

## **MONITORING EXTENSION : A COGNITION ORIENTED APPROACH TOWARDS EVALUATION**

G.H. Düvel<sup>1</sup>

### **1. INTRODUCTION**

It is generally accepted that proper evaluation is one of the key factors in enhancing the effectiveness and efficiency of extension. That, in fact, is one of the major purposes of evaluation, namely to improve present and future extension. However, the classical summative evaluation conducted after completion of a program cannot improve the present extension, but only future programs. This meets the needs and interests of managers and directors, but for the operators concerned about improving their present performance, this has little more than only a historic value.

If more is expected from an evaluation than learning whether and to what extent the intended results have been achieved, then evaluation will have to be more differentiated. It will have to provide answers as to why certain results were achieved, or why not. What is needed is a monitoring instrument, that allows the monitoring of change as it occurs and not only an evaluation at the end of the process or the program. This will allow the extensionist to know before the end of the program, whether he is still on track and whether or what adaptations have to be made regarding approaches, methods, messages, etc.

This emphasises the need to understand change and how it is brought about, which essentially relates to the determinants of change and understanding which of these causal factors are accessible for extension, how communication can be planned and carried out meaningfully, and how these determinants can be used to monitor and evaluate change.

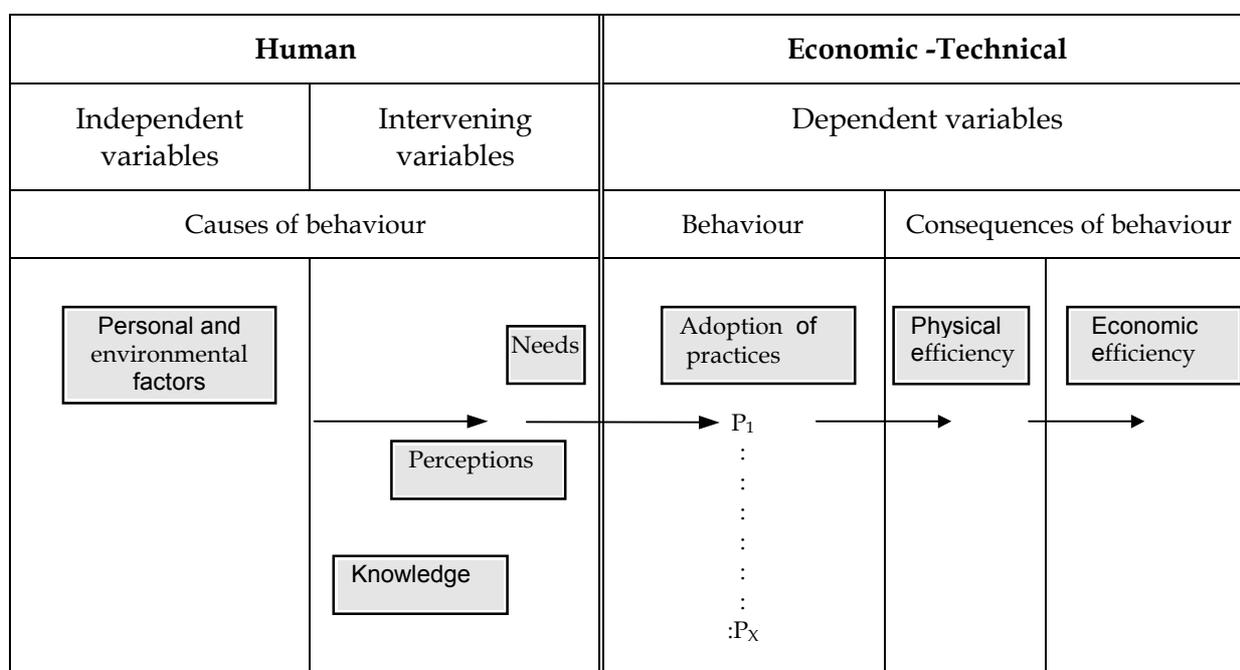
Against the background of behaviour theories, this paper identifies relevant factors or behaviour determinants that can be used to represent the focus of extension activities and extension objectives and can, consequently, be used for monitoring purposes. It shows how these determinants can be measured and gives an example of an evaluation and monitoring document.

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<sup>1</sup> *Professor and Director, South African Institute for Agricultural Extension, University of Pretoria, 0002 Pretoria, South Africa.*

## 2. IDENTIFYING MONITORING AND EVALUATION PARAMETERS

If evaluation and monitoring is focused on change, the change related factors and their inter-dependency could give an indication as to what the focus of objectives aimed at change should be. The problems encountered in agricultural development are usually efficiency related; the ultimate usually being, as indicated in Figure 1, economic efficiency (or inefficiency) which is usually the function of some form of physical inefficiency. Both are the results of behaviour, which, in a holistic context, can be described as management and entails the various practices that have to be adopted correctly and timely. This behaviour is caused by or is the function of behaviour determinants, which can again be subdivided into independent and intervening variables, the latter being the immediate precursors of behaviour through which the independent variables become manifested in behaviour.



**Figure 1: The relationship between behaviour-determining and behaviour-dependent variables in agricultural development**

From the above influence relationship it can be concluded that monitoring of a variable, as evaluation criterion is possible by evaluating the preceding or causal variable. For example, whether changes are occurring in terms of the economic or physical efficiency can be deduced from monitoring changes in adoption behaviour. An exact prediction is not possible, but it gives an indication as to whether there is progress and whether the extensionist is "on the right track".

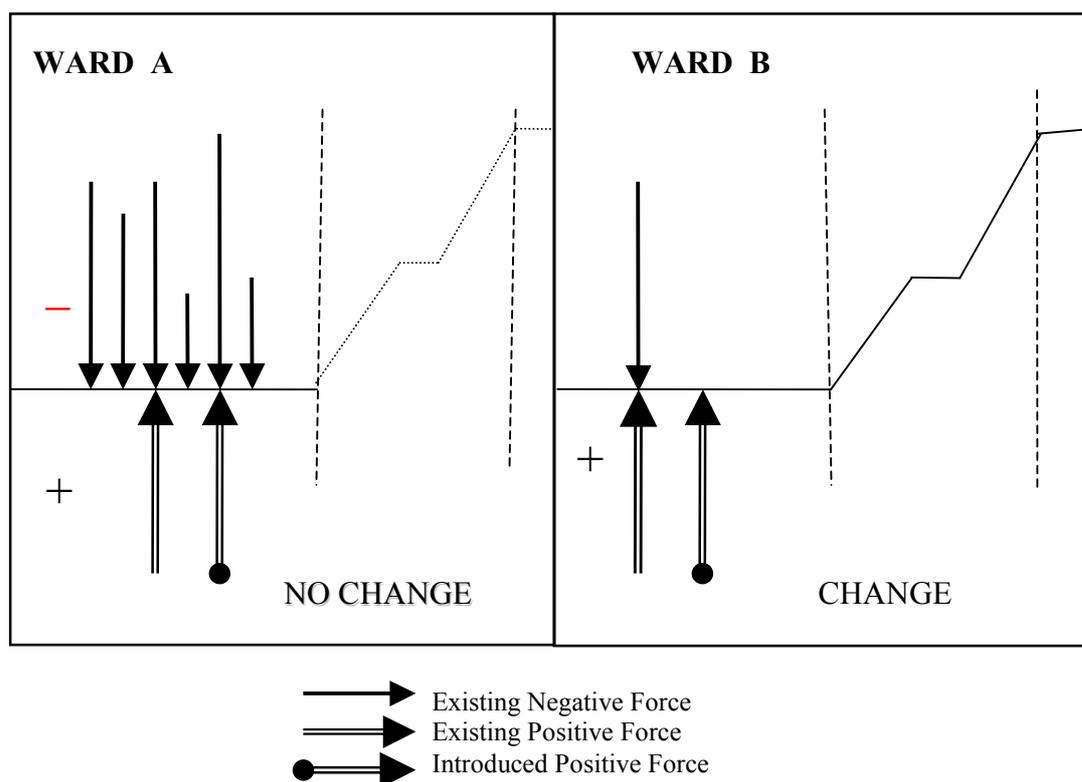
Similarly the adoption behaviour could be monitored by an evaluation of the intervening variables, which directly influence the adoption behaviour. These intervening or mediating variables can be associated with what Lewin (1951) refers to as the "forces" of change within the "life space" or "cognitive field". If a change of these forces, be it through strengthening of the driving (positive) forces or through the removal or reduction of restraining (negative) forces, leads to change in behaviour, they are obviously the most suitable and appropriate criteria or measures of change. For example, if the recommendation was for farmers to plant their crop earlier, this required change in behaviour could be brought about by changes in their cognitive field, of which needs, perceptions and/or knowledge are the main components. These are largely psychological constructs and, consequently the changes are of a covert nature. On the other hand, the overt changes (e.g. the planting time) would also be visible and measurable only after the next planting season. Whether the change agent is succeeding and making progress in this regard, can be concluded from an evaluation of the change in "forces" or change in the intervening variables.

The principle evolving from the above is that a form of monitoring is possible by focusing on the preceding or causal variables as evaluation criteria. The results of behaviour (e.g. profitability, or production efficiency) can be monitored through the adoption behaviour, which in turn can be monitored through evaluating the changes in the cognitive field (needs, perceptions and knowledge).

These latter variables are, as far as the extensionist's interest in evaluation is concerned, the most important and critical criteria. The more specific advantages of using the intervening variables as criteria of change are the following:

- \* They are, as direct determinants of behaviour, the logical focus of intervention, and consequently also the logical criteria of evaluation.
- \* They will, if monitored, reveal why (or why not) change has occurred. Similarly, it is through these variables that progress (or the lack of it) can be monitored and that the extensionist can get an indication concerning the adaptations that need to be made in terms of message, method or approach.
- \* They allow for a fair and just merit assessment or recognition of performance. It is not uncommon for an extensionist to either get undue credit for change that can only be partially accredited to him, or - perhaps

even more frequently -- not to get credit for what he has accomplished, simply because the change is of a covert nature. To illustrate this important consideration in extension management, two overtly similar situations in terms of the adoption of a practice (e.g. earlier planting) are shown in Fig.2. Although the wards A and B, served by two different extensionists, may appear similar in the sense that no recommended adoption may have occurred, they may differ considerably as far as the covert cognitive or psychological forces are concerned.



**Figure 2: The potential influence of similar interventions (introduction of a positive or driving force) in two situations which are overtly similar but differ in terms of the prevailing covert cognitive field**

In the example shown in Fig. 2, the forces (shown here as the average or typical cognitive field) in Ward B are almost in equilibrium, while the constellation of forces in Ward A is characterised by a very strong imbalance of negative over positive forces. It stands to reason that if both extensionists were equally successful in introducing a significant positive force of the same magnitude, visible large-scale change (expressed as movement) would only take place in Ward B, whilst the extensionist in Ward A, having been as successful, would have nothing visible to show.

### 3. MONITORING CRITERIA

As already mentioned the appropriate variables for monitoring change are the intervening variables, and more specifically the cognitive variables associated with needs, perceptions and knowledge. These have been selected and tested in extensive research projects over a number of years (De Klerk & Düvel, 1982, Düvel, 1975; Düvel & Afful, 1994, Düvel & Botha, 1990; Düvel & Scholtz, 1986, Louw & Düvel, 1978, Marincowitz & Düvel, 1987 and Düvel, 1995) and are incorporated in the following behaviour analysis model in a cause-effect relationship (see Figure 3):

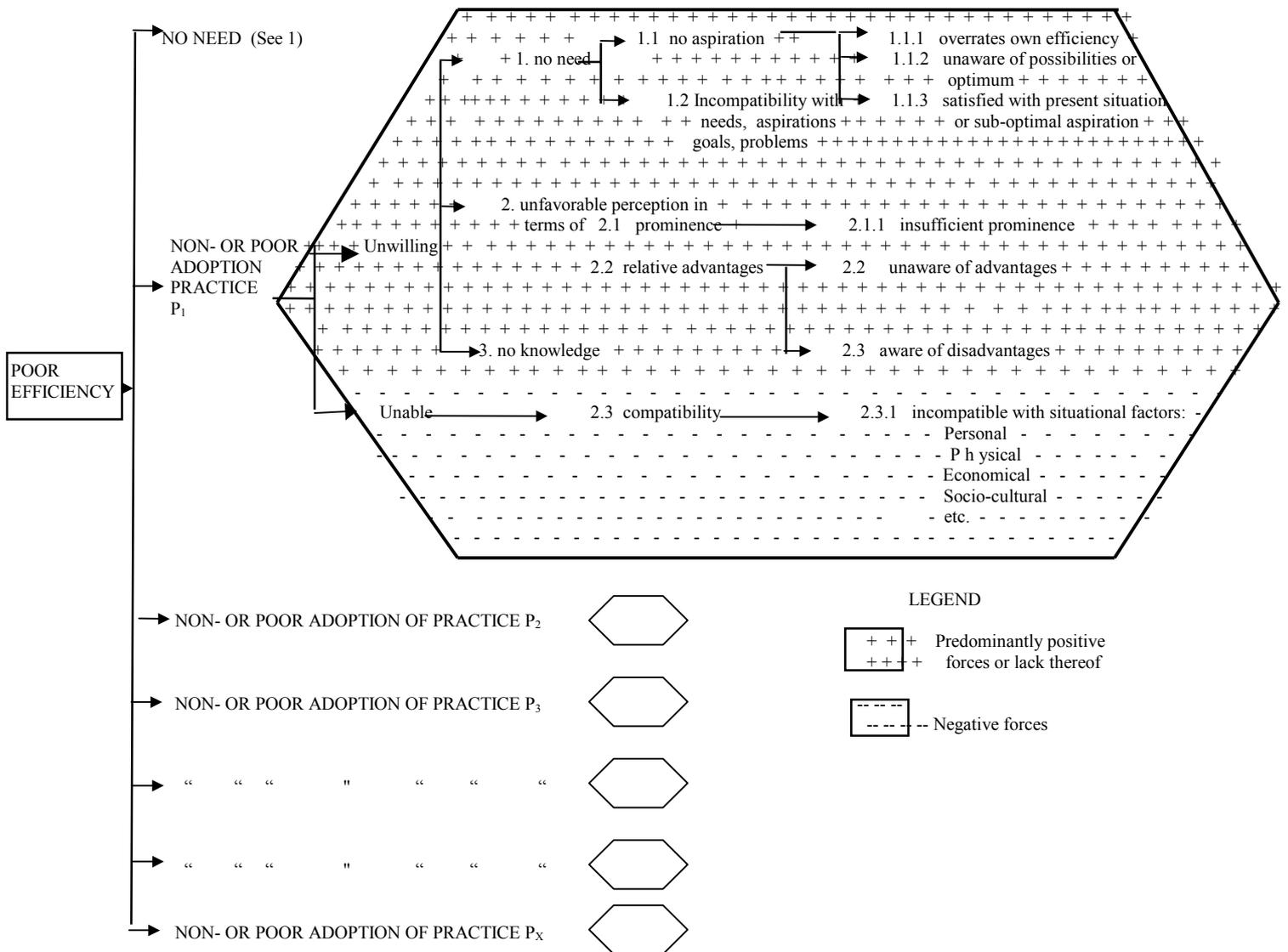


Figure 3: Model for behaviour analysis and intervention

### **3.1 Needs (1, Fig. 3)**

The concept of needs is used in a broad context and includes concepts like drives, motives, incentives, goals and even problems, mainly because the vocabulary of the psychology of motivation has as yet not been firmly established, resulting in these different concepts being used synonymously or being interchanged (Düvel, 1991). There appears to exist a "field polarity" consisting of a need (usually some form of deprivation resulting in disequilibrium or system in tension) located within the individual, and a goal object situated in the environment. The goal-object will assume a positive character (positive incentive) if it is perceived by the individual as having a potential need-satisfying capacity, and a negative valence in the case of a threatening further deprivation (negative incentive).

The need-related causes that have been found to determine the non-adoption of recommended practices are lacking aspirations (see 1.1 in Figure 3) and need incompatibility (see 1.2 in Figure 3). The lacking aspiration relates more specifically to a tendency on the part of the farmer to overrate his own efficiency, e.g. his grazing condition or production efficiency (1.1.1 in Figure 3), to an unawareness of the possibilities or the optimum (1.1.2), and to a satisfaction with the present situation or having a sub-optimal aspiration (1.1.3).

In a sense these aspects all have to do with the problem perception where a problem is regarded as being the difference between "what is" (present situation) and "what can be" or is strived at, viz. the desired situation (Düvel, 1997:59). If the existing situation, e.g. the efficiency of production or rangeland condition, is overrated due to "misperception" (see 1.1.1 in Figure 3), the perceived scope of the problem or potential need tension is reduced. If, at the same time, there is limited knowledge concerning the optimum that is achievable (1.1.2), the potential problem and need can be further reduced to an insignificant level.

Perhaps even more critical is the need compatibility (see 1.2 in Figure 3). This essentially means that an innovation or recommended practice does not fit the life space or need situation of the individual in the sense that it is not perceived as either a need related goal, or as a means of achieving such a goal.

### **3.2 Perceptions (2, Fig. 3)**

Although perceptions and needs (especially aspirations and goals) are related and interwoven, the necessity to identify all direct behaviour determinants as specifically as possible, justifies a separate focus on perception. Where needs usually relate to all positive or driving forces which in total constitute the

attractiveness, perceptions are of a more specific nature and are analysed on the basis of attributes of innovations. Rogers' (1983) classification of innovation attributes does not suit this purpose, mainly because of the broad and unspecific categories. In order to make provision for a wider spectrum of specific forces (for the purpose of cause identification as well as for addressing these causes in the attempt to promote change), these attributes have been redefined (Düvel, 1987). The categories that can be directly associated with field forces are relative advantages, compatibility aspects and prominence and consequently give direct access to the possible identification of relevant positive and negative forces.

An unfavourable perception as cause of unwillingness to adopt can thus have the following causes:

- (a) Insufficient prominence (2.1 Fig. 3), i.e. the recommended practice is seen as less prominent or less advantageous than the current one or than another alternative. This perception aspect corresponds with Rogers' (1983) definition of "relative advantage"
- (b) Unawareness of the advantages of the recommended solution (2.2 Fig. 3)
- (c) Awareness of disadvantages of the recommended solution (2.3 Fig. 3)
- (d) Situational incompatibility, viz. an awareness of constraints preventing the implementation of the solution or recommended practice (2.4 Fig. 3)

### **3.2 Knowledge (3, Fig. 3)**

Knowledge that is relevant in the case of innovation or practice adoption can be categorised as follows:

- (i) Basic knowledge or knowledge of principles.
- (ii) Knowledge associated with the awareness of relative advantages and knowledge of the recommended solutions.
- (iii) Knowledge in respect of the application of an innovation or practice.

The first two types of knowledge, in particular, are related to each other, but from a motivation point of view it is really only the knowledge concerning the recommended solution and its relative advantages (ii), that is of importance. This type of knowledge or cognition can be regarded as an intrinsic part of perception and thus largely overlaps with it. It is for this reason that an analysis of perception also caters for most relevant aspects of knowledge.

The knowledge of principles is important because it provides insight and therefore invariably has a bearing on the intensity with which the relative advantages are perceived as field forces. Basic knowledge is also fundamental if the farmer is to become independent or self-sufficient in terms of decision-making and self-help. Practical knowledge is one of the last pre-requisites for implementation or, in terms of Lewin's (1951) model, one of the last areas through which it is necessary to move before goal achievement.

This aspect is thus largely provided for under compatibility (2.4) and thereby supports the conclusion that, through an analysis of perception, most relevant aspects of knowledge can be identified.

#### **4. TOWARDS THE FORMULATION OF OBJECTIVES**

Meaningful evaluations are only possible with clearly defined objectives. They are the statements indicating where we want to go (in terms of situational change), in a specific time, from where we are now. They represent the "destinations" of the program journey, and permit us to read the "dashboard signals" that assure that we will arrive at our destination. The "destinations" are usually set in terms of efficiency parameters but should also be in respect of the causes of behaviour or cognitive field forces (see Fig. 2). The latter represent more particularly the "dashboard signals".

The identification of the relevant objectives can be done by means of a problem conceptualisation along the guidelines given by the model framework in Figure 3. This is illustrated in Figure 4 by means of a maize production example.

Being a hypothetical construct, the problem conceptualisation exercise has to be followed up with a survey to establish whether and to what degree the assumed or hypothesised problems or their causes are in fact problems. In this way the conceptualisation framework dictates what information needs to be gathered during the benchmark survey. The survey results provide the basis for the formulation of objectives. This process, especially the selection, priority determination and the setting of standards or ceilings to be attained should be, like the problem conceptualisation and the preceding problem delineation, a participative exercise involving the community or community representatives. Other important principles when formulating the objectives is that they be explicit (in terms of the kind of change, the extent -- minimum level -- of change, the area or target community and the time dimension) specific and comprehensive (so that every action or activity can be directly linked to formulated objectives) and integrated (showing a clear link-up

between the various levels of objectives, i.e. from general – mission and primary objectives – to the specific objectives and activities.

The following example, based on the conceptualisation information in Figure 4, is a document of objectives trying to meet most of the mentioned criteria or preconditions (Figure 5).

The above objectives are those of the program committee and as such only partially coincide with the work objectives of the extensionist. They do not meet the requirements for internal management, administration and control. For this reason, as well as for proper internal budgeting, a separate set of working objectives needs to be drawn up by the extensionist. His working objectives, focused on output.

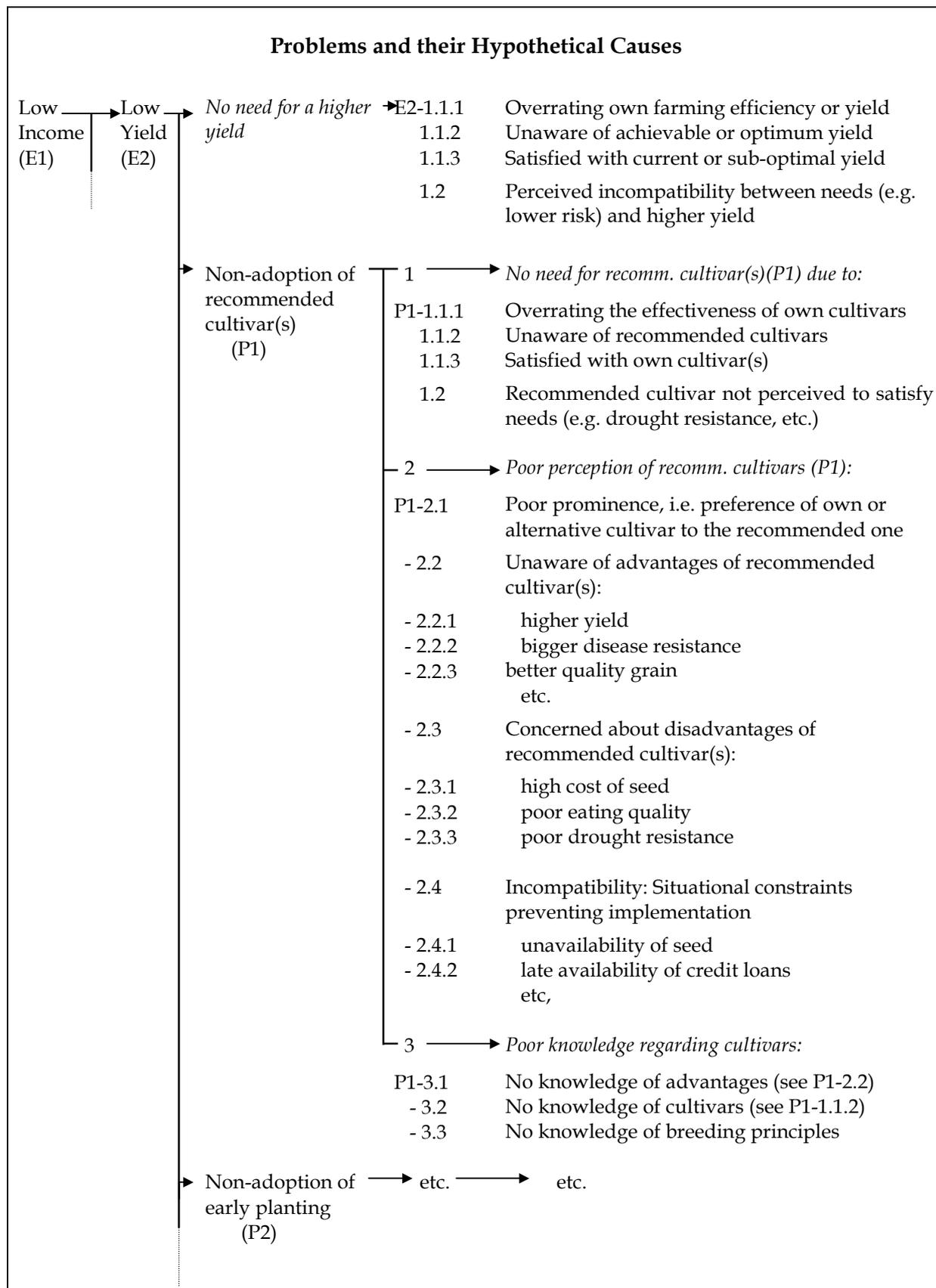
An example of such objectives is given in Figure 6. The format also allows for an easy and comprehensive calculation of the estimated costs or budget for the programme

In the initial planning phase these objectives or activities are bound to be still rather vague and general in nature. However, at the beginning of every month an adapted and detailed plan or set of objectives (including those relating to non-programmed activities) should be drawn up and submitted to management together with the month's work calendar. The work calendar is essentially only a variation of the above activities or work objectives, and should have their respective reference numbers for purposes of clarity and transparency.

## **5. THE EVALUATION DOCUMENT**

The increasing importance of evaluation and accountability justifies a clear indication to managers, sponsors and clients as to how and when the evaluation is to be done. For this purpose an evaluation document should be drawn up, summarising the selected objectives (primary, secondary and specific), the evaluation dates and the methods of evaluation. Figure 7 is an example of such a document.

One of the most appropriate ways of reporting on the progress and achievements, but also problems and failures, is through monthly reports submitted to the program committee at its monthly meetings. They should be supplemented by annual reports and later, at the conclusion of the program, by a final report.



**Fig. 4 Hypothetical problems and causes in maize production: an example of problem conceptualisation**

In view of (the mission) enabling communities towards improved life quality and higher standard of living through more profitable agricultural production, the objectives are:		
PRIMARY OBJECTIVE	SECONDARY OBJECTIVES	SPECIFIC OBJECTIVES
1 To increase the average maize yield in the Middlerest District from 2 to 3.5 tons over a period of 2 yrs	1.1 To increase the number of farmers having a need for increasing their maize yield from 21 to 90 by 1 Sept. 1988	1.1.1 To decrease the number of farmers overrating their production efficiency from 76 to 20 by July 1998 1.1.2 To increase the number of farmers having knowledge of the maize potentials on the Middlerest soils from 8 to 60 by July 1998 1.1.3 To increase the number of farmers being convinced that a higher yield will lead to lower risk (or higher profitability) from 25 to 75 by 1 September, 1998
	1.2 To increase the number of farmers growing the recommended cultivar(s)	1.2.1 To decrease the number of farmers overrating the effectiveness of their cultivars from 65 to 32 by July 15, 1998 1.2.2 To increase the number of farmers having knowledge of the recommended cultivars from 41 to 85 by July 15, 1998 1.2.3 To increase the number of farmers that are convinced that the recommended cultivars can contribute towards a higher yield, more drought resistance from 37 to 85 by July 15, 1998 1.2.4 To increase the number of farmers preferring the recommended cultivars to their own or other cultivars from 20 to 75 by July 15, 1998 1.2.5 To increase the number of farmers being aware of the following advantages of the recommended cultivars from 25 to 65 by August 20, 1998: <ul style="list-style-type: none"> <li>• higher yield</li> <li>• better grain quality</li> <li>• higher disease resistance</li> <li>• more drought resistance</li> </ul> 1.2.6 To decrease the number of farmers being concerned about the following disadvantages of recommended cultivars from 72 to 30 by August 20, 1998. 1.2.7 To remove the constraint of seed shortage perceived by 20 percent of the farmers before October 1, 1998.
	1.3 To increase the percentage maize planted before 15 November from 20 to 70 %	1.3.1 To reduce the number of farmers overestimating their planting time efficiency from 55 to 20 by November 10, 1998 1.3.2 etc. 1.3.3 etc.

**Figure 5: An example of integrated primary, secondary and specific objectives**

Objectives/Activities	Inputs/Costs	Standards
<p><b>1. To establish a program committee for the purpose of participation and ownership of the program.</b></p> <p>1.1 Decide or reflect on the nature (subject content) of the PDC<sup>1</sup></p> <p>1.2 Analyse the institutional structures and decide on the appropriate nature and degree of representation on the PDC</p> <p>1.3 Discuss the establishment of the envisaged PDC with the tribal chief or hierarchy</p> <p>1.4 Collect views and canvass support for the necessity, function, composition, election/nomination procedure in discussion with various community representatives or leaders, viz.</p> <p style="padding-left: 40px;">Farmer A Farmer B Farmer C Farmer D</p> <p>1.5 Arrange village meetings for election/nomination of PDC members.</p> <p>1.6 Prepare an introductory talk on the necessities and the functions of the PDC.</p> <p>1.7 Hold/attend the village meeting(s)</p> <p>1.8 Give publicity to the election results and convene the first PDC meeting.</p> <p>1.9 Prepare the first meeting with special reference to responsibilities, functions, office bearers, working procedure - constitution - and training program of the PDC.</p> <p>1.10 Hold the first meeting to have decisions taken regarding the above (1.9)</p> <p>1.11 Give publicity to the PDC regarding its objectives, functions, etc.</p> <p>1.12 Identify the next meeting (or regular meetings) for purposes of "problem conceptualisation".</p> <p><b>2. To conduct a problem conceptualisation with the PDC</b></p> <p>2.1 To prepare a draft problem conceptualisation to serve as guiding framework for the PDC conceptualisation exercise.</p> <p>2.2 To conduct a technical problem conceptualisation with the PDC</p> <p>⇒ List problems from PDC and survey</p> <p>⇒ Conduct a "result conceptualisation of all problems</p> <p>⇒ Agree on general problem (and goal) formulation</p> <p>⇒ Conduct problem conceptualisation according to causes.</p> <p>⇒ Identify "efficiency aspects" and "practices"</p> <p>⇒ Reconcile them with the survey.</p> <p><b>3. To analyse the survey results</b></p> <p><b>4. To compile a report based on the survey results</b></p> <p><b>5. To formulate (with committee) the primary and secondary program objectives</b></p> <p>5.1 Present findings to PDC</p> <p>5.2 Identify focus of objectives</p> <p>5.3 Decide on standards and aims</p> <p>5.4 Formulate objectives (primary and secondary)</p> <p><b>6. etc.</b></p>		

<sup>1</sup> Program Development Committee

**Figure 6: An example of work objectives and activities**

OBJECTIVES	EVALUATION DATE	EVALUATION METHOD*
<b>1. To increase the average maize yield in Middlerest from 2 to 3.5 tons over a period of 2 years</b>	July 1998 July 1999	Consult Statistics
1.1 To increase the number of farmers having a need for increasing their maize yield from 21 to 90 by 1 Sept. 1988	1 Sept. 1998	Sample survey
1.1.1 To decrease the number of farmers overrating their production efficiency from 76 to 20 by July 1998	27 June, 1998	Sample survey Question No 23
1.1.2 To increase the number of farmers having knowledge of the maize potentials on the Middlerest soils from 8 to 60 by July 1998	27 June, 1998	Sample survey Question No. 25
1.1.3 To increase the number of farmers being convinced that a higher yield will lead to lower risk (or higher profitability) from 25 to 75 by 1 September, 1998	27 June, 1998	Sample survey Question 22
1.2 To increase the number of farmers growing the recommended cultivar(s) from 25 to 80 within a period of 1 year	January, 1999	Records of Seed Companies
1.2.1 To decrease the number of farmers overrating the effectiveness of their cultivars from 65 to 32 by July 15, 1998	May 25, 1998	Evaluation form at cultivar demonstration
1.2.2 To increase the number of farmers having knowledge of the recommended cultivars from 41 to 85 by July 15, 1998	July 15, 1998	Sample survey Question 18-20
1.2.3 To increase the number of farmers that are convinced that the recommended cultivars can contribute towards a higher yield, more drought resistance from 37 to 85 by July 15, 1998	July 15, 1998	Sample survey Question 21-24
1.2.4 To increase the number of farmers preferring the recommended cultivars to their own or other cultivars from 20 to 75 by July 15, 1998	July 15, 1998	Sample survey Question 17
1.2.5 To increase the number of farmers being aware of the following advantages of the recommended cultivars to 65 by August 20, 1998: higher yield • better grain quality • higher disease resistance more drought resistance	August 20, 1998	Telephonic sample survey: Question No 14
1.2.6 To decrease the number of farmers being concerned about the following disadvantages of recommended cultivars from 72 to 30 by August 20, 1998.	August 20, 1998	Telephonic sample survey: Question No 14
1.2.7 To remove the constraint of seed shortage experienced by 20 percent of the farmers before October 1, 1998	August 20, 1998	Telephonic sample survey: Question No 14
1.3 To increase the percentage maize planted before 15 November from 20 to 70 %	etc.	etc.

\*Questions referred to are those used in previous (bench-mark) surveys.

## Figure 7. The evaluation document

### CONCLUSIONS

The main function of evaluation, over and above the important purpose of accountability, lies in the improvement of present and future extension. Especially for improving the present extension, a form of monitoring is required that gives an indication, whether the program is still on track, what progress is made and whether adaptations need to be made or not. For this purpose the intervening variables or cognitive field forces of needs,

perceptions and knowledge provide a suitable measure, and should consequently also feature in the specific objectives.

A monitoring based on cognitive aspects (intervening variables) is also bound to be a more just and fair measure of the extensionist's achievements. However, from an accountability and accreditation point of view, it is paramount that over and above the program objectives, working objectives be formulated to cover all his activities, even though they may be only of an input nature. For management this has advantages from a control point of view, which, under normal conditions, could be counter productive, but in South Africa with its current notoriously low level of delivery, this might be the lesser evil.

Proper evaluation places high professional and scientific demands on extensionists and calls for urgent in-service training programs. In the interim period it may be appropriate to let untrained extensionists operate as assistants to professional extensionists taking responsibility and ownership for programs beyond a single extension ward.

Unless every effort is made by extension to be truly accountable the aspect of affordability may rule out public or state extension services sooner rather than later.

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