention to certain very significant issues and aspects that have to be kept in mind while making telecommunication a truly viable mechanism for our country's all round development. These are issues and perspectives that an optional policy-making must address itself to in a sector like that of the telecommunications.

The first issues to be addressed are those of 'technology' and need for a change in the 'techno-economic paradigm'.²³ Taking into discussion both the 'technology' and a 'paradigmatic shift', Krishanlal Sondhi is of the opinion that:

22 A. Ahmad, 'The making of science & technology plan' in Ganapathy, Maru, Ganesh, Paul & Rao, ed., Public policy and policy analysis in India, New Delhi: Sage Publications, 1985, PP. 191-192.

23. For elaboration see K.L. Sondhi, 1991, op.cit, pp. 193-232.

The first very important concept to understand is that technology is one thing and innovation through a shift in the techno-economic paradigm quite another.....Technology per se, something to which our technocrats are pathologically fixated, has no value whatsoever of its own. What is needed for development isn't technology or new technology, but innovation through a shift in the techno-economic paradigm.²⁴

By paradigm shift he means a shift from an 'energy-intensive paradigm to that of an 'information based' one. In order to achieve this new techno-economic paradigm the basic input is 'technical innovation.'²⁵ The least important of all, for Sondhi, is technology. According to him,

Applying this pattern to telecommunication, the end product which ought to have been visualised is how at the earliest to make a shift from the rural-urban divide and agriculture-industry divide to a new kind of economic functioning. Where through information we would have decentralised manufacturing in batch production mode, distant learning systems, distant health care systems etc. For this the technical innovation needed was of providing an 'information corridor at the earliest possible. The choice of information technology was the least important and the most inconsequential. Instead, the exact opposite has been done. All the time has been infructuously spent in a so-called indigenous C.DOT switch and so the opportunity never arose to get the country to a different techno-economic mode.²⁶

The above statement can be held valid insofar as the need for a shift in the techno-economic paradigm is necessary, but to undermine the issue of 'technology' or

24. Ibid. pp.193-201.

25. Ibid.

26. Ibid. pp. 199.

regard it as totally inconsequential is to commit as much a blunder as to undermine the issue of a paradigm shift. With 'technology' is associated an entire set of issues like 'suitability', 'viability', 'cost-effectiveness' and 'self-reliance' etc. For instance talking of digitalisation of telecommunication network which is an improved form of technology than simple voice transmission, it can be said that if effectively used, it reduces the cost of transmission.²⁷ Another example can be that of C-DOT's digital switches like Rural Automatic exchange (RAX) which is much more efficient and cost effective than what is now working in the Indian telecom system, as they can operate without air-conditioning which switches developed abroad need and are also of low cost in comparison to the western ones. These are suitable for India's countryside, where though essential, yet due to lack of demand in commercial terms and increased cost of providing connections, prevent government from networking them. Another example is that of fibre optic cables which if replaces older copper ones can greatly increase the volume of data or voice transmission. Improved switching makes possible a wide range of enhanced services. Apart from all these, indigenously produced technology like C-DOT switches, can save the country its valuable foreign exchanges in the present adverse Balance of Payment

27. See K. Colhando, "Worse for confusion but not confounded", Telematics India, Vol. 3, March 1990, p. 46.

Situation. It can also enhance the country's export potentials. So the selection of technology should address itself to issues like their 'appropriateness to function in the most cost - effective manner', 'self-reliance', 'strengthening the country's export potentials' etc.

However the most important question to be addressed to is: Do we know the 'human' - i.e. social, economic and political implications of these technologies. If not, then a lot of work needs to be done in this area. 'What is most crucial about telecommunications technology, for that matter the entire gamut of communications technologies, isn't just the technology per se but how it is organised and used and the social context surrounding its use. Too often in the past, the importance of social, organisational, economic and logistical context of a communication technology hasn't been realised'.²⁸ Technology should be made user - friendly. Information technologies have to be used to prevent monopolisation of facilities like water, electricity, funds and so on in our villages. Even Vikram Sarabhai, the doyen of India's space and information science emphasised the social and human aspects of science and technology as the most important factor. To quote him :

Clearly the development of a nation is intimately linked with the understanding and application of science and technology by its people. It has

28. A. Singhal, & E.M. Rogers India's information revolution, New Delhi: Sage Publications, 1989, p. 26.

sometimes been argued that the application of technology by itself can contribute to growth. This is certainly true as an abstract proposition but fails in practicehistory has demonstrated that the real social and economic fruits of technology go to those who apply them through understanding.....I consider the leadership in science to achieve the following: First, to foster creativity and an interest in getting to the core of the problems ..., Secondly, to provide experience on a wide scale, whereby men can understand the backdrop in front of which he operated and can evolve values and ethics consistent with the real constraints imposed by his environment. Thirdly, to provide the application of science and scientists to the diverse practical tasks of society, that of building the economy, of creating desirable social environment and to problems of such matters as national policy, security and defence.²⁹

Another important thing to be addressed is the 'organisational factor'. The most important in India, even more important than technology transfer or financial resources, is the organisational change. A scientific and technological sector like telecommunications calls for a totally new form of organisational culture and pattern different from the types that characterise our general administration. Scientists like Dr. Homi Bhabha and Vikram Sarabhai emphasise this aspect of new organisational culture in areas like science and technology. Dr. Bhabha says: 'The type of administration required for the growth of science and technology is quite different from the type of administration required for such matters as the preservation of law and

29. V. Sarabhai, Science policy and national development, Kamla Chowdhry, ed., New Delhi: Macmillian, 1974, pp. 169-172.

order'.³⁰ "The tasks encountered by the media and communications in the contemporary world call for organisation wherein innovation and creative thinking are essential ingredients for survival as well as growth."³¹ Even Vikram Sarabhai advocated for new institutional and organisational structures devoid of vertical control. To quote him,

In my personal view, which is shared by many eminent foreign scientists, that the general absence of the proper administrative set up for science is a bigger obstacle to the rapid growth of science and technology than the paucity of scientists and technologists, because a majority of the scientists and technologists we have are made less effective through the lack of right type of administrative support.³²

According to him,

Structures, procedures and techniques are important but these must be sustained by a cluster of attitudes conveying care, trust and nurture on the part of responsible persons. There is need to understand that there is a shift from simple to complex technologies, from stability to innovation, from experience-based knowledge and skills to highly conceptual knowledge. The understanding of this change means the recognition of socio-technical systems rather than a mechanistic organisation structure. The recognition that highly trained and professional groups have different needs and motivations, the realisation that hierarchical structures and systems need to be minimised----".³³

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30. V. Sarabhai, Management for development, A collection of papers edited by Kamla Chowdhry, Delhi: Vikram Publishing House Pvt. Ltd., 1974, PP. 6.
31. K.L. Sondhi, 1991, op. cit, p.144.
32. Source , K. Sondhi, Communication growth and public policy, New Delhi: Breakthrough Publications, 1983, pp.116-17.
33. Ibid. p 30.

In pursual of such objective he suggested to keep up the open - ended support of individuals and organisations who have demonstrated the quality of excellence in their work. Such views are of tremendous importance in a country like India for creating creative organisational structure.

So as a concluding remark it won't be an exaggeration to say that a well-considered and rational policy formulated by taking into account the above parameters can really make telecommunications the electronic highways of our future socio-economic progress.

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