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S. GUNARATNAM

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The opinions expressed in this Journal are those of the individual authors and not necessarily those of the Sri Lanka Academy of Administrative Studies or the Institutions for which they work.

This issue of the Journal of Development Administration is primarily devoted to certain problems in the area of Agriculture which are of general interest.

In an article on the priorities of agricultural planning, J. M. Gunadasa makes some pertinent comments about the various aims of Agricultural Planning and the problem of maximising the relevant objective functions.

This is backed up by an article by S. Gunaratnam which analyses some of the patterns of the colonization aspect of the agricultural effort with special reference to the Dry Zone of the Island. He pin-points some of the problems that have arisen and makes some suggestions about how they might be faced in the future. (The second part of this article will follow in the next issue of the Journal).

Two non-Sri Lanka Authors contribute a research paper on the relative effectiveness of some group methods in the communication of agricultural information in another developing country, Nepal. Some interesting comparisons may be drawn with the experiences of the local scene.

This issue of the Journal also contains two articles which are relevant to problems of improving decision making procedures and choosing leadership patterns, whether in agriculture or in other areas. One of them is reproduced with kind permission from the Harvard Business Review, where it was recently reproduced as an "HBR Classic".

GUIDELINES TOWARDS THE IMPROVEMENT OF THE DECISION MAKING PROCESS IN PUBLIC SERVICE ORGANISATIONS *

RAJA G. GOMEZ

Decision making is probably the most fundamental function of a manager in the sense that anything that proceeds from his desk is an instruction or a suggestion to proceed (or not to proceed) according to a certain course of action. Thus the managerial decision maker is called upon to choose in this fashion between various alternatives, whether they be various plans open to his organization, various people whom he may select to staff it, various styles of leading his subordinates, and so on.

One may expect at first sight that every decision would be taken on the basis of pure rational argument. It has been pointed out that this is not always the case, but to be able to appreciate the extent to which non-rational considerations can enter the decision process, it is necessary first to break up the process itself into stages. We may also see in this way what other lessons can be learnt from the analysis. We may hopefully be able, too, to bring greater order into our own particular techniques of decision making by making such an analysis.

Stages of the Decision Making Process

Various authors have analysed the decision making process into varying numbers of stages. The analysis that follows, which is based on Duncan's approach [2], is perhaps as good as any.

In the first stage we must be clear about what the objectives are of the particular decision we wish to take. It is very often possible in the public service atmosphere to go on taking "decisions" without really being clear about what is being aimed at. This is undoubtedly one major reason for the generally poor level of decision making in the public service, and it arises from an uncritical acceptance of simply doing what the man who sat in the desk before you did last week, last month or even several years ago.

At this stage it is also perhaps necessary to be clear about the policy structure within which one operates. Certain policies we may wish to adopt (or to avoid) but it may not be up to pass judgment upon them, and it is rational to accept this fact at this stage. One may perhaps wish to examine as many alternatives as possible without being constricted by considerations of this type at this stage: however, in this case, this restraint must be clearly kept in mind at later stages when the alternatives that will be developed are being examined.

* This article is based on a lecture given by the author at the Sri Lanka Academy of Administrative Studies.

It is also necessary at this early stage to be clear about the significance of the decision one is trying to take. By this is meant that the level of effect of the decision must be clear at least in the very broadest terms, though here, too, we may decide at a later stage to drop certain alternative decisions we are examining because their possible effects and consequences are to be avoided.

To enter the next stage of decision making, we must now start collecting as much information as possible which is relevant to the decision we are trying to take. We must ensure that, along with this information, we have around us the necessary skills and knowledge to examine and appreciate the information. One of the difficulties encountered at this stage is that we can never be clear enough about how much information we should collect. And when is our information complete? A good guideline is to remember that we shall never have all the information that we need for perfection. If we were to make ourselves "fully informed", we should probably never be able to take a decision in time: that is to say, the decision itself would be stale by the time it is taken, or others may have gone ahead of us and, in effect, the decision that we would have taken would really have been the decision to do nothing.

There are some specific temptations that we must resist. One is the temptation to postpone decision making on the basis that the information is too little (for then, as we have seen above, the decision may well be a "non-decision"). Another temptation, to which the public service is very prone, is to appoint a committee at the slightest provocation. The appointment of a committee may be justified in certain cases, but it is well to remember that there is no guarantee of any relevant information being collected by such a committee. We tend to appoint committees, as Dale and Michelson have pointed out, to seek safety in numbers and to spread responsibility [1], but the results of the operations of such a committee may not quite often justify the appointment.

In the public services we often find it necessary to appoint committees to investigate some problem, to collect further information and to make recommendations. These are very important, valid and legitimate functions of committees. But it is rarely that a committee can really make a decision, and in such cases they would not be committees in this sense of the word, but some definite point of the decision making process in the organisation. A Cabinet or Council of Ministers or a Board of Directors or even a Staff Conference in a Department are examples of this type of "decision making committee".

We come now to the third stage of decision making which is the setting down of all possible alternatives open to us. However, just as we realised that we can never have all the information we need at the second stage of our decision making process, we should realise at this third stage that we shall probably never be able either to list all the possible alternatives that may be open to us. This may be occasioned by lack of time, by lack of skills, by lack of knowledge, by lack of resources, etc. Whatever the reason, it is always realistic to accept that there may be another alternative that has just not surfaced. Particular attention is drawn to this point because in the public services we often tend to short-circuit the process of listing of alternatives and to select the first decision that strikes us. There is a great difference in the thinking mechanism involved in this stage between members of public service institutions and members of commercial organisations. The lessons should be very clear.

The separation of alternatives will also help to highlight another distinction that may have to be made, namely the necessity for a short-term decision as well as, or in place of, a long term decision. But we are often content in the public services with taking a short-term decision and ignoring the long-term aspects or, less often, vice-versa.

It may also be suggested that at this stage it may be very useful to draw up a decision table or a decision tree or other semi-graphical device which will set out with some degree of visual intensity the alternatives and the consequences of each decision alternative so that the next stage of the process becomes somewhat easier.

This next stage is making the choice between the various alternatives that we have set down in our third stage. To many people, this is the very core of decision making. At this stage the decision process becomes very personal for this is a job for the one decision maker and no one else. True, he may appoint a committee or ask some one else to make a "decision". But in such cases his "decision" is merely to push the decision making responsibility on to some one else (and this may be a valid delegation) or simply to procrastinate till a further report comes to him. In real terms there is no escape from this stage of the process and all human activity stems from the imperatives of this stage.

Several things must be noted about the consideration of alternatives, not the least important of which is to realise that doing nothing or postponing a decision are themselves decision alternatives sometimes open. These are used perhaps more than they ought to be in the process of public service decision making.

Clearly our assessment of alternatives must proceed according to scientific methods. The processes of deduction and induction, of carrying out further experiments on alternatives and of simulating consequences are among the approaches available to us.

It is perhaps necessary to speak briefly about two common terms that are experienced in discussing decision making. One is intuition, the other is experience.

By experience I refer to that peculiar interaction of skills and knowledge which have been gained almost subconsciously or unconsciously (rather than as the direct effect of conscious training) by repeated exposure to pleasant and unpleasant effects of earlier decisions made by the person concerned or by others. The scientific marshalling of facts or their examination plays very little role in this process whereas, I suspect, they would have played a much greater role in some of the other factors which are listed below as constituting intuition.

Intuition, as Duncan points out, "has come to be one of those vague words which people use when they do not know what they are talking about and are not going to admit it" [3]. But nonetheless, it is widely used in decision making, and he sees intuition as a combination of four different factors, namely, knack or flair, skills acquired through training, intensive knowledge, and an interest in that area of decision. To this we should add perhaps a fifth factor, namely, what we spoke of above as experience.

It is necessary to be clear about these terms because we often hear, particularly from those members of organisations who are senior in age or have long service behind them, that they make decisions by intuition or by experience. As we see from the analysis we have just made, such decisions may carry with them their own dangers for there is no guarantee that all reasonable alternatives have been sufficiently considered.

To revert to the question of alternatives, we need perhaps to mention differences in two of the broad approaches available to us at this stage.

One approach may be to consider the whole problem purely in qualitative terms and this is often quite sufficient. But it may also be necessary to try to give some sort of quantitative value to the various alternatives open to us. This is easier in some instances than in others. But on the other hand, we must not adopt a quantitative approach purely for the sake of doing it. We must ask ourselves the question whether it is indeed meaningful to give some quantitative value to the various decisions. Much progress has recently been made in this area and measures of utility, as against simple financial or other considerations, are now becoming more and more available to assist in this process. The question of how much a decision should be based on quantitative considerations and how much on qualitative considerations is one to be settled in each case on its merits.

The very mention of quantification is a pointer to an element in the analysis of alternatives which is sometimes forgotten especially when decisions are made from a purely qualitative base. This is the fact of

some quantum of risk or uncertainty being allied to the effects of every decision that is being made. We must therefore, consider each alternative along with the consequences that may flow from it and the probability of their occurrence.

Many executives in the public services are also often troubled by questions of efficiency and fairness in decision making. They often find for instance, that in order to make a fair decision, they need much more information than they have, but which would be exceedingly time-consuming to collect. On the other hand they would be quite willing themselves to admit that a rapid decision may be more helpful to the person or persons affected by it. This is a trade-off that public servants have to learn to adopt in each instance, because as we have seen, the delay in the collection of information may itself invalidate or make stale the final decision.

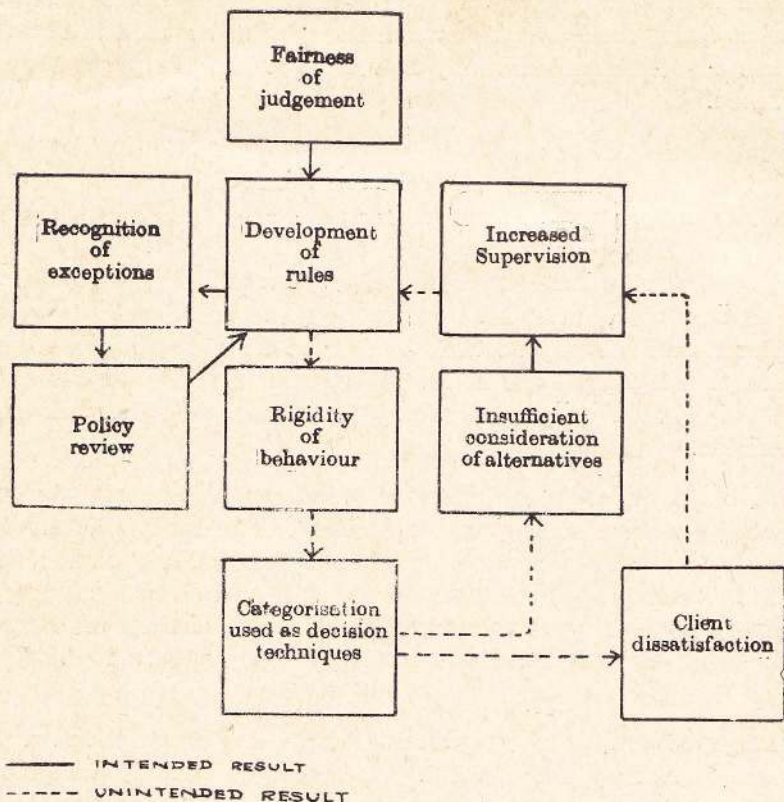
We do not often in the public services measure executive decision making capacity by the efficiency of the decision. With the public services taking on more and more developmental decision making, rather than simple routine administrative decision involved in governing a country, it seems necessary to clarify in what instances the efficiency of decision making should not carry greater weight. A different aspect of considerations of fairness and efficiency is examined later.

The last stage of our decision process is the implementation of the decision. Some of us may not consider this strictly a part of the process but it certainly deserves mention as a rounding off of the material of the decision, since it forces consideration of aspects of practicability of the decision, since it forces consideration of aspects of practicability of the only insufficiently considered.

Efficiency and Fairness in Public Service Decision Making

We noted above that there seems to be some difficulty in the public service climate of giving sufficient stress to efficiency in decision making. It seems sometimes that efficiency can be obtained only at the expense of fairness of judgement. If this really were so, it would be both dangerous and counter-productive. What I do suggest is that efficiency and fairness are not necessarily exclusive of each other in public service decision making, but rather that, owing to the bureaucratic structuring of these organisations, loss of efficiency seems to be an unintended consequence of the emphasis on fairness. (In certain instances the reverse may also be true).

The following model I propose on the basis of my own observations may be useful in suggesting how these unanticipated consequences may occur and may throw some light on what preventive action must be taken in each organisation to reduce their occurrence.



What I suggest in this model is this. To achieve fairness of judgment, we have to develop rules. These rules should be such as to permit certain virtues of public bureaucracy to be aimed at, namely, openness, use of discretion, flexibility of judgment (permitting handling of the exceptional case) and, of course, speed. The exceptional cases that are thrown up should be pointers to the review of policy and the development of new rules. Unfortunately the use of rules, as all students of the bureaucratic phenomenon are well aware, leads to rigidity of behaviour and the tendency to categorise problems to the extent of using categorisation itself as a decision technique. When this happens there is insufficient consideration of the alternatives open to the decision maker, resulting in a loss of efficiency as far as the decision process is concerned. The tendency to think in categories also leads to dissatisfaction on the part of one's clients because of the loss of individuality involved. Either result will lead to increased supervision being imposed, resulting in the development of further rules which will be ad hoc regulations rather than well-considered policy formulations.

It should be clear therefore that action needs to be taken at various points depending on each organisation's structure and task to prevent these unintended results taking place.

It should also be clear that, while fairness and inefficiency do not appear to be incompatible, the stress on fairness may lead to an unfortunate loss of efficiency owing to the weakening of some point of the decision making process.

Levels of Decision Making and Types of Decision

We may consider now the levels in an organisation at which decisions may be taken. It may be useful in this regard to keep in mind Herbert Simon's division of decisions into programmed and unprogrammed areas [5]. By a programmed decision is meant one that constantly recurs and can be fitted into the routine of an organisation. An unprogrammed decision, on the other hand, means one that has to be handled specifically because it has not occurred before. The use of such a dichotomy in the public service structure should be more or less obvious at first glance, for most such organisations are structured in a pyramidal fashion in order that that routine decisions could be taken as far down as possible. But the methods of operation of such organisations rarely lend themselves to the consideration of decisions within this very framework. It is often left to the person lower down to make a decision as to whether the required decision is a programmed or unprogrammed one; the consequences can be perilous for the organisation as well as for the public who are its clientele. It is therefore necessary for such organisations to have rapid procedures for separating out the non-routine decisions from the routine ones in the first instance.

Consideration along these lines will also considerably assist in the process of delegation of duties down the line and give a signal when the delegation progress is not functioning smoothly.

The level within an organisation at which a decision is taken must also be related to the degree of risk inherent in the decision and its consequences. As has often been pointed out, decisions which will be valid over a long time span are correlated with a high degree of risk and must be therefore taken at a higher level than otherwise. Decisions which can legitimately be considered as carrying little risk would be those whose effect will be valid only for a short period. These will generally be routine decisions, but it is necessary that the system should easily provide a signal if the degree of routine is not as great as originally programmed for.

It would be a very useful exercise for public service organisations to spend some of their time analysing specific areas where either delegation or its lack seems to be affecting their smooth working. This, too, is an exercise that is very rarely done.

Community and the Decision Process

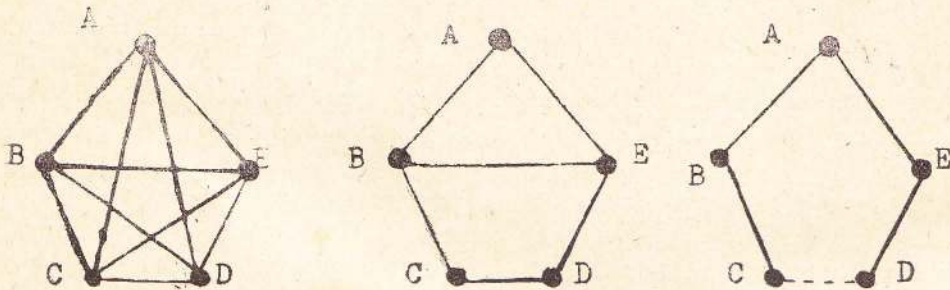
To be of any use a decision must also be communicated, as soon as possible after it is taken, to all those who have to carry it out as well as to those who would be affected by it. (It may also be necessary that certain decisions

be not communicated too widely). We must realize too, that the method of communication adopted to convey and carry out one particular decision may not be suitable towards conveying and carrying out some other decision. But in the public service structure this is not an approach that is considered at all. We tacitly assume that one structure is good enough for carrying out all decisions. Leavitt and Bavelas, among others, have shown the dangers inherent in this assumption [4].

They considered various communications structures such as



in which all communication is through a superior, as well as other channels like



They found that there is no one answer to the question which of these channels (or any other) will get the best results. This depends on both qualitative and quantitative aspects of the problem being tackled. This is a very important lesson especially for the public services, where we hardly even consider whether an organisation structure is able to take the strain in a given situation (whether in a problem of communication or otherwise).

Rationality and Habit in Decision Making

Lastly we come around to the question of rationality in the whole process of decision making. We now accept, as forcefully pointed out by Simon, that objective rationality is not always possible in decision making [6]. For one thing we may not have complete knowledge of facts and certainly

our knowledge of consequences will be always fragmentary. For another, assigning values to future consequences is also an imperfect process. Thirdly, as we noted earlier, we will never be able to list all the alternatives which we have to consider in the process of decision making for some of them will be beyond our range of skills or knowledge. And finally we may add to this list of the circumstance that the possible range of decisions may be very seriously affected by the practicability, and constraints on applicability, of each alternative being considered, some of which considerations may not be foreseeable.

We should perhaps end with a brief discussion on the effect that habit formation has on decision making, especially in the public service. It is very common to find senior public servants telling their subordinates or other audiences that they make decisions based on "habit". This means, when analysed, that they react in the same way to situations that appear similar. If this means further that the routine aspects of decision making are being separated from the non-routine aspects, something important in itself would be achieved. If, on the other hand, it means that this is not being done but an immediate response is being blindly given, the danger should be obvious. While there may be no irrationality in the process, the chances are that objectivity would be greatly reduced. We should therefore be rather suspicious of ourselves if we find ourselves taking decisions without some degree of hesitation, especially if the decisions are being taken at a fairly high level of the administrative ladder. Hesitation does not necessarily indicate incompetence: it should indicate the reaction time needed for the consideration of alternatives.

Conclusion

We have analysed the decision making process with particular reference to the structure of, and climate surrounding this activity in, the public services. Clearly there is large scope for a general strengthening of each stage of the process and those stages which appear weaker than others have specifically being identified, with some consideration of what may be causing the particular difficulty. It will certainly not be a bad idea for public servants to review the stages they themselves use in their own day-to-day decisions and to examine in an individual and personal manner what improvements they may be able to make for themselves.

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- [5] Simon, H. A., "The New Science of Decision Making", Harper and Row (New York, 1960), pp. 5-13.
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Relative Effectiveness of Some Group Methods in Agricultural Information Communication in Nepal

P. N. JHA AND J. R. BARAL

INTRODUCTION

THE progress in agriculture depends to a great extent on the speed of the dissemination of the messages of the new technology in the farming community and their wide scale adoption by farmers. In order to extend the new agricultural practices to farmers, more than 800 extension personnel of His Majesty's Government of Nepal have been working in the field. There are a number of communication media in hands of these personnel to communicate the new ideas effectively. These methods have invariably been classified as individual, group and mass methods. Taking into consideration the cost involved, group methods have often been preferred to individual contact methods as more number of farmers could be approached at a time. Among the group methods, lecture, group discussion, lecture-cum-discussion, flip book, flash cards flannel graphs and methods demonstration are most commonly used by the extension workers.

Further, while choosing the channels of communication, a communicator has to choose those channels which will bring effective communication of agricultural information. The information might vary and all the methods might not be equally effective in communicating the messages of different innovations. Hence, the selection of right channels for right purposes is the crux of the problem an extension worker is confronted with. A developing country that Nepal is, no such study had ever been conducted and the extension personnel choose the communication channels according to their personal preferences and convenience.

Keeping this in view, the present research project was designed to study experimentally the relative effectiveness of the selected group methods in agricultural information communication. The specific objectives of the study were : (1) to determine the relative effectiveness of lecture-cum-discussion, flip book and group discussion methods with respect to gain in farmers' knowledge about the use of artificial fertilizers in rice and control of stored grain pests of wheat and (2) to assess the amount of knowledge relatively retained by farmers about the use of artificial fertilizers in paddy and control of stored grain pests of wheat after fifteen days of their exposure through lecture-cum-discussion, flip book and group discussion methods.

The past work done in other countries

Geus (1953) studying the influence of the various methods of presentation reported that 38.30 per cent of the farmers exposed were influenced by picture only whereas lecture and discussion accounted for 44.80 per cent of the influence. Bhole (1957) reported lecture

meeting and group discussion as first in rank while comparing the efficiency per unit cost in comparison to literature and result demonstration. Roy (1967) stated group discussion as most effective followed by lecture method in the gain of knowledge of the farmer about the selected practices. Bhaskaram and Mahajan (1968) found lecture-cum-flash card as more effective than the lecture alone for retention of the knowledge about the seed treatment practice. Rao (1970) studying the effectiveness of selected audio-visuals in teaching farmers about foliar spray of urea on wheat crop observed that flannel-graph and flash cards were significantly superior to lecture in imparting knowledge. Dietrick (1960) found discussion method to be superior to the lecture method in developing abilities. Lokhande (1959) inferred that the group discussion was least effective in changing knowledge of the cultivators. Hakansson (1953) reported that there was an increase in the influence of meetings due to the use of supplements to the lecture (lecture and discussion) in which the effectiveness was 21 per cent more than the lecture method alone.

Research Methodology

In order to measure the initial knowledge, knowledge gained and the knowledge retained by farmers about the two practices, a knowledge test for each of the two practices was developed by following the principle of item analysis. For selecting the items in the test, four criteria, namely, item difficulty index, discrimination index, biserial correlation coefficients and representatives of that test were taken into consideration. Thus, 26 items for the use of artificial fertilizers in rice (P_1) and again 28 items for the control of the stored grain pests of wheat (P_2) were finally retained that formed the actual format of the knowledge test. The test so prepared was found to be highly reliable and valid. The total number of tickmarked items was the knowledge score obtained by an individual farmer. The range of score obtained by a respondent on the test might vary between 0 and 26 in each of the two tests in this study. Jha and Singh (1970) followed the same technique for measuring the knowledge about the high-yielding varieties of wheat.

Setting and the sampling

The study was conducted in Dhanukha District of Nepal. The district lies on the Eastern Tarai belt of the country. The activities of different agricultural offices and organisations are intensified in a coordinated manner. Based on the pilot study of the District, three identical villages : Deopura, Kumraura and Bispitti were selected. Care was taken to see that the three villages did not differ in caste, education, crops grown, religion, etc. The purpose in selecting three identical villages in three opposite directions at a distance of 5 kilometers was to replicate the exposures to similar groups of persons twice by each method without the possibility of seepage of the effect of a particular method tried in one village occurring in its neighbouring village.

Individuals above 15 years in age in all the three villages were categorised into 9 groups on the basis of three levels of each age and education. Following the principle of multi-stage stratified random sampling, 36 respondents out of the total male population surveyed and grouped were selected in each village. Thus, a total of 108 samples was drawn for the study out of a total of 494 male members in three villages. To test the

identitiness or the variation, if any, among the three selected villages, the initial scores obtained by the 36 respondents of each village about both of the practices (P_1 and P_2) were analysed differently and the analysis of variance is cited in Table 1.

TABLE 1
Combined Analysis of Variance of the Three Villages about P_1 and P_2 Practices

Practice	P_1			P_2	
	d.f.	M.S.	Calculated F.	M.S.	Calculated F.
Between villages ..	2 ..	22.62 ..	1.23 N.S. ..	56.69 ..	2.41 N.S.
Between strata within villages ..	24 ..	18.29 ..	1.30 N.S. ..	23.45 ..	1.56 N.S.
Error ..	81 ..	13.99 ..	— ..	14.95 ..	—
Total ..	107				

N.S. = Non-significant at 0.05 level.

From Table 1, it is apparent that the calculated value of 'P' was found to be non-significant in between villages as well as in between strata within villages. It was, thus, inferred that there was no existing variation in between the three villages. In other words, the selected villages were more or less identical and the study could be dependable and valid.

The design of research

The successional (before and after measurement) experimental design as suggested by Furfey (1955) was used for the study of the relative effectiveness of the three group methods.

Operationalisation of the concepts used in the study

Group methods.—Those communication channels, which could be used in a group situation. Lecture-cum-discussion, flip book and group discussion were the group methods selected for this study.

Lecture-cum-discussion.—It refers to a prepared informative talk given before a group of farmers followed by discussion. A group of farmers after getting an informative talk is engaged in a discussion around the talk.

Flip book.—Flip book consists of brief visual messages on spiral-bound convenient drawing sheets, arranged and displayed in a logical order to emphasise key points in a presentation.

Group discussion.—It is a group cooperative effort where a group meets together to try to understand and solve some particular problem common to it. In this process, ideas are clarified, systematised and misunderstandings are removed.

Initial knowledge.—It refers to the basic knowledge or the knowledge farmers have about the message before being exposed.

Knowledge gained.—It refers to the difference in the final and initial scores of a farmer on the same knowledge test as an effect of the use of a particular group method.

Knowledge retained.—It is the extent of knowledge possessed on the same knowledge test as the effect due to a group method minus the extent of the gained knowledge forgotten by farmers after a specific interval of fifteen days.

Hypothesis

Keeping the specific objectives in view, the following null hypotheses were to be tested :—

- H₁ : There is no difference in the amount of knowledge gained about the use of artificial fertilizers in rice by farmers through lecture-cum-discussion, flip book, and group discussion methods.
- H₂ : There is no difference in the amount of knowledge gained about the control of stored grain pests of wheat by farmers through lecture-cum-discussion, flip book, and group discussion methods.
- H₃ : There is no difference in the amount of knowledge retained about the use of artificial fertilizers in rice by farmers through lecture-cum-discussion, flip book and group discussion methods.
- H₄ : There is no difference in the amount of knowledge retained about the control of stored grain pests of wheat by farmers through lecture-cum-discussion, flip book, and group discussion methods.

EXPERIMENTAL FINDINGS

Relative gain in knowledge through the three group methods

The scores of the knowledge gained through all the three group methods were subjected to a combined analysis of variance as given in Table 2.

TABLE 2
Differences in Scores Attributable to Methods: Analysis of variance :

Practice	Use of artificial fertilizers in rice		Control of stored grain pests of wheat		
	(P ₁)		(P ₂)		
	d.f.	M.S.	Calculated F.	M.S.	Calculated F.
Between methods ..	2 ..	27.06 ..	3.91* ..	53.50 ..	10.01 †
Between strata within methods ..	24 ..	45.76 ..	6.61 † ..	37.25 ..	6.97 †
Error ..	81 ..	6.92 ..	— ..	5.34 ..	—
Total ..	107				

* Significant at 0.05 level

† Significant 0.01 level

d.f. = Indicates degree of freedom .

M.S. = Indicates mean sum of square.

F. = Indicates variance ratio.

The calculated value of 'F' (F=3.91 and 10.01 for P₁ and P₂ respectively) was statistically significant as shown in Table 2 indicating that the three methods differed significantly from one another in increasing the knowledge of farmers about both the farm practices. In other words, the amount of learning was not equal through the three group methods. The three methods were not equally effective.

The null hypothesis (H₁) is, therefore, rejected. The data support the proposition that there is a difference in the amount of knowledge gained about the use of artificial fertilizers in rice by farmers through lecture-cum-discussion, flip book, and group discussion methods.

Likewise, the null hypothesis (H₂) is also rejected. Hence, there is a difference in the amount of knowledge gained about the control of stored grain pests of wheat by farmers through lecture-cum-discussion, flip book, and group discussion methods.

Results with respect to extent of difference between lecture-cum-discussion, flip book, and group discussion methods are summarised in Table 3.

TABLE 3

Relative Effectiveness of the three Group Methods on Knowledge gained

Methods	Lecture-cum-discussion	Flip book	Group discussion ₁	Calculated 't'
Mean knowledge gained scored about the use of artificial fertilizers in rice (P ₁)	9.66 ..	9.39 ..	8.17 For M ₁ M ₂ ..	0.75 n. s. For M ₁ M ₃ .. 4.13+ For M ₂ M ₃ .. 3.38+
Mean knowledge gained scores about the control of stored grain pests of wheat (P ₂)	8.31 ..	9.36 ..	6.99 For M ₁ M ₂ ..	1.94 n. s. For M ₁ M ₃ .. 2.44+ For M ₂ M ₃ .. 4.38+

* Indicates greater than.

+ Significant at 0.01 level.

n.s.= Non-significant at 0.05 level.

A perusal of Table 3 reveals that for both the farm practices, farmers gained significantly less knowledge through group discussion as compared to lecture-cum-discussion, and flip book methods. On the other hand lecture-cum-discussion, and flip book did not differ significantly in their effect on gaining of the knowledge by farmers.

The analysis was extended further and the percentage gain in knowledge of farmers through the three methods about both the practices was also worked out.

TABLE 4

Percentage gain in knowledge of farmers through the three methods

Source	Mean score		Percentage ¹ gain in knowledge
	Initial knowledge	Knowledge gained	
<i>Use of artificial fertilizers in paddy (P₁)</i>			
Lecture-cum-discussion (M ₁)	.. 12.42 ..	9.66 ..	78
Flip book (M ₂)	.. 11.67 ..	9.39 ..	80
Group discussion (M ₃)	.. 14.04 ..	8.17 ..	59
<i>Control of stored grain pests of wheat (P₂)</i>			
Lecture-cum-discussion (M ₁)	.. 8.23 ..	8.31 ..	101
Flip book (M ₂)	.. 8.71 ..	9.36 ..	107
Group discussion (M ₃)	.. 10.60 ..	6.99 ..	66

¹ The percentage has been rounded to whole number.

A critical examination of Table 4, makes it clear that on the basis of the percentage gain in knowledge, the three group methods could be ordered as : (1) flip book, (2) lecture-cum-discussion, and (3) group discussion, for both the practices.

Relative retention of knowledge acquired through the three group methods :

The difference in the score obtained by farmers after 15 days of exposure and the initial knowledge score was taken as a measure of knowledge retained by farmers. The retention scores were subjected to a combined analysis through the technique of analysis of variance as given in Table 5.

TABLE 5

Knowledge retained through different Methods

Practice	ANALYSIS OF VARIANCE					
	Use of artificial fertilizers in rice (P ₁)			Control of stored grain pests of Wheat (P ₂)		
	d.f.	M.S.	Calculated F.	M.S.	Calculated F.	
Between methods ..	2 ..	239.73 ..	18.51+ ..	41.67 ..	3.42.	
Between strata within methods ..	24 ..	10.22 ..	0.56 N.S. ..	9.72 ..	0.79 N.S.	
Error	81 ..	18.35 ..	— ..	12.19 ..	—	
Total ..	107					

N.S. = Non-significant

* significant at 0.05 level.

+ significant at 0.01 level.

The computed value of 'F' was 18.51 as shown in Table 5 which is statistically significant at 0.01 level. The null hypothesis (H_3) is, therefore, rejected. The data support the proposition that there is a difference in the amount of knowledge retained about the use of artificial fertilizers in rice by farmers through lecture-cum-discussion, flip book and group discussion methods.

Likewise, for the control of stored grain pests of wheat, the computed value of 'F' was 3.42 which is statistically significant at 0.05 level. The null hypothesis (H_4) is, hence, rejected. The data support the proposition that there is a difference in the amount of knowledge retained about the control of stored grain pests of wheat by farmers through lecture-cum-discussion, flip book, and group discussion methods.

It is, thus, inferred that there was a significant difference in the knowledge retained about both the farm practices by farmers through lecture-cum-discussion, flip book, and group discussion methods. In other words, the effectiveness of the three group methods was not alike in retaining the knowledge.

Results with respect to the differences between the three group methods are summarised in Table 6.

TABLE 6

Relative effectiveness of the selected group methods in retention of knowledge

Methods	Lecture-cum-discussion (M_1)	Flip book (M_2)	Group discussion (M_3)	Calculated 't'
Mean knowledge retained scores about the use of artificial fertilizers in rice (P_1)	8.00	7.15	3.04	For M_1M_2 .. 0.84 (N.S.) For M_1M_3 .. 4.91+ For M_2M_3 .. 4.06+
Mean knowledge retained scores about the control of stored grain pests of wheat (P_2)	6.23	4.36	3.29	For M_1M_2 .. 2.21* For M_1M_3 .. 3.58+ For M_2M_3 .. 1.30 (N.S.)

N.S.=Non-significant.

* Significant at 0.05 level.

+ Significant at 0.01 level.

From the table, it is evident that there was no significant difference in the amount of knowledge retained by farmers about the use of artificial fertilizers in rice through lecture-cum-discussion, and flip book methods. But, farmers retained significantly more knowledge through these methods as compared to group discussion. In other words, lecture-cum-discussion and flip book were equally effective in retention of farmers' knowledge. Group discussion was significantly less effective in retaining farmers' knowledge than lecture-cum-discussion and flip book.

As regards control of stored grain pests of wheat, flip book, and group discussion were equally effective since the differences were non-significant. Lecture-cum-discussion proved most effective in retaining farmers' knowledge. The percentage retention of knowledge through the three methods is presented in Table 7.

TABLE 7
Percentage Retention of Farmers' knowledge through different group methods

Source	Mean score		Percentage ¹ retention in knowledge
	Initial knowledge	Knowledge retained	
<i>Use of artificial fertilizers in rice (P₁)</i>			
Lecture-cum-discussion (M ₁)	.. 12.42 ..	8.00 ..	64
Flip book (M ₂)	.. 11.67 ..	7.15 ..	61
Group discussion (M ₃)	.. 14.04 ..	3.04 ..	22
<i>Control of stored grain pests of wheat (p₂)</i>			
Lecture-cum-discussion (M ₁)	.. 8.23 ..	6.23 ..	76
Flip book (M ₂)	.. 8.71 ..	4.35 ..	50
Group discussion (M ₃)	.. 10.60 ..	3.29 ..	31

¹The percentage has been rounded to whole number.

From Table 7, it is obvious that on the basis of the percentage retention of knowledge, the three group methods could be ordered as : (1) lecture-cum-discussion, (2) flip book, and (3) group discussion for both the practices namely, use of artificial fertilizers in rice and control of stored grain pests of wheat.

DISCUSSION

The amount of knowledge gained through the three group methods differed significantly. Lecture-cum-discussion, and flip book methods did not differ significantly in their effect on gaining of the knowledge by farmers whereas these two methods differed significantly as compared to group discussion. On the basis of the percentage gain in knowledge, the three methods could be ordered as : (1) lecture-cum-discussion (2) flip book, and (3) group discussion, for both the practices.

Lecture-cum-discussion, and flip book were equally effective in retention of farmers' knowledge about the use of artificial fertilizers in rice. Group discussion was less effective with respect to amount of knowledge retained by farmers as compared to lecture-cum-discussion, and flip book methods. As regards control of stored grain pests of wheat, flip book and group discussion methods were equally effective in retaining farmers' knowledge, while lecture-cum-discussion proved most effective of all the three methods. On

the basis of the percentage retention of knowledge, the methods were ordered as : (1) lecture-cum-discussion, (2) flip book, (3) group discussion, for both the practices.

The findings furnish a guideline to the operational field workers in selecting the group methods for communicating the message in the farming community. They should as a first preference use lecture-cum-discussion method to communicate their ideas effectively. Lecture-cum-discussion has some advantages as compared to flip book method since it does not require much planning and preparation, financial and instrumental supports apart from being convenient to handle. Flip book involved the use of more senses and being attractive and systematic learning is more and faster. Undoubtedly, extension workers could use this method while working with farmers. Even for conducting training programmes for farmers and local functional leaders, the recommended group methods could be made use of.

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How to Choose a Leadership Pattern*

ROBERT TANNENBAUM AND
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“I put most problems into my group's hands and leave it to them to carry the ball from there. I serve merely as a catalyst, mirroring back the people's thoughts and feelings so that they can better understand them”.

“It's foolish to make decisions oneself on matters that affect people. I always talk things over with my subordinates but I make it clear to them that I'm the one who has to have the final say”.

“Once I have decided on a course of action, I do my best to sell my ideas to my employees”.

“I'm being paid to lead. If I let a lot of other people make the decisions I should be making, then I'm not worth my salt”.

“I believe in getting things done. I can't waste time calling meetings. Someone has to call the shots around here, and I think it should be me.”

Each of these statements represents a point of view about “good leadership”. Considerable experience, factual data, and theoretical principles could be cited to support each statement, even though they seem to be inconsistent when placed together. Such contradictions point up the dilemma in which the modern manager frequently finds himself.

NEW PROBLEM

The problem of how the modern manager can be “democratic” in his relations with subordinates and at the same time maintain the necessary authority and control in the organization for which he is responsible has come into focus increasingly in recent years.

Earlier in the century this problem was not so acutely felt. The successful executive was generally pictured as possessing intelligence, imagination, initiative, the capacity to make rapid (and generally wise) decisions, and the ability to inspire subordinates. People tended to think of the world as being divided into “leaders” and “followers”.

NEW FOCUS

Gradually, however, from the social sciences emerged the concept of “group dynamics” with its focus on members of the group rather than solely on the leader. Research efforts of social scientists underscored the importance of employee involvement and participation in decision making. Evidence began to challenge the efficiency of highly directive leadership, and increasing attention was paid to problems of motivation and human relations.

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Through training laboratories in group development that sprang up across the country, many of the newer notions of leadership began to exert an impact. These training laboratories were carefully designed to give people a firsthand experience in full participation and decision making. The designated "leaders" deliberately attempted to reduce their own power and to make group members as responsible as possible for setting their own goals and methods within the laboratory experience.

It was perhaps inevitable that some of the people who attended the training laboratories regarded this kind of leadership as being truly "democratic" and went home with the determination to build fully participative decision making into their own organizations. Whenever their bosses made a decision without convening a staff meeting, they tended to perceive this as authoritarian behaviour. The true symbol of democratic leadership to some was the meeting and the less directed from the top, the more democratic it was.

Some of the more enthusiastic alumni of these training laboratories began to get the habit of categorizing leader behaviour as "democratic" or "authoritarian". The boss who made too many decisions himself was thought of as an authoritarian, and his directive behaviour was often attributed solely to his personality.

NEW NEED

The net result of the research findings and of the human relations training based upon them has been to call into question the stereotype of an effective leader. Consequently, the modern manager often finds himself in an uncomfortable state of mind.

Often he is not quite sure how to behave ; there are times when he is torn between exerting "strong" leadership and "permissive" leadership. Sometimes new knowledge pushes him in one direction ("I should really get the group to help make this decision") but at the same time his experience pushes him in another direction ("I really understand the problem better than the group and therefore I should make the decision"). He is not sure when a group decision is really appropriate or when holding a staff meeting serves merely as a device for avoiding his own decision-making responsibility.

The purpose of our article is to suggest a framework which managers may find useful in grappling with this dilemma. First, we shall look at the different patterns of leadership behaviour that the manager can choose from in relating himself to his subordinates. Then, we shall turn to some of the questions suggested by this range of patterns. For instance, how important is it for a manager's subordinates to know what type of leadership he is using in a situation ? What factors should be considered in deciding on a leadership pattern ? What difference do his long-run objectives make as compared to his immediate objective ?

RANGE OF BEHAVIOUR

Exhibit 1—Presents the continuum or range of possible leadership behaviour available to a manager. Each type of action is related to the degree of authority used by the boss and to the amount of freedom available to his subordinates in reaching decisions. The actions seen on the extreme left characterize the manager who maintains a high degree

of control while those seen on the extreme right characterize the manager who releases a high degree of control. Neither extreme is absolute authority, and freedom are never without their limitations.

Now let us look more closely at each of the behaviour points occurring along this continuum.

THE MANAGER MAKES THE DECISION AND ANNOUNCES IT

In this case the boss identifies a problem, considers alternative solutions, chooses one of them, and then reports this decision to his subordinates for implementation. He may or may not give consideration to what he believes his subordinates will think or feel about his decision; in any case, he provides no opportunity for them to participate directly in the decision-making process. Coercion may or may not be used or implied.

THE MANAGER "SELLS" HIS DECISION

Here the manager, as before, takes responsibility for identifying the problem and arriving at a decision. However, rather than simply announcing it, he takes the additional step of persuading his subordinates to accept it. In doing so, he recognizes the possibility of some resistance among those who will be faced with the decision, and seeks to reduce this resistance by indicating, for example, what the employees have to gain from his decision.

THE MANAGER PRESENTS HIS IDEAS, INVITES QUESTIONS

Here the boss who has arrived at a decision and who seeks acceptance of his ideas provides an opportunity for his subordinates to get a fuller explanation of his thinking and his intentions. After presenting the ideas, he invites questions so that his associates can better understand what he is trying to accomplish. This "give and take" also enables the manager and the subordinates to explore more fully the implications of the decision.

THE MANAGER PRESENTS A TENTATIVE DECISION SUBJECT TO CHANGE

This kind of behaviour permits the subordinates to exert some influence on the decision. The initiative for identifying and diagnosing the problem remains with the boss. Before meeting with his staff he has thought the problem through and arrived at a decision—but only a tentative one. Before finalizing, it he presents his proposed solution for the reaction of those who will be affected by it. He says in effect, "I'd like to hear what you have to say about this plan that I have developed. I'll appreciate your frank reactions, but will reserve for myself the final decision".

THE MANAGER PRESENTS THE PROBLEM, GETS SUGGESTIONS, AND THEN AND MAKES HIS DECISION

Up to this point the boss has come before the group with a solution of his own. Not so in this case. The subordinates now get the first chance to suggest solutions. The manager's initial role involves identifying the problem. He might, for example, say something of this sort: "We are faced with a number of complaints from newspapers

and the general public on our service policy. What is wrong here ? What ideas do you have for coming to grips with this problem ?”

The function of the group becomes one of increasing the manager's repertory of possible solutions to the problem. The purpose is to capitalize on the knowledge and experience of those who are on the “firing line” from the expanded list of alternatives developed by the manager and his subordinates, the manager then selects the solution that he regards as most promising¹.

THE MANAGER DEFINES THE LIMITS AND REQUESTS THE GROUP TO MAKE A DECISION

At this point the manager passes to the group (possibly including himself as a member) the right to make decisions. Before doing so, however, he defines the problem to be solved and the boundaries within which the decision must be made.

An example might be the handling of a parking problem at a plant. The boss decides that this is something that should be worked on by the people involved, so he calls them together and points up the existence of the problem. Then he tells them :

“ There is the open field just north of the main plant which has been designated for additional employee parking. We can build underground or surface multilevel facilities as long as the cost does not exceed \$ 100,000. Within these limits we are free to work out solution that makes sense to us. After we decide on a specific plan, the company will spend the available money in whatever way we indicate.”

THE MANGER PERMITS THE GROUP TO MAKE DECISIONS WITHIN PRESCRIBED LIMITS

This represents an extreme degree of group freedom only occasionally encountered in formal organizations, as, for instance in many research groups. Here the team of managers or engineers undertakes the identification and diagnosis of the problem, develops alternative procedures for solving it, and decides on one or more of these alternative solutions. The only limits directly imposed on the group by the organization are those specified by the superior of the team's boss. If the boss participates in the decision making process, he attempts to do so with no more authority than any other member of the group. He commits himself in advance to assist in implementing whatever decision the group makes.

KEY QUESTIONS

As the continuum in Exhibit I demonstrates, there are a number of alternative ways in which a manager can relate himself to the group or individuals he is supervising. At the extreme left of the range, the emphasis is on the manager—on what he is interested in, how he sees things, how he feels about them. As we move toward the subordinate centered end of the continuum, however, the focus is increasingly on the subordinates—on what they are interested in, how they look at things, how they feel about them.

¹ For a fuller explanation of this approach see Leo Moore, “Too Much Management, Too Little Change,” HBR, January-February, 1956 p. 41.

When business leadership is regarded in this way, a number of questions arise. Let us take four of especial importance :

CAN BOSS EVER RELINQUISH HIS RESPONSIBILITY BY DELEGATING IT TO SOMEONE ELSE ?

Our view is that the manager must expect to be held responsible by his superior for the quality of the decisions made, even though operationally these decisions may have been made on a group basis. He should therefore be ready to accept whatever risk is involved whenever he delegates decision-making power to his subordinates. Delegation is not a way of " passing the buck ". Also it should be emphasized that the amount of freedom the boss gives to his subordinates cannot be greater than the freedom which he himself has been given by his own superior.

SHOULD THE MANAGER PARTICIPATE WITH HIS SUBORDINATES ONCE HE HAS DELEGATED RESPONSIBILITY TO THEM ?

The manager should carefully think over this question and decide on his role prior to involving the subordinate group. He should ask if his presence will inhibit or facilitate the problem-solving process. There may be some instances when he should leave the group to let it solve the problem for itself. Typically, however, the boss has useful ideas to contribute, and should function as an additional member of the group. In the latter instance it is important that he indicate clearly to the group that he sees himself in a member role rather than in an authority role.

HOW IMPORTANT IS IT FOR THE GROUP TO RECOGNIZE WHAT KIND OF LEADERSHIP BEHAVIOUR THE BOSS IS USING ?

It makes a great deal of difference. Many relationship problems between boss and subordinate occur because the boss fails to make clear how he plans to use his authority. If, for example he actually intends to make a certain decision himself but the subordinate group gets the impression that he has delegated this authority, considerable confusion and resentment are likely to follow. Problems may also occur when the boss uses a " democratic " facade to conceal the fact that he has already made a decision which he hopes the group will accept as its own. The attempt "to make them think it was their idea in the first place " is a risky one. We believe that it is highly important for the manager to be honest and clear in describing what authority he is keeping and what role he is asking his subordinate to assume in solving a particular problem.

CAN YOU TELL HOW "DEMOCRATIC" A MANAGER IS BY THE NUMBER OF DECISIONS HIS SUBORDINATES MAKE ?

The sheer number of decisions is not an accurate index of the amount of freedom that a subordinate group enjoys. More important is the significance of the decisions which the boss entrusts to his subordinates. Obviously a decision on how to arrange desks is of an entirely different order from a decision involving introduction of

new electronic data-processing equipment. Even though the widest possible limits are given in dealing with the first issue, the group will sense no particular degree of responsibility. For a boss to permit the group to decide equipment policy, over within rather narrow limits would reflect a greater degree of confidence in them on his part.

DECIDING HOW TO LEAD

Now let us turn from the types of leadership which are possible in a company situation to the question of what types are practical and desirable. What factors or forces should a manager consider in deciding how to manage? Three are of particular importance:

- Forces in the manager.
- Forces in the subordinates.
- Forces in the situation.

We should like briefly to describe these elements and indicate how they might influence a manager's action in a decision-making situation¹. The strength of each of them will, of course, vary from instance to instance but the manager who is sensitive to them can better assess the problems which face him and determine which mode of leadership behaviour is most appropriate for him.

FORCES IN THE MANGER :

The manager's behaviour in any given instance will be influenced greatly by the many forces operating within his own personality. He will, of course, perceive his leadership problems in a unique way on the basis of his background, knowledge, and experience. Among the important internal forces affecting him will be the following :

1. *His value system.*—How strongly does he feel that individuals should have a share in making the decisions which affect them? Or, how convinced is he that the Official who is paid to assume responsibility should personally carry the burden of decision making? The strength of his convictions on questions like these will tend to move the manager to one end or the other of the continuum shown in Exhibit I. His behaviour will also be influenced by the relative importance that he attaches to organizational efficiency, personal growth of subordinates, and company profits².

2. *His confidence in his subordinates.*—Managers differ greatly in the amount of trust they have in other people generally, and this carries over to the particular employees they supervise at a given time. In viewing his particular group of subordinates, the manager is likely to consider their knowledge and competence with respect to the problem. A central question he might ask himself is : "Who is best qualified to deal with this problem ? Often he may, justifiably or not, have more confidence in his own capabilities than in those of his subordinates.

¹ See also Robert Tannenbaum and Fred Massarik " Participation by Subordinates in the Managerial Decision-Making Process," Canadian Journal of Economics and Political Science August 1950, p. 413.

² See Chris Argyris " Top Management Dilemma : Company Needs vs. Individual Development," Personnel. September 1955, pp. 123-134.

3. *His own leadership inclinations.*—There are some managers who seem to function more comfortably and naturally as highly directive leaders. Resolving problems and issuing orders come easily to them. Other managers seem to operate more comfortably in a team role, where they are continually sharing many of their functions with their subordinates.

4. *His feelings of security in an uncertain situation.*—The manager who releases control over the decision-making process thereby reduces the predictability of the outcome. Some managers have a greater need than others for predictability and stability in their environment. This “tolerance for ambiguity” is being viewed increasingly by psychologists as a key variable in a person’s manner of dealing with problems.

The manager brings these and other highly personal variables to each situation he faces. If he can see them as forces which consciously or unconsciously, influence his better understand what makes him prefer to act in a given way. And understanding this, behaviour, he can often make himself more effective.

Forces in the subordinate :

Before deciding how to lead a certain group, the manager will also want to consider a number of forces affecting his subordinates’ behaviour. He will want to remember that each employee, like himself, is influenced by many personality variables. In addition, each subordinate has a set of expectations about how the boss should act in relation to him (the phrase “expected behavior” is one we hear more and more often these days at discussions of leadership and teaching). The better the manager understands these factors, the more accurately he can determine what kind of behaviour on his part will enable his subordinates to act most effectively.

Generally speaking, the manager can permit his subordinates greater freedom if the following essential conditions exist :—

- If the subordinates have relatively high needs for independence. (As we all know, people differ greatly in the amount of directions that they desire.)
- If the subordinates have a readiness to assume responsibility for decision making. (Some see additional responsibility as a tribute to their ability ; others see it as “passing the buck.”)
- If they have a relatively high tolerance for ambiguity. (Some employees prefer to have clear-cut directives given to them ; others prefer a wider area of freedom.)
- If they are interested in the problem and feel that it is important.
- If they understand and identify with the goals of the organization.
- If they have the necessary knowledge and experience to deal with the problem.
- If they have learned to expect to share in decision making. (Persons who have come to expect strong leadership and are then suddenly confronted with the request to share more fully in decision making are often upset by this new experience. On the other hand, persons who have enjoyed a considerable amount of freedom resent the boss who begins to make all the decisions himself.)

The manager will probably tend to make fuller use of his own authority if the above conditions do not exist ; at times there may be no realistic alternative to running a "one-man show".

The restrictive effect of many of the forces will of course be greatly modified by the general feeling of confidence which subordinates have in the boss. Where they have learned to respect and trust him he is free to vary his behavior. He will feel certain that he will not be perceived as an authoritarian boss on those occasions when he makes decisions by himself. Similarly, he will not be seen as using staff meetings to avoid his decision-making responsibility. In a climate of mutual confidence and respect, people tend to feel less threatened by deviations from normal practice, which in turn makes possible a higher degree of flexibility in the whole relationship.

Forces in the situation :

In addition to the forces which exist in the manager himself and in his subordinates, certain characteristics of the general situation will also affect the manager's behavior. Among the more critical environmental pressures that surround him are those which stem from the organization, the work group, the nature of the problem, and the pressures of time. Let us look briefly at each of these :

Type of organization :

Like individuals organizations have values and traditions which inevitably influence the behavior of the people who work in them. The manager who is a newcomer to a company quickly discovers that certain kinds of behavior are approved while others are not. He also discovers that to deviate radically from what is generally accepted is likely to create problems for him.

These values and traditions are communicated in numerous ways-through job descriptions policy pronouncements and public statements by top executives. Some organizations, for example hold to the notion that the desirable executive is one who is dynamic, imaginative, decisive and persuasive. Other organizations put more emphasis upon the importance of the executive's ability to work effectively with people-his human relations skills. The fact that his superiors have a defined concept of what the good executive should be will very likely push the manager toward one end or the other of the behavioral range.

In addition to the above the amount of employee participation is influenced by such variables as the size of the working units, the geographical distribution, and the degree of inter and intra-organizational security required to attain company goals. For example, the wide geographical dispersion of an organization may preclude a practical system of participative decision making, even though this would otherwise be desirable. Similarly, the size of the working units or the need for keeping plans confidential may make it necessary for the boss to exercise more control than would otherwise be the case. Factors like these may limit considerably the manager's ability to function flexibly on the continuum.

Group effectiveness

Before turning decision-making responsibility over to a subordinate group, the boss should consider how effectively its members work together as a unit.

One of the relevant factors here is the experience the group has had in working together. It can generally be expected that a group which has functioned for some time will have developed habits of co-operation and thus be able to tackle a problem more effectively than a new group. It can also be expected that a group of people with similar backgrounds and interests will work more quickly and easily than people with dissimilar backgrounds, because the communication problems are likely to be less complex.

The degree of confidence that the members have in their ability to solve problems as a group is also a key consideration. Finally, such group variables as cohesiveness, permissiveness, mutual acceptance, and commonality of purpose will exert subtle but powerful influence on the group's functioning.

The problem itself

The nature of the problem may determine what degree of authority should be delegated by the manager to his subordinates. Obviously he will ask himself whether they have the kind of knowledge which is needed. It is possible to do them a real disservice by assigning a problem that experience does not equip them to handle.

Since the problems faced in large or growing industries increasingly require knowledge of specialists from many different fields, it might be inferred that the more complex a problem, the more anxious a manager will be to get some assistance in solving it. However, this is not always the case. There will be times when the very complexity of the problem calls for one person to work it out. For example if the manager has most of the background and factual data relevant to a given issue, it may be easier for him to think it through himself than to take the time to fill in his staff on all the pertinent background information.

The key question to ask, of course, is; "Have I heard the ideas of everyone who has the necessary knowledge to make a significant contribution to the solution of this problem" ?

The pressure of time

This is perhaps the most clearly felt pressure on the manager (in spite of the fact that it may sometimes be imagined). The more that he feels the need for an immediate decision, the more difficult it is to involve other people. In organizations which are in a constant state of "crisis" and "crash programming" one is likely to find managers personally using a high degree of authority with relatively little delegation to subordinates. When the time pressure is less intense, however, it becomes much more possible to bring subordinates in on the decision-making process.

These, then are the principal forces that impinge on the manager in any given instance and that tend to determine his tactical behavior in relation to his subordinates. In each case his behaviour ideally will be that which makes possible the most effective attainment of his immediate goal within the limits facing him.

LONG-RUN STRATEGY

As the manager works with his organization on the problems that come up day by day, his choice of a leadership pattern is usually limited. He must take account of the forces just described and within the restrictions they impose on him do the best that he can. But as he looks ahead months or even years, he can shift his thinking from tactics to large-scale strategy. No longer need he be fettered by all of the forces mentioned, for he can view many of them as variables over which he has some control. He can, for example gain new insights or skills for himself, supply training for individual subordinates, and provide participative experiences for his employee group.

In trying to bring about a change in these variables, however, he is faced with a challenging question : At which point along the continuum should he act ?

Attaining objectives

The answer depends largely on what he wants to accomplish. Let us suppose that he is interested in the same objectives that most modern managers seek to attain when they can shift their attention from the pressure of immediate assignments :

1. To raise the level of employee motivation.
2. To increase the readiness of subordinates to accept change.
3. To improve the quality of all managerial decisions.
4. To develop teamwork and morale.
5. To further the individual development of employees.

In recent years the manager has been deluged with a flow of advice on how best to achieve these longer run objectives. It is little wonder that he is often both bewildered and annoyed. However there are some guidelines which he can usefully follow in making a decision.

Most research and much of the experience of recent years give a strong factual basis to the theory that a fairly high degree of subordinate-centered behavior is associated with the accomplishment of the five purposes mentioned. This does not mean that a manager should always leave all decisions to his assistants. To provide the individual or the group with greater freedom than they are ready for at any given time may very well tend to generate anxieties and therefore inhibit rather than facilitate the attainment of desired objectives. But this should not keep the manager from making a continuing effort to confront his subordinates with the challenge of freedom.

4. For example see Warren H. Schmidt and Paul C. Buchanan, *Techniques that Produce Teamwork* (New London, Arthru C. Croft Publications 1954) and Morris S. Viteles, *Motivation and Morale in Industry* New York, W.W. Norton & Company, Inc., 1953).

CONCLUSION

In summary there are two implications in the basic thesis that we have been developing. The first is that the successful leader is one who is keenly aware of those forces which are most relevant to his behavior at any given time. He accurately understands himself, the individuals and group he is dealing with, and the company and broader, social environment in which he operates. And certainly he is able to assess the present readiness for growth of his subordinates.

But this sensitivity or understanding is not enough, which brings us to the second implication. The successful leader is one who is able to behave appropriately in the light of these perceptions. If direction is in order, he is able to direct; if considerable participative freedom is called for, he is able to provide such freedom.

Thus, the successful manager of men can be primarily characterized neither as a strong leader nor as a permissive one. Rather, he is one who maintains a high batting average in accurately assessing the forces that determine what his most appropriate behavior at any given time should be and in actually being able to behave accordingly. Being both insightful and flexible, he is less likely to see the problems of leadership as a dilemma.

RETROSPECTIVE COMMENTARY

Since this HBR Classic was first published in 1958, there have been many changes in organizations and in the world that have affected leadership patterns. While the article's continued popularity attests to its essential validity, we believe it can be reconsidered and updated to reflect subsequent societal changes and new management concepts.

The reasons for the article's continued relevance can be summarized briefly.

The article contains insights and perspectives which mesh well with, and help clarify, the experiences of managers, other leaders and students of leadership. Thus it is useful to individuals in a wide variety of organizations—industrial, governmental, educational, religious, and community.

The concept of leadership the article defines is reflected in a continuum of leadership behaviour (see Exhibit I in original article). Rather than offering a choice between two styles of leadership, democratic or authoritarian, it sanctions a range of behavior.

The concept does not dictate to managers but helps them to analyze their own behavior. The continuum permits them to review their behavior within a context of other alternatives, without any style being labeled right or wrong.

(We have sometimes wondered if we have, perhaps, made it too easy for anyone to justify his or her style of leadership. It may be a small step between being nonjudgmental and giving the impression that all behavior is equally valid and useful. The latter was not our intention. Indeed, the thrust or our endorsement was for the manager who is insightful in assessing relevant forces within himself, others, and the situation, and who can be flexible in responding to these forces).

In recognizing that our article can be updated, we are acknowledging that organizations do not exist in a vacuum but are affected by changes that occur in society. Consider, for example, the implications for organizations of these recent social developments:

- The youth revolution that expresses distrust and even contempt for organizations identified with the establishment.
- The civil rights movement that demands all minority groups be given a greater opportunity for participation and influence in the organizational processes.
- The ecology and consumer movements that challenge the right of managers to make decisions without considering the interest of people outside the organization.
- The increasing national concern with the quality of working life and its relationship to worker productivity, participation, and satisfaction.

These and other societal changes make effective leadership in this decade a more challenging task, requiring even greater sensitivity and flexibility than was needed in the 1950's. Today's manager is more likely to deal with employees who resent being treated as subordinates, who may be highly critical of any organizational system, who expect to be consulted and to exert influence, and who often stand on the edge of alienation from the institution that needs their loyalty and commitment. In addition, he is frequently confronted by a highly turbulent, unpredictable environment.

In response to these social pressures new concepts of management have emerged in organizations. Open-system theory, with its emphasis on subsystems' interdependency and on the interaction of an organization with its environment, has made a powerful impact on managers' approach to problems. Organization development has emerged as a new behavioral science approach to the improvement of individual, group, organizational, and inter-organizational performance. New research has added to our understanding of motivation in the work situation. More and more executives have become concerned with social responsibility and have explored the feasibility of social audits. And a growing number of organizations, in Europe and in the United States, have conducted experiments in industrial democracy.

In light of these developments, we submit the following thoughts on how we would rewrite certain points in our original article.

The article described forces in the manager, subordinates, and the situation as given with the leadership pattern a resultant of these forces. We would now give more attention to the interdependency of these forces. For example, such interdependency occurs in : (a) the interplay between the manager's confidence in his subordinates, their readiness to assume responsibility, and the level of group effectiveness ; and (b) the impact of the behavior of the manager on that of his subordinates, and vice versa.

In discussing the forces in the situation, we primarily identified organizational phenomena. We would now include forces lying outside the organization and would explore the relevant interdependencies between the organization and its environment.

In the original article, we presented the size of the rectangle in Exhibit I as a given, with its boundaries already determined by external forces—in effect a closed system. We would now recognize the possibility of the manager and/or his subordinates taking the initiative to change those boundaries through interaction with relevant external forces—both within their own organization and in the larger society.

The article portrayed the manager as the principal and almost unilateral actor. He initiated and determined group functions, assumed responsibility, and exercised control. Subordinates made inputs and assumed power only at the will of the manager. Although the manager might have taken into account forces outside himself, it was he who decided where to operate on the continuum—that is, whether to announce a decision instead of trying to sell his idea to his subordinates, whether to invite questions, to let subordinates decide an issue, and so on. While the manager has retained this clear prerogative in many organizations, it has been challenged in others. Even in situations where he has retained it, however, the balance in the relationship between manager and subordinates at any given time is arrived at by interaction—direct or indirect—between the two parties.

Although power and its use by the manager played a role in our article, we now realize that our concern with cooperation and collaboration, common goals, commitment, trust, and mutual caring limited our vision with respect to the realities of power. We did not attempt to deal with unions, other forms of joint worker action, or with individual workers' expressions or resistance. Today, we would recognize much more clearly the power available to all parties, and the factors that underlie the interrelated decisions on whether to use it.

In the original article, we used the terms “manager” and “subordinate”. We are now uncomfortable with “subordinate” because of its demeaning, dependency-laden connotations and prefer “nonmanager”. The titles “manager” and “nonmanager” make the terminological difference functional rather than hierarchical.

We assumed fairly traditional structures in our original article. Now we would alter our formulation to reflect newer organizational modes which are slowly emerging, such as industrial democracy, international communities, and “phenomenarchy”. These new modes are based on observations such as the following :—

- Both manager and nonmanagers may be governing forces in their group's environment, contributing to the definition of the total area of freedom.
- A group can function without a manager with managerial functions being shared by group members.
- A group as a unit can be delegated authority and can assume responsibility within a larger organizational context.

Our thoughts on the question of leadership have prompted us to design a new behavior continuum (see Exhibit II) in which the total area of freedom shared by manager and nonmanagers is constantly redefined by interactions between them and the forces in the environment.

The arrows in the exhibit indicate the continual flow of interdependent influence among systems and people. The points on the continuum designate the types of manager and nonmanager behavior that become possible with any given amount of freedom available to each. The new continuum is both more complex and more dynamic than the 1958 version, reflecting the organizational and societal realities of 1973.

Exhibit 1. Continuum of leadership behavior.

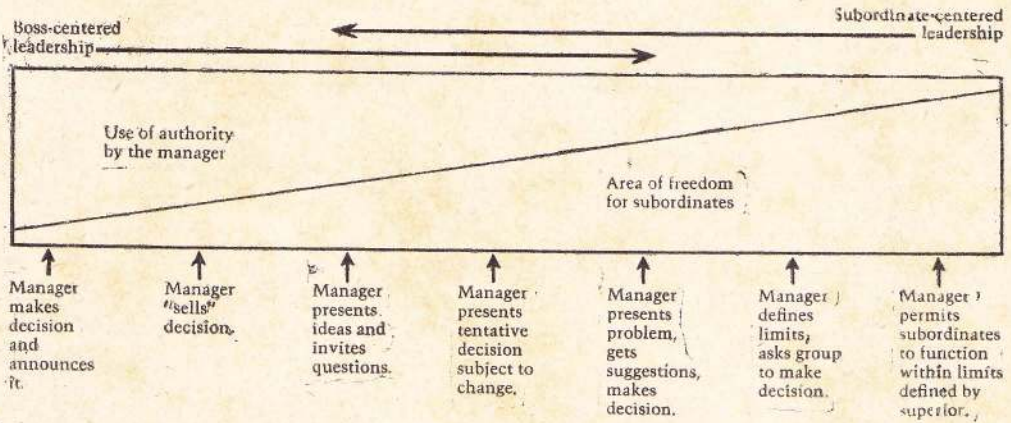
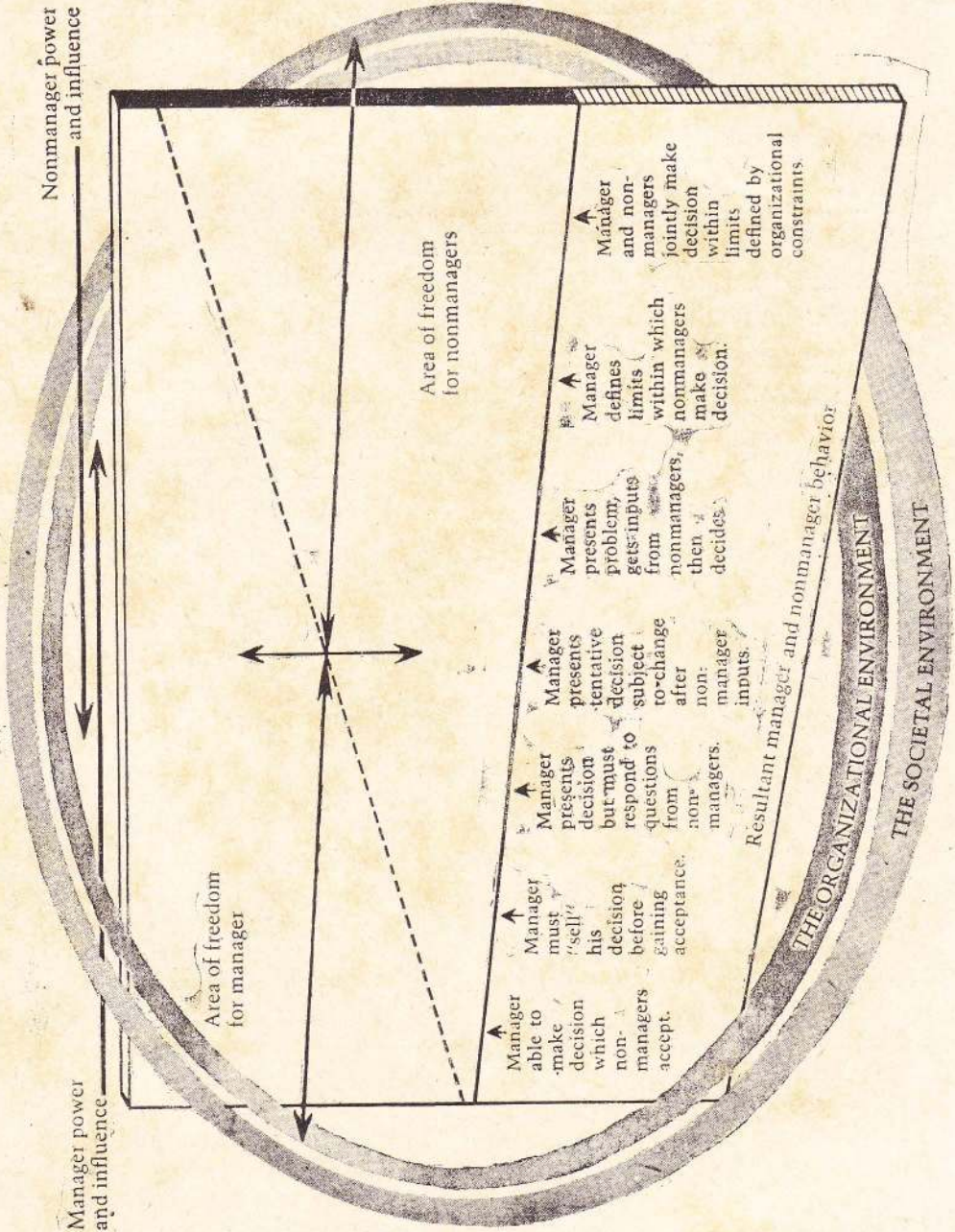


Exhibit II. Continuum of manager-nonmanager behavior



Agricultural Planning—A Priority

J. M. GUNADASA

A major task of development in the under-developed countries like Sri Lanka is the development of the agricultural sector itself.¹ It may be wondered as to why this is considered as so important, especially by those who advocate a rapid pace of industrialization to stimulate the self-sustaining process of development. The rationale here is clear and unambiguous. In the attempt to enjoy the living standards of the more developed countries, the development gap to be filled in the under-developed countries is sizeable. It however, varies with each under-developed country and the level of living of the more developed country that is taken for comparison. Some idea of it could be formed by comparing the per capita incomes of a few countries falling within the two groups (see table 1). But the position revealed from this comparison is at best an under-estimation of the magnitude of their development problem. Rapid population increase with annual rates between 2.0 and 2.9 per cent (see table 2) and gradually decreasing death rates add to the problem. Thus, the development effort in the under-developed countries consists of improving the present consumption levels which are very low and also providing the same facilities for the annually increasing numbers. The prevailing level of economic activity in the under-developed countries is inadequate to cope with this need. More goods and services have to be provided at a rate of growth that outpaces the rate of population increase so that both the improvement of the existing levels of living and meeting the needs of the increasing numbers can be attained without going through a protracted period of development that frustrates a nation to be cynical towards efforts at development and planning. The solution lies in the acceleration of the production of goods and services needed to attain the successive stages of growth and development. The strategy of development therefore, lies in the identification and promotion of those *sectors which contribute to the attainment of the above objective*. The priorities of resource allocation also have to be decided upon accordingly.

The types of goods and services needed to prepare for the successive stages of development depend on the prevailing conditions of an economy. In almost all the under-developed countries, the prevailing economic and social conditions are more or less similar.

Table 1*

PER CAPITA GROSS NATIONAL INCOME AT FACTOR COST IN 1969 OF SELECTED UNDER-DEVELOPED AND DEVELOPED COUNTRIES

(in U.S. dollars)

Country	1958	1969
<i>Under-developed</i>		
Kenya	69 ..	116
Malawi	34 ..	56
Morocco	158 ..	186
Argentina	489 ..	682
Bolivia	81 ..	167
Colombia	189 ..	299
Ceylon	118 ..	137
China (Taiwan)	151 ..	270
India	64 ..	73 (1968)
Burma	53 ..	67 (1968)
Indonesia	82 ..	86 (1968)
Pakistan	62 ..	131
Average for under-developed market economies	110 ..	150 (1966)
<i>Developed</i>		
United States	2,115 ..	3,814
United Kingdom	1,013 ..	1,513
Germany, Fed. Rep. of	790 ..	1,910
France	853 ..	2,106
Australia	1,120 ..	1,991 (1968)
Japan	290 ..	1,288
Average for the developed market economies	1,070 ..	2,030 (1968)

* Source : United Nations, *Statistical Year Book* 1970, pp.597-601.

The general levels of living are very low as may be observed from the table 1. A majority of the people live in rural areas as agriculturists (see table 3) and their levels of living are lower than the average levels of living indicated by the national per capita incomes. The symptoms of this low levels of living are under-nourishment, malnutrition, ill-health and illiteracy. The immediate cause of the low levels of living is the low income. Incomes are low due to several reasons. Given agriculture as the main source of income, the latter depends on the productivity and the size of land holdings of the individual cultivators. Due to rapid population increase over the past half century within an economic structure whose agricultural dominance is little changed (see table 4) land/man ratio in the agricultural sector decreased at an astonishing pace. Cultural factors like the laws of inheritance resulted in land fragmentation. The technology of production is mostly traditional. It is based on the use of higher land input for higher incomes. Labour being less productive due to the reasons stated above, therefore, with a traditional technology land sub-division results in progressively deteriorating peasant incomes. This

Table 2*

ANNUAL RATE OF POPULATION INCREASE BETWEEN 1963 AND 1969 IN SELECTED UNDER-DEVELOPED AND DEVELOPED COUNTRIES

Country	Annual percentage
<i>Under-developed</i>	
Kenya	2.9
Malawi	2.9
Morocco	2.9
Argentina	1.5
Bolivia	2.6
Colombia	3.2
Ceylon	2.4
China (Taiwan)	2.8
India	2.5
Burma	2.2
Indonesia	2.5
Pakistan	2.1
<i>Developed</i>	
United States	1.2
United Kingdom	0.6
Germany, Fed. Rep. of	1.0
France	0.9
Australia	2.0
Japan	1.1

* Source : United Nations, *Statistical Year Book* 1970, pp. 80-86.

perpetuates and worsens the ills of the peasant communities. In contrast the under developed economies also have an urban sector with emerging infant industries and also a commercialized sub-sector of primary production consisting of mining, forestry and plantation agriculture². In these sectors the incomes are high and enjoyed by a small percentage of the total population.

The national development objective of the under-developed countries placed in this situation should be the improvement of the living standards of the large majority of the peasant cultivators. For this more attention is needed for the development of the agricultural sector itself. As Mellor points out, the development of the agricultural sector is contributory to the entire development process in several ways.³ But contrary to much of conventional thinking, this development especially in the context of under-developed countries like Sri Lanka cannot be interpreted as a simple task of producing

Table 3*

PERCENTAGE OF POPULATION IN AGRICULTURE IN SOME SELECTED UNDER-DEVELOPED AND DEVELOPED COUNTRIES (AS ESTIMATED FOR (1965)

Country	percentage
<i>Under-developed</i>	
Argentina	20
Bolivia	63
Colombia	50
Ceylon	55
Burma	62
China (Taiwan)	47
India	70
Indonesia	67
Pakistan	74
Kenya	84
Malawi	80
Morocco	55
<i>Developed</i>	
United States	6
United Kingdom	4
Germany, Fed. Rep. of	8
France	16
Australia	10
Japan	24

* Source : UN/FAO, *Production Year Book* 1970, vol. 24, pp. 21-24.

surpluses in the agricultural sector to meet the demand elsewhere in the economy notwithstanding the plight of the agriculturists in the rural areas.⁴ Unlike some of the western societies where individual cultivators produce at levels above subsistence and regard farming as a commercial enterprise, agricultural development in the under-developed countries, in addition to increased production, involves improvement of the living conditions of the rural farmers themselves. Increased output in the agricultural sector, thus, has to be utilized firstly for the improvement of the farming community. It has several beneficial effects.⁵ With better food, improved health facilities and education, the under-nourished, disease-ridden and illiterate farm labour can be made more productive.⁶ When the farmers are convinced that opportunities are provided for them to enjoy the fruits of their own labour they begin to respond readily to programmes of development designed to increase farm production. This also leads to a change of attitude towards the solution of problems in agricultural production; the cultivator problems tend to be viewed more humanely and realistically. The minority of people in the non-agricultural sectors already enjoy living standards which are comparable with those of the more developed countries.

Table 4*

Industrial Origin of Gross Domestic Production at Factor Cost in Some Selected Developed and Under-developed Countries

(Percentage distribution for 1968)

Country	1	2	3	4	5	6
<i>Under-developed</i>						
Kenya	35	14	5	8	10	27
Malawi	35	10	5	5	9	37
Morocco	35	21	5	—	21	18
Arjentina	14	36	6	10	13	21
Bolivia	19	30	7	8	10	26
Colombia	31	21	5	7	14	23
Burma	34	10	2	7	29	17 (1967)
Ceylon	39	12	6	9	12	21
China (Taiwan)	23	27	5	6	13	26
India	52	15	4	4	10	15 (1967)
Indonesia	52	13	2	2	18	13
Pakistan	46	12	5	7	12	18
<i>Developed</i>						
United States ..	3	32	5	6	16	39
United Kingdom ..	3	47	7	8	11	33
Germany, Fed. Rep. of ..	4	44	7	6	13	26
France	7	38	10	5	11	23
Australia	9	34	8	8	15	26 (1967)
Japan	10	31	8	8	17	26

(1) Agriculture ; (2) Total industrial activity ; (3) Construction ; (4) Transport and Communication ; (5) Wholesale and retail trade ; (6) Others (comprising banking, insurance and real estate, ownership of dwellings, public administration and defence and personal and other services).

* Source : United Nations, *Year Book of National Accounts Statistics 1969*, vol. II, International tables, pp.67-112.

Therefore, supposing that in keeping with this objective, measures are adopted to improve the living standards of the vast majority of the peasant cultivators, then their income levels begin to rise. Assuming that the prices remain unaffected, the immediate effect of this is an increase of effective demand for the types of consumption goods that are already used by them without satisfying the existing needs fully. These are normally the low quality food items like grains, yams and vegetables, cheap clothing, low cost housing and minimum medical and educational needs.⁷ Once these basic needs are fully satisfied further rises of income gradually change the pattern of demand for high quality food and clothing, luxury consumer durables, and better medical and educational facilities.

If by increasing the income level what one means is an increase of the level of money income this may be easily attained. But the rise of money income is meaningless if the goods and services asked for in exchange are not available. Therefore, the solution of the problem of improving the living conditions of the peasant cultivators in the under-developed

countries lies firstly in the production of those goods that would be demanded by them with the gradual improvement of their incomes. As referred to earlier, most of them are the agricultural products that are already produced by the peasants, but in short supply. Due to their being caught in a vicious circle of adverse circumstances, the peasant cultivators themselves cannot intensify their production effort firstly, to close the gap between the prevailing low production and the satisfying level of need and secondly, to proceed further to satisfy new needs and desires which may be secondary or tertiary now but take priority at a later stage of development. It is not possible to leave this challenge to private initiative. It is less abundant, reluctant to make the type of investment needed and also incapable of meeting the social needs effectively. This is why it is undebatably accepted that governments must take the initiative in the economic development of the under-developed countries. This means that, it is in the sector of peasant agriculture that more investment and more production through government initiative are necessary.

Presently, in many under-developed countries including Sri Lanka, the consumption gap between the need and the level of peasant production is filled at least to some extent with the imports made possible by the foreign exchange earnings of the commercial sectors. Therefore, it may be surprising or even amusing to hear of no emphasis being laid on investment and production in this sector ; because without increased investment and production its foreign earnings decrease. The likelihood of this decrease is more probable due to adverse price fluctuations for these primary products in the world market. When the foreign earnings deteriorate, the imports have to be cut down ; then the levels of living in the peasant sector deteriorate too and the investment activity in general has to be slowed down due to shortage of capital created by low foreign earnings. This surely is the chain of events if nothing is done regarding investment and production in the peasant sector. But when action is taken to make investment in the peasant sector and intensify the production of those goods which are in short supply there, the need for a major part of its import requirements disappears. Thus, there will be saving of foreign earnings especially when the development of peasant agriculture is so adjusted as to minimize the use of foreign earnings. When this strategy is followed the need for further expansion of the more vulnerable commercial sector does not arise. The strategy instead builds up better security and resistance against the adverse effects of dependence on a few export commodities and their price fluctuations. Therefore, resource mobilization to develop the peasant agricultural sector is urgently needed in the under-developed countries.

Despite this position many under-developed countries have been labouring over a number of years with the mistaken notion that top priority of development must be given to industrialization and the related expansion of the non-agricultural sector.⁸ They seem to have been impressed by the present structural characteristics of the more developed economies without ever observing the sequence of their development which also at the initial stages manifested characteristics similar to those of the present day under-developed economies.⁹ Perhaps one may contend that knowing the path trodden by the more developed countries it is foolhardy to follow the same lengthy track when short cuts are available. This is truly a wise approach if short cuts envisaged take one to the destination one wants to reach. Apparently, the under-developed countries have believed so-

So much so, most of the investments have been made in the industrial and other non-agricultural sectors. Even the savings generated in the agricultural sector were diverted to the expansion of the other sectors. The idea has a popular appeal ; because the prospects of employment opportunities in the non-agricultural sector cut-off from the drab monotonous and poorly rewarding hard labour in the country side, are more attractive. It also gives the hallucination that there is going to be quick attainment of prosperity through the setting up of factories and industrial plants promoting more urban life with better facilities and amenities. But in fact this strategy has been a misleading one and it is so realized already by many under-developed countries.

The futility of this approach must be examined in relation to what happens when the strategy is followed for some time. No doubt with the investment of savings diverted from the agricultural sector, the industries may come up and the non-agricultural sector begins to expand. This expansion makes demands not only on capital but on other resources also. The most important of them is invariably bound to be labour. This also would be drawn from the agricultural sector with another misleading notion that the marginal productivity of labour there is zero.¹⁰ Now the non-agricultural labour force increases ; their income level rises more than that in the agricultural sector. Pattern of consumption also changes both along with the changed incomes as well as the new way of life in the industrial and urban community. Assuming that the intermediate inputs are available either through imports or from some tentative local sources of supply, the new industries also start producing goods which to start with in any case are essentially meant for the domestic market mainly constituted of an agricultural population. For this process of industrialization to proceed non-stop, industrial production must be maintained at least at the break-even point. This however, is not possible as envisaged by the strategy.

The output turned out by the expanding industries does not have the anticipated domestic market as the effective demand for them in the agricultural sector is negligible due to low incomes of large numbers of peasants. They who form a major section of the population are still living and producing at the same or even worse levels of subsistence. It is more likely that their conditions have become worse than they were as even the little savings found in the agricultural sector are diverted to the other sectors ; there is no capital left over for any development within the sector itself. Labour which is the most important factor of production next to land under this system is also withdrawn and now employed elsewhere. The higher income incentive in the industrial sector promotes the withdrawal of even more productive labour from the agricultural sector. This further affects the agricultural production. With the typically high birth rates and decreasing death rates, the agricultural sector is also left with an undesirable composition of population demanding more for consumption than contributing to production. Young ones, women and old people who tend to be left behind in the agricultural sector do not constitute a productive labour force. The net result therefore, is a neglect of agricultural production. The agriculturists themselves begin to feel food shortages and may find it difficult to maintain even the former levels of subsistence. This makes them further physically weak leading to ill-health affecting productivity in turn. In the meantime, the demand for various items of food and even intermediate inputs of agricultural origin begins to rise in the expanding non-agricultural sector. This demand has to be satisfied with production

in the agricultural sector itself. If not imports become necessary. It is a fantasy to expect agricultural supplies of food and raw materials from the agricultural sector when it cannot meet its own bare minimum requirements.

It may be imagined as to why the food requirements of labour and the other inputs of industries cannot be imported and the industrial products be exported when the domestic situation deteriorates. This is only a theoretical alternative ; its practicability is extremely remote at least at the initial stages of industrial expansion when the problem develops and a solution has to be found urgently. Firstly, the infant industries of any developing country are unable to enter into successful competition with the already established industries of the more developed countries especially in the external markets. Secondly, many of these external markets in the under-developed countries would be faced with the identical problem if the same strategy of development referred to above is followed. If a different strategy is followed such countries may protect their own domestic markets by various policy measures like high tariff barriers or even total ban of foreign products. In either situation dependence on foreign markets becomes problematic. Ultimately, food and raw material shortage bids prices and wages up. Poverty among agriculturists leave most of the industrial output unsold. Thus, after an initial spurt of activity the short-cut approach to development by means of the strategy of industrial expansion all at once, comes to a grinding halt leaving ruins both in agriculture as well as in industry. The strategy of the expansion of the non-agricultural sector by harnessing the resources of the agricultural sector without first providing for its own development therefore, can be considered as a road to ruin than development. It leads to the exploitation of the already worse-off peasant cultivators only to make a few already fortunate urban dwellers, elite and industrialists better-off ¹¹.

On the contrary, the position would have been different if the savings generated in the agricultural sector, along with other capital, are invested in the agricultural sector itself to improve its productivity, employment opportunities, income levels and the conditions necessary for agricultural diversification and surplus generation. The industrial expansion could be planned and phased out to match the rate of progress planned for the agricultural sector. It creates a state of sustainable mutual dependence between the two sectors in an under-developed economy. This sort of approach is more practicable and also most urgently needed in respect of the peasant sub-sector.

But how should one set about translating this strategy into action ? It calls for making more investment in the peasant agricultural sector, not indiscriminately but to make the optimum use of the available resources ; *i. e.*, to produce the maximum social benefits. A prerequisite of this is the identification of the investment projects which yield such maximum social benefits on given investments. For this the first step is the identification of a number of discreet investment projects that lead to increased agricultural production in the peasant sector ¹². Their identification in realistic terms is not possible unless one familiarizes oneself with the conditions of agricultural production in a peasant economy with a view to understanding the bottlenecks of development in relation to an intended or already proposed course of planned action.

Cultivators under subsistence agriculture make their production decisions more as satisficers than as profit maximizers¹³. Their wants in life are a few and usually determined again by the traditional way of life. Similarly, production for trade is limited. Both these characteristics are further enhanced by the poor development of transport and communication, urbanization and also very low levels of literacy among the peasant communities, again the characteristics of the very state of under-development. The result of all these interrelated factors is the adjustment of agricultural production to meet only the day to day subsistence requirements and perhaps some surpluses to make provision for special occasions and emergencies depending on the possibility of storage. In a set-up of this nature, the level of subsistence is directly dependent on the seasonal yield performance. In the usually small peasant holdings the amount produced, with the use of a traditional technology, is so small that very often it is hardly sufficient for a peasant family to go round till the next harvest. When the family grows bigger the level of subsistence deteriorates further and the land holding as well as the technology of production remain more or less unchanged. Damages and yield fluctuations resulting from the vagaries of weather render the position of the peasants extremely shaky. They live in a highly uncertain economic environment. The under-nourishment and malnutrition usually found in such communities make the peasant families more susceptible to ill-health and debilitating diseases. Loss to agricultural production from this cause is no small as the family labour is the most important input of production next to land. A householder falling sick during a cultivation season can cause untold hardships to the entire family.

Quite naturally in this state of agricultural production the risk absorbing capacity of the peasant cultivators is very low. Their ambitions are suppressed by the fears of uncertainty so characteristic of their agricultural life. Therefore, except for a few rich farmers who also may happen to be culturally more advanced, the peasants in general are compelled to make their production decisions as satisficers and risk minimizers. As long as this position prevails prospects for development also remain rather dim. As development proceeds, once the basic needs of the peasants are satisfied, surplus generation becomes necessary both to introduce the peasants to new levels of living as well as to meet the requirements of the expanding non-agricultural sectors. This cannot be achieved as long as the peasants continue to make their production decisions as satisficers ; because in this disposition all decisions are made to produce only that amount sufficient for their own subsistence by incurring the least risk. But in planned development the peasants must be made to behave as profit maximizers. Profit motive makes them continue and expand production as long as they make profits to the maximum possible. This provides better living conditions to the cultivators and greater surpluses to those who need them elsewhere in the economy.

A question that arises at this stage is that, if agricultural production is so important in the planned development of the under-developed economies why can't the production in this sector be directly undertaken and organized by some responsible central authority instead of leaving to the individual cultivators themselves ? Agricultural production, unlike industrial production, is dependent on nature to a very great extent. Thus, it is generally accepted that decision making in the field of agricultural production cannot be centralized to the degree that is achievable in industrial production. Referring to Indian

planning Gadgil says that, "in the field of agriculture the centre has only a limited role to play."¹⁴ This is particularly so in relation to the less developed countries where the peasant agricultural sector consists of a large number of small scale producers engaged in atomistic production under a multiplicity of varied physical, economic and social conditions. More satisfactory decision making by a central authority presupposes a thorough knowledge and understanding of this complex background of agricultural production. This may have to be considered more as optimistic than realistic. Therefore, decision making in agricultural production has to be left either to the individual cultivators or local organizations like the Cultivation Committees and the newly set up Agricultural Productivity Committees of Sri Lanka, constituted of cultivators familiar with the local conditions ; there is no choice but to fall back on the cultivators themselves.

How then should the peasant cultivators be made to behave as profit maximizers so that they make their production decisions also accordingly ? The solution lies in a multi-dimensional approach. The technology used in peasant agriculture is mostly primitive. Efficiency in production could be greatly improved by the use of techniques conducive to increased production.¹⁵ To adapt and develop them research programmes are needed. Contrary to the beliefs and speculations of armchair philosophising, peasant cultivators in the under-developed countries are found to respond to price incentives¹⁶. Price incentives do play a significant role. However, they are of little effect if, there are no satisfactory ancillary services like transport, marketing and irrigation facilities which the individual cultivators are unable to provide by themselves. The use of a new technology is almost always accompanied by new knowledge and also new inputs. Unless these are readily obtainable, their adoption and use cannot be expedited as desired. To adopt them the peasant cultivators do not have sufficient capital ; provision of credit can go a long way to ease off their helplessness. Traditional land tenure systems and fragmentation causing the scattering of holdings lead to inefficiency as well as the under-utilization of full capacity production. Then suitable forms of land reforms are needed. Illiteracy and isolation are two dominant barriers which keep the peasant cultivators unaware of the information regarding opportunities of production, marketing, prices and technology. To overcome them extension programmes consisting of farmer education and demonstration are needed. Despite all these, still the peasant cultivators may be hesitant to deviate from their traditional patterns of production due to their low risk absorbing capacities and the uncertainties of the production environment, viz., weather. Trade, transport and communication, prices, technological innovations, use of new inputs and availability of the requisite information risks now not only begin to play a very important role but each one of them involves certain and they are no less in magnitude than those when the cultivators make production decisions as satisficers. Thus when the peasant cultivators are expected to behave as profit maximizers the risks of production they face are further aggravated. What is more distressing to them is that now they face a set of quite unfamiliar risks but with the same vulnerable economic position. It is no wonder then that peasants who are already used to a certain way of agricultural life where production decisions are made to obtain some satisfying level of output with a minimum of risk, view the requirements of profit maximizing behaviour as totally unacceptable. Countering this resistance needs careful planning ; the provision of insurance schemes and the holding of buffer stocks and bigger reserves of food are some

possible devices¹⁷. Gittinger refers to the overwhelming importance of these various policy measures in more details¹⁸.

However, an aspect that has received only inadequate attention till recent times deserves particular reference. Despite the adoption of measures referred to earlier agricultural development in the peasant sector ultimately has to be regarded as a task of institution building. The significance of this becomes clear when the peasants are seen as the most disorganized professional group in the under-developed economies with all the attendant handicaps of illiteracy and low incomes. Hence their bargaining power over different social groups even at the local and district levels is quite weak. Knowingly or unknowingly this situation leads to the exploitation of the peasant cultivators to a certain degree by more affluent social groups which invariably tend to provide leadership to the farmer as various forms of organizations and institutions are being created and promoted along with the adoption of measures for the development of the peasant sector. Superficially the peasants also show the approval of such leadership, as they are helpless in the face of more affluent social figures who take in such positions of leadership. But given the opportunity of security against possible threats of this nature the peasant cultivators are more disposed to following the leadership of a more dependable person from among themselves. Such a person however may not be easily identifiable by an outsider as he usually does not make an attempt to appear as a prominent social figure. In conclusion, therefore, it should be stated that it is by building and energizing of the village level institutions around such genuine leaders that much could be attained in the agricultural development of the peasant sector.

References

1. Rossi-Doria remarks that, "the take-off of economic development may take place largely through increase and improvement of agricultural production. Even planning for industrial development—especially with respect to choice of industrial sectors, size and location of plants and planning overtime—must at least partially be in relation to agriculture and its development." see M. Rossi-Doria, "Analysis of Agricultural Structure for Regional Planning", *Regional Economic Planning: Techniques of Analysis for Less Developed Areas*, ed. by Walter Isard and John H. Cumberland (Paris, European Productivity Agency of the Organization for European Economic Co-operation, 1961), p. 239.
2. This makes an implicit reference to the concept of dual economy in the under-developed countries. In respect of Sri Lanka, Farmer says that this sort of economic duality is not so clearly marked especially in the wet zone areas due to the overlapping between the peasant and export sectors. This is particularly so in the coconut cultivated areas in the wet zone; see B.H. Farmer, "Ceylon: Some Problems of a Plural Society", *Essays in Political Geography*, ed. by Charles A. Fisher (London, Methuen & Co. Ltd., 1968), pp. 147-159. For more details regarding the concept of dual economy see, J. H. Boeke et. al. *Indonesian Economics: the Theory of Dualism in Theory and Practice* (The Hague, 1961); also see A.N. Agarwala & S.P. Singh, *Accelerating Investment in Developing Economies* (Oxford University Press, 1969), pp. 289-313.
3. Herman H. Southworth and Bruce F. Johnston, *Agricultural Development and Economic Growth* (New York, Cornell University Press, 1967), pp. 24-26.
4. *Times Literary Supplement*, 19th December, 1968.
5. As a usual practice in the under-developed countries there is a tendency to treat all immediate consumption as of lesser value than saving and investment. Thus, reinvestment benefits of a project are valued above those of immediate consumption. But this practice though looks rational is not quite convincing; see Michael Lipton, "Yield Saving Debate", *Paper read at the Seminar on Project Evaluation and Planning at the IDS, University of Sussex*, 15th November to 19th December, 1970.
6. Viner believes that when the effectiveness of labour is improved in this manner rapid economic development would readily follow. Although this view is contested by others it is not totally rejected. In fact its importance is recognized though with reservations; see Jacob Viner, *International Trade and Economic Development* (Glenco, Illinois, 1952), p. 131; also Bruce F. Johnston & John W. Mellor, "Role of Agriculture in Economic Development", *The American Economic Review*, vol. 51, no 4. (1961), p. 568, footnote 2.
7. Income elasticity of demand for food in low income countries is estimated to be 0.6 or more while in the high income countries it is 0.2 or 0.3. The change of demand in the rural and urban sectors of the under-developed countries can be expected to follow a similar trend; see Johnston & Mellor, *op cit.*, p. 572.
8. Perhaps this may be due to the misconstrued and indiscriminate application of ideas regarding the role of the agricultural sector towards the development and expansion of the other sectors; see John W. Mellor, *The Economics of Agricultural Development* (Cornell University Press, 1966), pp. 4-5.
9. See Benjamin Higgins, *Principles, Problems and Policies of Economic Development* (London, Constable and Company Ltd., 1968). pp. 188-206.
10. "The available evidence suggests that in most densely populated low income countries there is a positive marginal product from additional increments of labour applied to agricultural production."; see John W. Mellor, "The Use and Productivity of Farm Family Labour in Early Stages of Agricultural Development", *Journal of Farm Economics*, vol. xlv. no 3. (1963), p. 532. Also T. W. Schultz, *Transforming Traditional Agriculture* (Yale University Press, 1964), pp. 53-70.

11. Paul Streeten and Michael Lipton, *The Crisis of Indian Planning* (London, Oxford University Press, 1968), pp. 83-147.
12. Peter O. Steiner, "Choosing Among Alternative Public Investments in the Water Resources, Field", *The American Economic Review* (1959), pp. 893-916.
13. See Michael Lipton "The Theory of the Optimizing Peasant." *The Journal of Development Studies*, vol. iv, no. 3 (1968), pp. 327-351. Also J. Wolpert, "The Decision Process in a Spatial Context", *Annals of the Association of American Geographers*, vol. 54 (1964), pp. 537-558.
14. D. R. Gadgil, *Planning and Economic Policy in India* (London, Asia Publishing House, 1961) p. 177.
15. Mellor states that "the constraints on the means of developing agriculture provide that the major task of agricultural development must be one of creating and diffusing processes of technological change. These are almost by definition primarily tasks of institution building." See John W. Mellor, *National Planning ; "The Relation between Agriculture and Economic Development in the Context of Population Growth"*, *Cornell International Development, Mimeograph-29*.
16. One example is the response of the cultivators to change over increasingly to the cultivation of potatoes in Sri Lanka when the potato prices rose up subsequent to the ban of imports. Similar trends are observable in the cultivation of other crops like chillies and onions too.
17. Streeten and Lipton, *op.cit.*, p. 14.
18. J. Price Gittinger, *The Literature of Agricultural Planning* (Centre for Development Planning, National Planning Association, 1966), pp. 17-59.

Peasant Colonization in the Dry Zone of Ceylon: An Analysis of the Present Patterns, Problems and Suggestions for the Future

S. GUNARATNAM

PART I

The Dry Zone of Ceylon is a natural region, geographically and otherwise. Theoretically, P. G. Cooray's definition of the zone as the area where soil moisture falls below wilting point for at least two months in the average year, is a fair description of the area. Although there is a marked internal differentiation within the Dry Zone based on the differences of rainfall, this is not differentiated in this study.

Of all the natural regions of this island, this zone is the richest in human associations. This is the cradle of the ancient civilization of Ceylon. After witnessing the rise and fall of Kingdoms, this region became generally desolate and neglected. With the advent of the British administration large parts of these depopulated areas became property of the Crown as a result of legislation enacted during this period. The idea of populating these once prosperous areas started gradually when the voice of the Ceylonese people became heard in the political areas of the country. Planned colonization started within the last 40 years of this century. The need for colonization could be briefly listed as follows :

- (1) To give back to the peasants the land that were taken over as Crown property.
- (2) To ease the increasing pressure of population on the land of the South West country and the concern of the rising population to be redistributed.
- (3) The concern for the peasantry as a social institution worthy of preservation for its own sake as a " prosperous, self-supporting and self-respecting multitude of peasant proprietors ".
- (4) The constitutional changes which culminated in the " Donoughmore Constitution " of 1931 brought new forces into action. For the first time Ceylonese ministers became responsible for government departments and thus a new sympathy for the amelioration of the conditions of the peasantry was brought to bear. These actions crystallised as the land policy and culminated in the Report of the Land Commission of 1927-29.

1. P.G. Cooray, "Effective rainfall and moisture zone in Ceylon".

- (5) The legislators and public servants started to take a wider view of the economic and social problems of Ceylon and came to appreciate the significance of the connection between such problems as population growth, food supplies and landlessness. Some of these problems were brought home with tragic force by the years of the depression.
- (6) The application of D. D. T. spraying brought a complete revolution in environmental conditions of the Dry Zone by eradicating malaria. It is no mere coincidence that a new willingness to migrate to the Dry Zone became evident in the years following 1946.
- (7) The passing of the Land Development Ordinance No. 19 of 1935 and the appointment of a Land Commissioner who became the custodian of all Crown lands facilitated the new trends in no small measure.

There are at present 95 peasant colonies with a total colonist population of 37,940 and 339,731 acres under cultivation (Land Commissioner's Administration Report).

The wet season in the Dry Zone comes with the North-East monsoon in about November to January. The winds and the rains which they bring are uncertain and, in particular, are apt occasionally to arrive late. But normally a large proportion of the annual rainfall falls in the three North-East monsoon months, over 40 per cent everywhere, and as much as 60 per cent. in Jaffna. In the inter-monsoon periods (roughly February-May and September), there may be rains due to depressions and to local conventional circulations, but at most places these rains are variable and unreliable. Variability of rainfall is a phenomenon to be reckoned with in any assessment of the Dry Zone problem. One or two years heavy rainfall may so inflate the mean for a twenty-year period that it gives a very exaggerated impression of the rainfall that may be expected. "The Dry Zone peasants difficulties as are due to the vagaries of the rainfall are increased by the fact that it is apt to fluctuate, especially at certain seasons about the critical level which is effective. Effective rainfall may be defined as that which is just enough to keep soil moisture above wilting point, and thus to keep shallow rooted plants alive".

Rainfall is generally effective throughout the Dry Zone in the wet season, when in fact water logging is common, but there are occasional months of ineffectiveness which may spell disaster to chena crops ; and to say that rainfall is "effective" is far from saying that it is adequate for a thirsty crop like rice. In the dry season the rainfall is nearly always ineffective, annual plants wilt and die, and the apparently luxuriant natural vegetation survives only because of its deep roots, deciduous habits, small leaves or other adaptation. In the inter-monsoon periods there is a chance of effective rainfall which varies from station to station. This is why R. W. Ivers, who knew the Dry Zone well said "It may broadly be stated that without artificial irrigation and storage of water, human existence, in the North-Central Province would be impossible".

¹. B.H. Farmer in Pioneer Colonization in Ceylon.

The Dry Zone is watered for the be most part by short relatively small radial streams which rise within the zone itself and thus feel to the full the effects of its seasonal rainfall. Therefore there is little scope here for great perennial canals. Irrigation direct from rivers can in most places function in Maha only and storage tanks are, of necessity, the commonest type of work. Moreover, because of rainfall variability, yields of catchments vary greatly from year to year. There are thus years of greatly reduced cultivation or total failure on the one hand, and of flood and great damages to works on the other. It becomes difficult to say what is the safe maximum cultivable area beneath a given tank if water resources are to be fully utilized. Most modern engineers have played for safety, but the waste of water in years of heavy rainfall is then colossal¹.

There are one or two major streams, such as the Mahaweli Ganga and its tributary Amban Ganga which rise in the Wet Zone and have a perennial flow, though they are still subject to great seasonal fluctuation.

In the limestone country of the Jaffna Peninsula, water supplied by the rains is stored naturally underground, and are tapped by shallow wells. Recent investigations of the water resources of the Northern part of Ceylon have belied the earlier belief that the limestone conditions exist all over the North of a line joining Kalpitiya in the West Coast to Mullaitivu in the East. Only the existence of such limestone waterbearing rocks have been found in the North of Puttalam area in the West in a narrow strip running along the Mannar Coast line not extending beyond a few miles interior. The same may be the case in the Eastern coast as well. The Kilinochchi Paranthan and the Vavuniya district are floored with crystalline rocks, virtually impervious except for rare and irregular joints as is the case in the rest of the Dry Zone.

This shortage of underground water has made the Dry Zone entirely dependent on surface irrigation with all the waste by evaporation that accompanies, as the temperature in the Dry Zone is uniformly high throughout the year averaging 80 F. It also means that the supply of water for domestic purposes presents a serious problem in settlements as has been experienced in major settlements like Kantalai in the Trincomalee district.

The soils of the Dry Zone, like so many other tropical soils, have the same defects like lacking plant nutrients and humus which give the soil their favourable properties. There is also the point that tropical rains acting at high temperatures, leach away soluble nutrients far more rapidly. But, on the whole, the Dry Zone soils are quite adequate and occasionally rich and the Ceylonese peasant is capable of utilizing the soils with the indigenous techniques and methods. History shows beyond doubt, that the average soil of the Dry Zone has been quite adequate for paddy cultivation, to say the least.

As stated earlier, there were several reasons and aims behind the commencement of planned colonization schemes. The pioneers chose family farms as the basis of the settlement patterns in these first attempts and this continued till today as the basis of all the Colonization Settlements in the island. The Ceylon peasant is highly individualistic and the family farms are the most suited to their temperament. Besides, the pioneers wanted

¹. B.H. Farmer in Pioneer Colonization in Ceylon.

that the family unit, which has been the basis of Ceylon's subsistence agriculture with its varied values both economic and social, be preserved in the new settlements. While preserving the family farms, the settlements were planned in Units varying from 150-300 people preferably from the same village or adjoining villages, with the same environmental conditions, so that the new farmers who are uprooted from their villages of birth form themselves into nucleus that will give them a feeling of security and a feeling of a village setup.

The colonists for the Dry Zone schemes came largely from the South-West country of Ceylon and from the Kandyan provinces. But the villagers who lived in and around the irrigation schemes were absorbed into the schemes wherever they were found to be convenient. A typical example of the breakdown of the colonists into categories is enumerated as below :—

for Parakrama Samudra Colony.

“ According to the methods of selection employed the 2,780 colonists of this colony in 1953 fell into five categories :

- (1) Compensation (175 colonists). Most of the lands of the villages of this area had been acquired into the colony. The peasants who consequently became landless received allotments in the colony.
- (2) Local 483 colonists. Landless peasants and those with little land in this area and in some of the other villages of the Polonnaruwa district were also selected as colonists.
- (3) Those who had served as labourers in government departments connected with the establishment of the colony received allotments in recognition of their services.
- (4) Immigrant (1,198 colonists). This category represents a selection intended to realize the main aims of peasant colonization. The colonists came from overcrowded villages of six administrative districts in the Wet Zone. Some of them were refugees from the landslide at Kotmale. They received allotments without going through the normal selection procedure.
- (5) Exservicemen (571 colonists).¹

Social and Economic Background of the Colonists

A typical example of the social and economic background of colonists in the various schemes of the Dry Zone is again illustrated by the study of Dr. H. N. C. Fonseka in his study of the same colony. (Data on 136 colonists interviewed, see next page).

¹. Parakrama Samudra Colony, an example of peasant Colonization in the Dry Zone of Ceylon, by Dr. H. N. C. Fonseka.

Agricultural Traditions

The simple wooden plough drawn by a pair of bullocks was generally employed in preliminary tillage in paddy cultivation except in the case of some peasants who used bullocks to trample the fields. Unselected varieties of paddy were planted in all cases. Most colonists sowed paddy broadcast, but transplanting was widely practised by those from the Kegalle and Kandy districts and by Kotmale refugees. Organic manure (farmyard and green manure) was used by most colonists except those from the Polonnaruwa district. Only a few colonists from Kegalle, Kandy and Nuwara Eliya districts applied artificial fertilizers on their fields. (In an example colony-Parakrama Samudra)

Land Use—Physical Set Up of Settlements

Most of the lands in the colonization schemes were either lowland or highland. This division of the land was based only on the level of the land on local differences of relief and slope on which the layout of the irrigation channel system depended. Since gravity irrigation depended on levels and they invariably followed the contour lines the division too followed the gradient of the land into low land, and high land even though other factors like soil also was taken into consideration in this division. Areas that could be irrigated were classed as low land and those could not, as highland. There were also land set apart for communal buildings and civic centre purposes in the highland section and also small extents of land reserved as forest and pasture reservations to meet the needs of the colonists.

The highland allotments which consists of a house, well, latrine and comprises an extent of 2 acres are thus grouped together on land which is higher from the irrigation channels. It spreads out the farms some 100–200 yards apart. The small village consists of 300–500 allotments which are provided with a civic centre with the following buildings :

- (1) Co-operative Stores
- (2) Midwife's Quarters
- (3) Dispensary
- (4) School with 2 Teachers Quarters
- (5) Post Office.

When these villages are more than 2 or 3, a greater centre is provided with a Rural Hospital and a bigger school with provision for more number of teachers quarters.

The low land is also carved out into blocks of 3–5 acres depending on the size of the allotments, the older schemes having 5 acres and the newer schemes 3 acres and even 2 acres in some places. However, the extent of the blocks are uniform in individual schemes. These allotments are sited along the channels and the distance of individual allotments of colonists do not exceed generally more than $1\frac{1}{2}$ to 3 miles from their highland allotments.

The cultivation in these settlements can also be divided as :

- (1) Low land cultivation
and
- (2) Highland cultivation.

Data on 136 Colonists interviewed

Category	No.	Community	No.	Religion	No.	Caste	No.	Original size of Family		Size of family in 1960	
								No. of Members in family	No. of families	No. of members in family	No. of families
Compensation and local	22	Kandyan Sinhalese	79	Buddhist	18	Goigama	84	1	7	2	1
Labourers	14	Low Country Sinhalese	43	Muslim	13	Padu	12	2	9	3	5
Immigrant	81	Muslims	13	Christian	5	Wahumpura	8	3	10	4	4
Ex-servicemen	13	Tamil	1								
							5	4	11	5	12
							5	5	17	6	14
							4	6	21	7	23
							2	7	24	8	22
							2	8	14	9	20
							13	9	11	10	20
							1	10	7	11	7
								11	3	12	6
							14		2	14	1
										16	1

Lowland Cultivation

Schemes of settlements in the major part of the Dry Zone were based on irrigation water from tanks which store water either from the rains during the rainy season or water diverted from rivers by anicuts. The tanks are constructed by providing bunds at convenient points in a catchment area and the stored water is distributed by means of distributary channels from which water is led by sub-distributary and field channels to the fields. These lowland allotments are cultivated both in the rainy season and in the dry season.

The former is called Maha and the latter Yala. Paddy grown on irrigated fields is the dominant crop in these lowland allotments. It constitutes the basic crop on which the whole economy of the peasant depends. The North-East monsoon rains provided an additional supply of water during the Maha, while the Yala depended entirely on irrigation water. The extent of land cultivated for the Yala depended on the availability of water in the reservoir tanks. It is not unusual that the extent of cultivable land is reduced when there is a shortfall in the water storage.

Highland Cultivation

The highland generally has no irrigation facilities. The crops commonly cultivated in the highland allotments are tree crops (coconut, jak, citrus, murunga, pomegranate, mango, cashew nut and kapok), plantains, vegetables (onions, chillies, yams and manioc), dry grains (kurakkan, gingelly, maize and sorghum) and rainfed paddy.

The tree crops grow especially well where the water was artificially raised by proximity to the tank, irrigation channels or other water courses, provided the plants were individually watered during the dry season. Murunga was normally planted along the boundary of the allotment together with other trees to serve as a fence. Few plantains are grown in the colony because of their low resistance to drought and high winds.

Many colonists cultivated vegetables during the Maha season in quarter to three-quarter acre plots. This was mainly to meet domestic needs, but wherever in surplus they were sold. Quite often, the crop was spoiled by the heavy rains during this season. The cultivation of dry grains were quite widely practised during the first few years of the settlement but becomes less important due to the gradual impoverishment of the lands after several years of continuous cropping. Wherever conditions of terrain and soil permitted, the colonists cultivated half to two acres of paddy during the Maha season and the crop was entirely dependent on the North-East monsoon rains. But on the whole most highland allotments in the Dry Zone are in a poor state of development due to the lack of water for any useful cultivation.

Techniques of Paddy Cultivation

The traditional wooden plough or a light iron plough drawn by a pair of buffaloes is still the predominant way of ploughing even though the use of tractors has been more intensified during the 1965-74 food drive of the Government. The colonists are aware of

the superiority of the tractor even though many still preferred to carry on the traditional methods of cultivation with animals. Some were of the opinion that the tractor dug too deep and brought up the infertile sub-soil.

Some found tractors too expensive to buy and those who owned animals did not like to incur extra expenditure. However, the colonists preferred the use of tractors for the first ploughing of the hardened earth by tractors and followed it by the traditional ploughing methods when the earth is wet and flooded and mudding conditions prevailed.

As a result of a concerted food drive the use of pureline paddy was increased in these areas. But even though the Government advised them to purchase fresh seed paddy from the Agriculture Department once every three years, the majority still used paddy from each year's harvest for seed. Transplanting is extensively practised only in a few schemes in Polonnaruwa, Anuradhapura and Ampara districts during the Maha season. Here the colonists by transplanting the seedlings obtained yields of ten to twenty bushels more per acre and some even 30 to 40 bushels more. But transplanting could not be carried out in some other schemes to the full extent during the Maha, because the area involved was too large or there was not enough trained labour and because it was too expensive to do so. Very little transplanting was done during the Yala season because of the lack of time in this short season. The Japanese method of transplanting was done in certain schemes and this method of transplanting was practised in Ceylon, planting of paddy in regular rows, but fewer seedlings are planted at each point and the interval between the seedlings was narrower. Hence the method is more labour exacting.

Many people were reluctant to adopt it because of the high labour costs involved. The yields obtained were about the same as those obtained by normal transplanting.¹

It was found in many schemes, most colonists from the Kandyan areas cultivated their paddy crops systematically, intensively, and adopted methods like transplanting more widely and weeded their fields regularly. Most found family labour insufficient and employed additional hired labour.

The application of both organic manure and artificial fertilizers were limited but is now growing as a result of the concerted food drive which organized 'Package development projects' as models. The farmers are slowly realising the profitability of the use of fertilizers in their cultivation habits.

Agricultural Production and Income

Statistics of yields of paddy in the lowland for the two seasons Maha and Yala 1959-60 relating to the colonists of Parakrama Samudra which could be taken as a typical dry zone colony, indicate that most of them secured yield in one of the four yield groups : 26-30, 30-40, 46-50, and 56-60 bushels per acre. The majority who secured yields in one group for the Maha season secured yields within the same group for the Yala season.

1. Dr. H.N.C. Fonseka. Parakrama Samudra Colony—An Example of Peasant Colonization in the Dry Zone of Ceylon.

The high yields reflect the better agricultural practices adopted by these people. The figures given above for the two harvests could be considered as representative of a series of years for the following reasons :

1. all these allottees had been cultivating their allotments for a period of over ten years ;
2. the improve techniques of agriculture had been in operation for some years ; and
3. climatically the agricultural year 1959-60 was a normal year.¹

The incomes of the colonists were derived mainly from the sale of paddy. Statistics reveal that most of them obtained incomes between Rs. 500-2,000. The incomes bear a strong correspondence to the yields of paddy. The estimates of expenditure connected with paddy cultivation vary from Rs. 300 to 1,000 for a 3 acre allotment and Rs. 500 to Rs. 1,500 for a five acre allotment. On the basis of these estimates the majority of the colonists obtained poor to medium net incomes. The incomes derived from subsidiary crops from the highland were quite small and were not regular. It varied from Rs. 30 to Rs. 100 for a season.

Identification of Different Patterns in Settlements

As said earlier the settlements in the Dry Zone are mainly based on irrigation schemes on the basis of lowland and highland cultivation. This is how colonization schemes were conceived at the start and the extent allocated was determined on the basis of labour force available per family as paddy was a labour intensive crop.

However, some attempts were made to settle peasants on the basis of cultivation of other crops. They are :

1. The settlements based on the highland crops like coconut, vegetables and schemes based on a combination of these two with adoption of poultry farming.
2. Recent attempts on the basis of subsidiary food crops like chillies, onions, etc. on irrigated land.

In the early 1960, schemes of settlements were started in the Dry Zone based on coconut cultivation. Units of 5 acres of land suitable for coconut cultivation was given to a family. It was anticipated that a colonist family will receive a minimum annual income of Rs. 1,750 from his allotment from the time the coconut trees come into bearing which is normally from the 6th year. Expenditure per colonist in these schemes roughly came to Rs. 11,250 per family.²

¹ Parakrama Samudra Colony. Dr. H.N.C. Fonseka.

² Administration Report of the Land Commissioner 1966-67.

The allottees were expected to subsist by undertaking vegetable cultivation or by adopting poultry or animal husbandry till the time the coconut comes into bearing. While the coconut schemes are popular in more favourable areas like Chilaw, the schemes started in the actual dry zone which is marginal climatically to coconut like the Vannathivilla scheme in Puttalam district, Kiranchi and Mulangavil in the Jaffna district and schemes in Trincomalee and Vavuniya districts have not been successful and are problem schemes to this day. My personal experience in managing these schemes for a considerable number of years makes me to come to the opinion that no further coconut schemes should be started in these areas unless it forms part of a mixed farming with a properly organized poultry and dairy farming. Coconut which takes over 10 years in the dry zone for bearing could be expected to bring in additional income.

In the recent years settlements have been started on the basis of cultivating chillies, onions and vegetables. Even though they have been initiated as unemployed youth schemes,¹ in essence they are colonization schemes. These are either lift irrigated or irrigated by channels from reservoirs. The Muthaiyan Kaddu in the Vavuniya district and the Visuwamadu Kulam and Dri Aru scheme are examples for the Lift-irrigated schemes, while the channel-irrigated schemes could be illustrated by the one at Rajangane where the youth scheme is sited.

In these schemes units of 3 acres of irrigable land was alienated and the allottee and his family is expected to live on the income derived from this land.

In all these schemes the Government provides the normal assistance as in the earlier paddy schemes.

Assistance to Peasant Colonists

Crown land is alienated to colonists as a protected holding under the Land Development Ordinance on a permit. This means that the permit is only personal to the permit-holder who can enjoy the land subject to the fulfilment of certain conditions and obligation.

He cannot dispose of the land to anyone nor can he lease or mortgage the land. If the conditions of the permit are not observed, the Crown has the right to cancel such permits and in that event the land reverts to Crown free of all encumbrances. But if the allottee fulfills these conditions he could continue to enjoy the fruits of the land and on his death his spouse or one of his children will inherit the land subject to the same conditions. Only one person will inherit it to avoid fragmentation of the land. The allottee pays a sum fixed by Government as a rent called the annual payment for the lease-hold.

The State also assists the allottee by incurring various types of expenditures on the development of the land. The first is the bearing of the cost of irrigation development. This includes the construction of the headworks, main channels and access roads both to

¹ For detail information see 'Evaluation Report on Youth Schemes' by E. M. D. Wickremasinghe, S. B. Gupta & S. Gunaratnam.

and within the irrigated area. In recent times the cost of these items has averaged in the region of Rs. 1,000 per irrigated acre. As newer schemes are undertaken with greater engineering and other costs, this cost is likely to rise to about Rs. 2,000 per irrigated acre.¹

The next item is the cost of developing individual allotments. The Director of Land Development has given Rs. 6,500 as average cost for a standard allotment for the following items :

1. Jungle clearing
2. Fencing
3. Ridging
4. Stumping
5. Cottage or house
6. Latrine
7. Proportional cost of communal well
8. Proportional cost of roads
9. Proportional cost of general buildings.

The third item are the costs incurred by the Land Commissioner in transporting the colonist from his original village, a subsistence allowance for 6 months until the colonist harvest his first crop, an issue of seed paddy, a few necessary implements and planting materials for the highland allotment. The costs total on an average of Rs. 425 approximately. The total cost of producing an economic holding in a colonization scheme is as follows :

		<i>Rs.</i>
1. Irrigation : 3 irrigated acres at Rs. 1,000	...	3,000
2. Development of allotment	..	6,500
3. Assistance for settlement	..	425
4. Cost of survey, etc.	..	375
		10,500

The cost includes proportionately the construction of roads and general buildings such as post offices, schools, dispensaries, administrative buildings, officers' quarters, etc.

Internally the colonies are served by minor roads. The minor roads are connected by cart tracks to the highland allotments. Most of these cart tracks could be used by cars during dry weather. Carts and bicycles are the most widely used mode of conveyance within the colony.

¹ National Planning Council Interim Report.

Marketing

Paddy is the most important cash-crop and the customer is the Government which buys the paddy under the guaranteed price system at Rs. 25 per bushel. This has been organized through multipurpose co-operative societies which are organized for each colonization scheme. The retail business for the colony is organized through smaller stores for each unit of 300 colonists in the schemes.

There are three sources of credit available to the colonists :

1. multipurpose co-operative societies,
2. traders, and
3. fellow colonists.

Generally the greater part of the colonists are in debt to the co-operative societies by way of not paying agricultural loans obtained for cultivation and invariably in debt to the traders as well.

(To be continued)

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