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REFERENCE

REPORT

OF THE

**STUDY GROUP ON
PRODUCTIVITY AND INCENTIVES**



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DEC 1977

NATIONAL COMMISSION ON LABOUR

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FOREWORD

The National Commission on Labour appointed the Study Group on Productivity and Incentives in its attempt to assess the application and results of productivity and incentive schemes in industries in India and to understand the basic problems connected with the introduction of such schemes. This was one of the series of Study Groups set up by the Commission for covering different areas of its terms of reference. The Study Group was required to analyse available information and project its thinking on problems relating to productivity and incentives in the years to come.

The views expressed in the report are the views of the Study Group. In examining them for framing its final recommendations, the Commission will attach due importance to these views coming as they do from knowledgeable persons. In the meanwhile, the report is being published by the Commission with a view to seeking comments on it from persons/institutions interested in the subject.

The Commission is grateful to the Chairman and Members of the Study Group individually for completing their work within the time limit fixed for them. The Commission is also grateful to all persons/institutions who may have helped the Study Group in reaching conclusions.

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I. INTRODUCTORY

The Study Group on Productivity and Incentives was appointed by the National Commission on Labour vide its Memorandum No. 6(2)/67-NCL dated 26th April, 1967. The following persons were appointed as members of the Group :

1. Shri Bagaram Tulpule
2. Dr. R. M. Shah
3. Shri N. S. Mankiker
4. Shri A. A. Niazi
5. Shri Duleep Singh
6. Shri N. S. Ramaswamy
7. Shri M.R. Ramsay
8. Shri N. H. Sheikh

2. Subsequently, vide their Memorandum No. 6(11)/67-NCL dated 12th May, 1967, the Commission substituted Shri A.N. Buch, Textile Labour Association, Ahmedabad, in place of Shri N. H. Sheikh in the original composition of the Group.

3. The term of reference for the Study Group was as follows :—

“The Study Group will, in regard to the subject allocated to it, ascertain facts from available literature on the subject, draw conclusions and suggest solutions to the problems posed by the Group for the consideration of the Commission. The Commission may also pose problems for consideration of the Group from time to time. The Study Group will submit its report as early as possible”.

4. At its first meeting held on 16th May, 1967, the Group had the advantage of the presence of Shri B. N. Datar, Member-Secretary of the Commission. The Group sought from him some elaboration of the term of reference. It was advised that it could try to tap the primary sources of information regarding the application and results of productivity and incentive schemes in different factories in different parts of the country. The Secretariat of the National Commission also supplied the Group with copies of reports of various enquiries and studies which had been made in this field in the past and other relevant literature from time to time.

5. In order to obtain factual information regarding productivity practices in industries in India, the Group circulated to a number of factories a brief questionnaire seeking the relevant information. About 14 companies responded to the questionnaire and supplied valuable information regarding the productivity practices and incentive schemes in operation. The Group records its thanks to these companies for the response to its questionnaire.

6. The first three meetings of the Group were devoted to an exhaustive general discussion of the subject assigned to the Group, at the end of which the broad topics to be covered were listed and a drafting committee was appointed to prepare the first draft of the initial report to be submitted by the Group to the Commission. The first draft was then considered by the whole Group and after various modifications, was finalised.

7. In this report, the Group has viewed productivity in its total scope, not restricting it to labour productivity alone. Productivity of labour has, of course, been discussed at some length, but that discussion also has the total view of productivity as the context. The Group has tried to identify the various factors that hamper productivity and to indicate the measures that have to be taken for overcoming them. The Group has only very briefly indicated the various productivity techniques that are available to industry for increasing productivity and has dealt at somewhat greater length with the technique of incentives. The Group has also tried to invite attention to the precautions and safeguards that have to be kept in mind in the application of these productivity techniques. The Group has, however, avoided a detailed discussion of the techniques themselves in the report.

8. The Group was fortunate in obtaining from the National Productivity Council considerable information regarding a recent survey conducted by them on the productivity techniques and incentive schemes in operation in a large number of factories. Since the factual information obtained by the NPC in this survey can be the basis for worthwhile conclusions, we have incorporated in this report a summary of the broad findings and conclusions of that survey, pointing out also the limitations of the survey itself.

II. THE BACKGROUND

9. The word "Productivity" has come into sudden prominence during recent years and has assumed great importance and significance in the context of the industrial development of the country.

10. In the past, the related problem of efficiency was discussed with the worker as the focal point of attention. The Royal Commission on Labour, while discussing, in its Report, the possible methods of raising the standard of living, referred to two main factors, poverty and low level of efficiency of the Indian worker and observed that the Indian worker produced less per unit time than the worker in any other country. The Commission recognised the fact that the causes of this low efficiency were complex and that some could be traced to the climate of India and other factors, but that a powerful influence was exercised everywhere by the low standard of living. It went on further to say that inefficiency was attributable to lack of both physical energy and mental vigour and that these to a large extent were different aspects of the same problem, for, physical weakness cut at the root of action, initiative and desire. It further observed that this weakness arose from the hardships to which the worker with indifferent physique was subjected to, especially his unsatisfactory diet and the conditions under which he was compelled to live. These hardships were considered mainly the results of his inability to afford anything better. The conditions continue to prevail even today in the case of a large majority of the working population.

11. The Commission made a number of suggestions to break this vicious circle at as many points as possible and suggested efforts to enhance the efficiency and improve the conditions of life of workers. Thus, the focal point of attention was the worker and not the efficiency of the enterprise as a whole as is the concept of productivity.

Factors Affecting Productivity

12. Labour productivity is usually measured as output per man-hour. A given degree of productivity, therefore, indicates the capability of the working people to produce. Capability to produce is in turn dependent on socio-economic

factors that operate in the given situation, degree of technological growth and the efficiency of the environment in which work is carried out. Viewed in its very broad context, productivity is a most complex phenomenon in industrial society. It is influenced by so many factors. "Brought to bear on it are the ethics, the ideologies and the customs which men create to guide their conduct ; the physical attributes of climate, raw materials and space which mark the geographical location of the particular society ; the operating structure, the leadership and the goals of the institutions of production and of these related agencies which affect their functioning; the technology and the equipment made available in the past and currently being provided ; the numbers, the skills, the industriousness of the people and the nature of the informal and formal rules under which they work. These and other forces are all at work. To disentangle any separate force in this web of causative factors with any precision is well nigh impossible. But, productivity is a goal in its own right as well as a test in the comparison of systems, for it is the source of the standard of living of the people, a major determinant of the availability of leisure, a basis for the status and even the survival of a nation".

13. Considering a much more restricted field, an industrial unit, the factors affecting productivity may be classified under two broad heads—internal factors of productivity and external factors of productivity. Higher productivity can be obtained by better organisation, better processes, better methods, better machines and more effective use of labour, materials and capital equipment in the individual workplaces. These may be classified as the internal factors of productivity. In regard to these matters, the initiative rests within the unit. The effective exercise of management's responsibilities in these matters calls for techniques which come under the broad head "scientific management".

14. The external factors of productivity are more complex and wider in scope. They may be local, national or international. The fiscal and economic policy of the government can have a serious impact on the normal functioning of an enterprise. Political and ethical and cultural considerations and traditions of social discipline, custom and religion also come into the picture. Both sets of factors affecting productivity inter-act. External factors may affect the working of an enterprise in various internal ways.

15. It is clear that the approach to the problem of

productivity will have to be comprehensive and all-embracing, touching almost every facet of the socio-economic policy of the country. A government which is concerned about the need for higher productivity has a responsibility for following policies which are in harmony with the objective of increasing productivity. The best assurance of productivity growth lies in preserving an economic climate in which rewards, whether of employers or employees, depend upon efficient performance.

16. Increase in productivity of Indian labour requires change in the social and economic circumstances of the working people, development of a modern technological base, and improvements in the organisation of work. Social and economic circumstances of the working people can be changed only as a result of massive effort spread over a considerably long period of time. Higher productivity itself, is in the ultimate analysis the only guarantee of continuing increase in the standards of living. Immediate increase in labour productivity is, however, not possible without a commensurate betterment of the social and economic conditions of the people. Programmes for improvements in labour productivity should, therefore, be so developed and implemented that they provide a substantial share of the gains of productivity to the workers.

17. Development of a modern technological base requires use of known machines and processes and scientific research to develop better methods of production. Most dramatic increases in productivity have in fact always been achieved through development and use of new methods and processes.

18. Improvements in the organisation of work call for changes in the general organisation of the companies, better utilisation of machines, materials, men and space, simplification, standardisation and specialisation, control of quality, better maintenance of machines and buildings, improved communications and more desirable industrial relations. Improvements in the organisation of work are not likely to give such dramatic results as those achievable on introduction of new methods and processes. The cumulative effect of such measures is, however, sufficiently rewarding in terms of higher productivity.

Productivity Movement in India

19. Though a few management consultants had been operating since the thirties, the Productivity Movement as

such made a beginning in India with the arrival of the first ILO Productivity Mission in 1952. It was at a meeting of the ILO Industrial Committee on Textiles held in Geneva that year, that reference was made to the need for increasing productivity, and the Director General of the International Labour Office undertook to assist the Government of India by making available the services of a team of experts to show "how productivity of workers in Indian Textile and Engineering Industries can be raised by the application, in selected plants, of modern techniques of work study and plant organisation and, in addition, where appropriate by the introduction of suitable systems of Payment by Results". During its term of assignment from December 1952 to May 1954, the ILO Mission, however, could not, for various reasons, adhere to the objectives in view.

20. Under the conditions then existing it was not found possible, particularly in the Textile industry, to improve the system of payment by results as had been originally planned. This was mainly due to the legally established pattern of wages fixed by the Labour Courts and Industrial Tribunals, decisions which were arrived at with difficulty after prolonged negotiations. It is generally accepted that the introduction of Payment by Results should be preceded by a thorough work-study so that the rates of payment under the system, once established, would not be disturbed as a result of subsequent improvements which raise productivity. Any such attempt, it was felt, would create disturbance in the existing systems of payment and have an adverse effect on industrial relations. It is only in the engineering industry, because of the ease with which the methods improvement programmes could be initiated, the work of the Mission met with some success.

21. The Mission's efforts were therefore mainly directed to demonstrating "to the trade union leaders and management alike that, given adequate supervision, members of the existing staff in Indian plants can secure important improvements even after a comparatively short and incomplete training in productivity improvement techniques".

22. The experience of the first Mission showed that the objectives of the Productivity Programme had to be formulated on a realistic assessment of the conditions prevailing at that time. Subsequent years proved that the success of the productivity programmes lay in the understanding of the actual situation more than the preconceived aims and objectives.

23. The most encouraging result of the ILO Mission was the decision of the Government of India to establish the Productivity Centre under the Ministry of Labour and Employment. The Productivity Centre which started functioning in 1955 now forms a wing of the Central Labour Institute which is concerned with the scientific study of all aspects of industrial development as relating to the human factor and to the problems of the man-at-work. The Productivity Centre started with a series of educational programmes directed to all levels of management and workers. Later, when the National Productivity Council was set up with vastly greater resources in carrying out the campaign for increasing productivity at the national level, the Centre confined its activities to meet the felt needs of groups of industries and the approach of the Productivity Centre was selective, such assistance being provided at the joint request of Labour and Management of units or groups concerned.

24. The work of the Productivity Centre, programmes for national development and work of some management consultants gave an indication of the potentialities of initiating a much more comprehensive and wider campaign in the field of productivity. The Government of India accordingly sent a team to Japan to study and report on the productivity movement there. The National Productivity Council was consequently set up as an autonomous body with representatives of the Government, employers, labour and institutions already engaged in the work relating to industrial productivity, on its policy making bodies. The National Productivity Council commenced work in February 1958 with the objective of propagating the concepts and techniques of productivity through training, dissemination of information and other means. The NPC promoted the establishment of Local Productivity Councils in important industrial centres. Forty seven LPCs have since been set up as autonomous bodies with the same tripartite character. These steps helped to spread the organisational net-work for productivity to all important industrial centres and to associate all parties, namely, Government, labour and employers with the productivity movement. Autonomous character of the Local Productivity Councils further provided a basis for the development of a sense of participation of local employers and trade unions in the productivity movement.

25. The National Productivity Council drew upon the

experience of other countries while preparing its programme of action. The assistance by the Governments of the United States, U. K., France, West Germany and the U. S. S. R. helped substantially and continues to help the implementation of the programmes of the National Productivity Council.

26. In U. K. and the continental countries, the campaign was initiated by organising teams from industries to visit the plants in the corresponding industry in the United States. The teams were selected with great care. Members were chosen who commanded respect in the industry concerned and who were likely to profit from the visits and were capable of exerting their influence in persuading the industry to take serious note of the team's report and assist in the implementation of the recommendations. Arrangements were made for each team to make preliminary visits to various establishments in the industry before proceeding to the USA. These visits were intended to provide the members an opportunity to make an assessment of the conditions in the industry and its problems.

27. What is of particular interest is the action taken following the return of each team from the USA. Each team was responsible for preparing a report outlining its experience and the lessons that could be drawn from it. Vigorous action was taken in disseminating the information. The various teams' reports, summaries of them, conferences on them, and discussion about them — in which the team members 'on both sides of industry' took part — spread the collective experiences of each team through the industries concerned, and through related industries which had not sent teams to America. Further, this experience was taken up as raw material by other bodies — by trade associations, trade unions, and the professional organisations of accountants, production engineers, personnel managers, industrial psychologists and others — in such a way that the technical implications for British industries and firms were thrashed out from all angles and stand-points".

28. By and large, the teams that visited USA reported that higher levels of productivity in the USA were not achieved by methods or techniques unknown or which could not be adopted in their own countries. But they emphasised that the initiative for applying these methods or techniques lay principally with management. The main benefit of the work of the Productivity Teams lay in the interest generated

by the discussions on the reports on the need for raising the levels of productivity in the industry. Peter Drucker in his book "The Practice of Management" in emphasising his point of view that the human resource must always be motivated to work, has admirably reviewed the work of these teams in the following words: "Nothing brought this out better than the reports of the teams of European technicians and managers who came to this country under the Marshall Plan to study the causes of American productivity. These teams (and there were several hundred) expected to find the causes in machines, tools or techniques, but soon found out that these elements have little to do with our productivity, are indeed in themselves a result of the real cause; the basic attitudes of managers and workers. Productivity is an attitude, was their unanimous conclusion." The general acceptance of the recommendations made by the teams meant that the industries concerned had to create the necessary climate and evolve the necessary machinery for giving effect to them, particularly in the matter of training personnel in higher productivity techniques and in the other allied fields of specialisation. Training programmes were initiated by industry and these were matched by the training programmes initiated by the trade unions for the benefit of their own members.

29. In India too, the movement was initiated by organising similar teams composed of management and labour representatives with the difference that the teams from India also visited Britain, West Germany, Japan, U.S.S.R., Czechoslovakia and Poland besides U.S.A. Each team submitted a report on its findings and recommendations, which were published by the National Productivity Council and widely circulated to the industry. The members of the teams have on return participated in seminars, contributed articles and given talks from various platforms and from the All India Radio to popularise their findings. The assistance of the Governments of U.S.A, Britain, France, West Germany and U.S.S.R. also enabled the National Productivity Council to send Indian technicians, managers and trade unionists for training to the respective countries. The participants of these training programmes have, after a period of work on return to their job in India, reported having made significant improvements relating to better human relationship, improved utilisation of resources and innovations in their respective fields of work.

30. However, the impact of these programmes has not come up to expectations. This may be due to various causes. Only a few really top-ranking persons could be involved in these programmes. The follow-up action was not as intensive as it should have been. Industry itself did not show great keenness about understanding and implementing the recommendations of the teams. The interest of trade unions especially, could not be enlisted in the follow-up.

31. Almost concurrently with the programme of sending study teams and trainees abroad, the National Productivity Council also started conducting training courses in the various subjects of productivity within the country. Till March, 1967, the LPCs and NPC had conducted 2,142 courses covering a total of 39,410 participants. The NPC has evaluated the impact of its training programmes. Questionnaires were sent to the participants and their employers for this purpose. The answers indicate that the training has benefited the organisation, brought about change in the outlook, behaviour and competence of the participants and that the trainees have been able to effect significant improvements in the areas of their functioning. Improvements are reported in machine utilisation, reduction of break-downs, improvements in quality and quantity, reduction in cost and waste and improvements in management-worker relations.

32. Realising that the movement for productivity cannot be successful without the active participation of Trade Unions, the NPC and LPCs were conceived as tripartite bodies with equal number of representatives from Government, employers and labour. Consequently, all the national trade union organisations are represented in the NPC and its Governing Body. The trade unions operating in the respective regions are similarly represented on the LPCs. Nominees of the Trade Unions also hold important posts of office-bearers in the National and Local Productivity Councils. The Productivity Councils also initiated programmes for training trade unionists in modern management and productivity techniques. Courses for workers and nominees of trade unions are organised through the Local Productivity Councils free of cost and in the Indian languages. Fee is also waived for trade union representatives in other programmes of the National Productivity Council. The council has also started accepting nominees of trade unions in the one-year training course in Industrial Engineering which is run to train the engineers of the National and Local Productivity Councils. Participants

in this programme are paid a stipend of Rs. 450/- per month.

33. The NPC and LPCs have also started to undertake specific assignments to assist the industry to define, analyse and solve the problems concerning human relationships, production, quality costs, etc.

34. Apart from the Productivity Councils and the Productivity Centre, there are a number of other bodies and institutions doing laudable work in the field of productivity. These include the various management training institutions and colleges, the institutes of training in industrial engineering, the various research institutes set up by industries, some professional organisations and such others.

35. Though the work of all these agencies has doubtless made some impact on productivity in industries and units which they have been able to reach, there is still no room for complaisance about the results achieved. Taking industry as a whole, it cannot still be said that their keenness or expertise in the matter of productivity has been greatly enhanced. Productivity has not yet achieved the dimension of a national campaign that it was intended to be. At a Conference on Productivity and Management in July, 1967, Professor M.S. Thacker remarked, "If we look at the existing conditions and present state of productivity in our industrial enterprises both in the public and private sectors, there is a lot which needs to be done. I thought the NPC, over a decade since its establishment, would have been able to bring efficiency of the management upto the degree that was required. Unfortunately, this increase in efficiency has not been noticed". It is not infrequent that opinions are also voiced of the lack of support in the drive for increasing productivity.

III. ORGANISATION OF WORK

36. The primary responsibility to raise productivity in individual undertakings rests with the management. Raising productivity in the undertaking calls for action in three main fields ; organisation and control of work, personnel policy, and plant and equipment.

37. In a country where there is much unemployment and under-employment, the easy availability of labour inhibits efforts being made towards more effective planning and organisation of work with due regard to man-machine relationship, the work-place, the environment and personnel factors involved. Most things are taken for granted. Fortunately, in the present campaign for increasing productivity and in the need for a little more attention to these matters with a view to making more effective use of all available resources and in the new concept, labour is not considered as an expendable commodity but as any other resource going into production. Here it may be more pertinent to mention the need for organising the work-place and work so that the job can be carried out with the least physiological cost to the worker. Prof. Christensen in his report "Man-at-Work" (Central Labour Institute) points out that the physiological cost of living and working must be met by a food calorie intake. A major portion must necessarily be used to maintain life, leaving only a very small percentage of the food intake to enable work to be done. In view of the poor nutritional standards of the workers, it is very necessary that proper attention must be given to fit the job to the man and the man to the job.

38. How the poor physique and the low calorie intake can result in low efficiency is very well illustrated by many examples which can be met with in industry. In a well-known rubber company, it was stated that the efficiency of our operators on light jobs such as manufacture of cycle tyres and tubes was as high as can be found in some of the best associates of the company elsewhere in the world. It is only in cases where heavy expenditure of energy is involved in work, that the efficiency is very low. It was stated that in the case of motor-car and truck tyres, the corresponding efficiency was as low as 45%. This points to the need for proper organisation of work so that the jobs requiring heavy

expenditure of energy are kept to the minimum or suitable mechanical handling equipment made available.

39. The action to be taken in these fields would vary with the economic position of the undertaking. Even when it is not possible to make substantial changes in equipment, it will always be possible to use more fully and efficiently the means available on the one hand for the continuous improvement of organisation and methods, and, on the other hand, for the active participation of all personnel in efforts to increase productivity.

40. The raising of productivity would require an examination of the general organisation of the undertaking and a clear definition of the lines of authority and responsibility. The advantages of adopting a form of organisation which permits specialisation of functions together with adequate coordination have been recognised increasingly in large establishments and organisations. The application of work study techniques will lead to improvements in the layout of factories and work-places and in the design of equipment, to better working environment, improving the organisation of work and simplifying process, thus resulting in better utilisation of materials, equipment and manpower. Work Study improves planning and control of production and efficient manning of plant, could provide indices of labour performance and serve as a basis for control of labour cost and, in appropriate conditions, for systems of Payment by Results.

41. Careful attention to production planning and control would ensure availability of materials and components when and where they are required, reduction in idle time of the machines and proper utilisation of manpower.

42. Simplification, standardisation and specialisation would bring out improved economies of operation by cutting down the range and variety of articles produced and by the use of mass production techniques.

43. Close cooperation and interchange of information between departments responsible for design, planning and production would lead to maximum efficiency in labour and plant utilisation. An up-to-date knowledge of the various items of equipment and materials used, would help the design and planning staff to devise the most economical methods, processes and efficient tools.

44. Attention devoted to costing and budgetary control

would provide accurate information about unit cost; the means to control expenditure properly by comparing results actually achieved with budget forecast; and guidance in planning for the future. The special attention given to raw material and marketing policies—in particular, reorganisation of methods of distribution and a study of markets—would ensure an outlet for an increase in production. In case where adequate markets exist, where supplies of material and labour are sufficient and where overhead costs represent a substantial portion of total cost of production, the possibilities of increasing production by working a number of shifts would result in a reduction in cost.

45. The initiative of management and their technical experts cannot be successful unless a favourable climate is created wherein the trade union movement and workers are generally prepared to accept responsibilities for increasing productivity. This acceptance must find practical test in the individual establishments.

IV. PRODUCTIVITY TECHNIQUES

46. Productivity has been expressed in many ways. One of the ways of expressing the concept of productivity may be "optimising/maximising the economic utilisation of all available resources and investigating and utilising the best known resources, as also creating new resources for different activities, be it industrial, commercial, agricultural, services or any economic activity involved in our day-to-day life".

47. This wide concept of expressing productivity has resulted in the techniques of productivity being evolved out of the utilisation of knowledge in various disciplines for understanding and assessing the effectiveness of diverse economic activities.

48. Industrial engineering is concerned with the design, improvement and installation of integrated systems of men, materials, machinery and management. It draws upon specialised knowledge and skill in the mathematical, physical and social sciences together with the principles and methods of engineering analysis and design to specify, predict and evaluate the results to be obtained from such systems.

49. It must be stressed that production methods and technology that have proved successful in one situation or country will not necessarily prove so in another where the availability of raw materials and other resources, climatic conditions, scale of operations, and such other factors are quite different. All these and other similar factors must, therefore, be kept in mind when selecting the machinery, equipment, design of product, materials, methods and techniques to be used for production in a given situation.

50. Use of sound work-study techniques yield data from which work-allocation, manning of processes, time-standards, job-values, production norms and incentive schemes, can be computed or devised. However, the data cannot be gathered or used mechanically without proper regard for their effect upon the workers involved. It is, therefore, essential that the workers' representatives and trade unions are associated in the application of the techniques, so that their confidence in the data-collection can be ensured. Further, the norms, standards, job-values etc., derived from the data should guide management and the

union in arriving at agreed decisions on the changes to be made, giving due consideration to the special features of the given situation.

51. The depth and width of concept involved in industrial engineering and productivity bring into totality of its scope a vast array of activities which primarily can be covered under the science of management. The following outlines the different techniques that have been usefully employed:

1. Method Study

52. Method Study is systematically recording, analysing and critically examining present and proposed ways of doing a job and the evolution and application of easier and more effective methods.

53. It consists of careful definition of the problem to be studied, recording of relevant facts about the existing ways of doing a job, critically examining the present procedures adopted in sequential order, developing a practical, effective and economical way of doing it, taking into account all factors influencing the circumstances, installing the evolved method as a standard practice and ensuring the maintenance of the standard practice.

54. The definition of the problem to be studied will have to be based on economic, technological and human factors involved in the situation.

55. The evolution of a new method would involve critical evaluation of different factors like objective, material, activity, sequence, place, equipment, method, person doing the job, analysing reasons as to why it is performed in the present way, investigating into probable alternatives in respect of the different factors, and selection of any particular alternative in preference to the various possibilities.

2. Work Measurement

56. Work Measurement broadly covers the application of different techniques to establish the work content of a specified task by the determination of time required for carrying out the particular job under consideration at a defined standard of performance by a trained worker. The following are the main techniques adopted in Work Measurement:

- (i) Time Study;
- (ii) Activity Sampling;
- (iii) Development of synthetic times from standard data;

- (iv) Predetermined Motion Time Systems;
- (v) Analytical estimating.

3. Time Study

57. Time Study is the determination, as closely as possible, from a prescribed number of observations, the time required to carry out a given activity at a specified standard of performance. The stop-watch is used for this purpose. It takes into account performance rating which is applied to the actual observed times thus deriving the normal time for a job.

58. *Work Study* which is generally meant to include method study and work measurement can, if not properly applied, create strained relations between management and labour. Their application requires confidence, sincerity, integrity on both sides, and management should provide adequate assurances to workers that this will not be made use of as a tool which can affect workers' interests. On the other hand, work study, if systematically applied, can strengthen industrial relations and achieve prosperity of enterprises through higher productivity. Workers' fears and suspicions, while being time-studied, can be dispelled if it is properly explained. It is important that the fear of redundancy among workers should be overcome before commencing the studies and this is easily achieved by management generally giving an assurance that no worker will lose his employment as a direct consequence of application of work study. Rather, he would be redeployed on other jobs as a result of replanning, expansion or through natural wastage. Also it is important to keep workers and their representatives fully informed before such studies are conducted.

4. Inventory Control

59. Inventory control is the optimisation of capital investment in inventories with minimisation of cost of capital involved with due regard to the cost of stockouts of manufacturing, components and spares and finished goods inventories. It helps maintain adequate liquidity position and improves return on investment. In India, many surveys have revealed that crores of rupees are invested in inventories and the turnover is invariably very low which results in financial problems to the industrial undertakings.

60. It includes the concept of selective inventory control which facilitates priority of attention and control on a few selected items of inventory which primarily matter in the improvement of the whole situation.

5. Stores-keeping Methods and Practices

61. This relates to a complete study of receiving, inspection, storage, codifying and classifying and issuing all materials, spare parts, general stores etc., in an industrial or business undertaking. Statistical inspection methods are included, covering the various sampling plans while dealing with large quantum of stores. Classification will have to take into account grouping of items to be an advantage in regard to physical storage, families of parts, stores and financial accounting, standardization etc. Codification would include the different systems, viz., alphabetical, mnemonic, sequence, numeric, combination and the general digital system largely preferred for mechanised accounting. Layout studies cover the achievement of a proper and systematic location of different items which facilitate their easy identification and minimum weight-distance movement including the benefits of group storage of part families. *System of Recording* covers the whole paper work system from the time goods are purchased upto the point of manufacture and distribution of finished goods. It also includes the brass ring and McKeskey systems used for tool control.

6. Plant Design and Layout

62. This is primarily focussed towards application of work-study principles to plant design and layout at the design stage thus achieving the vast economies possible right from the initial conception of the project. Work Study is used as a preventive tool, which is generally not at present appreciated in Indian practice. It is far better, easier and cheaper to make changes at the drawing board stage of the development of a project than on the shop floor or after its completion. Every aspect of space utilization, integration of all facilities, economical materials handling, technology used, overall layout etc., are questioned and effective answers found for the best and most productive utilization of facilities in the early stages of the project. In view of the developmental nature of our economy, this area can be termed very important especially in respect of new projects.

7. CPM and PERT

63. The Critical Path Method and Programme Evaluation and Review Technique have some factors in common, though they have been devised to solve different problems and are applied somewhat differently. PERT was devised in 1958 by the Navy Special Projects Office in the United States.

while planning, scheduling and achieving the Polaris Missile Programme. Its impact has been such that today in the U.S. it is virtually impossible to get a defence contract for work without being involved in PERT. Both are network techniques, and where each activity time is deterministic, it would coincide with the concepts of the CPM, while in the case of first-for-ever projects where the time estimates are not possible to be determined with precision, assessments of time relating to the optimistic, most likely and pessimistic times would be made and the estimated PERT time determined using the Beta distribution. The determination of the Critical Path Method helps in assessing the completion date of a project. In the use of PERT, it has been possible to assess the probabilities of completion of a specified project in respect of any target date, using the principles of statistics. PERT costs deal with the economics of crashing activity times at increased cost, with respect to reduction of overhead expenditure for reduced time, while objectivating to achieve a sooner completion date of a project.

8. Standardization, Simplification and Variety Control

64. The definition of Standardization as approved by the International Standards Organisation for Standardization is, "Standardization is a process of formulating and applying rules for an orderly approach to a specific activity for the benefit and with the co-operation of all concerned and, in particular, for the promotion of optimum over-all economy taking into account the functional conditions and safety requirements. It is based on the consolidated results of science technique and experience. It determines not only the basis for the present but also for future development and it should keep pace with progress." Applications of standardization are in the areas of units of measurement, terminology and symbolic representation, products and processes, specification of material, machine, instrument, for quality, composition and performance, inspection and sampling, tests and analysis, safety of persons and goods, and model form of agreement and contract.

65. Variety Control involves the elimination of unnecessary types and grades, shapes and sizes of manufactured goods. The basic principle of variety control is that a single item should serve for as many different purposes or for as many different classes of equipment and kinds of construction as possible. In this sense, variety control can be applied at

various levels within a single unit, within a single industry, between several industries and among all industries in a nation, among all industries throughout the world, and as an integral part of the standardization programme. The areas of application of variety control in industry can be on different product lines, within a product group, diversity of finishes and packing, basic designs, component parts and sub-assemblies, materials, tools etc.

66. Simplification enables production department to improve planning, achieve higher rates of production and machine utilisation and simplify control procedures, while in regard to the consumer, it tries to satisfy the consumer by giving him a choice or furnish him the nearest to what he wants.

67. The different techniques used in these areas are :

- (i) Market research and Opinion Survey,
- (ii) Profit analysis and profitability studies,
- (iii) Preferred numbers,
- (iv) Consumption studies,
- (v) Classification and codification,
- (vi) Value Engineering,
- (vii) Modular coordination,
- (viii) Documentation,
- (ix) Work Study and Quality Control.

9. Job Evaluation

68. Job Evaluation is the determination of the value of an individual job in an organisation in relation to the other jobs within it. An important aspect of job evaluation is the joint participation of labour and management in the whole programme, right from the very initial stages of job description. While the methods employed for evaluation would be governed by the nature of jobs covered, the success of the programme while implementing it would depend on the degree of acceptance achieved by labour and management at the various stages of the evaluation. Hitherto, job evaluation has been applied more in the area of activity of industrial workers. In general, there are non-quantitative systems and quantitative systems. Under the non-quantitative, the two common systems are the "ranking system", and "grade description system", while in the quantitative systems, we have the "point system" and the "factor comparison system". Either a particular system or variations of the different systems are adopted in practice to suit a particular situation. Some factors commonly employed for evaluating jobs are education, experience and training,

skill, responsibility and dependability, working conditions, intelligence and initiative etc.

10. Merit Rating

69. Merit Rating is the evaluation of work performance in an orderly and systematic way. Different factors used in rating individual behaviour traits and aspects of work performance include : dependability, attendance, willingness to cooperate, sound health, house keeping practices, level of initiative, capacity to judge, job knowledge, quality of work, potentiality for growth, volume of work, intelligence, safety consciousness and versatility. The effectiveness of a merit rating programme would depend upon its receptivity and integration in respect of the environmental factors in an organisation and the weightage given by management to rewards and punishments on the basis of such a rating. It is important to eliminate errors of personal equation in the implementation of such a programme and this is generally achieved by a review of the evaluation by a different person or committee in respect of a particular individual who is rated.

11. Value Engineering

70. Value Engineering is one of the more recent potential techniques evolved which has helped in sustaining economies of even developed and affluent countries and also combated the stiff competition faced by these countries from developing and low-cost economies. While in cost reduction the focus of investigation is on the specification, in value engineering the focus is on the function performed. The four basic questions asked in respect of value engineering are :

What does it do ?

What does it cost ?

What else would do the job ?

What does that cost ?

71. Through a brain storming process consisting of persons with different and diverse background, the question "what else would do the job" is answered through a variety of possibilities which can be developed from a number of ideas that emerge.

72. The cost in respect of the different ways of doing a job are evaluated and a way of achieving the desired function is selected, with due regard to cost economies. It has been often quoted that value engineering is a new American Industrial Technique that has been described as the biggest thing since mass production. For import substitution in our

economy, value engineering must be considered as indispensable.

12. Office Organisation and Methods

73. This would primarily include the application of work study principles to office working. While work study generally focusses its application to industrial workers, Organisation and Methods techniques are used for the study of office workers. It includes charting procedures, questioning and evolution of new systems and methods, development of manuals in different management functions, studies relating to responsibilities and authorities, accountability and management audit, work measurement for office workers, organisation studies, performance evaluation, control of office costs etc.

13. Materials Handling

74. It is primarily the application of work study techniques to material handling problems which covers analysis and improvement of such activities in stores, processing departments, transportation, offices, etc. It also covers the different factors that enter into the selection of mechanical handling equipment and devices. It objectivates in its totality to integrate the handling activities with the primary activities of production.

14. Production Planning and Control

75. This technique is many a time referred to as the nerve centre of an industrial enterprise. It integrates the demands and sales, availability of plant and equipment capacities, and capabilities, human skills, flow of materials, spares and components, in the fulfilment of sales and service needs of the organisation. Optimisation in utilising different facilities like men, machines, materials etc., is achieved through the application of different techniques of forecasting, quantitative methods and Operations Research. The line of Balance Technique is also used.

15. Waste Reduction

76. This technique is gaining greater importance in recent times especially in the light of the need to reduce costs and utilise all resources to the best advantage of society. Its application can be in different functions of an enterprise. However, its focus would naturally be on those functions which spend a greater part of the organisation's resources. In an industry, the production function has attracted this area of study. Industrial wastes are in several forms, viz., wastages in the form of man-power, machine, time, materials etc., and

their reduction can greatly contribute to reduced costs and increased profits. The whole gamut of techniques and methods used in Industrial Engineering can find systematic application in Waste Reduction studies.

16. Product Engineering

77. Product Engineering includes the basic conception, research, engineering and commercialising of a product. It takes account of a variety of factors, i.e. need, design, marketing, production, aesthetics, economic risks, technology and capital in the evolution or introduction of a new product and also in the review of an existing product.

17. Systematic Plant Maintenance

78. This includes the study of the maintenance function, economies of maintenance, control procedures, work order systems, categorisation of equipment, lubrication, craft measurement, maintenance cost control, equipment replacement policies, etc. which are of vital importance especially in the light of large industrial complexes of modern times and higher levels of break even factors in large scale process operations involving high investments. The importance of plant maintenance in relation to labour is vital in view of the critical features of labour management relations especially when there are frequent plant break-downs in the industry.

18. Techniques in Personnel Administration

79. Of necessity, an organisation must grow in order to live. Many are the new techniques, which industrialists have studied, the introduction of which into industry is calculated to improve productivity. Where these new techniques had been introduced and had only a limited value, investigation has invariably shown that insufficient thought and action had been given to the human aspect.

80. Results are only obtained through people. Therefore, the cooperation of people is necessary in order that any new system of work can function properly. In other words, they must be motivated to accept and work the new system to the optimum extent.

81. The fact that incentive schemes etc., produce enhanced earnings is, in itself, not a sufficient enough motivator. Many are the cases where this can be shown. This cooperation can be achieved only by recognising that the man on the shop floor is a human being and not a 'cog in a wheel'.

82. There must be an interest in work if one is going to

give of one's best. There must also be pride in doing a good job. There must be a 'sense of belonging' to the organisation.

83. There must be a recognition that every man has his dignity, that people are entitled to their own opinions, and that security is the reward for good service.

84. To achieve a state where the worker is amenable to these new systems, management should strive to give :

- (i) Good working conditions
- (ii) Well trained supervisors
- (iii) Good counselling facilities
- (iv) Fairness in all dealings
- (v) Information—the fullest possible
- (vi) Good training facilities
- (vii) Joint consultation
- (viii) Systematic Merit Rating
- (ix) Good selection programme for promotion as well as for new entrants
- (x) Good grievance procedure

19. Techniques in Marketing

Consumer Behaviour

85. Regional variations in India are too many, to permit of any generalisation. The demographic, social and economic environments in which the Indian population are placed today show marked differences, with the result the marketing research techniques that have been developed to understand these complexities have proved quite inadequate. For instance, the consumer behaviour studies undertaken by the National Sample Survey, and by the Indian Statistical Institute, could bring to light the specific behaviour patterns that have been influencing the marketing operations in this country only in a cursory manner. One of the important techniques used by the Indian industry for understanding the consumer behaviour is the attitude measurement survey. Because of a high degree of inter-disciplinary approach involved in this kind of effort, and because such surveys are expensive, very few companies have so far been in a position to conduct such surveys. It is worthwhile to mention here that the attitude measurement surveys have yielded good results in the consumer goods fields.

Test Marketing

86. Test marketing is the technique whereby the large-scale simulation of the market is created, so that the needed adjustments in terms of the product, packing, the channel selection, pricing and promotion could be properly developed.

This kind of process, especially in mass marketing, helps the marketer to improve productivity, or in some instances, may be at least to minimise the productivity loss. So far, 6 to 7 companies have been adopting this technique to test the market so that whatever productivity gains have been created by the production are not lost for want of an effective marketing machinery.

Product Planning and Policy

87. The product, being the centre around which the entire organisational success is built, cannot be successfully designed and developed unless it incorporates within itself the engineering requirements and fulfils the consumers' needs. Much productivity gains have been made by using some of the following marketing techniques, before or after the introduction of the product.

Product Test

88. Especially in such of those consumer products wherein the consumer's attitude is largely conditioned by his personal involvement with the product, the techniques of product tests and blind product tests* have been proving useful pointers for developing product on the most profitable lines. For instance, the tea, coffee, cigarettes and foodstuff manufacturers in India could successfully find out the attitude of consumers towards their product, using these techniques. Particularly, a foodstuff manufacturer, because of a survey conducted with the consumers, using the blind product test, could successfully revamp his production methods and processes. This no doubt proves that the contribution of marketing techniques to productivity can be enormous.

89. In the industrial marketing field, the straight product tests have brought out startling results in terms of the use-problem with certain machine tools, textile machinery and power-driven tools. The improvements that were noted and that were brought to light through product tests help the manufacturers in designing and developing the products suitable to customers.

Packaging Research

90. In the marketing process, packaging is looked upon

*Product test is a situation wherein the product is tested for its intrinsic and psychological qualities with the existing or prospective users. In a simple product test (mostly industrial products) the brand and the manufacturer's identity are known to the respondents, whereas in a blind product test, the manufacturer's identity and the brand are not disclosed to the respondents.

as a part of the product. The consumers' preference for a particular product is the result of not only their liking for the product but also, in many instances because of the packaging advantages that go along with the product. This is a very important concept behind the product development and product offering. Much productivity gains have been noticed, especially in the foodstuff and some of the pharmaceutical products, because of the marketer's consciousness of the basic relationship between product and the packaging. The analgesics (pain-relieving non-prescriptive pills such as aspirin) market could make impressive progress because of the control the marketer had on the packaging of the product. The heat-sealed strip packaging has enormously contributed to raising productivity and consumer appeal. It is acknowledged that the productivity that the manufacturers of analgesics have attained today could not have been possible but for the timely introduction of the heat-sealed strip packaging in this field.

Distribution Channels

91. Marketing is defined in a number of ways. One of the definitions (which is quite interesting) looks at marketing as the process of exchange of goods and services in which the products and services are made available to the consumers at the right time, at the right place, at the right quantity and at the right price. With the increasing distance that is being created between manufacturers and the consumers in today's world, productive intermediaries who could make the products available to the consumer have become the acceptable and imperative elements in the business today.

92. Marketing cost has been one of the elements that have attracted attention of the top management, this being an important aspect affecting the distribution network, and ultimately, the sales volume for the company. If in order to distribute effectively his products in different areas, one has to take his product into new areas, proper controls are essential on the direction and scope of marketing cost. The technique of distribution-cost analysis has been devised with a view to knowing the cost centres that are taking place in the distribution pipeline and the corresponding services that are being obtained from the different units of the channel. This technique has facilitated the manufacturers to take basic decisions in the adjustment of the channels and in the reduction of the marketing cost. "The value added by distribution" is to be properly understood for improving the marketing

productivity, particularly, the overall productivity of the organisation, in general.

Shop Audit or Retail Audit

93. The retail audit is the technique by which the marketer tries to understand the movement of his brand vis-a-vis the movements of his competitors' brands. This technique involves the actual physical inventory of the companies' brand with the dealer, at given intervals. Three or four companies in the field of pharmaceuticals, foodstuff, and cosmetics successfully tried out this technique with the result the entire marketing strategy could be improvised and streamlined.

Promotional Policies and Methods

94. Advertising, involving the print, commercial radio, movie or out-door is more often dubbed as economic waste. This kind of reaction is seen mostly because of the problems involved in measuring the effectiveness of advertising. Although many techniques are used in U.S.A. and the Continent for measuring the effectiveness of advertising, in India, because of the relatively small amount spent on advertising, not many companies have shown interest in understanding advertising research for evaluating their promotional policies. It is worthwhile to mention here that some of the advertising agencies have conducted readership surveys which have brought out the nature and type of audience available to the English and local language newspapers and journals in the country.

95. The function of marketing is subject to all kinds of uncertainties, and it often happens that the productivity gains made through production achievements are lost for want of an effective and disciplined marketing system. The vastness of the Indian market and the enormous potential it suggests for corporate growth in this country, cannot be successfully tackled and exploited if marketing is not made highly productive. Appropriately, marketing is looked upon as *the deliverer of the standard of living* at the macro-level, since it is the relationship setter between the manufacturer and his markets.

20. Operations Research and Quantitative Methods

96. The importance of taking management decisions also based on quantitative criteria has been gaining momentum in modern times. A good part of the decision-making process is generally seen to be effective with quantitative

knowledge. This area utilises relevant and latest knowledge in many fields of learning i.e., mathematics, physics, chemistry, engineering, technology, and social sciences for defining the problem and formulating models which can yield solutions either worked out manually or with the aid of computers. Ultimately, the human mind, when applied to these solutions with its ability to judge with discretion, can select a suitable solution based on any particular set of factors which may have been optimised, maximised, or minimised. Various techniques and methods are used, among them being probability theory, queuing theory, statistical methods, theory of games, linear and quadratic programming, dynamic programming and symbolic logic.

21. Management Controls

97. With the complexity of modern industrial and business enterprises, management control techniques become useful in evaluating both the performance of enterprises at the functional level and the overall performance. Management controls operate on the principle of exception and need the establishment of bench marks, sign boards, etc., which are easy to understand without referring to a great mass of detail. Control does not aim at curtailment, rather it regulates. Management control essentially works from top downwards while the other detailed controls work from bottom upwards. The essence of management controls involves

- (a) collection and classification of vital information to ensure that nothing of importance can occur without drawing attention to it,
- (b) comparative assessment of their relative importance,
- (c) use of charts and devices to clearly illustrate the facts of the situation,
- (d) expressing the whole period results in suitable dimensions which can be easily understood by the Chief Executive with a brief study of a few minutes, independent of the size or complexity of the organisation.

98. The control positions which are generally considered are :

- (a) the business position,
- (b) the operating position,
- (c) the profit and loss account,
- (d) the financial position.

99. The techniques of such a control envisage the development of ratios for studying the behaviour for any specific activity or function or a group of activities or functions. The use of ratios transforms the perspective vision of management from the ineffective ways of looking at absolute figures which may not be comprehensively meaningful in terms of control. Relative values can aid and be pivots for exercising control.

Gains of Productivity

101. Productivity gains arise when there is increase in productivity; that is there is a difference between productivity measured at two different points of time. In simple terms, the gains of increased productivity during any interval of time is the difference between the amount which the production during that interval would have cost if the productivity had not increased and the actual cost of production during the interval. In other words, the productivity gains during any given interval of time is the difference between the cost of production calculated on the basis of the level of productivity at the beginning of the time interval and the actual cost of production during the interval, both costs being calculated at constant prices except where the price variations are attributable to increased productivity.

Characteristics of Productivity Gains

102. Like productivity, the gains can also be calculated between any two stages of a productive process for any resource or factor of production or the combining factor and over any period of time. It is the characteristic of all productivity gains that they are continuous in nature; they continue to flow so long as the operations continue at the higher level of productivity.

V. MEASURING AND SHARING GAINS OF PRODUCTIVITY

Productivity

100. Productivity is the measure of the extent to which the resources are utilised to produce goods and services. It measures this through determining the ratio between the output of wealth or net result and the input of resources. It can be measured between any two stages in a productive process. In other words, we can measure productivity for a single operation in a process, or the entire process, or the entire plant, or the industry or the economy as a whole. It can be separately measured for each resource i.e. for a man, for a group of men, a major material, capital, power etc. Two productivity values will, however, be comparable if both of them are for the same resource, are in terms of the same unit, and are for the same stages of a productive process.

Gains of Productivity

101. Productivity gains arise when there is increase in productivity; that is, there is a difference between productivity measured at two different points of time. In simple terms, the gains of increased productivity during any interval of time is the difference between the amount which the production during that interval would have cost if the productivity had not increased and the actual cost of production during the interval. In other words, the productivity gains during any given interval of time is the difference between the cost of production calculated on the basis of the level of productivity at the beginning of the time interval and the actual cost of production during the interval, both costs being calculated at constant prices except where the price variations are attributable to increased productivity.

Characteristics of Productivity Gains

102. Like productivity, the gains can also be calculated between any two stages of a productive process, for any resource or factor of production or the contributing factor and over any period of time. It is the characteristic of all productivity gains that they are recurring or continuous in nature ; they continue to flow so long as the operations continue at the higher level of productivity.

Other Gains

103. It is of note that gains also accrue from various elements of speculation, changes in capital values, market conditions and management of property. But, these could hardly be called as gains of increased productivity.

104. There are a variety of factors which contribute to higher productivity. In the context of this Study Group's work, they could be classified into the following four major groups :

- (i) Improvement in the level of effort and skill of the worker. This measure of labour performance which is the ratio between the standard time (based on consistent and reasonable norms established by given technical conditions within which work has to be performed) required to do a job and the actual time taken to do it.
- (ii) Improvements in product design, process, materials, equipment, layout and work methods brought about by
 - (a) an idea of the worker or any other worker ;
 - (b) research and development, including special studies ;
 - (c) technological development elsewhere.
- (iii) Improvement in output due to capital intensification within the same technology.
- (iv) Improvements in management methods and practices.

105. Gains in productivity resulting from improvements of type (i) are wholly attributable to the workers. Similar gains due to improvement of the type (iii) are wholly attributable to capital. The gains of type (ii) and (iv) are mainly attributable to management of operations, but also have elements attributable to either workers or capital or both.

Sharing Gains of Productivity

Principles

106. The principle of sharing the gains of productivity has been accepted by all. It is agreed that the gains should be equitably and fairly shared by all agents in the productive process, namely—the community, the worker and the inventor. If sharing of gains has to be a practical proposition, it is obvious that the mechanics of sharing should fulfil the following conditions :

- (i) Increase in productivity should result in material gains and that the gains should be measurable.
- (ii) Sharing is concerned with increase in productivity irrespective of the level of productivity.
- (iii) Sharing will have to be done on specific increases in productivity of department or on unit to unit basis and not for the industry or economy as a whole.
- (iv) Sharing between the parties has to be on the basis of certain agreed formula, to be impersonal and less disputable. The Group, however, is of the view that it will be neither feasible nor useful to evolve a universal formula for sharing gains from higher productivity applicable to all industries and under all conditions and situations.
- (v) The sharing of gains of specific increases in productivity should have no bearing on the existing level of wages or general increases in them, ad hoc or systematic, through the process of collective bargaining or otherwise. Similarly, it should have no effect on sharing of gains or increased receipts resulting from factors other than specific increases in productivity.
- (vi) Sharing can be done only when the gains have materialised and that no share can be larger than the gain. Share must necessarily come out of the gains.
- (vii) Sharing should not result in serious dissatisfaction among non-benefiting workers inside as well as outside the unit. It should not upset or crumble the wage structure.
- (viii) Sharing should not be an excuse for retrenchment, demotion or loss of earnings to workers or for practising poor human relations or undermining the growth of trade unionism.
- (ix) For sharing to be equitable and logical, the proportion of shares of the various parties should have some reasonable relationship with the extent of contribution that each party makes for obtaining the gains. At the same time, the need to enable the wages and living standards of workers to rise continuously with rising labour productivity must

also be kept in mind. This requires that labour should not be denied the benefit of higher productivity arising due to other factors also.

Methods of Sharing Gains

107. Several methods already exist for sharing gains due to increased productivity or otherwise. These may be classified as follows :

A. Sharing with labour

- (i) General increase in wages and/or allowances ;
- (ii) Systematic increase in wages through annual increments or merit increments or both ;
- (iii) Increased special allowances or higher fringe benefits ;
- (iv) Incentive payment to workers on individual performance or group performance ;
- (v) Production bonus based on total production of a department or a unit ;
- (vi) Awards for suggestions ;
- (vii) *Ad hoc* awards for exceeding the targets ;
- (viii) Profit sharing plans, including statutory bonus ;
- (ix) *Ad hoc* annual bonus awards.

B. Capital

- (i) Increased profits.
- (ii) Increased dividends.
- (iii) Increased ploughing back of profits.
- (iv) Increased appropriation to capital reserve fund.

C. Community

- (i) Price reduction of goods and services.
- (ii) Increased taxes, duties etc., paid to Government and local authorities.
- (iii) Increased donations to social welfare services and organisations.

108. In addition, there are several other methods of sharing the gains. These are :

A. Labour

- (i) Promotion or otherwise recognition of excellence.
- (ii) Improved working conditions.
- (iii) Increased facilities and opportunities for self-development and advancement.
- (iv) Improved employee amenities inside the plant such as lockers, rest rooms, canteens, drinking water facilities, first-aid rooms, recreational facilities etc.

- (v) Lesser working hours, more paid leave and holidays.
- (vi) Improved employee amenities outside the plant such as medical and health facilities and facilities for housing, children's education, cheap rations, transport, recreation, extra-curricular activities etc.
- (vii) Improved other social benefits such as employment insurance; group health, accident and life insurance; credit facilities etc.

B. Capital

- (i) Modernization and expansion of production facilities.
- (ii) Improved management development and employee training facilities.
- (iii) Expansion and improvement of productivity services.
- (iv) Expansion of research, experimentation and developmental facilities.

C. Community or State

- (i) Improved quality and utility of goods and services.
- (ii) After-sales service at no extra cost.
- (iii) Closer adherence to commitments such as delivery dates, quality etc.
- (iv) Reduced burden on special services.
- (v) Reduced burden in respect of training, research and nation building activities.

109. Problems of whether to share the gains through financial or non-financial means can best be solved by individual management on the basis of existing levels of wages and of non-financial benefits to labour, capital and community. Since wages in India are low, monetary gains would normally be more acceptable and useful to workers than non-monetary ones.

Comments on Possible Means of Sharing

110. The important characteristics of the possible financial means of sharing the gains of productivity with labour are described below :

- (i) *General increase in wages* : Wage increase may or may not have any relationship with the increase in general level of productivity and, in any case, it has no direct relationship with specific instances of increased productivity. They perpetuate the share and thus, if the gains cease on any account, the increase

in wage no longer remains a share but becomes a burden. Further, they do not reward individuals according to their contribution to gains and if an attempt is made to do so, it will distort the wage structure. Thus, while wages should increase from time to time as general level of productivity and total industrial output increases, it cannot be a general basis of sharing the gains of specific increases in productivity.

(ii) *Systematic increases in wages* : In this system, there is an automatic increase in wages, generally every year, by a predetermined amount. Though in the present systems, these increases do not have any relationship with productivity, there is technical feasibility of linking this system with overall productivity. For example, if it is established that in an organisation the annual increase in the overall productivity has been say 4%, then such a trend could be presumed for future years and a system of 4% annual increase in wages could be built into the time scale grades. This could continue till the wage structure is reviewed and re-negotiated at the expiry of the current agreement.

(iii) *Incentive schemes* : This system is the most effective means of sharing the gains of productivity arising out of increased efforts on the part of workers. This is described in detail elsewhere in the report.

(iv) *Suggestion schemes* : These schemes solicit suggestions from the individual workers, and on receiving an acceptable suggestion, reward the suggestion. The rewards are generally related to the gains according to a pre-determined scale. Such schemes constitute an excellent means of obtaining ideas for higher productivity and sharing the resulting gains.

(v) *Production Bonus* : In this system, workers are paid a lump-sum amount for exceeding production targets, according to a predetermined scale. It is a means of sharing the gains of general increase in productivity, only when the production increases due to increase in productivity and not by increases in the inputs. Since measurement of overall production cannot isolate all the other contributing factors and as the bonus is not related to individual contributions, it is not as fair and effective a means of sharing the gains as incentive schemes.

(vi) *Profit-sharing Plans* : These are essentially systems of sharing the profits with the workers in a predetermined proportion and manner. Most profit-sharing plans have no direct relationship with productivity as they are based on total profits which accrue on several accounts. This, however, does not mean that such plans are worthless ; they have some other objective which they are quite adequately achieving.

(vii) *Production-sharing or Cost-saving Plans* : There are many varieties of production-sharing plans, all of which have potentialities of becoming a means of sharing the gains of increased productivity on plant-wise basis. The well-known plans of this type are the Scanlon plan, the Nunn-Bush plan and the Rucker share of production plan. These plans are known by the names of the persons who first formulated them. Although these plans vary in details, they are based on essentially the same principles. In all these plans, the objective is to reward the employees for increasing the productivity, expressed in relation to labour or in terms of units of labour as below :

Out-put

Productivity = $\frac{\text{Out-put}}{\text{The labour employed}}$

The labour employed

The 'output' is expressed either in terms of total value of sales or total production value. The total production value, which is also called value added by manufacture, is the total value of sales minus the cost of material, supplies and power.

A Typical Approach to Sharing Gains of Higher

Productivity of Labour

111. Keeping in view the characteristics, capabilities, advantages and disadvantages of the various methods of sharing described above, it appears that a comprehensive system of sharing the gains of specific increases in productivity will be somewhat as follows :

Type of gain

Type of plan

- | | |
|--|-------------------------|
| 1. Gains due to additional efforts of workers while working within the given technical conditions. | Wage incentive schemes. |
|--|-------------------------|

2. Gains due to technological changes.
- (i) Suggestion Schemes.
 - (ii) Promotion to higher grade through re-valuation of job, taking due note of the increased sophistication and higher productivity of the machine and equipment.
 - (iii) Lump-sum awards—ad-hoc or predetermined.
3. Gains due to increases in productivity on other accounts as also due to overall effect of 1 and 2 above.
- Production-sharing or cost-saving plans.

VI. INCENTIVES

Place of Incentives in Productivity

112. Incentive is simultaneously, a device of increasing productivity and equitably sharing its gains. There are several ways of increasing productivity. The important among these are :—

- (i) Improved product design ;
- (ii) Improved processes and materials ;
- (iii) More and better machines and equipment ;
- (iv) Better work methods ;
- (v) More effective utilisation of manpower at all levels ;
and
- (vi) Better organisation and planning.

113. Incentive is concerned with more effective utilisation of manpower, which is the cheapest, quickest and surest means of increasing productivity. Methods involving improvements in product design, processes, materials, machines and equipment require capital investment (a scarce commodity) and lot of time to start giving results. They may also involve foreign exchange. Some of these require investments in research and development which may take several years to mature or produce practical and worthwhile results.

114. As against these, more effective utilisation of manpower, improved work methods, and improved management organisation and planning require practically no or little capital expenditure and bring about results as soon as they are applied. These means of increasing productivity therefore should receive our first attention. Gains accruing from these would enable action on the capital intensive methods of increasing productivity for even greater results.

115. The present level of manpower utilisation in the industry as a whole is of the order of 40 to 50%. The only practicable and self-sustaining means of improving the utilisation is to introduce incentive schemes, to stimulate human exertion and provide a positive motivation to greater output and higher productivity.

The Concept of Monetary Incentive

Monetary Incentive—Defined

116. Monetary incentive can be best defined as extra financial motivation. It is designed to stimulate human exertion by rewarding the person, over and above the time rated remuneration, for improvements in the present or targeted results.

Types of Financial Motivation

117. Financial motivation could be provided in many ways such as promotion to higher grade, increments in the same grade, ad hoc lump-sum rewards, greater and better physical amenities and incentive wages. Of all these, the most direct and conceptually correct financial motivation is the incentive wage wherein the total wages and its quantum varies, according to a pre-determined scale, in direct proportion to the results achieved during the relevant wage period. In none of the other cases the incentive payment can be made directly proportional to the results achieved from period to period and according to pre-determined scale.

System of Industrial Remuneration Reviewed

118. There is a distinct and clear attempt in the system of industrial remunerations, particularly those based on job evaluation and other systematic approaches, to compensate man for all of his contributions. A man's contribution to an activity is manifold and some of the major ones amongst these which could be identified with the various constituents of wages are—

- | | |
|-----------|----------------------|
| 1. Time | 5. Responsibility |
| 2. Skill | 6. Working condition |
| 3. Effort | 7. Co-operation |
| 4. Ideas | 8. Continued service |

119. If the existing patterns of industrial remunerations are analysed, the following contribution-remuneration relationship would be observed :

Kind of Contribution	Method of Payment	
	For normal contribution	For extra contribution
1. Time	Basic wage + Fixed Allowance	Overtime wages.
2. Skill	Basic wage based on Job Evaluation + Allowances	Higher basic wage + Allowance through promotion
3. Effort	Basic wage based on Job Evaluation + Allowances	Incentive Bonus and Merit Increments
4. Ideas	Suggestion Rewards	—
5. Responsibility	Basic wage based on Job Evaluation + Allowances	Higher basic wage + Allowances through promotion
6. Working condition	Basic wage based on Job Evaluation + Allowances	Higher basic wage + Allowances
7. Cooperation	Continued payment of basic wage + Allowances	Incentive Bonus
8. Continued service	Time Scale Increment in Basic wage	Promotion and Fringe Benefits

120. It will be seen from the above that what is generally called as incentive is paid for extra contribution of effort and cooperation. The ideas are rewarded through suggestion awards, and extra time through overtime payment. Extra contribution on most of the remaining factors are rewarded through promotion to the higher grade, resulting in higher basic wage and allowances. Continued service is encouraged through increments in the time-scale grades, promotion, and the various fringe benefits most of which are related to length of service.

The Concept of Integrated Wage Payment

121. The normal methods of wage payment are virtually "Zero-Result" payments. The basic wage plus the dearness and other fixed allowances constitute the full and complete payment for all the job characteristics or the expected inputs. But it has no relationship with the actual results achieved. One might argue that since the wages are paid for a period of time, the application to job during that period and consequently the results is automatically considered. This is however only an expectation. The system of payment by itself does not ensure this. What is really ensured is attendance and neither application to job nor results.

122. Incentive schemes provide a means of "positively" ensuring the best application for the entire period of attendance time. They thus supplement the wage payment systems to make wages a function of both the job characteristics and application to job.

123. When application to job is measured by the results, then the total system of wage payment (Basic+D.A.+Incentive) reaches its ideal state of "payment by result" which is the only economically viable system of payment.

124. It should, however, be conceded that the performance based system of wage payment is more complex and cumbersome than the system based entirely on attendance. But this is unavoidable till we reach a stage where, by sheer force of habit supplemented with normal supervision, we could achieve the fullest and most productive application to job.

The Mechanics of Incentive

125. The incentive schemes are simply devices for coinciding the interests of the employees with those of the organisation in a more demonstrative and realistic manner. The problem of incentive is of not only stimulating and sustaining human exertion at optimum levels, but also channelising the resulting increased activity towards achievement of the desired results. The basic mechanics of incentive scheme is:

- A. To stimulate an individual to
 - (i) put in as much effective effort as he can, day in and day out, through
 - (a) working at optimum pace,
 - (b) using his effort more effectively and skillfully, and
 - (c) applying himself to work for as great a proportion of available time as possible;
 - (ii) co-operate and co-ordinate his work with others as best as he can;
- B. Towards achievement of certain specified objectives or results;
- C. By rewarding him (making extra payment) according to, and in proportion to, the objectives or results achieved.

Elements of Incentive Scheme and Their Design

126. An incentive scheme is defined by its following main elements :

- (i) Objectives
- (ii) Measurement of achievement or performance
- (iii) Base or datum performance
- (iv) Quantum of incentive and performance-reward relationship.

These are described in some detail in the following paragraphs.

Objectives

127. Incentive schemes can be devised to fulfil any organisational interest so long as the interest does not stand in the way of employees' interest, and is something which the employees can help achieve. The following are some of the objectives which incentive schemes may be required to achieve:

1. Increased Output
2. Reduced Time
3. Higher Workload
4. Improved Methods
5. Improved Quality
6. Higher Plant Utilisation
7. Higher Material Utilisation
8. Improved Process Efficiency
9. Economy in the Use of Services and Utilities
10. Cleanliness
11. Greater Safety
12. Effective Supervision
13. Reduced Absenteeism
14. Reduced Cost on Other Accounts

Selection of Objectives

128. Correct selection of objectives can make all the difference between a successful scheme and a scheme doomed to failure. Some of the important considerations in the selection of objectives are that they

1. should be of interest to management;
2. must be possible to measure;
3. must be of economic importance;
4. should be within the control of the employee or group of employees;

5. should avoid the tendency to over-emphasise one factor at the expense of the others to the detriment of the overall purpose of the scheme;
6. should be such that it should be possible to show the operator how the factors can be improved. (Towards this end, a document setting out the recommended method of obtaining the improvement should be prepared and issued); and
7. should not be more than two or three.

129. In most cases, INCREASING OUTPUT consistent with the quality standard is the objective sought to be achieved through an incentive scheme. Where increasing output is not within the control of the operative, such as when attending to a chemical process, then the objective of the scheme might be to increase WORKLOAD to improve labour productivity and to improve the PROCESS EFFICIENCY through effective control of the process. For a truck driver, the objectives may be increased UTILISATION of truck, less CONSUMPTION of fuel and greater SAFETY. For the attendant on the cane crusher, the objectives may be greater YIELD of juice from cane, increased WORKLOAD, and better UTILISATION of crusher.

Measurement of Performance

130. To reward persons according to, and in proportion to, the achievement of the objectives, it is necessary to measure the objective achievement or performance quantitatively. The measurement of performance has the following aspects :

- (i) Definition of performance as an index, ratio or a straight quantity.
- (ii) Setting standards or norms for measurement of performance.
- (iii) The period of performance evaluation or assessment.
- (iv) The unit of manpower i.e., individual or group.

Considerations

131. The following considerations should be kept in view in measuring performance :

- (i) There must be a direct relationship between something of value which is measured to assess the performance and the contribution made by the workers.
- (ii) The measured standard should not be influenced to any great extent by external agencies or factors.

- (iii) Measured standard must be based on definite quality requirements with proper and direct controls placed on waste.
- (iv) Standards should be set through systematic work measurement, and should be rigidly maintained.
- (v) Standards should be guaranteed with clause to account for significant methods improvements.
- (vi) Shop procedures and methods should be standardised.
- (vii) The minimum acceptable performance should be carefully set, and the maximum achievable performance should be known.
- (viii) There should be equitable adjustment for failure to meet the task when the causes of failures are beyond the employees' control.
- (ix) There should be sufficient scope for increasing performance.

Standard

132. Standards for measuring performance as indicated above must be set using industrial engineering techniques. They should be realistic, fair, equitable and reasonably accurate. Incorrect standards, whether tight or loose, are the principal causes of the failure of many an incentive scheme and are known to have done incalculable harm not only to the working of incentive schemes but to the whole concept behind it, the industrial relations and peace, worker and union attitudes towards management, level of productivity etc. Standards for measuring output, production, workload and plant utilisation should be developed through techniques of Work Measurement. For developing standards for material utilisation, quality, safety etc., statistical techniques involving analysis of past and experimental data should be employed.

Period of Assessment

133. The period over which performance is assessed should be as short as possible, for the incentive to be effective, and for the worker to be able to relate his efforts with the earnings while he still remembers all that happened during the period being assessed. It is good practice to assess the performance every day or every shift, and inform the worker of his performance index the very next day.

134. If the performance is likely to be affected by factors other than the efforts of the worker and the consequent

variation in the performance can average out only over a longer period than a day or a shift, then it may be desirable to assess the performance over such longer period. The principle is to keep the period of assessment as short as possible.

Unit of Manpower

135. Incentive is most effective when an individual is rewarded on his own performance. No one works better than for one's own self. Therefore, the best unit of manpower for assessment of performance or achievement is an individual. However, when it is difficult to assess the performance on individual basis, or where the performance of an individual depends upon another, it becomes necessary to reward an individual on the basis of the performance of the group. Such schemes are popularly called as group incentive schemes.

Group Incentives

136. The group incentive system is not a new or a different wage formula. The wage incentive formula used in group systems are the same as those used in individual incentive systems. It is only a method of computing and distributing earnings among a group of workers who pool their accomplishments. The group system is applied best when

- (i) there is community of interest among the members of the group ;
- (ii) it is impossible to measure the contribution of individual members accurately and economically ;
- (iii) the measured contribution is a result of the efforts of all members of the group ;
- (iv) the measurement of individual contribution might force individuals to work towards cross-purposes ;
- (v) there are violent fluctuations in workload, and during the low periods individuals are likely to turn out more only at the cost of others; and
- (vi) the individuals cannot be provided with equal opportunity of incentive earnings.

Coverage

137. Once incentive is introduced in a plant or an organisation, it is imperative to extend it to cover as many of the employees as possible. Incentives, being related to earnings, are taken by employees as an additional benefit provided by management, and as such the employees would naturally press for extending this benefit to all employees.

Suitable schemes could be developed for almost all categories of employees, including supervisors, managers, maintenance workers and clerical staff.

Critical Performance Indices—Defined

138. In an incentive scheme there are four critical indices, namely, the standard index, the reference index, the base index and the incentive index. These are defined below :

(i) *Standard Index* : When the actual achievement equals the standard achievement, the Performance Index is 100 and this index is called the STANDARD INDEX. This index corresponds to the performance of an average operative who is adequately qualified (mentally and physically), skilled, trained and experienced for that particular job, and who is working at normal pace under good supervision, but without the stimulus of any financial incentive.

(ii) *Reference Index* : Since such an average operative may or may not exist in a particular plant, and for reasons of history, ineffective supervision over a long period of time, lack of proper shop procedures, and for various other reasons, the average performance of operatives, before introduction of any incentive scheme, is generally below the standard index. This index may be termed as REFERENCE INDEX, being the performance during a certain selected reference period before the introduction of Incentive Scheme.

(iii) *Base Index* : The index for exceeding which incentive is paid is generally called BASE INDEX. The base index may be the same as the reference index or any other between the reference index and the standard index.

(iv) *Incentive Index* : Under the stimulus of a Financial incentive, the operatives would increase their performance from the base index to standard index, and then beyond. After some time, the average index under incentive would stabilise and remain steady (other factors remaining constant) at a certain value higher than the standard index. This index may be termed as INCENTIVE INDEX.

Base Index

139. The base index is the most critical aspect of an incentive scheme. The point of performance beyond which incentive should start being paid, is one of the key points in labour management negotiations over incentive schemes. According to classic industrial engineering practice and also from the very definition of standard, the incentive should start from the standard performance. But if the reference performance is much below the standard performance as is the case almost everywhere in this country, an incentive is required in the first place to reach the standard performance. Most well-known and successful schemes in this country, therefore, very rightly start the incentive near about the average reference index. There are also schemes where each small group starts at its own reference index but the incentive payment is so arranged that at standard performance all groups get the same incentive. Beyond the standard performance all the groups have the same scheme.

Performance-Reward Relationship

140. As mentioned earlier, incentive is earned for exceeding the Base Performance Index. The rate (rupees per hour) at which incentive is earned obviously varies according to the level of performance. At base performance index the incentive rate is zero, and as the index increases from here, the rate also increases in some proportion to the increase in performance. This proportion depends upon the performance-reward relationship.

Incentive Rate

141. The Incentive rate should be a certain percentage of the wage as it should have the same job differential as in wages. Where wages carry dearness allowance, it would be desirable to base the incentive rate on the sum of basic wage and dearness allowance. In the time-scale incremental grades, it would be convenient for accounting purposes to have incentive rate as a percentage of the wage at the middle of the grade, irrespective of the position of an individual in the grade.

Incentive Amount

142. Incentive is earned for the actual period during which the operative is engaged on the incentive job; in other words, for the actual time taken to do the job. Thus, the actual amount of incentive earned is the product of the incentive rate corresponding to the performance achieved and the actual time taken to do the job.

Considerations

143. In designing the performance-reward relationship, the following considerations should be kept in view :

- (i) The scheme should reward employees in direct proportion to the increase in performance.
- (ii) The reward should be over and above the basic wage which must be guaranteed.
- (iii) The reward should be sufficiently strong, generous and fair.
- (iv) Reward should keep the scheme profitable.
- (v) Reward should be unrestricted unless it is established that beyond a certain range the performance would increase due to factors other than the efforts of the employees or would work against the overall objective.
- (vi) Performance-reward relationship should not penalise employees with less improvement range, because they have been efficient in the past.
- (vii) It should be simple to understand and the reward should be easily calculable by the employees.

Types of Relationships

144. There are several types of schemes, each known by its originator. However, basically, there are three types of relationships depending upon the ratio of increase in performance to increase in incentive rate. They are Straight Proportional Relationship, Geared Relationship and Variable Geared Relationship. They are defined below :

- (i) *Straight Proportional Relationship* : In straight proportional relationship, the incentive payment is in simple proportion to the performance above a datum (Base performance). When a graph is drawn relating payment to performance, the relationship appears as a straight line passing through the origin. This constitutes the fairest relationship, and should nearly always be attempted.
- (ii) *Geared Relationship* : A geared relationship is one in which the relationship between payment and performance is other than the straight proportional.
- (iii) *Variable Geared Relationship* : Variable geared relationship denotes different degrees of gearing at different levels of performance.

Multi-factor Scheme

145. In multi-factor scheme where the incentive is paid for performance on more than one factor, the total incentive payment is the sum total of the incentive earned on each factor. Separate performance-reward relationships are developed for each factor. In designing such schemes, special care should be taken to ensure that total incentive earning potential is equitable for all sections of employees irrespective of the number of factors on which their performance is measured.

Quantum of Incentive

146. The quantum of incentive is another key aspect of the incentive scheme and labour-management negotiations on it. The most fundamental concept governing the quantum is that the incentive should not increase the direct unit cost at any level of performance. This establishes the upper limit of the quantum. The lower limit is set by the requirements of motivation. That is, what quantum will attract attention and generate the requisite inducement. The fairest quantum is one which, beyond the standard performance, passes on the entire savings in direct labour cost to the workers as incentive after providing for the cost of installing, operating and maintaining the scheme. The organisation will gain on the savings in the overheads and increased volume of production and sale. For performances between the base and the standard, the quantum of incentive should be on a reduced scale (i. e. the savings in direct labour cost should be shared between the worker and the organisation) to provide for additional cost due to incentive being paid to certain individuals or groups at current levels of performance and to maintain inter-plant, intra-plant and inter-company parity.

Organisational and Employee Safeguards

147. Unless an incentive scheme is applied equitably from both the management's and the workers' points of view, good industrial relations will be difficult to secure or maintain and the increased output, lower costs and higher earnings which might have been obtained from the successful operation of the scheme may not be forthcoming. Distrust between management and workers and friction among the workers themselves may prevent the scheme from functioning properly, may lead to wasteful disputes and strikes, or may even force the complete abandonment of the scheme. It is, therefore, vital that the interests of both the organisation and the employees are safeguarded by suitable provisions in collective agreement.

Employee Safeguards

148. The following are some of the principal safeguards from the employee's point of view :

- (i) The consent of the representative of the workers concerned should be secured before any scheme is introduced. The scheme may initially be introduced on trial period at the end of which both management and workers may be free to seek changes and clarification.
- (ii) The scheme should cover as large a proportion of workers in the establishment as possible in order to avoid dissatisfaction due to disparities in earnings.
- (iii) The representatives of the workers should participate in the timing of jobs ; rate setting ; fixing of standards ; selection of workers for time study ; establishing proper working conditions, rest allowance, unavoidable delays and other elements and procedures of work measurement.
- (iv) The workers should have the right to question any standard which may appear to be improper within a certain predetermined time period. Such disputed standards should be proved by demonstration, past records or further study as may be convenient.
- (v) The organisation of work and shop procedures should be reviewed both before and during the introduction of scheme to ensure continuous, steady and uninterrupted flow of work and sustained earning potential.
- (vi) The wage structure should be reviewed to remove any wage anomalies which may exist and to prevent development of such anomalies due to the scheme.
- (vii) The job security should be guaranteed. No worker should lose his job, status, position or earnings due to the incentive scheme.
- (viii) The existing time-rated total wage should be guaranteed.
- (ix) The standards and the rates should be guaranteed. Once finally set, they should not be changed or cut except where there is a significant change in the work content of the job due to change in the product, materials, process, equipment or methods. No such changes in the standards or rates should be

made without proper consultation with workers' representatives.

- (x) The workers should be informed of their performance and earnings while they still remember the efforts put in to achieve that performance. For this purpose, performance should be measured over as small a period as possible.
- (xi) The scheme should ensure safety and health of the workers by establishing fair and reasonable standards, adequate minimum guaranteed wages, discouraging cut-throat competition amongst employees and avoiding penalties for low performance. Earning of incentive should be voluntary.
- (xii) The scheme should reward workers on factors which are within their control and should not penalise them for loss in performance due to reasons beyond their control. Adequate provisions should exist in the operation of the scheme to ensure this.
- (xiii) The scheme should be simple enough for employees to understand and should appear fair in both design and operation.
- (xiv) Incentive schemes should not be used as temporary expedients to overcome a particular situation and then allowed to lapse. To win the confidence and faith of workers, scheme should be devised to permit workers to gain a permanent benefit from it.
- (xv) The scheme should provide attractive and fair rewards and should not throttle the earning potential of the workers.
- (xvi) The scheme should provide equitable earning opportunity to all workers.
- (xvii) The scheme should have adequate provisions for seeking prompt solution to employees' grievances about any part of the scheme and should not leave management commitments flexible or ambiguous.

Organisational Safeguards

149. Some of the important organisational safeguards are that the scheme

- (i) Does not increase unit cost. In fact it should reduce unit cost.
- (ii) Achieves the objectives of the scheme and does not run counter to other objectives.

- (iii) Ensures maintenance of quality standards.
- (iv) Does not upset the wage structure.
- (v) Provides commitments on the part of workers to cooperate in establishing fair, realistic, equitable and reasonably accurate standards.
- (vi) Does not interfere with other existing plans, systems and schemes.
- (vii) Does not reward individual workers out of proportion to their contribution ; and
- (viii) Keeps management in full control of the operations.

Compensation for Lost Time

150. Incentive scheme establishes a condition of contract between the worker and the organisation in which the workers' remuneration is linked with the performance or the results. Like in any other business contract, in this case also, the worker expects the scheme to have a set of rules to fairly and equitably deal with the various conditions that might arise affecting his remunerations. This is particularly important as, for being really attractive and motivating, the incentive payment is a sizable portion of his total earnings, and he is deeply concerned with maintaining at all times his total remuneration. One of the very important points in this regard is the conditions and factors which are beyond his control and which reduce his incentive earnings. The worker expects an equitable adjustment for failure to meet the set performance levels when the causes of failures are beyond his control. These include conditions such as stoppage of work due to lack of materials, breakdown of equipment, lack of orders etc.

151. There are three main ways of dealing with such conditions, viz.,

- (i) The standards or norms set themselves include adjustment for time lost due to causes beyond the control of the worker. In such cases, no compensation for lost time will be necessary. This, however, would be equitable only when the performance is measured over a sufficiently long period of time wherein the stoppages would even out and when there is no change in the pattern and the quantum of such stoppages.
- (ii) The lost time may be excluded from the period considered for calculating the performance and paying incentive. This will mean that the worker

would be paid for the lost time at his normal wage rate without any incentive. Where the incentive payments do not form a very substantial percentage of the total remunerations, this system is fairly logical and equitable because after all incentive should be payable only when the worker works at the required level of performance. The workers' argument against this is that it is organisation's responsibility to provide continuous work and if they are not able to do so, why should he be deprived of the opportunity of earning incentive.

- (iii) The lost time may be excluded from calculation of performance and payment of incentive as in (ii) above; but incentive may be paid for the lost time on the basis of the average incentive earned during a certain specified period. While this appears to be equitable from the workers' point of view, it goes against the concept of payment by result because incentive is being paid even when there is no result.
- (iv) In case of piece-rate where there is no normal guaranteed wages, the lost time may be paid at a certain pre-determined fall-back rate.

152. In choosing any one of the above methods of providing compensation for lost time, special consideration should be given to the procedure and the cost of keeping records of the lost time and safeguarding against fraudulent practices of booking excessive lost time and thus earning higher incentive. Where the cost of booking is excessive and the fraudulent practices cannot be easily checked, the most appropriate procedure for dealing with lost time will be as indicated in (i) above.

Protection Against Rate Cutting

153. Nothing has brought the system of incentive schemes into greater disrepute than the practice of rate cutting followed by certain organisations in the past. In early days of incentive schemes, the norms or piece rates used to be reduced or revised when some workers were found to be making excessive earnings. This was mainly because the norms were often loose and were not based on work measurement.

154. The practice of rate cutting is bad for both the organisation and the worker. It is bad for the organisation because workers would soon come to know of it and peg their production, at a level lower than what was achievable, for fear of rate cutting. If they could earn a certain amount

with half the effort, why should they work more, get the rates cut and then work twice as hard to earn the same amount? It is bad for the workers because their earning potential is limited and reduced and because those who are sincere and hard working are the ones who suffer most.

155. To safeguard against this practice, the scheme should guarantee the norm or standard or the piece rate. Once fixed, no change should be made in the standard. This provision makes it incumbent on the organisation to set a fair and reasonably accurate standard at the very outset. It is, therefore, most vital that standards are established through the modern techniques of work measurement.

156. It is obvious that a standard holds good only so long as the method remains unchanged. If there is any substantial change in the work methods, product, process, material, tools, machines, layout etc., the standard does not hold good and needs a change. This is important, for, if this is not done, the worker will earn incentive out of proportion to the effort put in. If the change in methods makes the standard tight, the worker would lose his earnings. If it makes it loose, he will have excessively high earnings. It is, therefore, necessary that while guaranteeing the standard, simultaneously, the scheme should provide that if there is any significant change in methods, materials, process, machine, tool etc., the job will be remeasured and a new appropriate standard established.

157. While on this point, it is necessary to also consider as to how to correct the faulty standards and the mistakes made in the existing schemes. There are already many organisations which had established norms without any systematic work measurement and are now faced with the problem of loose standards and excessively high and out-of-proportion incentive earnings. At some places, the incentive earnings of some workers are as high as 4 to 5 times their normal wages. It appears that methods such as those described below may be adopted to correct such situations :

- (i) Start all new workers on a new scheme based on proper work measurement.
- (ii) Where feasible, shift the high earning workers to jobs with high normal wages and thus adjust some of their excessive incentive earnings against the wages.
- (iii) Pay mutually agreed lump-sum amount as compensation and attract the old workers to the new scheme.

Incentive Scheme and Basic Wages

158. Incentive schemes are introduced to meet only a specific requirement, namely, quantitatively linking the wages with performance. Best results are obtained when it is left alone and not mixed-up with other aspects of remuneration, motivation etc. It is not a cure-all or a substitute for other wage plans or forms of motivation. It is neither a method of effecting wage increases nor of checking demands for higher wages, nor of justifying low wages.

159. Incentive should be over and above the basic wage and should not affect in any way the quantum of basic wage which should be governed entirely by the characteristics of job such as those considered in job evaluation.

160. Incentive is paid for performance beyond a norm. This means, at least conceptually, that the basic wages are for working at the norm and that the incentive is the payment for working beyond the norm. It is, therefore, obvious that the existence or absence of incentive scheme should not have any effect on the basic wages, specially because the basic wage is not affected by the norm.

Ceiling on Wage Incentive

161. Since human capability has obvious limitations, there is already an in-built biological ceiling on performance. It is, therefore, unnecessary to establish an arbitrary ceiling on incentive earnings. Any ceiling will be arbitrary and restrictive as it is impossible to precisely determine in advance the maximum performance which any individual could achieve under any condition. Ceiling is undesirable from the point of view of the organisation as it might lose the contribution which the worker might be able to make beyond the ceiling. It is undesirable from the worker's point of view for it would limit his earning potential if he could go beyond the ceiling.

162. It might be argued that the organisation must know its liabilities and that it is not healthy to have an unlimited liability. If the standards are based on proper work measurement, the liability will not be unlimited. The system of work measurement itself is based on a certain average performance under incentive condition. In other words, the standard set by good work measurement is such that if a large number of workers were to perform the operation, the average performance achieved by them will be a known value. The individual performance cannot be predicted but the average performance of all is predictable. Ceiling should never be a substitute for poor work measurement.

or a safeguard against loose standards. It is not fair to the workers but hides wrong standards, methods changes and, above all, deprives the organisation from obtaining full advantage of its resources.

163. There are, however, situations where, on certain technical considerations, it is necessary to restrict the performance to a certain level below the biological limit of human capability. In such cases, a ceiling is justifiable. Some of the major technical considerations which sometimes warrant a ceiling are :

- (i) Requirements of safety;
- (ii) Controlling workmanship, quality and costly rejections;
- (iii) Avoiding excessive strains or wear of the equipment;
- (iv) Preventing undue overstraining of the worker on a job involving intensive effort and fatigue or on a job necessarily to be performed in hazardous working conditions.

Sharing Gains of Technological Changes

164. Technological changes include improvements in product design, process, materials, equipment, work methods etc. These may or may not involve additional capital. Similarly, these may or may not involve higher effort, skill or responsibility on the part of the worker. Where such changes involve increased effort, skill or responsibility of the worker, the need for sharing the gains of such technological changes with the workers is obvious. Even where the technological changes have no effect on the worker, there too, there are demands for sharing the gains with the workers.

165. There are obviously three ways of sharing these gains, viz.,

- (i) Increase in the wages of the concerned workers.
- (ii) Payment of a lump-sum amount once for all.
- (iii) Increased share under the existing schemes of production bonus, annual bonus, profit sharing bonus or production-sharing cost-saving schemes.

166. Increase in wages of the concerned workers on account of a technological change will be a sound basis for sharing the gains only when the increment given has some relationship to the efforts, skill and responsibility requirements of the job. In revising the wages on the jobs affected by technological change, due note must be taken of the greater

sophistication and higher productivity of the new machines and equipment or methods. Further, it must be appreciated that advancing technology will bring better standards for labour only if the productivity gains of the advancing technology are available to the workers too. Denial of such gains to them will condemn them indefinitely to the present low standards.

167. Payment of a lump sum reward for making technological change acceptable to the workers is in fact a kind of inducement to make the workers accept the change. If a general plan could be drawn linking in advance the amount of lump sum payment and the amount of gains, this system of sharing could be workable. Since it will be a lump sum payment, it would not distort the wage structure. It could be argued that since gains are recurring, a lump sum reward is not a fair share. But, if this method of sharing is used in addition to the method described at [iii] above, the recurring part of the gains will be taken care of by the latter. In fact, this will have the added advantage that the gains are shared not only by the workers who are concerned with that particular technological change, but also by others in the organisation.

Non-financial Incentives

168. Man is motivated by a complex of stimulants—economic, biological, social and psychological. He has several needs and his needs are never ending. He is simultaneously trying to satisfy all the needs, though all of them may not have equal importance, and at a given moment of time, he may have a hierarchy of needs. It is, therefore, important that for optimum results, there should be simultaneous application of all forms of motivation—financial and non-financial. Financial motivation is the main subject of this report and to make the report comprehensive, the important non-financial motivations are listed below :

- | | |
|--------------------------|-----------------------------------|
| (i) Good human relations | (viii) Support |
| (ii) Self-respect | (ix) Higher responsibility |
| (iii) Team spirit | (x) Greater authority |
| (iv) Recognition | (xi) Job satisfaction |
| (v) Status | (xii) Improved working conditions |
| (vi) Sense of belonging | (xiii) Greater leisure |
| (vii) Appreciation | |

VII. TRAINING FACILITIES

169. With the vast, expanding industrial complex of today, training at different levels and in specific areas has gained importance and its vital role in contributing to higher productivity has been accepted beyond doubt. Training is an integral part of new systems for higher productivity. Attendant upon the introduction of new systems is the need to train people to understand and accept their new responsibilities and authorities. Nothing is more calculated to give a person the inferiority complex than not to know his job. Training programmes have invariably demonstrated to persons working in an organisation that management are doing all in their power to fit them into the job. In this way, he feels part of the organisation and thus develops a sense of belonging, and is thereby motivated to higher achievement. Training is recognised as an investment in manpower for achieving full utilisation of resources. Sound training can, especially in an economy like ours where there is an ever-growing need for goods and services in view of a vast population, achieve the growth rate of organisations with greater moment. The old concept of acquisition of knowledge primarily through experience and evolving out of the factors of hit and miss has given way to organised development, collection and presentation of knowledge for assimilation which have greatly reduced the longer years of experience required for achieving expertise, if not completely eliminating it. The main areas of training for higher productivity would include :

1. Craftsman Training.
2. Supervisory/Foremanship Training.
3. Scientific and Technological Training.
4. Management Training
5. Training of professional Industrial Engineers.
6. Trade Union Training

Craftsman Training

170. The translation of the concept of new products, designs, mechanisms, or items for improved economic activity for meeting the vast needs of a growing society would largely depend on the various skills available and required to exist in craftsmen directly on the job. In the past, some

industrial organisations have recognised the need for trade apprenticeship training schemes with a bias to the respective needs and practices that exist in their organisations. With the rapid demand for skilled craftsmen consequent to industrial growth in the country, the Apprentice Training Act was enacted in 1961 to augment the supply of trained craftsmen badly needed in the country. During the last decade, there has been a considerable development in the training of craftsmen in the country. Apart from apprentice schemes in industrial establishments, other institutes like the Central Training Institutes and the Industrial Training Institutes throughout the country as also private technical training establishments have been set up in the country. The specification of minimum educational levels has aided in minimising communication problems in the training process.

171. The rapid growth of science and technology, especially in view of the minimisation of time lag from the point of generation of new knowledge and its application, will pose problems of craftsmen obsolescence in different age groups which can bring about human problems of readjustment. It is necessary to tackle these problems in a planned manner and adult retraining programmes for craftsmen become a necessity in the progressive development and adaptation of a modern industrial culture.

Supervisory/Foremanship Training

172. This refers to training of mainly the first line supervisor and forms an important link in achieving higher productivity after the conception of an idea and decision to go ahead with it. In large organisations where direct control of activities is required to be vested in many foremen, the performance of the whole organisation can be sensitive to a large extent depending on the effectiveness of these supervisors. A supervisor in industry will be required to deal with a variety of aspects, which may bring within its scope, among the important, the following :

1. Job knowledge
2. Job scheduling
3. Technical skills
4. Worker motivation
5. Implementation of incentive schemes
6. Communication
7. Human relations

173. The width and depth of technical skills and job knowledge would depend on the sophistication of industrial operations which is invariably included as a routine part of initial technical training and would generally be specific about the nature of production or other activity in a particular situation. While in the more traditional and uniform industries it may be possible to generalise the requirements of technical skills and job knowledge, it would invariably have to be tailor-made to suit the adoption of job intricacies and technical levels of a particular industrial or economic activity. Motivation, communication, good human relations etc., may be considered as common factors which would be necessary for any industry and the training in these areas could be generalised to a greater degree, the sensitivity of each factor depending on any particular environmental situation. More industries and organisations in our environment have been seen to use the tool of wage incentives for motivation and higher productivity, and, it has been experienced that with all the expertise that may have gone into the designing and tailoring a wage incentive scheme, the contribution of the supervisor in its success cannot be underestimated.

174. Supervisory training has been achieved through on-the-job and in-plant programmes, TWI [Training Within Industry] programmes, Foremanship Certificate courses in technical institutions, and productivity council and management association programmes specially meant for supervisory development. The importance of this can be seen from the recent announcement to set up a National Institute for Training foremen at Bangalore, by Government.

Scientific and Technological Training

175. The contribution of science and technology in improving productivity can be very basic and radical, which in many instances has been seen to be sizeable when compared to increase in productivity in operational and managerial aspects. The vast strides made in the basic and applied areas of knowledge has resulted in the review of content and coverage at even the basic levels over the past two decades. The coverage of basic training can focus towards either the development of routine operational personnel, or research and development manpower very much required for sizeable improvements in productivity. Training in this area would have a wide coverage starting from general scientific engineering and technological institutions, or specialised but yet formative in character like textile engineering and technology,

jute technology, foundry engineering, applied geology etc. A vast number of institutions are contributing to this area of training with the active participation of institutes of national importance, viz., the Indian Institutes of Technology and other institutes of applied study. From the point of view of the industry, technological training after the qualifying level (degree or diploma) will have to be tailored to suit the operations and needs of the enterprise and, in some instances, in highly specialised areas which deal with sophisticated machinery and equipment. Many institutions and industrial associations, including Productivity Councils, have played an active role in meeting the required need in the area of post-qualifying training to strengthen the efforts and meet the needs of industrial enterprises. It may be relevant to stress the importance of the extent of training necessary to cover the suitable adaptation of modern technology in our environments which may not yet have, in all areas, harmoniously developed in its required fullness. This will make exacting demands on the need for greater creativity and adaptation of new technology in which training can play a vital role.

Management Training

176. Management training, although comparatively recent in relation to other professions like the medical, legal, accountancy and similar areas, has attracted important attention and management has been recognised as a profession in view of a vast body of knowledge it has engulfed, the skills and expertise necessary for effectiveness as a manager, and the social acceptance that has widely been achieved. It can be seen from an analysis of the expanding scope and extent of coverage included in management that there is probably no area of learning and knowledge which can be excluded from its fold. It is not meant to characterise that a manager should know anything and everything, but only to highlight the vastness of the areas of activity which will be engulfed in the context of managerial responsibility and coverage. The fertile application of the knowledge of various branches of learning and professions has made management knowledge inter-disciplinary and inter-professional in character. The old concept of training of a manager primarily through experience and purely evolving out of the experience gained in his work environments has given room to the understanding and practice that managers can be formally trained. While it is not meant that training can be substituted for experience, an organised approach to the develop-

ment of management through the process of formal training can equip people much faster to become full-fledged and able personnel to take up the vast and gigantic responsibilities of a growing and developing economy like ours. The pace of industrialisation over the last three Five Year Plans in the country has attempted to compress growth-rate over a much shorter time-span than may have usually been achieved over a much longer period in the usual course. In this context, the importance of training management personnel need hardly be overemphasised.

177. The knowledge of management is both quantitative and qualitative, and it has been conceived of as constituting both science and art. The scientific and quantitative areas of knowledge have made use of the mathematical and physical sciences, including principles of engineering analysis and design, for developing quantitative criteria in decision-making. The area of problems that a manager would have to encounter in dealing with matters relating to human factors of industry is also being progressively rationalised into an organised body of knowledge that is generally referred to as the behavioural sciences, and the addition of knowledge in this area is increasing, which can reduce and minimise at some stage in the continuum of knowledge the so-called intangibles in the area of management. The recognition of skills and expertise in specific areas of management has accepted the identification of different functions with the coordinated help of which the management of an enterprise in its totality would be structured.

178. In view of the identification of both functional areas of management and general management, formal training in management has been conceived of from a level usually after an adequate standard of professional or general education which will constitute a base and starting point for acquiring and appreciating knowledge of the different functions and the aspects of functional coordination in general management. There are institutions and universities in the country which offer post-graduate programmes in management, like the Indian Institute of Management, Calcutta and Ahmedabad, the University of Delhi, Bombay and Calcutta etc. These programmes have had the benefit of collaboration and assistance from Harvard Business School, Massachusetts Institute of Technology, Stanford and other Universities.

179. While it would be certainly most appropriate to see fully qualified managers occupying various positions in

industries and organisations in the country in view of a rapid pace of development that has taken place especially after independence, the need to strengthen and improve the abilities and skills of personnel at different levels of management has been appreciated and thus the productivity councils, management associations, institutions like the Administrative Staff College of India, Hyderabad, and other bodies offer courses of short duration which have greatly aided in bridging this gap. The experience gained and anticipated needs of such short-duration programmes for practising managers led to the establishment of the National Institute for Training in Industrial Engineering (NITIE), a residential institute with United Nations aid and I.L.O. as the U.N.'s executing agency in providing assistance. The concept of Industrial Engineering at NITIE includes the knowledge of the science of management in its different functions, including the area of general management. Such short-term courses have been objectivated to cater to the needs of managers who may not have gone through formal management programmes in universities and institutes, but who require to keep up-to-date with the growing knowledge of management.

Training of Professional Industrial Engineers

180. Industrial Engineering, as a service function of management, has been recognised and increasingly adopted with the growing industrial complex in our country. In the past, consultants operating in the country contributed to a good part of training of personnel in this specialised area. Over the last decade, institutes and universities have taken up this job of training professional industrial engineers, like the Indian Institutes of Technology, Indian Institute of Science, Bangalore, Victoria Jubilee Technical Institute, Bombay, etc. For experienced personnel who desire to formalise their training as professional industrial engineers, the National Institute for Training in Industrial Engineering and NPC offer many short courses, which when completed, could give a thorough background with a pragmatic approach. The Institute of Industrial Engineers [India], which was established in 1957 and has emerged as a full-fledged professional body, is contemplating the holding of examinations in this field for such persons who desire to qualify as professional industrial engineers with a practical background of experience. The Institute of Work Study Practitioners [London] has been conducting examinations for professional practitioners

in this field. These professional bodies play a very vital role in the regulation of the profession, fostering and assisting education and research and promoting the understanding of industrial engineering as a vital service to management.

Training For Trade Unionists

181. Trade unions, as workers' representatives and spokesmen, have a key role to play in raising productivity. The view is widely held in the USA that trade unions have forced management to become more efficient and productivity-minded under the continuous pressure of the unions for higher wages, more liberal fringe benefits and shorter hours for workers.

182. Workers in our country have various apprehensions and misgivings about raising productivity. Introduction of technological change raises numerous complex problems for workers. The sophisticated productivity techniques are also beyond the comprehension of an average worker. Unless, therefore, the workers feel assured that their interests will be fully and positively protected, they are suspicious about any efforts of management to raise productivity. It is the duty of the trade unions to protect their interests. In doing so, they also create among them the confidence that any increase in productivity will not be at their cost but to their benefit. Cooperation of workers in the productivity project can then become possible.

183. Where management's attitude towards the trade union is more positive, the union may be called upon through some joint consultative machinery, not only to play a responsive role but also to actively initiate ideas and efforts in the field of productivity. On the other hand, where management itself is inefficient and indifferent to productivity, the union may have to force it to raise its own efficiency, as otherwise, the workers' wages and other benefits cannot rise.

184. To play their key role successfully, it is necessary that trade unionists and their leaders have adequate training in the field of productivity, especially in the various productivity techniques and the methods of handling industrial disputes involving productivity.

185. Today, there are hardly any facilities for imparting such specialised training to trade unionists. The courses of the Central Board for Workers' Education give only an incidental place to productivity. It is doubtful if the courses

run by trade unions themselves do justice to this subject. The Local Productivity Councils have made some efforts to run special courses for trade unions ; but these have been few and far between. There is perhaps not sufficient awareness among the top national leadership of the trade union movement about the importance of productivity training as a part of trade union training.

186. It is, therefore, necessary that all agencies, official as well as voluntary, that are active in the field of trade union education and above all, the Central trade union organisations themselves are induced and encouraged to give due place in their courses to training in productivity techniques and in handling the resulting problems.

VIII. USE OF PRODUCTIVITY TECHNIQUES IN INDUSTRIES IN INDIA

187. Factual information regarding the nature and extent of the use of productivity techniques in industries in India is available only to a very limited extent. Our Group made an effort to obtain some such information by sending out a questionnaire to a number of industrial establishments and trade unions, but could not get much.

188. The National Productivity Council recently conducted an extensive survey in this field. The extent of response that it received from the industries, though not entirely satisfactory, was still quite considerable. To our knowledge, this survey is one of the most recent and extensive so far undertaken. The NPC Regional Office at Bombay was good enough to make available to us the advance copy of their report on the survey and we summarise below its broad findings and conclusions.

189. The survey was conducted with a view to

- (i) getting first hand information of the nature, extent and depth to which industries in India make use of Work Study/Industrial Engineering techniques ;
- (ii) assessing the problems and difficulties associated with the application of these techniques.

190. The NPC prepared a special questionnaire for the survey and it was sent out to about 1000 organisations in India. A total of 87 of these were received duly filled in. Out of these, two questionnaires could not be processed because of inadequate information. The remaining 85 were fully analysed and the findings and conclusions are based on these 85 replies. They should be taken along with the limitations of the survey. The responding companies were relatively few in number. Most of them are well established with relatively sophisticated managements and hence not really representative or typical. Though the questionnaire attempted to quantify all information, this was not entirely possible and in some cases even the companies which responded did not give information on all the questions.

191. In a large majority of the responding companies, the survey revealed that though various industrial engineering

techniques being used over a wide area of operations, the application of the techniques in depth was not very common.

192. The personnel to whom the application of productivity techniques is entrusted is not always adequately trained in the techniques themselves and in their use.

193. Time Study is the most popular Work Measurement technique in use. Work Sampling, Production Study and Analytical Estimating come next in that order. The Work Measurement is primarily done on the production jobs and much less on the maintenance, stores, clerical work, tool room and such other jobs. Use of Work Measurement for purposes other than production, such as computation of costs or determination of man-power requirements, is relatively less common.

194. Though the implementation of Method Study proposals is fairly satisfactory, the survey revealed that about 35% of the efforts of the specialists in this respect were wasted in 28.5% of the responding companies.

195. The reasons of non-implementation of the proposals of Work Study are various. The two most important reasons seem to be :

- (i) Resistance of Middle Management;
- (ii) Change in situation subsequent to submission of proposals.

196. In some cases, non-cooperation by labour and indifference of top management were also found to be the cause for non-implementation, but these were relatively less important. The resistance of middle management seems to be due mainly to inadequate association with investigations. Other factors may be fear of the unknown, loss of face and fear of insecurity.

197. About 70% of the responding companies have incentive schemes in operation, but only about 25% have such schemes for departments other than production. On an average, the schemes seem to have achieved increases in output between 30-50% and increases in earning between 25-45%. Not many companies have reported reduction in rejections or in absenteeism or savings in materials as a result of the operation of incentive schemes.

198. The starting point of performance for earning incentives varies among the responding companies; but the most common starting level seems to be between 40% and 60% performance. 80% of the incentive schemes are based

on Work Measurement Data. Past performance records, pure bargaining and rated capacity of the plant are also used as basis of incentive schemes in several companies.

199. The workers are informed of their incentive performance daily in about 31% of the companies, monthly in about half of the companies and weekly in about 25% of the companies. The use of inventory control is reported by about 68% of the responding companies, but the methods used do not seem to be quite satisfactory in a number of these.

200. 34% of the responding companies have wage structure based on Job Evaluation using Point Rating System. Advanced techniques like PERT, Operations Research are used by 49 and 32 companies respectively. Ergonomics is used by only 6 companies.

IX. PRODUCTIVITY AND TECHNOLOGY

201. There is no doubt that the spectacular gains in productivity achieved by the developed countries have been due, to a large measure, to continuously advancing technology. What can be achieved through better organisation and greater human effort alone is necessarily limited, whereas the achievements made possible by advancing technology are practically limitless.

202. The use of advanced technology, however, raises various kinds of problems and these need to be satisfactorily resolved if the full benefits of advanced technology are to be derived. In a developing country which has vast unutilised human resources and where the level of wages is relatively low, the most sophisticated technology may not always be the most economical one. Whether in a particular situation the adoption of a particular technology will be economically beneficial or not will need to be examined on the merits of each case. The other factors which may also limit the use of higher technology would be

- (i) aggravation of unemployment;
 - (ii) scarcity of capital, especially of foreign exchange;
 - (iii) lack of technical knowhow;
 - (iv) the problems of maintenance of sophisticated equipment and of its full utilisation;
 - (v) the limited purchasing power of the community compared to the full capacity of advanced equipment and consequent operation below capacity;
- and so on.

203. The displacement of labour caused by advancing technology has been a difficult problem in all countries and all the more so in a developing country with a very large volume of unemployment. Even in the developed countries, the sudden increase in labour productivity made possible by automation has posed problems before the Government, the industries and the trade unions which have not been easy to resolve in the short run. It is now generally recognised that the human problems that changing technology poses call for

- (i) sufficient advance planning of the change and full advance consultation with all groups that are likely to be affected by change;

- (ii) phasing the introduction of the change so that the displacement of the labour can be balanced either with the overall growth of the industry or with other factors like natural wastage, retraining for employment in other industries, and so on;
- (iii) reduction in the hours of work;
- (iv) adequate facilities for training in the new skills and operating techniques for the changed technology;
- (v) extensive measures of social security so that the unavoidable redundancy of labour will not cause excessive hardship to the workers concerned;
- (vi) high purchasing power in the community as a whole.

204. In our country, while some efforts have been made from time to time to evolve agreed approaches to technological change, the actual introduction of the change seems to be without much regard to the agreed principles. Consequently, there is widespread fear and suspicion among workers towards technological change. It is of the utmost importance that sufficiently effective controls are devised and enforced along the lines indicated above so that labour may be reassured that its interests will be adequately protected.

205. Adoption of advanced technology is not a substitute for the best possible utilisation of all available resources. Indeed, sophisticated technology demands a high degree of work-planning and organisation and co-ordination of human effort. The proper "attitude of mind" as well as the various techniques mentioned earlier remain important determinants of productivity whatever the level of technology in use.

X. HUMAN FACTORS IN PRODUCTIVITY

206. The use of right methods and techniques is no doubt important for raising productivity. It must be realised, however, that the methods and techniques cannot by themselves yield their full benefits unless due attention is also paid to the human aspects of productivity. After all, methods and techniques have to be developed and applied by human beings at various levels from top management down to the worker on the shop floor. Unless these persons who have to develop and apply the methods are willing and able to make the proper use of such methods, productivity cannot rise.

207. The organisation of industry being what it is, the initiative in the efforts to raise productivity has to come primarily from the employers and the managements. It would be wrong to assume that such initiative is always readily forthcoming. The various productivity missions which have worked in our country found that frequently, there is no particular keenness on the part of top managements to undertake any purposeful efforts to raise productivity. A recent survey of the working of work-study and incentive schemes carried out by the NPC also revealed that resistance from top management is one of the factors hampering such schemes. Evidently, where such keenness does not exist at the top, priority has to be given to see that it is generated before any worthwhile efforts can be undertaken at the lower levels to raise productivity.

208. There are various factors which act as obstacles in raising productivity. One aspect of the total effort to raise productivity ought to be viewed as removing such obstacles. The other aspect of such efforts is the generation among all concerned of a positive interest in and urge to raise productivity.

209. Some of the factors which act as obstacles to raising productivity are :

Obstacles to Raising Productivity

1. Poor Standards of Nutrition

210. There is abundant evidence to show that the possible physical effort of a worker depends to a large extent on the adequacy of the quality and quantity of food which he consumes. There is also enough evidence that the average

Indian worker's food is deficient both in quality and quantity and this affects his effort and work-performance. It would be a mistake to expect from an Indian worker the same standard of physical effort as from his better-fed counterpart in the more prosperous countries. Productivity demands that high priority should be given to improving the nutritional standards of Indian workers.

2. *Poor Living Conditions*

211. The housing conditions in the large industrial cities in India have been proverbially poor and, during the past two decades, these have grown worse due to the rapid growth of the cities and the failure of housing and other civic services to keep pace with such growth. A sizable proportion of workers in such cities do not at present have any houses to live in at all and they have to live in hutments and slums. They do not have the most elementary services of sanitation, water supply or roads. Further, a very large proportion has to stay single in the cities since they cannot keep their families with them for want of houses. Living in such conditions, it can hardly be expected that the worker will be physically or mentally in a condition to put in his best efforts to raise productivity. Providing at least a minimum standard of housing for workers must also get high priority.

3. *The Attitude of Employers/Top Managements*

212. The traditional assumptions of employers and top managements about workers are that workers are naturally lazy, irresponsible and incapable of making any positive contribution to their jobs. Traditional management is, therefore, based on the theory that the worker can be made to work only by the use of "the Carrot and the Stick". These assumptions are being challenged and disproved by a large number of research scholars and management consultants in U.S.A. and Britain. Their experience suggests that while the carrot and the stick are effective to a certain extent, they cannot bring out the best performance from the workers. The famous theory "Y" of Prof. MacGregor suggests that the traditional management assumptions have to be given up and workers have to be looked upon as responsible individuals who not only naturally want to work to the best of their ability, but who can also exercise a degree of initiative, responsibility and resourcefulness in the performance of their jobs.

213. While conditions in our country may be different in many ways than those in the U.S.A. and Britain, there is no

reason to believe that human nature here is basically different than elsewhere. Top managements in India need to take note of the trends in the management thinking towards workers in the other countries and have to earnestly re-examine their own assumptions in relation to their workers, for the traditional management assumptions are among the most serious obstacles in the way of raising productivity.

214. It is the general trade union experience even today that managements are not very willing to take workers and their organisations into confidence in dealing with general productivity problems nor are they very willing to give a generous share in the benefits of productivity to the workmen. As a result, trade unions feel that there is not much that they can do in this field and that what little they can do is not worth doing anyhow.

4. *Unsatisfactory Industrial Relations*

215. It is hardly necessary to emphasise the influence of industrial relations on productivity. Where industrial relations are unsatisfactory, it would be extremely difficult to introduce any of the usual productivity techniques smoothly and to secure the cooperation of the workers in operating such techniques. Without such co-operation, the techniques are not likely to succeed.

216. It is not suggested that differences should not arise at all between labour and management. That would be an obviously unrealistic expectation. Sound industrial relations, however, demand that there should be a degree of "mutual recognition" between the management and the representative organisations of the workers, that the two sides should purposefully build up attitudes and traditions of resolving their differences and disputes through collective bargaining on a bipartite basis. Even occasional strike or lock-out may not be ruled out as a step in the process of resolving such disputes; but the basic attitude of the two parties has to be problem-oriented. Where the very right of the workers to form a union or to bargain collectively with the employer is denied either expressly or in practice, or when every difference between the employers and the union leads to either a trial of strength or resort to the time-consuming process of adjudication, sound industrial relations cannot be built up.

217. The nature of problems that arise in the field of productivity techniques and incentive schemes is such that they can be best comprehended and tackled by those who are directly concerned with the problems. Moreover, such pro-

blems cannot be anticipated and decided once and for all, but have to be tackled continuously as and when they arise on the floor. Hence, the conciliation and adjudication methods that are commonly in use in our country for deciding industrial disputes are not very helpful to the parties in tackling productivity problems. Moreover, the technical nature of such problems makes it difficult for conciliation officers and the adjudicator; to understand them properly. It is, therefore, of the utmost importance that those employers who are keen on productivity should purposefully strive to build up sound bipartite relationship with their employees and their organisations.

218. The development of bipartite industrial relations cannot be achieved overnight. There is a view that the industrial relations legislation in our country places undue reliance on Government intervention and thereby inhibits bipartite relations between labour and managements. The fact cannot be gainsaid that over the past 20 years, both trade unions and employers in our country have been accustomed to leaning upon the Government for resolving their disputes. This trend will have to be reversed and this will call for a deliberate effort from both sides.

5. *State of the Trade Union Movement*

219. The condition of the trade union movement in our country is also not very helpful for the development of sound bipartite relations. Especially, in the field of productivity, trade union rivalries can prove very harmful. Besides, most unions do not have the necessary technical knowledge at their disposal and are too poor to pay for such knowledge for dealing with productivity problems. This is a challenge the trade unions can ignore only at their own peril; for, new methods, techniques and productivity practices are bound to gain increasing application in industry and quite apart from the question of productivity itself, unions will be unable even to protect the interests of their members if they cannot develop within themselves the basic knowledge and expertise about productivity techniques.

220. Trade unions, by and large, recognise the fact that continuously rising living standards for working people cannot be achieved except through continuously rising labour productivity. Any gains possible through organised pressure alone can only be limited and short-term. That does not, however, mean that the importance of ensuring fair conditions for labour can be underrated in the short run. For, it is the

equitableness of the present conditions that helps produce the right attitudes among labour and the unions towards productivity. Certain obvious factors make it difficult for the unions to whole-heartedly accept productivity as a major objective.

6. *Fear of unemployment*

221. In many industries where the rate of growth is low, increase in labour productivity inevitably results in reduced employment. Even if any immediate retrenchment is avoided, the total contraction of employment in any industry over a fairly short period is a matter of grave concern to the unions especially in a society where vast unemployment is one of the most serious economic and social problems. It is sometimes argued that though machanisation often reduces jobs in the short run, it creates more jobs in the long run. This is true only when the rate of growth of the economy as a whole is at least equal to, if not higher than, the rate of growth of labour productivity. Where this is not so, the increase in labour productivity does threaten the jobs of workers. Besides, to a worker who is about to lose his job now, it is no consolation that two or three jobs may come into existence five or ten years later in the place of one he loses today.

7. *Fear of Excessive Workloads*

222. The workers and the trade unions fear that the efforts to increase productivity might result in excessive workloads which might affect their health and safety.

223. These apprehensions on the part of the trade unions are very real and they cannot be dispelled merely by assurances or exhortations. An attempt to set at rest these apprehensions was made in the 15th Indian Labour Conference in the year 1957 when a decision on rationalisation was unanimously adopted. In practice, however, questions of rationalisation and resultant displacement of workers have not been dealt with strictly in terms of the said decision. The employers have contended that it is their prerogative to introduce new processes and machinery and the tribunals dealing with the disputes arising therefrom have upheld their contention as also their freedom to retrench employees whenever necessary. The unions have been precluded from questioning the propriety of the technological changes or their effects on employment. The criteria laid down by the 15th Indian Labour Conference have had little weight with the tribunals. Unless this state of affairs is changed, it is unrealistic to

expect trade unions to show any great enthusiasm for productivity.

Positive Measures

224. Apart from attending to these factors which act as impediments to raising productivity, it is also necessary to take steps to create among all concerned a positive interest in raising productivity.

225. Motivation of workers is a field where considerable research has been conducted in other countries, but not enough in India. It is recognised elsewhere that with growing affluence, reduced unemployment and extensive social security, the importance of money as a positive motivator or of the threat of unemployment as a negative motivator have diminished greatly. Various other motivating factors are recognised to operate.

226. It may be that in India because of the low wages and standard of living of workers as well as the vast unemployment, money is still a much stronger motivator and unemployment a much greater fear than in other countries. However, even here, there are cases where it is found that high wages, lavish welfare expenditure or rigid disciplinary rules do not succeed in motivating workers to higher productivity. Apart from money, the worker aspires for his own personal dignity, recognition of his worth and his skills, opportunity for development and use of his talents, congenial social relations at the work-place and so on. Where these are denied to him, even the poor worker such as ours is not likely to be positively motivated for productivity, financial rewards notwithstanding. In the words of Russel Currie, "It is often said that 'work-study is 10% technical and 90% psychological' and this of itself indicates the degree of importance which is attached to human factors in incentive situations." Again "on the gain side, a man's hopes and desires may be summarised in one word 'Self-respect'. It is by respecting his self-respect that the management can enlist the man's intelligence which is the true purpose of incentives in industry. Incentive schemes not so organised can only be the source of industrial discontent, as in fact they are" (Russel M. Currie—"Financial Incentive." — "Productivity", NPC Journal, Vol. IV No. 3, pages 488-489).

227. There are many industrialists in our country who do not take this view of the human factor in productivity. One of the foremost industrialists in our country who was President of the FICCI once, said in an interview, "the

worker's duty ends when he does the work assigned to him by contract. Evidently, his place in productivity is limited.... Really speaking, the industrialist alone (in the broad sense) is the productive factor and he alone has a right to enjoy the fruits of productivity". (Shri S. L. Kirloskar, "Chitramaya Jagat", May, 1966, Productivity Special Number.) With this view of productivity, an employer can hardly complain if his worker shows no interest in it.

228. The positive contribution that the workers can make towards productivity if their cooperation is secured by setting up the appropriate institutional framework, was clearly shown by experience in Great Britain and U.S.A. during the years of the Second World War. The Factory Productivity Committees which were set up in U.S.A. at the initiative of Mr. Donald N. Nelson, Director, War Production Board, did perform an outstanding job. A scholarly study of their role, undertaken by Doris Duffy, credits them with the following achievements:—

- (i) Millions of man-hours and dollars were saved through suggestions made in Committee meetings or by individuals through the jointly operated suggestions systems.
- (ii) Many tons of copper, steel, aluminium, paper, etc. were saved through conservation efforts.
- (iii) The life of tools was extended through education in better care of tools.
- (iv) Quality was improved and rejections were reduced.
- (v) Industrial accidents and deaths were reduced.
- (vi) Absenteeism and turnover were reduced.
- (vii) Efficiency of labour was increased and health improved through nutrition committees.
- (viii) Transportation of materials was speeded up.
- (ix) There was a general improvement in morale and good feeling.

229. Mr. Nelson himself had this to say about the achievements of the Labour-Management Production Committees. "I do not pretend that the universal installation of labour-management committees is going to bring about an industrial millennium; but I know from experience that we would not have reached the amazing war production peaks we did reach if we had not found and enlisted the new force which a labour-management committee can tap, and I firmly believe that in these war plants men of management and labour set a pattern which can be of untold value to our

country in peace time" (quoted by Doris Duffy in "Role of Government in Labour-Management Production Committees"—Catholic University of America Press, Page 97)

230. Some efforts to organise similar committees was started in our country immediately after the Chinese attack in October 1962. The effort, however, did not meet with much response and was not purposefully pursued for sufficient time. As soon as the immediate situation of aggression disappeared, the efforts to promote productivity were also virtually given up. Given the right climate and sufficiently sustained effort, there is no reason to believe that similar committees in our country will fail to show results.

Role of Supervisors

231. The role that supervisors play in influencing the attitudes of workers towards work and productivity is perhaps not fully appreciated in our country. The survey of the working of incentive schemes conducted by the NPC recently has revealed that resistance by middle management is the most important single cause of the lack of success of incentive schemes. Researches in other countries have shown that an employee-oriented supervision is far more effective in getting the best performance from workers than a purely work-oriented supervision. It is necessary that top managements take due note of this and take steps to create the proper attitudes among middle managements and supervisors by example and training.

232. The idea of workers' participation in management which has been talked about a great deal has similarly failed to come up to expectation. The basic cause for this may be that the foundations of industrial relations in this country are not strong enough to sustain such an ambitious superstructure. It has, however, been proved in a wide variety of situations that decisions are most effectively implemented when the parties concerned with implementing them have an opportunity of participating in making the decision. Viewed in this light and not merely in the context of the prerogatives of management or of labour, participation can be recognised as an important device to enlist the will and the talents of all concerned in the tasks of productivity.

XI. THE ROLE OF GOVERNMENT

233. The general political and economic climate in the country is a factor which has a far-reaching effect upon the attitudes of the employers, workers and trade unions towards productivity. A social climate of optimism, enthusiasm, and justice in which employers and workers can feel confident that a continuing expansion of output and improvement of standards as well as an equitable distribution of the output are assured, is conducive to an attitude which strives for increasing productivity. It is the responsibility of the Government to provide such political and economic climate by formulating appropriate policies and implementing them efficiently.

234. The economic and industrial climate in our country for sometime past, it must be recognised, has not been very helpful to increasing productivity. Due to scarcity of foreign exchange, shortage of many industrial raw materials and the generally slow pace of economic growth, many industries have been operating far below their capacities. Employment in many industries has stagnated or even contracted as a result of this. In such a situation, the employers as well as the workers are likely to view as somewhat unrealistic the talk about increasing productivity. In such a situation, highest priority must be given to enabling the industries to operate near full capacity and to providing increasing employment. The rising prices, the erosion of real wages and widespread unemployment are also circumstances which do not inspire the worker to raise productivity or give him a feeling that he has a stake in increasing productivity.

235. The magnificent response that the worker can make to the needs of industry was demonstrated in our country in situations where the workers shared with other groups, a sense of high national purpose when the security of the country was threatened in 1962 and again in 1965. However, such a high sense of purpose has to be perceived as such by the workers themselves and cannot be created by exhortations or preaching. Today, productivity has not become such a high purpose because the conditions and the relations relevant to productivity are not conducive to it.

236. The importance of creating a climate in which workers will perceive their own stake in raising productivity cannot be over-emphasised. There is a broad feeling today among workers that the structure of industrial ownership and industrial management is such that benefits of improved labour productivity do not accrue to workers in sufficient measure. There is also a feeling that in the formulation of broad social and economic policy, needs and aspirations of workers do not get adequate consideration. There is some ground for this feeling, for, over the past 15 years while labour productivity has increased significantly, the real wages have fallen and living conditions have deteriorated. In such a situation, it is difficult to expect workers to feel particularly enthusiastic about increasing productivity. It is for the Government to take necessary measures to change this situation.

237. We have referred earlier to the effects of the poor nutritional standards and living conditions of workers, upon productivity. Apart from their psychological impact leading to indifference, their physical impact upon productivity is also very grave. While an underdeveloped economy may not be able to meet the requirements of all sections of the community fully, it is important that within such limitations everything possible should be done to raise the nutritional standards and the living conditions of industrial workers.

238. The Government has come to play a very significant role in industrial relations in our country. It is not conceivable that it can suddenly give up the role and take a completely indifferent attitude towards labour-management relations. It must be recognised, however, that mere prevention of industrial conflict through conciliation and adjudication is not a sufficiently positive contribution to industrial relations. Without giving up the objective of protecting the weaker sections of the working people as also of keeping labour-management disputes within the boundaries dictated by broad national interest, the Government should purposefully follow industrial relations policies calculated to throw greater responsibility on the employers and trade unions themselves in the matter of resolving their own disputes. Since the Government is one of the largest employers it should set a lesson in seeking sound bipartite relations with their own employees.

239. The initiative taken by Government in the formation of the National Productivity Council and the continued

support given to it and to the Local Productivity Councils, have made a worthwhile contribution towards productivity thinking in a general way. During recent years, the Productivity Councils have also begun to undertake actual floor-level work to help industries to improve their productivity. These services need to be greatly extended. The public sector can also set a model to the industries in the country generally in making the most rational use of productivity techniques and thereby demonstrating their value.

240. Hardly any research has been done in our country in this field, and most of our practices are based on research and methods developed in other countries. This is not a very happy state of affairs. At the same time, it is unlikely that private agencies will be able to undertake research in this field to the extent required except with the active encouragement and help from Government. It is the responsibility of the Government to provide such encouragement and help to competent private agencies as also to organise extensive research on its own on various aspects of productivity.

241. While some larger companies with relatively sophisticated management have trained industrial engineering personnel of their own and a few others are able to hire the services of specialist consultants, a large section of employers do not have any productivity expertise at their disposal. Trade unions, as mentioned earlier, have even less. Any systematic effort to raise productivity often suffers from this lack of expertise on both sides. Trade unions also view with some misgivings the efforts of specialist consultants hired by employers. The Government could help resolve this difficulty by providing a competent, independent agency which both sides could approach for advice and guidance and which could help resolve disputes arising over the introduction of productivity techniques.

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Bombay,
Dated December 31, 1967.

Chairman

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

II. THE BACKGROUND

Productivity is influenced by many factors some of which are internal to a unit while others are external to it. The approach to productivity should be comprehensive and all-embracing. (Paras 12-15)

2. Increase of labour productivity in India requires improvement in the social and economic circumstances of workers. Substantial shares of gains from increasing productivity should, therefore, be provided to labour. (Para 16)

13. Increase in productivity also requires a modern technological base and improved organisation of work. (Paras 16-18)

4. The productivity movement in India began with the arrival of the ILO Mission in 1952. The Mission's efforts did not go far due to the fear that any great changes might disturb the established wage structure and industrial relations in the Textile industry. The experience of the Mission showed that productivity programmes have to be formulated on a realistic assessment of actual situations, rather than on preconceived aims and objectives (Paras 19-22)

5. The setting up of the Productivity Centre and later of the National Productivity Council and the Local Productivity Councils, and the work done by them by sending Productivity Teams abroad and running training programmes in productivity have given further impetus to the productivity movement. The impact of these efforts has not, however, come upto expectations due to various causes. (Paras 23-35)

III. ORGANISATION OF WORK

6. The primary responsibility to raise productivity through proper organisation and control of work, personnel policy and plant and equipment, rests on management. (Para 36)

7. Work should be so organised as to minimise the physiological cost of doing it. In India, due to the very low nutritional standards of workers, this is particularly important. (Paras 37-38)

8. Full and efficient utilisation of available means and continued improvement in organisation and methods can increase productivity even when substantial changes in equipment are not possible. The application of work-study including production planning and control, simplification, standardisation and specialisation, close co-operation and interchange of information, costing and budgetary control and so on, are important in the efforts to raise productivity. (Paras 39-45)

IV. PRODUCTIVITY TECHNIQUES

9. Several techniques have been evolved for raising productivity by optimising/maximising the utilisation of all available resources. These techniques draw upon knowledge in various disciplines—mathematical, physical and social sciences—and apply it to men, materials, machinery and management. (Paras 46-48)

10. Production methods and technology that have proved successful in one situation or country will not necessarily prove to be so in another when availability of raw materials, scale of operations, climatic conditions and such other factors are quite different. (Para 49)

11. Productivity techniques should be applied with the association of the workers' trade unions and the data derived from the studies should be used as guide to the management and the union in arriving at agreed decisions about the changes to be made. (Para 50)

12. *Method Study* consists of selection of work to be studied recording of facts about the existing method of doing it, critically examining these facts, evolving an improved method of doing it, installing the evolved method as standard practice and maintaining it. (Paras 52-55)

13. *Work Measurement* is the determination of the time required to carry out a particular job at a defined standard of performance by a trained worker by the use of any among several available techniques (Paras 56-57)

14. In the application of Method Study and Work Measurement, together referred to as Work Study, the fears and suspicions of workers about loss of jobs or harm to their other interests must be dispelled by giving them clear assurances and by keeping them and their representatives fully informed before the studies are conducted. (Para 58)

15. Other techniques in Industrial Engineering are :—

- (i) Inventory Control (Paras 59-60)
- (ii) Stores keeping Methods and Practices (Para 61)

- (iii) Plant Design and Lay-out (Para 62)
- (iv) CPM and PERT (Para 63)
- (v) Standardisation, simplification and variety Control (Paras 64-67)
- (vi) Job Evaluation (Para 68)
- (vii) Merit Rating (Para 69)
- (viii) Value Engineering (Paras 70-72)
- (ix) Office Organisation and Methods (Para 73)
- (x) Materials Handling (Para 74)
- (xi) Production Planning and Control (Para 75)
- (xii) Waste Reduction (Para 76)
- (xiii) Product Engineering (Para 77)
- (xiv) Systematic Plant Maintenance (Para 78)
- (xv) Personnel Administration (Para 79-84)
- (xvi) Marketing (Paras 85-95)
- (xvii) Operations Research (Para 96)
- (xviii) Management Controls (Paras 97-99)

V. MEASURING AND SHARING GAINS OF PRODUCTIVITY

16. Productivity is a measure of the extent to which the resources are utilised to produce goods and services and it can be measured between any two stages in a productive process. It can also be measured for each resource. Two productivity values will be comparable only if both are for the same resource, in the same unit and for the same stage (Para 100)

17. Gains of productivity during a given interval of time is the difference in the cost of production on the basis of the productivity at the beginning of the time interval and the actual cost of production at the end of the interval, both costs being calculated at constant prices. (Para 101)

18. Equitable sharing of the gains of productivity among all the agents must fulfil a number of conditions (Para 106)

19. Several methods already exist for sharing the gains of increased productivity among labour, capital and the community. There are also several non-financial methods of sharing the gains. (Paras 107-110)

VI. INCENTIVES

20. Incentive is a device for increasing productivity and sharing the gains of the increase. Among the various available methods, it is the cheapest, quickest and surest. Along

with it, improved work methods and improved organisation and planning should also receive first attention since they require no capital expenditure. (Paras 112-116)

21. Monetary incentive is paid for extra contribution of effort and co-operation, as distinct from the normal wages which take note of the characteristics of the job itself. Hence, wages and incentives can together take account of both the job characteristics and the workers' application to the job. (Paras 116-122)

22. The performance-based system of payment is more complex than that based entirely on attendance. (Para 124)

23. Incentive schemes are devices for coinciding the interests of the workers with those of the organisation and can be devised to fulfil various objectives though the most common objective is to increase output. (Paras 125-129)

24. In measuring performance for the purpose of payment of incentives, a number of considerations need to be kept in view. (Paras 130-131)

25. Incorrect standards do incalculable harm to the concept as well as the operation of incentives. Hence, correct standards should be set by using industrial engineering techniques. (Para 132)

26. The period for assessment of performance for the purpose of computing incentive earnings should be as short as possible, a day or a shift being the proper period wherever practicable. (Paras 133-134)

27. Individual incentives are the most effective ; but group incentives can also be adopted where special conditions render individual incentives difficult to adopt. (Paras 135-136)

28. Once incentives are introduced in a plant, it is imperative to extend them to cover as many of the employees as possible (Para 137).

29. The four critical performance indices in incentive schemes are :

- (i) The Standard Index,
- (ii) The Reference Index,
- (iii) The Base Index,
- (iv) The Incentive Index. (Para 138)

30. Since in India the Reference Index is far below the Standard Index, incentives have to start near about the Reference Index. (Para 139)

31. Incentive should be computed as a certain

percentage of the basic wage plus dearness allowance. (Paras 140-141)

32. In designing the performance-reward relationship, a number of considerations have to be kept in mind. Different types of relationship are also possible. (Paras 143-144)

33. Multi-factor incentive schemes which measure workers' performance on more than one factor separately and reward such performance, can also be designed. (Para 145)

34. The quantum of incentive earnings should be such that it should not raise the total unit cost of production but should reduce it, and, at the same time, should be adequate to generate motivation. Above the standard performance, it should pass on to the worker the entire savings in the labour costs. Between the base performance and standard performance, the rate of incentive should be somewhat lower than above. (Para 146)

35. Various kinds of safeguards to protect the interests of workers as well as of the organisation should be provided in the collective agreement on incentives. (Paras 148-149)

36. The worker expects an equitable adjustment for failure to meet the set performance levels due to causes beyond his control such as lack of materials, breakdown of equipment, lack of orders, etc. Such adjustment can be ensured by :

- (i) including a factor of adjustment for lost time in the standards and norms themselves where the time loss, such as can be averaged out over a period of time by reference to the records.
- (ii) paying for the lost time at the normal wage rate without incentive ;
- (iii) paying for the lost time at the average incentive rate for the time actually worked.
- (iv) In case of piece rates, providing certain pre-determined fall-back wage rates. (Paras 150-152)

37. Rate-cutting undermines the confidence of workers in an incentive scheme and hence defeats the purpose of the scheme. Hence, the incentive norms and standards or the piece rates should be guaranteed. The scheme should provide for remeasuring of jobs affected by any significant change in the methods, materials, machine processes, tools, etc. (Paras 153-156).

38. In existing schemes, if standards are faulty, it may be possible to correct them ; but in doing so care must be taken to suitably compensate workers who may be adversely affected by such corrections. (Para 157)

39. Incentive schemes are not a method of increasing or decreasing wages or of justifying low wages. Existence or absence of an incentive scheme should not have any effect upon the basic wage which should be governed entirely by the characteristics of the job. (Paras 158-160)

40. It is unnecessary to establish any arbitrary ceilings on incentive earnings to limit human exertion. However, technical grounds like safety of workers or equipment or requirements of quality may justify, under proper circumstances, ceilings to limit performance to levels below human capacity. (Paras 161-163)

41. Gains of technological change should also be shared with workers through one or more of the following methods :

- (i) Increase in wages of concerned workers,
- (ii) Lump-sum payments,
- (iii) Larger share in various bonuses and production-sharing/cost-saving schemes. (Paras 164-167).

42. Various kinds of non-financial incentives are also known to motivate workers and these should be properly used simultaneously with monetary incentives. (Para 168)

VII. TRAINING FACILITIES

43. Training at different levels and in specific areas plays a vital role in contributing to higher productivity. The main areas of training are :—

- (i) Craftsman Training,
- (ii) Supervisory/Foremanship Training,
- (iii) Scientific and Technological Training,
- (iv) Management Training,
- (v) Training of Professional Industrial Engineers,
- (vi) Trade Union Training (Para 169)

44. The rapid growth of science and technology makes it necessary to provide adequate retraining programmes for craftsmen who have already been employed in industry. (Paras 170-171)

45. The supervisors in industry play an important role in determining the performance of the whole organisation and they have to deal with a variety of aspects ; technical, social and human. The training of the supervisors, therefore, requires to be given sufficient importance. (Paras 172-174)

46. A large number of institutions are today engaged in education and training in the field of science and technology, management and industrial engineering. These institutions are making valuable contribution to productivity by supplying industry with personnel of the required training and competence and also raising the performance of the personnel already in employment by offering them opportunities for training in their respective specialities. (Paras 175-180)

47. To enable trade unionists to understand the problems of productivity and the techniques used, to overcome their misgivings regarding the consequences of rising productivity and to enable them to play a positive role in the productivity campaign, facilities to give them training in productivity need to be expanded. All the agencies presently engaged in trade union education work should give due importance to productivity in their courses. The Central Trade Union Organisations have a special responsibility in this respect. (Paras 181-186)

VIII. USE OF PRODUCTIVITY TECHNIQUES IN INDUSTRIES IN INDIA

48. From replies received from about 87 well established companies with relatively sophisticated management to a questionnaire issued by the NPC for the purpose of a survey, the following conclusions about the use of productivity techniques in industries in India can be drawn : (Paras 187-190)

- (i) Industrial engineering techniques are used over a wide area of operations, but not much in depth.
- (ii) The personnel entrusted with the application of productivity techniques is not always adequately trained therein.
- (iii) Work-measurement is primarily applied to production jobs and not much to other kinds of jobs. Time study is the most widely used method for this purpose.
- (iv) The proposals evolved by work-study are often not implemented, resistance by middle management being the most common cause thereof. Non-cooperation by labour or indifference of top management are not serious obstacles in implementation.
- (v) Among the responding companies the use of incentive schemes is common on production jobs but

infrequent on other kinds of jobs. Increases of 30-50 per cent in output and 25-45 per cent in earnings have been generally achieved. Starting point of incentive earnings is usually between 40-60 per cent performance.

- (vi) The frequency of information to workers on their incentive performance generally ranges from daily to monthly.
- (vii) Use of other techniques like Job Evaluation, PERT, Operations Research, etc. is not very common even in this relatively sophisticated sample. (Paras 191-200)

IX. PRODUCTIVITY AND TECHNOLOGY

49. While technology in the long run opens up the gates to virtually limitless productivity, the adoption of any particular level of technology in a given situation has to take into account a number of factors : economic, social and human. (Paras 201-202)

50. The displacement of labour by advancing technology is a problem which calls for effective action in the following ways :

- (i) Sufficient advance planning of the change and full advance consultation with all groups that are likely to be affected by change ;
- (ii) phasing the introduction of the change so that the displacement of labour can be balanced either with the overall growth of the industry or with other factors like natural wastage, retraining for employment in other industries, and so on ;
- (iii) reduction in the hours of work ;
- (iv) adequate facilities for training in the new skills and operating techniques for the changed technology ;
- (v) extensive measures of social security so that the unavoidable redundancy of labour will not cause excessive hardship to the workers concerned ;
- (vi) high purchasing power in the community as a whole. (Paras 203-204)

51. Adoption of higher technology is not a substitute for the use of proper productivity techniques to ensure the best possible use of existing resources. (Para 205)

X. HUMAN FACTORS IN PRODUCTIVITY

52. Factors which hamper productivity of workers are :

- (i) Poor standards of nutrition (Para 210)
- (ii) Poor living conditions (Para 211)
- (iii) The traditional management assumptions that workers are naturally lazy, irresponsible and incapable of making any positive contributions to their jobs. These assumptions inhibit any positive response from workers and trade unions to productivity efforts. (Para 212-214)
- (iv) (a) Unsatisfactory industrial relations which make it extremely difficult to introduce productivity techniques smoothly and successfully. To promote sound industrial relations the employers and workers should build up the proper attitudes and traditions of resolving their differences on a bipartite basis. This requires a certain degree of mutual recognition between both the sides.
- (b) The present administrative machinery for dealing with industrial disputes is not adequately equipped to handle problems of technical nature which are involved in the field of productivity. This makes it all the more important that employers keen on productivity should purposefully seek sound bipartite relations with the organisations of their employees.
- (c) The question needs to be carefully examined whether the present industrial relations law and machinery inhibit the growth of sound bipartite relations between labour and management. (Paras 215-218)
- (v) (a) Trade unions must evolve some satisfactory methods for resolving, at least at the unit level, the problem of their mutual rivalry since such rivalry does much harm to productivity. (Para 219)
- (b) Trade unions must also develop within themselves the necessary specialised knowledge and expertise in productivity techniques both for protecting the interests of their members and for playing a positive role in productivity. (Para 220)

53. The decision of the 15th session of the Indian Labour Conference on rationalisation which sought to allay

the fears and apprehensions of workers regarding loss of employment and excessive workloads, has not proved effective in actual practice. (Paras 221-223)

54. Special attention must be paid to the motivation of workers since that is the decisive positive factor in raising their productivity. Human factors like workers' individual, social and psychological needs are important in their motivation. (Paras 224-226)

55. Workers can make a positive contribution to productivity if their active cooperation is sought and enlisted for the purpose through appropriate institutional framework like joint productivity committees and through suggestion systems, etc. (Paras 227-232)

56. Attitudes and skills of supervisors have much influence on the attitudes and performance of workers under them. Proper training of supervisors is, therefore, important. (Para 231)

XI. THE ROLE OF GOVERNMENT

57. The Government must pursue policies which will contribute to the growth of a social, political and economic climate in the country conducive to the rapid and continuing growth of production and productivity and equitable distribution of the same. (Para 233-234)

58. The objective of increasing productivity must be raised to the level of a high national purpose and the regulation of industrial relations as well as policies in other related fields should be oriented towards this objective. Especially, it must be ensured that the workers get their due share in the benefits of rising productivity and their status in the social and political set up in the country is paid due attention to. (Paras 235-236)

59. The Government must take purposeful steps to improve the nutritional standards and living conditions of workers so as to raise their productivity. (Para 237)

60. The industrial relations legislation and administration in the country should be so conceived as to promote sound collective bargaining even at the risk of some possible industrial conflicts. (Para 238)

61. Specialised bodies working in the field of productivity like the NPC, the LPCs, the training institutes in productivity etc. should be provided the means to extend their activities at the shop-floor level. (Para 239)

62. Research in all aspects of productivity needs to

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be promoted and encouraged on the widest possible scale so that approaches and methods best suited to Indian conditions can be developed and made available to industry. The public sector should play a particularly active role in this respect. (Para 240)

63. The Government should provide specialised, technically competent, independent and impartial agencies to assist employers and trade unions in handling productivity problem and resolving disputes arising therefrom. (Para 241)

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