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Consultancy Research Report  
(FOR LIMITED CIRCULATION)

*With compliments from:*

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MANPOWER PLANNING  
FOR THE  
NORTH-EASTERN REGION  
(PART I)



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## PREFACE

Planners, administrators and researchers play more meaningful roles and make more relevant contribution by mutual inter-action and support. As researchers, we have gained immensely by this opportunity offered by the North-Eastern Council to study the manpower requirements, and education and training needs of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura.

2. We, in turn, hope that this study will, to a significant extent, fill the gap in knowledge on manpower in the North-Eastern Region and provide a basis for planning and action during the Fifth Plan.
3. However, a manpower plan can only be as sound as the business plan or the task plan; and task plans do get modified, delayed or shelved. In order, therefore, to enable each State/Union Territory to make the necessary changes in manpower projections, the various steps such as the basis for planning, the staffing patterns and sector-wise information of existing and required personnel have been spelt out in great detail. It will be seen that information on existing personnel is not always complete; the States themselves will have to fill in these data gaps.
4. The analysis presented here in Part I will be taken a step further in Part II of the study to follow, which will seek to analyse and establish inter-relationship as between employment, education and training and a number of economic parameters in a manner useful to planners and administrators in the long run.
5. We would like to acknowledge particularly the research assistance rendered by Sarvashri R. K. Nijhawan and A. K. P. Parate and the services provided by Sarvashri R. H. Iyer and Anand Prakash of the Editorial Unit, Shri B. V. S. Sastry of the Documentation Unit and Shri R. K. Gupta and his rotaprint team.
6. This study took us through rough but beautiful and interesting terrain to widely divergent groups and levels of people, planners, educators, State Government officials, back to Delhi and discussions with Government departments and other agencies. It would be difficult to acknowledge individually the help and assistance so generously given by all of them.

New Delhi  
March 1975

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SECTION I: INTRODUCTION AND  
SUMMARY OF  
FINDINGS

## 1. INTRODUCTION

This study was undertaken by the Institute of Applied Manpower Research at the request of the North-Eastern Council, which felt the need for a full assessment of the manpower requirements of the North-Eastern Region for the effective implementation of the development schemes and projects in the Fifth and subsequent Plan periods. The Chairman of the North-Eastern Council desired this problem to be tackled in two phases :

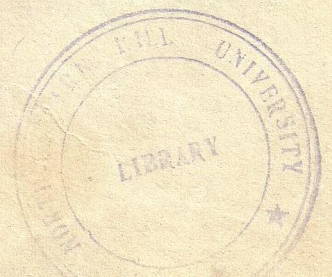
"Immediately, a crash programme was called for to assess the manpower availability and requirement at the micro-level in certain important selected sectors for the next five years to enable timely action to be taken for arranging and ensuring availability of skilled personnel for the Fifth Plan with the help of existing training facilities in and outside the region. This could be followed by a general survey and study of overall shortages and requirements of manpower in the constituent units of this region and the region as a whole to help in the long-range perspective planning of educational and training facilities to be developed within the region for the people of the region".

The IAMR therefore undertook for the seven States/Union Territories in the North-Eastern Region—Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura—a manpower planning exercise which included both micro-level sectoral studies, and macro-level studies for long-range planning.

### OBJECTIVES:

Part I: Micro-level studies: To assess manpower requirements at micro-level for important selected sectors and an evaluation of manpower availability, potential of manpower education and training facilities vis-a-vis manpower requirements.

Part II: Macro-level studies: To provide a macro-level model for assessing manpower demand and supply and planning for educated/skilled manpower.



Both these studies would provide data and insights into manpower requirements not merely in terms of numbers, but also educational requirements to ensure availability of skilled personnel, whether on a crash basis or as a well-developed long-term strategy.

### SCOPE:

The present study (Part I) concerns itself with an evaluation of manpower requirements for public sector of critical categories of personnel namely Medical, Teaching, Agriculture, Veterinary and Engineering and requiring a level of formal or non-formal education and training in key sectors, and their supply trends. The key sectors are :

- Health and Family Planning
- Education
- Agriculture
- Veterinary and Animal Husbandry
- Large, Medium and Small Industry
- Major and Medium Irrigation including flood control
- Power and Energy
- Public Works (Roads and Construction)
- Public Health Engineering
- Transport

The analysis also indicates the nature of education, training and any feasible plans to bridge the gap between demand and supply.

### METHODOLOGY:

Demand: The approach is basically normative, based largely on a study of the staffing pattern, existing and proposed, in the States/Union Territories, the experiences of other States and recommendations of study groups and Commissions for similar/comparable activities. The requirements, thus estimated, are compared for reliability with the requirements arrived at on the basis of known macro-level norms wherever such are available.

Supply: Supply is worked out on the outturn method though, in the absence of adequate institutional outturn data for the early years, information on migration, etc., the 1961 or 1971 Census data—are used as the base for building the stock.

The methodological issues vary considerably for the various sectors of economic activity and for the various types of personnel such as Medical, Teaching, Veterinary, Agriculture and Engineering. As these issues are discussed under the relevant sectors, rather than repeat them here, only the basis for Planning and the basic steps have been spelt out here-  
under in order to provide an insight into the approach adopted in this study.

### BASIS FOR PLANNING:

It was decided that the basis for forecasting manpower requirements for the Fifth Plan period would be

Schemes as approved by the Working Groups: financial outlay and physical targets: Where the Working Group recommendations are not specific enough, the targets specified in the State draft Plans will be taken as the basis.

### STEPS INCLUDING SOURCES OF DATA:

Step 1: Study of overall growth patterns and significant issues.

Step 2: Examination and tabulation (department-wise and sector-wise) of information on projects vis-a-vis their investment, physical targets, technical input and output, both during previous Plan years (for continuing projects) and the Fifth Plan period.

Step 3: Tabulation of information on manpower, project-wise, existing and projected, for the Fifth Plan (tied in with tabulation of Step 1) as provided by the States, classified on the basis of occupation (activity analysis) and educational/training requirements.

Step 4: Examination of all available and relevant information on manpower requirements, manpower norms for comparable projects/schemes.

- a) Experience on other comparable projects by other States/Agencies.
- b) Manpower Norms developed and recommended by controlling Ministries.
- c) Manpower Requirements/Norms developed by advisory or consultancy groups.

Step 5: Analyse the basis of staffing patterns and the projected manpower requirements indicated by the States in the light of the above analysis (Step 4) to determine the pertinent staffing patterns for the Fifth Plan period.

Step 6: Estimate manpower requirements (occupation-wise with education training profiles) based on norms/staffing patterns arrived at in Steps 3 and 4 above. This takes cognizance of under- or over-staffing in earlier years:

- i) Estimate total at the end of the Fifth Plan period for those sectors/projects wherein the sub-activities envisaged are of a continuing nature and are built up over the years, such as Health, Education, etc.

Where the projects, by their very nature, include different sets of activities i.e. as in setting up a hydel power station which comprises construction, various phases of power generation, transmission, etc., calculate additional positions required for different time phases.

- ii) Calculate additional staffing requirements: Total requirements (Step 6-i) -- existing positions as provided by the States (Step 3).
- iii) Adjust the additional staffing requirement for vacant positions and attrition to arrive at additional manpower requirements.

Step 7: Tabulate manpower, existing, total and additional requirements -- sector-wise/activity-wise -- and then regroup sectoral data to reflect the requirements of manpower separately for Medical, Teaching, Agriculture, Veterinary and Engineering.

Step 8: Based on other known macro-norms, calculate manpower requirements, wherever possible, to provide a second set of projections.

Step 9: Project stock in 1974 and 1978 and supply during the Fifth Plan period based primarily on the outturn data and supplemented by Census information.

Step 10: Match total demand with stock at the end of the Fifth Plan and additional manpower requirements during the Fifth Plan with supply during the period, to identify shortages/surpluses of manpower.

The Data Sources are indicated in the footnotes and also appended as Annexure-I (1).

## 2. SUMMARY OF FINDINGS AND RECOMMENDATIONS

### 1. GENERAL:

i) The point, repeatedly emphasised throughout the report, is that the estimates of manpower demand and supply given by this study are based on schemes and projects approved by the working group for the Fifth Plan period, vide tables incorporated in the text for facility of reference. Any change in the plans will call for corresponding modifications of the manpower requirements. Manpower plans can only be as reliable as the States'/Union Territories' plans.

ii) Education, training or employment have costs attached to them. For instance, an engineer would cost approximately Rs. 2,700/-\* per year of his training, and a diploma holder Rs. 1,800/-\* per year. On the other hand, the employment of a degree-holder with little or no service experience will cost approximately Rs. 15,000/- per year, a diploma holder approximately Rs. 12,000/- per year and an I. T. I. trained technician approximately Rs. 9,000/- per year by way of salaries, other benefits and related costs. Therefore, in taking decisions, whether to set up additional education and training facilities, these costs and the additional employment costs to the States have to be borne in mind. The costs of a manpower plan have to be budgeted for.

iii) For the North-Eastern Region, the strategy of manpower education and training should not be merely one of matching it with employment potential in the short run, i. e., five years, but a deliberate long-term strategy, which will balance the region's economic growth potential and the required levels of education and skill training, building up a relevant education design for realistic social aspirations.

iv) Education and Skill requirements for manning managerial administration, marketing commercial, clerical and other such positions have been analysed and demands for personnel to man such positions have been broadly assessed. However, these have not been consolidated or deliberated upon in this study.

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\* IAMR: Pattern of Expenditure and Per Student Cost in 1972  
(Report under preparation).

v) The development of entrepreneurship in the small and medium-sized sector, the small and ultra small shops---handicrafts manufacturing or servicing, is of considerable importance in view of the pressing need for labour intensive economic development in the region. The question of small business entrepreneurship, how it develops, the educational and training support it requires, are issues of utmost concern.

## II. MEDICAL PERSONNEL:

vi) The estimates for the Fifth Plan period are :

|             | <u>Demand</u> | <u>Supply</u> |
|-------------|---------------|---------------|
| Doctors     | 1, 504        | 1, 593        |
| Nurses      | 2, 290        | 1, 062        |
| ANMs        | 2, 605        | 1, 200        |
| Pharmacists | 729           | 595           |

In addition to this, there would be a requirement of 2,660 other paramedical personnel. This demand is generated by State Government programmes only. Based on present outturn pattern, and assuming all outturn is available to State Governments, the shortage of nurses, ANMs and pharmacists during the Fifth Plan period would be of the order of 1,238, 1,400 and 134 respectively. (Ref.: Sub-Section 7).

vii) Based on demand projections, the ratios of doctor to population and ANM to population achieved would be lower than the Mudaliar Committee norms, whereas in the case of nurse to population and pharmacist to population, they would be well above. They would, however, be better than the all-India ratios estimated for 1979, i. e., the health coverage would be ahead of the all-India coverage. However, these norms, in isolation, have little significance, considering the vast rural population and rural area in this region of 91.6 per cent and 99.7 per cent respectively. In fact, the demand projections, except for pharmacists, are on the conservative side. (Ref.: Sub-Section 8).

viii) A number of means to augment supply have to be adopted:

a) fuller utilisation of the present capacity; (In the absence of firm data no clear-cut suggestions could be made).

- b) decreasing the wastage rate of doctors and other para-medical personnel;
- c) setting up of newer institutes/facilities for training, particularly for ANMs, and other para-medical personnel. The recruitment of nurses, pharmacists and ANMs from outside the Region will not, even as a short-term measure, meet the situational needs, viz., medical personnel for rural and hill areas;
- d) modification of education/training requirements. (This is a major education policy decision which has to be carefully considered).

Some of the other issues relate to training/re-training of the present inadequately trained nursing personnel, ensuring opportunities for medical education, training to rural population on a priority basis, and providing incentives for attracting rural women to the nursing profession. (Ref. : Sub-Section 8).

### III. TEACHING PERSONNEL: GENERAL EDUCATION:

- ix) The issues common to all the States/Union Territories, by and large, are :
  - a) training of untrained teachers;
  - b) need for attracting rural candidates for teacher training programmes, particularly rural women;
  - c) identifying subject-wise teacher training requirements and organising training programmes to meet this need; and
  - d) instituting Retraining/Refresher programmes. (Ref. : Sub-Sections 14 and 15).
- x) Arunachal Pradesh will have a small shortage of 264 teachers for elementary education and probably no shortage of teachers for high/higher secondary education. This State will not have to contend with the problem of setting up additional teacher training facilities and should, instead, pay attention to improving training, curricula, methodology, etc. (Ref. : Sub-Sections 14 and 15).
- xi) Assam is estimated to have a shortage of 63,643 elementary teachers (there is some doubt about the existing number of teachers indicated in the return and hence this should be verified) and a surplus of

1, 530 teachers for high/higher secondary education. Undoubtedly, this calls for increasing the teacher training facilities, but the strategy should be to establish facilities which are flexible enough to be adapted for training any category of teaching personnel once the gap of elementary teachers is bridged. (Ref. : Sub-Sections 14 and 15).

xii) Manipur, if it continues with its present outturn of teachers, will have a problem of surplus of teachers at the end of the Fifth Plan. As the coverage of ~~teachers~~ in 1979 would be 100 per cent in age group 6-11 and 60.4 per cent in age group 11-14, any substantial increase in teacher training requirements is out of the question. (Ref. : Sub-Sections 14 and 15).

xiii) Meghalaya will face a substantial shortage of trained teachers for elementary education and a marginal shortage of high/higher secondary teachers. At the end of 1979, Meghalaya will have covered the entire population of children in the age group 6-11 and 44 per cent of the age group 11-14. Additional teaching facilities must, therefore, be flexible so that, once the largely substantial shortage of elementary teachers is met, they can be adapted for training untrained teachers and for re-training. (Ref. : Sub-Sections 14 and 15).

xiv) Mizoram, which will achieve a 100 per cent coverage in elementary education and 60 per cent coverage in high/higher secondary education in 1979, will then have a surplus of 399 elementary teachers. The shortage/surplus of other categories could not be assessed for paucity of data. (Ref. : Sub-Sections 14 and 15).

xv) Nagaland, in 1979, would have achieved 100 per cent coverage in elementary education and 69 per cent in high/higher secondary education. It will only have a marginal shortage of 180 elementary teachers and a marginal surplus of 214 high/higher secondary teachers. No additional teacher training facilities would thus appear necessary except for training untrained teachers who constitute a large component of the existing stock. (Ref. : Sub-Sections 14 and 15).

xvi) Tripura presents an interesting contrast. At the end of 1979, Tripura would have achieved 90 per cent coverage in age-group 6-11 and 54.5 per cent in age group 11-14. This means that Tripura will have to continue to expand its enrolments for another decade or even longer. In this context, the substantial shortage of 1, 374 elementary teachers and the surplus of 2, 013 high/higher secondary teachers call for an increase in the elementary teacher training facilities and partial utilisation of high/higher secondary facilities for training untrained teachers and re-training. (Ref. : Sub-Sections 14 and 15).

#### IV. AGRICULTURAL PERSONNEL:

xvii) The demand projections are in the context of the positions/job-education files. (Ref. : Sub-Section 18).

xviii) The estimate of additional demand for the Fifth Plan period at the Graduate level (M. Sc. /B. Sc. ) is 1, 329, of which 425 can possibly be substituted by Matriculates with technical training. The additional supply of agricultural graduates is estimated to be of the order of 350, resulting in a shortage of between 545 and 979. (Ref. : Sub-Section 20).

xix) The above estimates are only for State projects/schemes. There would be an approximate additional demand of 100 graduates for private sector and self-employment programmes. This would inflate the shortages correspondingly. (Ref. : Sub-Section 21).

xx) The additional demand for personnel with technical training at levels below the graduate level would range between 1, 932 and 2, 357. In the absence of complete information regarding training facilities for this category of personnel, no estimate of shortages has been possible. (Ref. : Sub-Section 20).

xxi) The four alternatives available for augmenting supply are :

- a) increasing intake in the existing college,
- b) minimising wastage,
- c) recruiting from outside the State, and
- d) setting up of additional agricultural colleges.

Except for (c), the other three require immediate follow-up action. (Ref. : Sub-Section 21).

xxii) Though the graduate shortages suggest the need for two agricultural colleges it would be advisable to set up initially only one such college. (Ref. : Sub-Section 21).

xxiii) Whether it is the agricultural college or agricultural training facilities (polytechnics), these should be established in the rural areas and preference for admission given to rural/tribal boys and girls. This would be one way of arresting the practice of shifting cultivation. Further, these agricultural colleges and training centres must be assigned responsibility for clearly identified group of blocks/villages to initiate agriculture research training and implementation in these blocks/villages, the above training facilities including farmer training centres should be along the lines suggested by the National Commission on Agriculture. (Ref. : Sub-Section 21).

#### V. ANIMAL HUSBANDRY AND DAIRYING PERSONNEL:

xxiv) The demand projections are in the context of position/job-education profile determined by the study. (Ref. : Sub-Section 24).

xxv) The total additional demand for Veterinary Science/Animal Husbandry and Dairying diploma holders, graduates and post-graduates is 876 as against a supply of 200 during the Fifth Plan period. The resulting shortage would be 676. In respect of veterinary field assistants/stockmen, the additional demand would be 3, 012. In the absence of comprehensive supply figures, no shortages have been estimated. (Ref. : Sub-Section 26).

xxvi) The shortage of graduates and post-graduates, veterinary/dairying personnel would be of the order of 500, and this points to the need for setting up of at least two veterinary colleges and one polytechnic/training school at the diploma level. This recommendation takes into consideration the increase in capacity utilisation and reduction in wastages possible. (Ref.: Sub-Section 27).

xxvii) As in the case of Agriculture, the location of veterinary colleges and dairying institutions in rural areas with preference given to rural candidates merits consideration. The set-up of the dairy institutes may be based on the Anand Dairy Strategy. (Ref.: Sub-Section 27).

## VI. ENGINEERING PERSONNEL:

xxviii) Demand projections are based on the Job-Education profiles drawn up by this study. The profiles presented by the States/Union Territories except for a few exceptions are similar to those suggested by other project reports, consultancy documents, etc. (Ref.: Sub-Section 54 and Education Profile Annexures).

xxix) For the Fifth Plan period, estimate of the additional demand for graduate engineers is 1,720 as against an additional supply of 722 resulting in a shortage of 998. The additional demand of diploma holders is 7,665 as against a supply of 1,559, resulting in a shortage of 6,106. The additional demand for other technicians is over 20,000 for which the supply estimates are not available. (Ref.: Sub-Sections 52, 53 and 54).

xxx) These demand estimates are for the majority of the State/Union Territory projects/schemes but do not include Small-Scale Industries, Mining, Quarrying, Banking as also Private Sector, for which an additional demand will be generated. (Ref.: Sub-Section 50).

xxxi) Of the many alternatives available to augment supply, recruiting on a short-term basis even on deputation (except at senior levels) is not favoured. A review of the capacity utilisation particularly of the Tripura Engineering College to understand the low enrolments and optimise on the facilities would be necessary. The wastage rates are not alarming compared to the all-India wastage rates; however, measures to reduce it further need to be studied. The need for establishing additional education facilities at all levels is a definite conclusion. (Ref.: Sub-Section 54).

xxxii) The important decision, therefore, relates to the strategy for setting up the additional education and training facilities. The demand estimates are on the conservative side; even at present there are about 138 vacant positions requiring degree holders and 491 vacant positions requiring diploma holders. This is more than the numbers registered on the live registers of the employment exchange in 1973. So every argument is in favour of setting up as many colleges and training centres as resources permit. However, the suggestion is that the engineering colleges, polytechnics, I.T.I.s and other craftsmen and in-service training facilities should be established in graduated phases over a 3-year period with built-in annual controls, as against setting them up on a crash basis. (Ref.: Sub-Section 54).

xxxiii) The subject-wise requirements of the engineering education and training are available from the staffing patterns. (Ref.: Sub-Sections 32, 34, 36, 38, 40, 41 and 46).

xxxiv) The emphasis should be on close education/training link up with on-going schemes/projects---not merely in terms of summer jobs or term papers/or project reports, but in a more integrated manner. Even for training at graduate levels, but most certainly for training at lower levels, the successful Japanese experiment of the Merchant apprentice and Work man apprentice may well be worth considering. This would also influence the choice of location of these colleges and training centres. (Ref.: Sub-Section 54).