CHAPTER I

REVIEW OF LITERATURE

This chapter reviews the relevant literature to bring out a research perspective for the proposed study. The review is divided into four sections. The first section maps out the evolution of the open systems paradigm from the application of systems concepts to organization theory. In the second section we review literature on systems analysis, operations research and management, and the application of these methods to organizations in general and the health services in particular.

The third section of this chapter goes onto review the studies on district public health services organization in India to develop a critique, which leads to the fourth and final section of this chapter where our perspective for the study of the District Public Health Services System is outlined.

1.1 ORGANIZATIONS AS OPEN SYSTEMS

Organization theory was the product of works done by the classical theorists. A number of later researchers have added, currently used newer theoretical perspectives. The organization as the object of study has been labelled as complex, formal, bureaucratic, and the large-scale organization. The classical theorists included Max Weber; Robert Michels; Frederic W. Taylor; Elton Mayo, and Fritz J. Roethlisberger and William J. Dickson; Chester I. Barnard; and Talcott Parsons whose theories on organizational bureaucracy; oligarchy; scientific management; human relations; cooperation, and social systems respectively have been pioneering works.

More recently, the theoretical perspectives on the sociology of organizations have been transformed by the works of Peter M. Blau on Functional theory, James G. March and Herbert A. Simon on Decision-making theory, Amitai Etzioni on Compliance relationships between organizations, and Daniel Katz and Robert L. Kahn's Open systems theory.
"Before the advent of open-systems thinking, social scientists tended to take one of two approaches in dealing with social structures, they tended either: (1) to regard them as closed systems to which the laws of physics applied or (2) to endow them with some vitalistic concept like entelechy."1

One example of closed versus open systems is evident in the concept of entropy.2,3 Entropy increases toward a maximum as the physical or closed system attains the state of the most probable distribution of its elements, a state of maximum disorder. In social systems, however, structures tend to become more elaborate rather than less differentiated and the operation of entropy is counteracted by the importation of energy from their environment by these living and open systems which is characterised by negative entropy or negentropy.4,5

**Negentropy** is a state of dynamic equilibrium which marks the outer edge of the system boundary.6 It is the most steady state of systems function and by this mechanism a system maintains itself in homeostasis (for example, the state of health).7 The role of the environment therefore, is most important for the survival of any living or social system.

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2 **Entropy** is energy loss or energy that cannot be turned into work- Scott, W. Richard, 1987, *Organizations Rational, Natural, and Open Systems*, Prentice Hall, New Jersey, p.82.


6 Braden and Herban, 1976, op.cit., p.18.

7 Ibid.
A social organization is shaped by its environment over a period of time and the latter always remains both a threat and a resource for the organization. Moreover, the environment of any organization has various dimensions to it viz., physical, technological, cultural, and socio-political.

Based on cybernetic theory, Luhmann developed a notion of systems in which the relationship between the system and its environment was understood in terms of a difference in complexity where the environment's complexity was always greater than that of the system situated in it. The existing complexity gradient between the system and its environment defines the boundaries between them and the system functions to reduce this complexity difference.

The external environment in turn contributes to the internal environment of an organization or system in the form of its climate and culture. According to Ekvall, "Organizational climate arises in the confrontation between individuals and the organizational situation. Routines, rules, procedures, strategies, policies, and physical environment - all such factors in the organizational situation evoke reactions in the people involved." This model of the organization as an open system is an improvement upon the closed and natural system

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perspective which stressed that the personal characteristics of the staff in an organization, are independent of the external environment."

However, the debate on naturalism of organizations continues as Khalil, like Luhmann mentioned earlier, argues that social organizations should be viewed as complexities to understand their nature and to overcome the shortcoming of reductionist and functionalist reasoning. One of the most important developments of applied science in the last thirty years has been this study of complexity.

"Complex" is the term most appropriate to identify the category of objects, designed to meet definite social requirements. The complex systems concept signifies, a spectrum of characteristics and difficulties in understanding them. Ellis and Ludwig enumerate these as "Aside from descriptive difficulties and, currently, fabrication difficulties arising from complexity, the real haunt associated with complexity is compounded of reliability and operability."

To understand and analyse such complexities therefore, different scientific disciplines are required simultaneously, to study the individual aspects and components of the object and their patterns of interaction. As a matter of fact, as Scott remarks, many levels of analytical complexity can be identified as one moves from organizational-individual to societal-


organizational relations. However, he identifies three most critical levels of organizational analysis which are: (i) the behaviour or attributes of individual participants within organizations, labelled as the social-psychological perspective, (ii) the structural features and social processes that characterise the organization and its subunits, which is labelled the structural perspective, and (iii) the organization as a collective actor functioning in a larger system of relations, the ecological perspective.

More than the complexity problems of reliability and operability the crucial difference between social and non-social systems is that of the system objectives or the purpose, goals, and values of the system.\(^\text{19}\) The goals of organizations when specified minimise to some extent the problem of what is a means and what is an end.\(^\text{20}\)

**Five types or levels of goals** of social systems or organizations have been identified by Perrow\(^\text{21}\) on the basis of, whose point of view is recognised - the society, the customer, the investor, the top executives, or others, and these are respectively the societal, output, system, product, and derived goals.

Therefore, a lot depends on the factors of who decides and the priorities of the decision makers which decide the type of goal(s) of a social system.\(^\text{22}\) Furthermore, where standard operating procedures exist, organizational attention often shifts from the purpose to the process of the service which leads to the problem of goal displacement, or the substitution of means for

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21 Ibid, pp.135-37.

ends and a preoccupation with conformity to rules and regulations. Such complexities need to be tackled for any organizational analysis, and lead us to the review of analytical methods to arrive at a suitable paradigm for the analysis of social systems including human service organizations viz. the public health services.

1.2 SYSTEMS THEORIES AND, SYSTEMS ANALYSIS, OPERATIONS RESEARCH AND MANAGEMENT, AND THEIR APPLICATIONS TO ORGANIZATIONS AND HEALTH SERVICES

Systems concepts evolved along with structuralism and functionalism at the beginning of the present century. It was born as a trend in scientific knowledge, to improve upon the methodological crisis of its philosophical-epistemological foundations and the purely elementalist paradigm of scientific outlook. The systems doctrine associated itself with the conception of wholeness (integrative approach) which followed the principle of irreducibility of the whole to its parts, as the whole was understood to have properties more than the sum of its parts.

"Systems theory can be seen in its social philosophy as another variant of organicism - the image of society as an organism subject to growth and decay, which evolves over time into new and more differentiated forms." The wholistic thesis of organicism pertaining to organic wholes have been based on five interrelated ideas: (i) the analytic approach as typified by the physico-chemical sciences proves inadequate when applied to certain cases- for example, a biological organism, society, or even to reality as a whole; (ii) the whole is more than the sum of its parts; (iii) the whole determines the nature of its parts; (iv) the parts cannot be understood if considered in isolation from the whole, and (v) the parts are dynamically interrelated or


interdependent.\textsuperscript{26} Essentially, elements of a system, necessary for its function are both structural and transactional and their degree of interaction is stated in terms of wholeness or nonsummativity, and the increasing complexity of these interrelations during the system process is called equifinality.\textsuperscript{27}

The organismic metaphor of organizations directs our attention to issues of survival, organization - environment relations, and organizational effectiveness and consequently goals, structures, and efficiency become subsidiary to problems of survival and other more biological concerns.\textsuperscript{28} It is in this organismic perspective that the outputs of a system are seen as the things released when they are no more required for internal systems function.\textsuperscript{29}

However, products of the systems functions are also present as outputs.\textsuperscript{30} Very aptly therefore, we can say that the first aim of any organization is not the search for efficiency or profits, but, the search for survival, efficiency or profits being the basic conditions for that.\textsuperscript{31}

Though, from the above discussions it is difficult to separate the concepts of organizations and systems, the origin of systems theory however was disparate from that of organization theory. Nonetheless, similar to the organization theory, emergence of systems theory proceeded in stages of first, a number of anticipations by philosophers and psychologists

\begin{itemize}
  \item \textsuperscript{27} Braden, C.J. and Herban, Nancy L., 1976, op.cit., p.8.
  \item \textsuperscript{28} Gamage, Cyril, 1995, "Holistic and Fragmented Approaches in Culture and Their Implication for Management - Some Basic Issues", \textit{Marga, Qrly. Jnrl.}, vol.13, no.4, p.73.
  \item \textsuperscript{29} Braden, C.J. and Herban, N.L., 1976, op.cit., p.18.
  \item \textsuperscript{30} Ibid.
\end{itemize}
and then the full fledged statements of Von Bertalanffy established it as a movement in biology and physics.\textsuperscript{32}

Starting with the contextualist and organicist approaches of Stephen C. Pepper, to Lawrence J. Henderson's Equilibrium and, Walter B. Cannon's Homoeostasis, systems theory was established as a scientific movement by Ludwig Von Bertalanffy by his essay "The Theory of Open Systems in Physics and Biology" and his **General Systems Theory** (GST).\textsuperscript{33}

This general theory of systems incorporated various fields for the scientific control of existing systems of men, machines, materials, money etc., i.e., it formed the basic science of which Systems Engineering, Operations Research, and Human Engineering represent the applied sciences.\textsuperscript{34,\textsuperscript{35}} Thus, the systems approach, in essence, originated concurrently both in biology and modern technology in the form of various types of systems research.\textsuperscript{36} albeit, Systems Analysis and its application is considered to have flourished during World War-II\textsuperscript{37}. The origin and growth of Operations Research in Great Britain was also during the late 1930s in preparation for the Second World War.\textsuperscript{38}

\begin{itemize}
\item \textsuperscript{32} Lilienfield, Robert, 1978, op.cit., p.8.
\item \textsuperscript{33} Ibid, pp.7-22.
\item \textsuperscript{36} Blauberg, I.V., et.al. 1977, op.cit., p.32.
\end{itemize}
A "system" is defined as "A group of elements (persons, organizations, equipment, concepts, etc.) which are related in such a way that they influence each other and the behaviour of the elements as a whole"; or "system" is a heuristic concept useful in denoting bounded, complex units with interacting internal components. In the case of living organisms and purposively constructed social organization the concept connotes boundary maintaining activities in the pursuit of the maintenance of the system.40

**Systems Analysis** is the examination of various elements of a system with a view to ascertaining whether the proposed solution to a problem or problems will fit into the system and, in turn, effect an overall improvement in the system, while, **Operations Research** is the application of scientific methods, by interdisciplinary teams, to problems involving the control of any aspect of an organised system so as to provide solutions.41 The fundamental difference between the two is that while systems analysis is useful for larger issues and to formulate strategies, operations research is used to solve smaller issues and tactical level problems.42

**Systems analysis** is also defined as the analysis of systems and their objectives with a view to re-allocation of resources to improve performance.43 The goal of systems analysis is

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to define the significant features of the problem under study and it is used for "(i) planning, (ii) improved methods of delivery, (iii) effectiveness analysis, and (iv) decision analysis."44

Although classical systems analysis and operations research have been highly effective in armed forces, business and industry, their adaptation and application to complex social systems have not been frequent. Like the case of organization theory, Systems Analysis and its sister disciplines such as Operations Research too often failed to achieve successful implementation because of an incomplete and often incorrect methodology.45

It was felt that analysts make assumptions that do not stand up to serious examination. One such assumption was that the "hard" part of a problem which could be expressed in mathematical terms could usefully be isolated from the human and organizational elements and these could thus be eliminated from the analysis.46 As pointed out by Ida Hoos,47 the attempts to use quantitative indicators and to construct "cost-effective" models have been unsuccessful in the past and the great number of mathematical models developed have mostly gone waste without any practical application.

What has emerged over the last few years is a practical and flexible problem-solving approach of systems analysis and operations research.48 In this approach, (i) a delivery system is first analysed and then broken down into smaller, more manageable problems for study. (ii) These smaller problems are then investigated not only singly but also in relation to each other

44 Ibid.
46 Ibid.
to identify possible solutions. (iii) The potential solutions can then be analysed systematically and critically, and the most promising selected for testing.

Hence, the systems approach formed the theoretical and methodological basis for the elaboration of Systems Analysis problems. Among the latest improvements upon the previously followed narrow Systems Analysis, have been the works of Ackoff and Checkland. More than Ackoff's "iterative planning" Checkland's "Soft Systems methodology" have been found useful, as it provides a structured way of tackling ill-structured problems without imposing on them either the means-end dichotomy of the "hard" methodology or, any other assertive schema of this kind.

The concept of Systems Analysis becomes more complicated and vast when we consider Nappelbaum's perspective: "The concept of Systems Analysis is expounded on the basis of a variety of non-traditional research ventures which have been appearing in scores over the past few decades. Management science, control theory, cybernetics, Operational Research, problem solving theory, action theory, artificial intelligence, knowledge representation theory, data theory, some of the aspects of mathematical psychology, praxiology, systems engineering and some of the branches of normative economics and sociology, decision-making theory etc. can be quite instructive in this respect. This list can be extended ad-infinitum."


51 Checkland, Peter, 1984, "Rethinking a Systems Approach", in Kiss and Tomlinson (eds.), op.cit., pp.43-60.

The modern scientific and technological revolution has been in a sense a transition from the production of technical items to the creation of technological systems.\textsuperscript{53} Such systems are not fundamentally mechanical, chemical, biological, psychological, social, economic, political, or ethical. These are different ways of looking at such systems and understanding of such systems requires an integration of these perspectives where integration means synthesis of disciplinary perspectives in the process of conducting studies.\textsuperscript{54}

However, the main concept of 'System' stems from the ideas of General Systems theory and cybernetics and the main concepts of the systems approach are the "system", "process", "input", "output", "feedback", "constraints" etc.\textsuperscript{55} Furthermore, according to Hirschheim,\textsuperscript{56} it is the social sciences and not the physical sciences where systems, systems analysis and operations research really belong, because these are involved with people in a social setting. He also interprets phenomenology as the underlying philosophical base and a suitable paradigm adopted by Checkland for his "soft systems methodology". Phenomenology, as we know, is the study of phenomena and thus, is empirical.\textsuperscript{57} But, earlier it has been tenaciously used to oppose positivism.\textsuperscript{58} The point is to move away from positivism, which is felt to be deficient, for the social sciences.\textsuperscript{59}

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Thus, systems analysis asserts: (i) the organic integrity of the subjective and the objective in systems studies, (ii) the notion of structure that gives systems their integrity and determines the boundaries making it distinct from its surroundings, and (iii) the interdisciplinary nature of the "systems effect" of emergent properties due to the interactions of the system as a whole and the subsystems within it.

The concepts of boundaries and hierarchies of systems have been points of debate till now. As Abbott argues, "Social entities come into existence when social actors tie social boundaries together in certain ways. Boundaries come first, then entities.... An organization is a set of transactions that are later linked into a functional unit that could be said to be the site of these transactions."

Additionally, boundaries of hierarchical or interconnected systems form spaces between them which forms a medium of transport of information and energy and is called the interface. Thus, it is mandatory to identify the boundaries of any system to be studied, to define it as a system at the first place.

The hierarchical concept, however, is less debated as it is well accepted that hierarchical structures naturally emerge in the course of development from the simple to the complex via fixed intermediate forms. It is also of importance to note that the very notion of a system is hierarchical as it presupposes the unity of three basic concepts: (i) a system as an element of a larger system which conditions its interactions with the environment, (ii) a system as an integral entity, and (iii) a sum of its own elements or subsystems.


This hierarchical nature of systems has led to the hierarchical systems theory which is an abstract theory of how problems may be solved in a multi-level fashion. In this method, like the flexible problem solving approach mentioned earlier, the total problem situation is conceptualised as consisting of a set of smaller sub-problems. If these subproblems were solved individually and the resulting subproblem solutions pieced together, one would not necessarily obtain a satisfactory solution to the overall decision problem. Rather, the subproblems must be coordinated in some fashion, that is, a solution process in terms of subproblems on different levels, where lower level subproblems are coordinated by higher level ones.

Systems Analysis as a phrase apparently, is a contradiction in terms, of the wholism of system and the elementalism of analysis. However, from the discussions of the theories and concepts of Systems Analysis done above, we understand that Systems Analysis is a dialectical synthesis of the thesis of wholism and the antithesis of elementalism. Such "synthetic analysis" demands C.Wright Mills' "social imagination", prophecies and innovations for organizational change and improvement.

Relevant in internal systems function and systems operation is the question of optimization versus suboptimization. In socio-technical systems, usually, some subsystem is optimized rather than the overall system. For example, in systems utilizing human and technological sub-systems, it is a common fault to suboptimize around the humans.

Extending the suboptimization concept a little further, we arrive at the concept of organizational co-optation as opposed to organizational optimization. The former being

64 Dirickx, Yvo M.I. and Jennergfen, Peter L., 1979, Systems Analysis by Multilevel Methods, John Wiley and Sons, Chichester, p.4.
65 Ibid, pp.1-3.
characterized by a high degree of non-congruence in decision making, goal displacement and authority subversion. 67

Therefore, to emphasise once more the essential feature of systems theory as with Field theory and Gestalt theory is that the interrelationships among coacting components of an organized whole are of fundamental importance in understanding the totality. 68 The components or entities are necessarily altered by the relations into which they enter, this is the heart of the theory of internal relations. 69

In this approach to socio-technical systems analysis there are two main trends which may be called in short the "mechanistic" and the "humanistic". 70 The mechanistic approach emphasizes, theoretically, cybernetics, regulation by feed-back, computerization, and the methods of systems engineering as used in business and industry. The humanistic trend in systems theory not only duly acknowledges and makes use of all theoretical and practical approaches that the mechanistic trend legitimately puts forward but also transcends them. In this humanistic trend, systems approach may contribute towards a reorientation of medical thought and attitude.

On the basis of the above, it is identified that (i) assessment of the resources available, (ii) the possibilities for action, and (iii) the decision regarding resource allocation are the primary questions within the health services. 71 Even if a proper decision is taken, it remains

meaningless unless it can be carried out for which three main qualities appear necessary\(^72\) - (i) an adequate health service structure with (ii) proper management, and (iii) accepted by the people it serves.

Thus, in the context of the situation where the health service infrastructure is adequate or with the given resource constraints and as far as health services per se is concerned the problem is primarily the lack of **administration** and proper **management**.\(^73\)

It cannot be over emphasized here that systems analysis and operations research are also concerned with management and the vital components of management are organisation and administration, the essence of which is "the coordination and adjustment of the activities of individuals with a view to the attainment of a common end."\(^74\) Careful attention to the **organisational design** is a prerequisite to improve the **effectiveness** of the organisation.\(^75\)

Moreover, the management of change and personnel management are also vital. The interest in the contribution of personnel management to health programmes lies in the adjustment of the personnel available to the needs of the organisation. But, in the **personnel management** method, health managers rarely achieve any awareness that they themselves, and the medical and paramedical professions in general, form groups with their own interests and special self-perceptions.\(^76\)

Consequently, and of major significance therefore, proper management's contribution to the improvement of health services has been questionable. This is more so because the focus

\(^72\) Ibid.


\(^74\) Skeet, Muriel, 1973, op.cit.


\(^76\) Ibid.
of management in all complex organizations has shifted from the goal of efficiency to innovation and survival. It has been observed in the past that "induction of personnel from management institutes failed to improve the very low level of efficiency of working of the health services delivery system." As today's knowledge about management shows that everything in an organization affects everything else. This indicates that the purely technical dimensions of the organization must be linked with its social, political and administrative environment, as the latter are perhaps more important and critical factors in the health services system.

The concept of Total Quality Management and the theory of Socio Technical Systems (STS theory) as applied to organizations of Public Health and Health Care are based on the notions of system with subsystems, congruence, and a flexible and creative problem solving approach with the objective of improvement by innovation or change. In the case of major changes to be planned either at the macro or micro level and to review results of new interventions in the health service, simplified systems analysis is necessary.


Applied to health and the health services, such changes are more feasible at the level of organizations of the services as, health in the political context is not a revolutionary issue. Therefore changes should be brought about by systems analysis in health service organizations and can be of its structure, technology, or manpower.

In other words, the critical dimensions of the health service system are its technical component, its manpower, the organisational structure and its administrative aspect. While these four are in continuous interaction with each other within the system of the health services, these are under continuous influence of the environment in which the health service is set.

The prime factors of the environment or the larger system would be (a) the health problems of the local population that the unit of the health services attempts to serve, (b) the national and local socio-cultural and political setting, and (c) the administrative control from above for example for a district health services the control by the state health administration.

It is appropriate, thus, to conceptualise the health services system as an "open system" where on one hand the subsystems are in continuous interaction among each other, and on the other hand these subsystems separately and, the system as a whole are constantly influenced by the external environmental factors.

The Health Services System and its study has been conceptualised in other countries by Reinke, Kohn and White, etc., and analysing the organisational situation of the health services for implementation of programmes and projects has been described by Bainbridge and


Moreover, goals and environment of Public Health Systems have been diagrammatically shown by Bailey and Thompson.\

Banerji has shown the dimension of time to influence the changes in the system and its environment, which increases the dynamicity of the complexity of the health services. This understanding of the health services system is necessary for any attempt to study the health services, understand its problems and solve them. These varied concepts and theories of Systems Analysis, Operations Research and Management have been applied to problems in health and health service organizations by Werley et al., Reynolds, WHO, and in the methodologies of Health Systems Research.

However, despite commendable efforts by the WHO and other international organizations of Health and Development, the utilities of Health Systems Research has been the least. As

87 Bailey, Norman T.J. and Thompson, Mark (eds.), 1975, op.cit., Fig.1, p.337.
noted by Barker,96 Hogrefe and Huber suggest that "despite its proven usefulness there is currently only limited use of Health Systems Research in managerial decision making". Gaps remain in our understanding of the foundations of the expansion of the health services.97 Such shortcomings were also present with the studies of the health services in India.

Any problem in a health service usually represents a series of inter-related problems,98 whose very complexity removes it from the relatively straightforward causal relationships.99 Jackson100 identifies various problem contexts from mechanical unitary to systemic pluralist, the latter being particularly suitable for the problems of the health services, and he also states that for such complex systemic pluralist problem contexts the soft systems thinking of Ackoff and Checkland is specifically suitable.

Furthermore, to apply the techniques of systems analysis and operations research to the problems of health services, the smallest unit or the system has to be demarcated. Since the district is the key level for the management of primary health care and is also the most peripheral unit with comprehensive political and administrative powers,101 it should be considered the smallest unit for a study of the public health services system.


It is also generally agreed that the district health services organization with its ultimate responsibility for implementing both curative and preventive health services through a network of hospitals, PHCs, and dispensaries has not been as effective as intended and that the functioning of the district health organisation is not research based instead uses routine administrative procedures and ad-hoc decisions. Obviously, considerable operations research was thought to be necessary to rationalise the District Health Organization since long.\textsuperscript{102}

This early enthusiasm and zeal to improve the Public Health Services took concrete shape in the constitution of the Task Force on "Operations Research for Improved Delivery of Health Services" in 1974, by the Ministry of Health and Family Planning of the Government of India.\textsuperscript{103} This committee was to suggest specific action measures with regard to past and future Operations Research activities in the health services.\textsuperscript{104}

It developed an operational conceptual model of Health Care Delivery System in India\textsuperscript{105} and set the goals of Operations Research as minimisation of costs or maximisation of benefits i.e., defining the optimal solution for the Health Care Delivery System.\textsuperscript{106}

The Task Force also prioritised problem areas for operations research studies both at the micro and macro levels.\textsuperscript{107} There were twenty-six problem areas outlined for the micro-studies and eleven for the macro- studies. Among the areas for macro-studies, problem number three

\begin{footnotesize}
\begin{enumerate}
\item NIHAE, 1974, District Health Administration Research Project, Phase II, Study Report, No.24, National Institute of Health Administration and Education, New Delhi, p.1.
\item Ibid.
\item Ibid, Fig.1, p.7.
\item Ibid, p.11.
\item Ibid, pp.15-19.
\end{enumerate}
\end{footnotesize}
was on "Studies towards understanding of organizational and extra-organizational variables influencing the output in health, family planning and nutritional services." 108

But, inspite of such a meticulous beginning, the efforts toward the achievements of the objectives of the Task Force Committee did not materialise, either in substantial and significant research output or in any perceptible improvement of the efficiency and effectivity of the health services in this country.

1.3 REVIEW OF STUDIES ON THE PUBLIC HEALTH SERVICES

There have been only a few district studies till date. A review of the main district level studies alongwith some related state level projects in India is given below:

Ia) District Health Administration Research Project, Rohtak. 109

This study was the first attempt to apply operations research to the health services administration in a district, in the country. Undertaken by the National Institute of Health Administration and Education (NIHAE), New Delhi with technical and financial support of WHO and UNICEF, it had the following objectives:

(1) (a) To make a comprehensive study of health services at the district level, (b) To assure most effective and efficient use of resources, (c) to assure integration of preventive and medical care activities, and (d) to assist in orientation of the above mentioned personnel vis-a-vis (b) and (c).

(2) From the above to evolve a methodology for research in the organisation of health services at the district level which could be applied throughout India, and:

(3) To formulate recommendations concerning the optimal organisation for district health services.

The study was undertaken in two phases - "Phase I" or Diagnostic Study was intended to focus on District Health Administration, more specifically on (a) Organisation and Administration, (b) Utilisation of manpower and material resources, and (c) working of health programmes. The importance of studying the socio-administrative milieu of the district health services and opinions of the personnel were realised to be significant in the activities of the health services but these were deleted from the diagnostic phase. The findings of this phase highlighted the fact that the bottlenecks to an efficient functioning of the health services are at the district level.

Yet, the second phase or the Manipulative phase which was to be based upon the findings of the first phase was undertaken not in a district but in a PHC. Thus, the purpose of the second phase of introducing specific changes in District Health Organisation could not be achieved.

Therefore, the Multipurpose Worker's (MPW) scheme, which was first formulated on the basis of this study was only partially tested at the level of the PHC and the operational problems of such an integrated functioning in the district organisation as a whole could not be sorted out. Consequently, the objectives of formulating a research methodology and developing an optimal organisation of district health services could not be achieved.

Ib) Before the launching of the above mentioned Rohtak Study, State level exploratory study of Integrated Health Services in India was undertaken in 1971. Eight-states were selected for the study for (i) studying the background factors with a view to elucidate the operating processes, (ii) studying of differential perception of the phenomenon of integration,

(iii) studying of the extent to which integration has progressed in different states, and (iv) studying of the impact of integration.

The methodology used, included interviews, scrutiny of records and reports and observations. States were selected on the basis of the organisational structure of the health services in them particularly at the district level. This study was also carried out in two phases of (a) exploratory study in the states of Punjab, West Bengal, Gujarat, Maharashtra, Andhra Pradesh, Rajasthan, Uttar Pradesh and Mysore, and (b) depth study in Andhra Pradesh, Uttar Pradesh, Rajasthan and Mysore.

Among the findings of the study two were significant for the integration of the Health Services: (i) there was a unanimity through the State, district and block level personnels about the basic concept of an Integrated Health Services, and (ii) an undue and excessive reliance on administrative orders and instructions, which were at best neither exhaustive nor informative enough, to generate the required change of outlook and approach on the part of those expected to implement on Integrated Health Service.

Another study of relevance for the concept of Integration was the Indepth Study on National Tuberculosis Programme of India conducted by the ICORCI. The main focus of this study was the National TB Programme from the Centre, State and district levels right down to the village level. The methodology of a systems approach was adopted for this study and the programme along with its associated programmes and services were analysed in detail.

Nevertheless, a substantial portion of the study report is on the Integration of the Health Services System which was thought to be necessary for an efficient and effectively functioning Health Services incorporating all the major Health and Family Welfare Programmes.


112 Ibid, pp.6-8, 57-66.
Among the many significant findings of the study and its recommendations was the active utilisation of the multipurpose workers in case finding and sputum smear collection of suspected tuberculosis cases.

Another most important recommendation made by the study was the fact that "unless radical improvements are effected in the General Health Service System, it will be unrealistic to expect any substantial and lasting improvement in the national programmes like of Tuberculosis, Malaria, etc." 113

II. Integrated Health Services Project, Miraj114, 115

This project was being implemented by the voluntary health agency of Miraj Medical Centre. The uniqueness of this project was that parallel health programmes were being delivered instead of the Government health programmes. It was also covering only one Taluka, Miraj, which had three PHCs in its coverage area.

Resource inputs to the project came from the State Government of Maharashtra and the District Zilla Parishad of Sangli and extra inputs and funds were provided by the missionary World Council of Churches, Geneva. The services and benefits provided to the population of Miraj Taluka were divided among the female and male field staff. The female staff catered to maternal and child care, Family Planning, treatment of minor ailments, and health education services, whereas, the male staff called Basic Health Workers (BHWs) were providing the anti-communicable diseases services mainly, including detection of infectious cases, smallpox, malaria, tuberculosis, leprosy, and collection of vital statistics. The BHWs had to provide

Family Planning and health education services also, along with the female staff. Thus the services of Family Planning programme was given more importance and priority by the project.

The integration of services was only at the grassroot level and no organizational innovations could implemented for the PHC or Taluka levels in the project. It was mentioned that the medical officers at PHCs presented the greatest resistance to integration as well as the fact that the PHCs were the bottlenecks in supply of medicines and vaccines from the District level to the subcentres. It was striking to note that even with the extra inputs of resources and the missionary zeal of the project implementors, the problems faced in delivering services for the Leprosy, Tuberculosis and Malaria programmes were similar to the Government set up. No evaluation of the impacts of the project was made.

IIIa) Organization for Change: A Systems Analysis of Family Planning in Rural India.\(^{116}\)

This study though did not attempt to understand the district health organization as a whole and focussed on the Family Planning Programme only, yet, its systems analysis approach makes it significant to be mentioned here.

Undertaken in five districts of rural Uttar Pradesh to study the family planning programme as a system, an effort was made to find out "What is actually happening as policy intentions are implemented".\(^ {117}\) Three pre-requisites for the adopted approach were identified: (a) the conceptualisation of the inter-relatedness of factors pertaining to the rural population, the implementation agencies, and the wider environment within which they exist; (b) the exploration of a broad range of organizational issues; and (c) the examination of both systems and organizational issues within an empirical framework.


\(^{117}\) Ibid, p.382.
In defining the family planning programme as a system three major subsystems were identified: (a) the villagers or the clients; (b) the staff or family planning workers who interacted with the villagers; and (c) the larger administrative system of which the workers formed a part.

This unique and broad conceptualisation led to the important conclusion that the problems in the family planning programme are not isolated but inter-related, that is, they are systemic in nature.¹¹➗

IIIb) Another study on the Family Planning Programme of significance here was conducted by L.H. David.¹¹⁹ Primarily, based on previous micro-level studies, and interviews and discussions with Central Government, State and field level personnels, this study focussed on the policy, strategy and implementation aspects of the population control programme activities. Targets and incentives of this programme were analysed as influencing factors separately, as was the organisation of the programme.

The findings included: the targets were distributed method wise and not by the characteristics of the acceptors. Inability to achieve the target results brought in a sense of frustration down the line causing the workers and peripheral units to lose their basic purpose of micro planning. It was recommended that the target-setting exercises should be more managerial than purely demographic, in terms of infrastructure available.

The managerial analysis of the incentives-scheme showed that for all practical purposes such incentives should be discontinued and instead communication and services performance should be strengthened. The organization was said to be the most critical link between policy and its implementation. In the case of strategy formulation and implementation, the organization structure is a critical determinant of effectiveness.


IV. **Punjab’s Pilot Project on Primary Health Care**

A project of the State Government, it was implemented in the Nurpur Bedi Community Development Block as a pilot venture for **Primary Health Care**. The highlights of this project were that it was envisaged to be community-need-based, with active participation of the community and maximum reliance on available community resources.

The health care delivery system of the study block was integrated to the government system and emphasis on an integrative approach of preventive, promotive, curative, and rehabilitative services, with due importance to **intersectoral integration** was envisaged.

However, the first and most important addition in terms of medical infrastructure in the region was a new 50-bedded hospital at Singur near Nurpur Bedi block which was to function as the referral centre for the area, whereas, the existing PHC infrastructure in the project block remained deficient in many respects. Thus, the said objective and steps identified for the implementation of the project remained unfulfilled if not violated with the overt emphasis on the curative services.

Among the findings of the assessment of this pilot project, the noteworthy were: its conceptual and implementational limitations, as a result of which, it only strengthened the **provider approach** to primary health care. Lack of inputs in reorienting the doctors and other personnel towards the community based, primary health care orientation as well as failure to involve the local community, and deficiencies in coordinating and supervising the working of the different members of the health team were due to the absence of efficient management of the project.

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The baseline survey was deemed necessary for two objectives:

1. Studying the existing pattern of functioning of health care services in order to determine the organisational and implementation aspects which need strengthening, and

2. Computing certain indicators prior to the implementation of the project against which the impact of the project could be assessed. The study was a part of the process of monitoring and evaluation of the Area Project launched in eight districts of the State to strengthen the primary health care facilities.

While it intended to study health care services in districts, actually the survey was again done at the primary health centre level. Instead of finding out the weaknesses in the organisational and implementation aspects of the health services per se, the survey was conducted on the various developmental activities in the villages.

A lot of data was collected from the interviews and observations of health personnel at PHCs and on health needs, health services and involvement of community in health activities and inventory of medical and other public health activities at the village level.

Nevertheless, the shortcomings in conceptualising the health care organisation in a district led to such faulty assumptions as "the MOs at PHCs are the nodal points for planning, organisation, supervision, coordination and management of the services in their area" proved wrong by the findings which showed that "only 40% of the planning of PHC activities were done at PHC level".122


122 Ibid., p.4.
VI  Area Development Project in Orissa - A Review.

The highlight of this study's design was the putting of a multidisciplinary team of an architect, civil engineer, statistician and demographer, sociologist, anthropologist and a health planner to collect the data through discussions and observations of state and district officials. Entrusted to do an assessment of the relevance, effectiveness and impact of the area development programme activities the researchers actually ended up making a simplistic analysis of it.

Making it very clear that "just by providing a building or posting a trained staff does not change the entire functioning of the PHC" they turned out doing an assessment of the material used and the number of buildings for health centres constructed, the numbers of ANMs trained, the amount from the allotted funds used for different activities in the project and declaring already known facts like the passive role of district officials in formulating the programme. The case studies of the PHCs evaluated only the family planning and the mother and child health programmes' performances leaving out other functions of PHCs of the communicable disease programmes, medical care and collection of vital statistics.

The most surprising fact of the study conducted by the operations research group was the suggestion given by them after doing the above assessments to undertake operations research on the organisation and management of the project to increase its efficiency.

VII  Operations Research in Delivery of Primary Health Care in Varanasi District.

It was the first district level project supported by the ICMR on operational research in delivery of primary health care, in Varanasi, to evolve an alternate strategy for better health care.

125 Ibid, p.18.
delivery system. The project was action oriented and had the objective of improving the delivery of primary health care to the people within the existing infrastructure.

The drawbacks of the study, which lasted for 5 years, as reported by the ICMR were (i) piece-meal unit-wise approach in implementing the project instead of an integrated approach, (ii) the project was not designed in a manner that it could get institutionalized in the existing health services, (iii) the research processes were not well documented and since the project was action oriented these processes were vital, and (iv) the end-line survey was not conducted and thus the impact of the project activities could not be established.

VIII Study of Systematic Analysis of Functioning of Health Team at District and Block Level.

This study sponsored by the WHO, was undertaken by the Department of Planning and Evaluation of the National Institute of Health and Family Welfare (NIHFW), New Delhi, and completed in 1988. The objectives of the study were:

(a) to study the health and family welfare organisational structure at district and PHC levels.
(b) to list the expected functions to be performed by functionaries of health team at block level.
(c) to compare the expected services with those actually provided under primary health care at block level.
(d) to assess the workload of health functionaries at PHC level and below.
(e) to study linkage between district and PHC functioning and examine role played by team members at two levels in providing primary health care.

Among the salient findings of the study, twelve out of a total of fourteen were on PHC level and below. Only two of the findings were on district level services:

(a) the total strength of various categories of staff was found short by 15 percent, and

non-achievement of targets under different programmes at district level was attributed to lack of coordination amongst CMO, DMO, and MEIO.

Thus, there was no finding on the vital aspect and the objective of linkage between district and PHC levels.

IX A Study of Health Services Delivery System in a District of Uttar Pradesh (Bulandshahr district).

Another of the WHO sponsored studies of the premier institute of NIHFW, this study was conducted incorporating personnels from different disciplines and belonging to the departments of Planning and Evaluation, Statistics and Demography, and Community Health Administration of the national institute. Among the three objectives of the study, the one most critical was to study the structure and functioning of health services delivery system in the district.

From the data chapters of the report it could be scrutinised that more stress was given on the hospitals than the preventive programmes. The programmes were also dealt separately, without an understanding of the interesting effects of each other on their infrastructure, supportive services and performances.

Thus, the conceptualisation of the study lacked the integrated approach to be adopted under the Multipurpose Health Programme. Yet, one of the most important findings of the study was "that there is a lot of scope for improvement by redistribution and re-allocation of resources already available with the health services delivery system in the district."

128 NIHFW, 1989, Report of a Study Conducted at Bulandshahr District of Uttar Pradesh under WHO Project, IND-PHC-001/D; Department of Planning and Evaluation, NIHFW, New Delhi, pp. (i), 34, 105, and 161-455.
A DANIDA sponsored study, it was also conducted by the Department of Planning and Evaluation of the NIHFW, in four districts of Madhya Pradesh. The study had three objectives: (a) to study the perception of Supervisory staff regarding the concept of supervision and related roles and responsibilities, (b) to study the existing supervisory practices, their content, feedback, follow-up and problems faced at different levels of district health care delivery system, and (c) to identify the supervisory functions and related training need at different levels of the district health care delivery systems.

The study, though incorporated the integrated approach of the multipurpose scheme, yet, it was limited to the aspect of supervision of the subsystems only. Other important aspects of the health services viz., planning, administration, and procurement and distribution of technology were not under study. However, supervision being a critical function of the district, the study gave a good idea of the status of the services existing under the multipurpose scheme as illustrated in the study findings.

The main findings of this study were: (i) the multipurpose functioning at the sector and section levels has been receiving unipurpose or vertical supervision from the main system. The posts of Dy.CMOs at the district, as envisaged under the MPW scheme were not existing at the study districts; (ii) at the sub-systems level, the district level officers have not been available for programmes like Blindness and Leprosy, while the officers of Malaria, Tuberculosis, and MCH programmes have been made more or less immobile because of various avoidable considerations; and (iii) at the PHC level, amongst the second to fourth medical officers, a general notion

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persisted that all administrative work and supervision of field staff were not their job responsibilities. These were considered as basically the functions of the M.O.-incharge, only.

The main suggestion given on the basis of the findings of this study was that the CMOs, district level programme officers and the M.O., PHCs have to be made more mobile with regular field visits. The need of supervision by observation of work has to be impressed upon them, they needed extensive training on "working of national health programmes" and "management of health services".

The leanings of the medical professionals toward the curative services need to be checked by suitable administrative measures, and the supervisory guidelines and checklists need to be developed for the different categories of health personnels working in the main system and its sub-systems.

XI  Organisation and Management of the Multipurpose Health Worker's Scheme - A Case Study

This study conducted by the National Institute of Rural Development (NIRD), Hyderabad, intended to explore the managerial dimensions of the rural health care system and examine the effectiveness of management of the Multipurpose Health Worker's (MPHW) Scheme in two states viz., Karnataka and West Bengal.

Among the specified objectives were: (i) to study the organisational structure and management of health care services in Karnataka and West Bengal in general, and of the MPHW scheme in particular, (ii) to examine the functioning of the MPHW scheme and its impact on the rural populations of the sample states, and (iii) to suggest improvements in the overall functioning of the MPHW scheme.

The methodology adopted for the study, included three randomly selected PHCs from one district in each state, and four to five subcentres from each selected PHC. Primary data were collected through interviews of Multipurpose Workers, Health Supervisors, Medical Officers, and the beneficiaries. Main focus of the interviews was on the multipurpose workers and the beneficiaries, with a hundred of each, selected randomly in each of the two study States.

The managerial aspects studied were the organisational set up at state, district, and PHC levels; supervision of workers and supervisors at the block level, programme implementation at the PHC level by monthly review meetings; and coordination at State and District levels between the Department of Health and the District Magistrates and Zilla Parishads. Understandably, the shortcomings in studying the District Level in details and the limitations of the methodology to interviews only and a lack of the systems approach to the health services and the MPHW scheme, led to the simplistic analysis and superficial suggestions made by the study.

Apart from the district studies reviewed above, there have been either state level review of performances or studies at the levels of PHCs and below, which obviously did not consider the necessity of studying a district as the unit of the health services organisation with systemic characteristics.131,132

Overview of the Studies Reviewed

Conceptualisation of the health services in general and the public health services in a district in particular, were weak in most of the eleven studies reviewed. While, the vertical systemic and subsystemic linkages of the health services were visualised in some of the studies, the horizontal linkages among services and programmes within the system at the district level


and below have not been identified in any of the researches conducted on the Integrated Health Services.

This is one of the most important drawbacks of the studies, in view of the presently Integrated Multipurpose Health Programme in implementation. Of special mention here is the Bulandshahar study which studied the total district's public health services system but did not identify the linkages between the major programmes as subsystems under the integrated format.

Three points discerned by us from the review of literature done earlier, and found to be essential in doing an analysis of any health services and its problems, but were not understood in most of the studies reviewed are:

(a) to see the systemic nature of the problems within a health services,
(b) to study the health service system as an "open system" where external environmental factors like the epidemiological, socio-cultural, political and administrative setting, influence it constantly, and
(c) the interactions between the services, programmes, levels of institutions, and other elements when identified as subsystems.

Moreover, again excepting for the ICORCI, David's and Mishra et al's studies none identified the key subsystems of the health service system which led to the disjointed analysis of isolated factors for the ineffectiveness of the services. In the name of the district, in-depth studies of PHCs reduced the understanding of the implementation of various projects and programmes. The integration of the Family Planning and General Health Services was not considered by any of the studies though, shown to be more effective, efficient and equitable from the findings of the Narangwal Study.133, 134

However, the studies also revealed certain important features of the Health Services System, which helped us to identify the key problem situations in the system. These were: **firstly**, the problems in implementing the Integration of the Health Services System though it is well accepted by the personnel of the services; **secondly**, the relevance of getting to know the perceptions of the Health Service personnel regarding the organisation of the system; **thirdly**, the importance of focussing on and documenting the processes of planning, decision-making, implementing, monitoring and evaluating the delivery of programme activities and services; and **fourthly**, the significant functional dimensions of the system were identified as supervision, communication, training, transport and reporting.

It can be iterated here, that the identification of the priority problem area by the Task Force for operations research studies, that of understanding the organizational and extra-organizational variables influencing the output of the services remained unsolved and is of relevance even after twenty years of its realisation. Also of relevance here, is the general comment made by Tripathi\(^{35}\) that the contemporary culture in India gives great emphasis upon certain success-goals without equivalent emphasis on the institutional means for achieving these goals.

Furthermore, in an extensive review of articles on applications of Operational Research in Health in Developing Countries, Datta\(^{36}\) notes that though thirty-five percent of all studies were on **Health Planning**,\(^{37}\) most of these were on macro aspects of planning on wide ranging

\(^{134}(...continued)^{134}


issues like heath care, financing strategies, hospital management etc. But, there was none on micro-level integrated health planning at the district level.

Therefore, he suggests among other research priorities in this field in developing countries, a study on micro-level integrated health planning at the district level.\textsuperscript{138} He also recommends the need of 'soft' O.R. for problem structuring based on 'soft systems methodology' as well as 'hard' O.R., for better theories and models to tackle the interrelationships of many parameters.

1.4 PERSPECTIVE FOR THE PROPOSED RESEARCH

The review of literature on theories of organizations as open systems and the various methods of Systems Analysis, by Blauberg et al, Jack Reynolds, Ackoff, Checkland, Taylor and the applications of these by B.D. Mishra et al, and L.H. David enabled us to develop our conceptual base and our framework for this study. The review of studies on the District Public Health Services in India has also helped us identify the gaps that need to be filled by further research.

Our analysis of the District Public Health Services is called Systems Analysis and not Operations Research because: (1) since it will not be an action research study by a multidisciplinary team, we do not label it as operations research. (2) we will not implement the suggestions or improve the system as such and, (3) since the district health services organisation needs to be viewed as an open, dynamic, and complex system and then understood and analysed, we call it a Systems Analysis. As clarified by Bailey,\textsuperscript{139} systems analysis is better adapted than operational research, to deal with complex interacting systems of broader and more qualitative issues.

\textsuperscript{138} Ibid, p.1449.

Thus broadly, (i) we will study the larger district system of the health services because breaking this system into sub-systems (for example PHCs or subcentres or individual programmes) and then studying these as smaller systems or autonomous, independent entities creates problems. It artificially reduces their dynamicity and complexity, leaves out their linkages of dependency to the larger system of the district, and ends up being simplistic and ineffective;

(ii) We shall use an integrative perspective which seeks to locate associations between different components of the System at various levels. It also gives priority to an integrated policy over integration of personnels. In absence of the former, integration at lower levels is more disruptive for programmes which are not given priority by the policy and its strategies;

(iii) We attempt to examine the major functional dimensions of the system ranging from planning, supervision, coordination, training, transport, supply systems to management;

(iv) We see the boundaries of the system as pervious because they are conceptualised as the interface between the external and internal realities. In the case of the District Health Service System this boundary of the interface between the external and internal elements in fact is the work culture of the system;

(v) Our emphasis is to delineate the external and internal linkages of the District Health Services and study their anomalies;

(vi) We shall use qualitative data to stress on processes at work within the system. Efforts will be made to quantify the qualitative dimensions to the extent possible, to stress on the importance of the qualitative dimensions of the system under study.140 This is more pertinent in view of the data quality and quantity available at district levels which are often incomplete.

140 Bulmer, Martin states that study of organizations should incorporate both qualitative and quantitative methods, and in any event, quantitative data always rest upon qualitative distinctions, in Bryman, Alan, 1988, Doing Research in Organizations, Routledge, London, p.18.
and unreliable. In other words, we intend to incorporate a soft systems methodology which will enable us to give more emphasis on the qualitative aspects of the system. This is considered relevant, given the complexity and dynamicity of the public health services in a district;

vii) Use of the Case Study method along with other social science research methods\textsuperscript{141}, \textsuperscript{142} will therefore be an important tool of our research. The advantages of the case study method are its capability to address generality if used for theoretical rather than statistical interpretations.\textsuperscript{143}

viii) The analysis of the system will help to concentrate on the structural and functional changes which if implemented can increase the efficiency of the District Public Health Services.

Our methodology and design for the proposed study were based on the above perspective, and we discuss these in the next chapter.

\begin{itemize}
    \item \textsuperscript{141} Taylor, Carl E., 1980, "Evaluation Methodology in Primary Health Care", in \textit{National Conference on Evaluation of Primary Health Care Programmes}, ICMR, New Delhi, p.383.
    \item \textsuperscript{143} Bryman, Alan, 1988, op.cit., p.18.
\end{itemize}