



**BAIF Development Research Foundation
Evaluation Training Workshop**

**November 6-10, 1989
a Reference Document**

Prepared for:

**BAIF Development Research Foundation
Poona**

and

**International Development Research Centre
Ottawa**

19 December 1989

Preface

Between 3 and 10 November 1989, we visited the BAIF Development Research Foundation in Poona. Together with 30 senior members of BAIF's management and professional staff, we reviewed BAIF's monitoring and evaluation systems and considered ways to structure and improve them.

We would like to thank BAIF, and in particular Manibhai Desai, Girish Sohani, Madhuri Newale and Sachin Kanekar for the excellent organization of the workshop and for making our visit comfortable.

Further, we would like to thank Anne Whyte, Terry Smutylo, Vijay Pande and other IDRC staff for their continuous interest in and support of this assignment.

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Foreword

This report is a practical reference document on the topics which were discussed during a five day BAIF-VHB Evaluation Training Workshop on 6-10 November 1989. The workshop was part of the International Development Research Centre's (IDRC) contribution to its partnership with BAIF. The workshop was attended by 30 senior members of BAIF's management and professional staff¹ and three consultants of VHB Research and Consulting Inc., Toronto. There were four objectives for the workshop:

- to foster a positive attitude towards evaluation among BAIF management and staff;
- to identify ways to improve the program monitoring and evaluation functions at BAIF;
- to train BAIF staff in the use of evaluation concepts and techniques; and
- to assist BAIF in drafting monitoring and evaluation plans for improving the management and delivery of BAIF programs and for assessing the effects of those programs.

In preparation for this workshop, the VHB consultants - on assignment from IDRC² - together with BAIF staff mapped out and assessed the internal monitoring and evaluation systems with a specific emphasis on BAIF's development programs. In addition, the problems and training needs of BAIF's management and staff were identified. The results of this review were discussed at a BAIF-VHB seminar on 26-27 June 1989 and are extensively reported in VHB's report entitled *BAIF Development Research Foundation, Monitoring and Evaluation*, September 1, 1989.

1 A full list of participants of the Evaluation Training Workshop is presented in Appendix A.

2 The full Terms of Reference of this assignment is presented in Appendix B.

BAIF is a large and complex organization and the various development programs are supported by a wide range of activities including applied research projects focusing on the testing and adaptation of advances in science and technology relevant to the specific context of rural India; field testing projects to verify the adequacy of various technologies before dissemination to farmers; implementation research projects carried out to develop new intervention approaches; a bull station and semen storage facilities to ensure the continuous availability of large quantities of high quality semen; substantial amounts of various vaccines and medicines produced to be made available to farmers through the development projects; pre-service and in-service staff training programs to upgrade the skill and attitudes of field staff.

This training workshop focused on *monitoring and evaluation systems for BAIF's development programs*, with specific reference to the Dairy Cattle Production Programme and the Socio-Economic Rehabilitation Programme for Tribals. The presentations, discussions and brainstorming sessions addressed general topics such as approaches to evaluation; concepts and definitions related to monitoring and evaluation; and the formulation of monitoring and evaluation plans. Further, specific attention was given to the use and formulation of indicators, basic statistics including sampling, and computer supported data management.³ The workshop did not address in any significant way the monitoring and evaluation of BAIF's supporting research projects. The workshop was too short to do so and, in view of expected substantial expansions of the Dairy Cattle Production and the Tribal Rehabilitation Programme, BAIF has given priority to formalizing and structuring present monitoring and evaluation activities in these two development programs.

In preparing this workshop, VHB's consultants made use of two excellent publications of the World Bank:

- Casley, Dennis J. and Kumar, Krishna (1987) *Project Monitoring and Evaluation in Agriculture*, The John Hopkins University Press, Baltimore and London.
- Casley, Dennis J. and Kumar, Krishna (1988) *The collection, Analysis and Use of Monitoring and Evaluation Data*, The John Hopkins University Press, Baltimore and London.

The approach and contents of these two books are pragmatic and based on a blend of theory and practical experience. They cover most of the subjects of interest for BAIF in its effort to formalize and improve the present monitoring and evaluation functions in its development programs.

This report does not pretend to be a complete guide for monitoring and evaluation in the way both books of Casley and Kumar are. The contents of this reference document are based on VHB's presentations and BAIF's discussions and brainstorming sessions during the workshop. Chapter 1 presents a general introduction to monitoring and evaluation establishing the framework and defining terminology that is used in the later chapters. Chapter 2 explores the possibilities of formulating indicators of change to assist in BAIF's monitoring and evaluation processes. Chapter 3 gives an overview of various relevant data collection methodologies. Chapter 4 explains how data management by personal computers could improve the use of BAIF's monitoring records. Chapter 5 provides a short overview of data analysis techniques. Chapter 6 explains the components of a monitoring and evaluation plan and contains preliminary monitoring and evaluation plans for the Dairy Cattle Production Programme produced during the workshop. The format of this report is that of monitoring and evaluation plans, its contents consist of the results of discussion sessions during the workshop. To become full-fledged monitoring and evaluation plans, this preliminary document needs to be revised and refined on the basis of further discussions and decisions within BAIF.

1 MONITORING AND EVALUATION: approaches, framework and terminology

Monitoring and evaluation as a discipline is a relative newcomer to the field of development work. Despite the fact that project monitoring is as old as management, it has only recently been recognized as an important management tool for rural development programs and projects. Project evaluations, when undertaken, have mostly been limited in concept and scope and were mainly concerned with disbursement and delivery of physical inputs and outputs. Evaluation as a periodic assessment of the relevance, performance, efficiency and impact of a project in the context of its stated objectives, has also only recently become an integral part of development projects and programs. This positive development can be attributed to the concerted efforts of UN organizations such as the FAO, the World Bank, UNESCO, UNICEF, the ILO, and the WHO, which encourage donors and recipients to introduce formal monitoring and evaluation systems as integral functions of development projects and programs.

The framework and definition of terminology, presented in this chapter and used further in this document, have been derived from publications by the above UN organizations and specifically from the *Guiding Principles for the Design and Use of Monitoring and Evaluation in Rural Development Projects and Programmes*, a 1984 publication of the ACC Task Force for Rural Development of the UN.⁴ This booklet, together with the publications of Dennis J. Casley and Krishna Kumar represent the common understanding and joint efforts of the UN agencies and organizations to provide a conceptual and practical framework within which monitoring and evaluation systems for rural development programs can be designed and developed.

⁴ The Administrative Committee on Coordination (ACC) is composed of all heads of the UN agencies and organizations and acts as the highest level coordinating body of administrative and other matters of common interest to the agencies and organization within the UN system. The ACC set up the Task Force on Rural Development in 1976.

The principles and methods introduced by the UN have been used flexibly and adaptations and additions were made to tailor them to BAIF's particular needs. However, by following basically the framework and terminology of the UN organizations, it is hoped that the results of BAIF's evaluation efforts will become more accessible to third parties and better comparable with the evaluation results of other development programs.

1.1 Approaches to evaluation

Various evaluation approaches, applicable to rural development programs and projects exist. Each approach embodies a certain set of assumptions about what evaluation is, how it should be conducted, what sorts of results will be produced and how these results are to be communicated. Probably the most common approaches in the context of rural development programs and projects are the *experimental* and the *goal-oriented* approach.⁵

The experimental approach

The experimental approach to evaluation aims at deriving generalizable conclusions about the impact of a project or program, and about the effectiveness or efficiency of different intervention approaches. The principles of scientific research are applied and the evaluator uses the basic techniques of experimental test design such as randomization, statistical analysis, control groups, longitudinal analyses, multi-variate analyses.

The main emphasis of this approach is on controlling extraneous factors and on isolating program influences. A major focus is the technical validity of the conclusions. The objectivity and generalizability of the conclusions are its major strengths. However, this approach faces difficulties in establishing controlled conditions in the real world in which development projects are carried out and tends to reduce complex influences to simple causal patterns.

The goal-oriented approach

The goal-oriented approach aims at measuring the extent to which aims, objectives and work targets are accomplished. The approach is a natural outgrowth of a

5 A good description of the experimental and the goal-oriented approach is given in Stecher, Brian M. and Davis, W. Alan (1987) *How to focus an Evaluation* Sage Publications, Inc., California 91320. This book is part of the series *Program Evaluation Kit*, edited by Joan L. Herman and published by Sage Publications. This and the other books of the Program Evaluation Kit are available in the library of BAIF's Information Resource Centre in Pune.

generally applied model for project design, which consists of the identification of a specific set of aims and objectives and organizes project activities to achieve them.

The main emphasis of this approach is on the measurement of success in terms of project specific criteria rather than on comparisons with control groups or other projects. Its major concerns are the clear delineation of relationships between objectives and activities of *one* specific project and on the procedures that are to be used to measure the attainment of goals and objectives. These concerns form the major strength as well as the weakness of this approach: it encourages project staff to focus on specific elements of the project that are meaningful for them, but in doing so they may miss important unintended consequences of the project.

The *experimental approach* tries to answer questions such as why did this program in this area succeed and why did it not in other areas? Or, what is it in BAIF's activities that makes the organization more successful in its rural development work than other organizations? This approach would allow BAIF and other interested parties to better understand the process of rural development and the ways in which this process can be positively encouraged.

The *goal-oriented approach* attempts to answer questions such as have the pre-set work targets, objectives and aims been attained and if not, why not? This approach allows for the continuous improvement of the project cycle - design, planning, implementation, evaluation - and is specifically relevant for fast expanding organizations such as BAIF that continuously start new projects.

BAIF is certainly interested in exploring the process of rural development and ways in which this process can be encouraged. However, BAIF implements its various development projects on the basis of contracts with sponsors. These contracts are precise and do not allow for socio-economic explorative evaluation studies. Therefore, BAIF has adopted the *goal oriented approach* for its monitoring and evaluation systems to assist in improving management of the funds entrusted by sponsors.

1.2 A framework and definitions of terminology

Various frameworks and terminologies are used in monitoring and evaluation. This section attempts to define some of them in order to create a common reference frame and language within BAIF. The framework for monitoring and evaluation and the definitions presented in this section reflect BAIF's goal oriented approach to monitoring and evaluation.

The purpose of a project⁶ is to convert a set of resources into desired results through an organized set of activities. The resources are called *inputs*. The results are divided into three broad categories: *outputs, effects and impacts*. The latter correspond to a project's hierarchy of objectives, namely the short, intermediate and long term goals, or *work targets, objectives and aims*, respectively.

Inputs

Inputs are goods, funds, services, manpower, technology and other resources provided for a project with the expectation of producing outputs and achieving the objectives of a project.

The inputs of the Dairy Cattle Production Programme, for example, are manpower, funds, deep frozen semen, technology, transport facilities for the field staff. The inputs of the Wadi project of Socio-Economic Rehabilitation Programme for Tribals are the above and mango graft, materials required for the establishment of one acre family orchards, and training services.

Outputs, effects and impacts

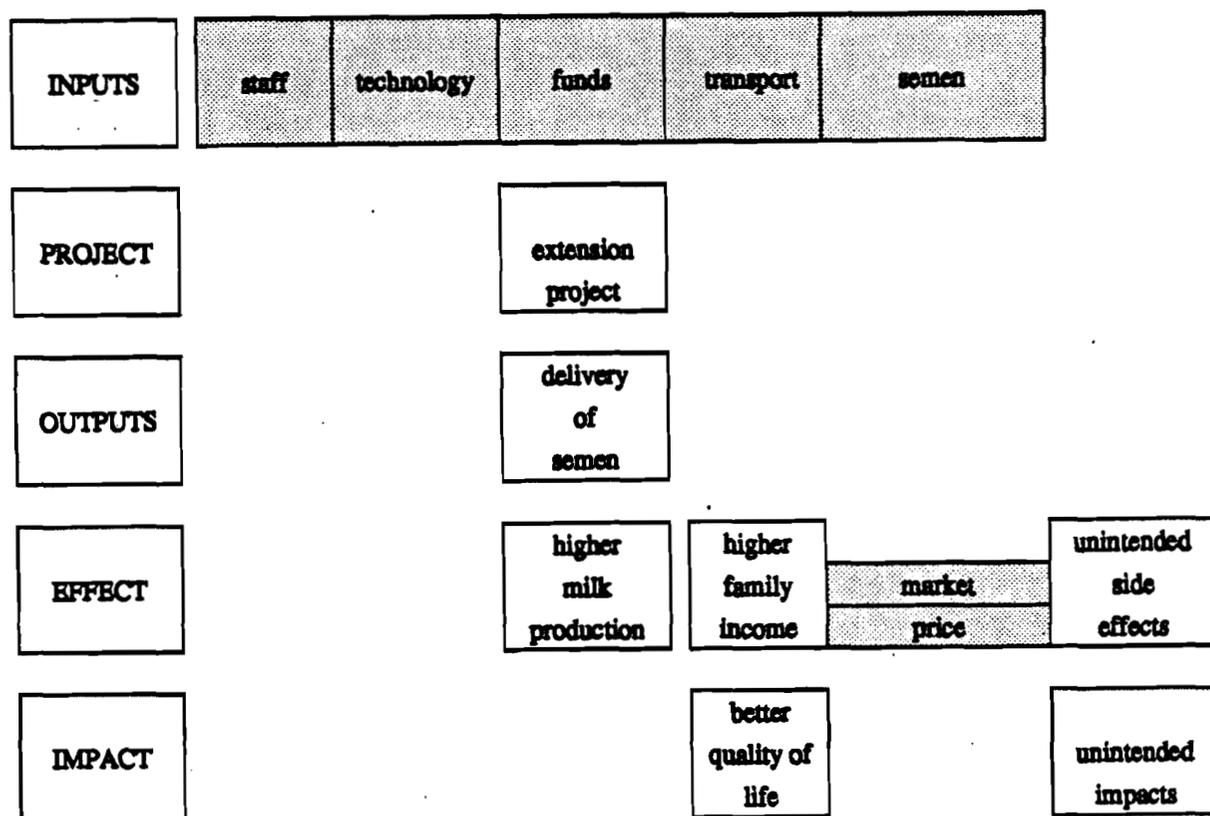
Outputs are the specific products or services which an activity has actually produced from its inputs. Examples of project outputs within BAIF's development programs are cross-bred calves (within the context of the Dairy Cattle Production Programme) and one acre family mango orchards (in the context of the Socio-Economic Rehabilitation Programme for Tribals).

Effects are the outcomes of the use of project outputs by the beneficiaries. Examples include milk, specifically the incremental yields obtained from cross-bred cows or mango's from the family fruit orchards.

Impacts are the outcomes of project effects, i.e. an expression of the results actually produced. Impacts may also be defined as the ultimate change in the living conditions of the beneficiaries resulting (wholly or partially) from a project or program. Examples include changes in actual living conditions flowing from the project, e.g. improved nutritional status, better schooling for the children, wider participation by the target groups in community life and decision making. Impacts thus may be expected at both the individual or family level (changes in nutrition, housing, health) or at community level (distribution of incomes and wealth, community facilities, soil productivity).

⁶ Projects are generally part of a program. Both projects and programs are activities organized for achieving specific aims and objectives, the difference being one of scope, magnitude and diversity. Throughout this document the term project will apply to projects as well as programs.

Table 1: Project inputs, outputs, effects and impacts



The distinction between output, effects and impacts may seem somewhat arbitrary. For example, is the frozen semen, delivered at the doorstep of the farmer's family the output (i.e. the specific products or services which an activity has actually produced from its inputs) of the Dairy Cattle Production Programme, or is it the cross-bred calf that is later born? Is the extra milk production of a family the effect of the Programme, or is it the higher family income resulting from its sale? Is this higher income to be considered an effect at all, or should it be regarded as an impact of the project? Clarity about what exactly is reckoned to be output, effect or impact is important when one defines indicators to facilitate

monitoring and evaluations (see chapter 2). It is sufficient to note that outputs, effects and impacts are project specific and that their delineation depends on how the work targets, objectives and aims of a project, respectively have been formulated.

Most projects have unintended effects and impacts, which may reflect positive or negative developments within the context of the project's aims and objectives. For example, a rural access road project may increase the gully erosion in the area; or, an irrigation project increases farmers' income not only from additional crop yields but also from the sale of fish which they began to keep "in" the irrigated fields.

Aims, objectives and work targets

Goals are the desired results of a development project and can be arranged in a hierarchy of two or more levels. The most commonly used hierarchy consists of three levels, i.e. short term goals or *work targets*, intermediate goals or *objectives* and long term goals or *aims*. Work targets are the *desired outputs* of a project, objectives the *desired effects* and aims the *desired impacts*.

BAIF's preliminary list of aims, objectives and work targets of its Dairy Cattle Production Program and of its Socio-Economic Rehabilitation Programme for Tribals is listed in ?.

Monitoring, On-going Evaluation and Impact Evaluation

Monitoring is the continuous review and surveillance of a project by the project management at every level of the hierarchy of an organization to ensure that input deliveries, work schedules, financial disbursements and *targeted outputs* are proceeding according to work plan. Thus, monitoring scrutinizes the project operations from input deliveries up to what has been determined to be the project outputs and assesses them in the light of pre-set work targets.

The *purpose of monitoring* is to achieve *efficient project performance* by providing feedback to enable project management to improve operational plans and to take timely corrective action in case of shortfalls and constraints.

BAIF already has detailed and effective monitoring systems in place for its various development programs. They provide the management at various levels in

Table 2: Aims, objectives and targets of the Dairy Cattle Production Programme and of the Socio-Economic Rehabilitation Programme for Tribals

**DAIRY CATTLE
PRODUCTION
PROGRAMME**

aims

- to create gainful self-employment
- to achieve sustainable livelihood
- to improve quality of life

objectives

- increase milk production
- increase number of high milk producing quality animals per family
- reach the maximum number of families in each Centre

targets

- timely reimbursement of expenses
- number of fresh cows inseminated
- participation level by sections as per sponsor requirements
- efficient semen use
- wise spending of money

**TRIBAL
REHABILITATION
PROGRAMME**

aims

- to create gainful self-employment
- to achieve sustainable livelihood
- to improve quality of life

objectives

- establish productive orchards and forestry plants to get an family income within 5 years
- improve health status in general and of women and children in particular
- provide good potable water

targets

- plant and aftercare of 40 mango trees and 1600 forestry tree per tribal family
- intercrop in *wadi* plots min. of 10 gunthas/family
- raise seedlings to fulfill total requirements
- develop land
- harvest water as per condition
- motivate max. no. of families to participate
- train 1 person per part. family in wadi components
- supply required inputs for each wadi
- MCH care to all families
- mobil clinics for preventive and curative health services
- train women in health topics
- purify drinking water

The aims, objectives and targets of the Dairy Cattle Development Programme and of the Socio-Economic Rehabilitation Programme for Tribals listed here result from discussions in various groups during the workshop. To become formal aims, objectives and targets, they need to be revised and refined on the basis of further discussions

the organization with information about how the work is proceeding.⁷

On-going evaluation is the analysis, during the implementation phase of a project, of its *effectiveness*, continuing relevance and likely future impacts.

The *purpose of ongoing evaluation* is the provision of information about needed adjustments of work targets and objectives and implementation strategies, as well as providing information for future planning. *On-going evaluation* examines whether the assumptions or hypotheses made during the project formulation stage are still valid, or whether adjustments are required to ensure that the overall project aims will be achieved.

BAIF has a strong informal on-going evaluation system and has decided to formalize this system.

Table 3: Monitoring, on-going evaluation and impact evaluation

ACTUAL		DESIRED		
	INPUTS		PROJECT PROPOSAL	
	PROJECT			
	OUTPUTS	MONITORING	SHORT TERM GOALS	work target
unintended effects	EFFECTS	ON-GOING EVALUATION	MEDIUM TERM GOALS	objectives
unintended impacts	IMPACTS	IMPACT EVALUATION	LONG TERM GOALS	aims

⁷ A review of these monitoring systems can be found in VHB's report *BAIF Development Research Foundation, Monitoring and Evaluation*, September 1, 1989.

Impact evaluation is the assessment of the overall results of the project in the context of its long term goals or *aims*.

The main *purpose of impact evaluation* is to learn lessons for future planning, i.e. for the design or formulation, appraisal, implementation, monitoring and evaluation of future development activities.

Table 4: Differences between monitoring and evaluation

	MONITORING	EVALUATION
<i>objectives</i>	assessment of functioning activities	assessment of relevance, performance, efficiency and impact
<i>reference period</i>	continuous	periodic
<i>sources of information</i>	from within project only	from within and from outside
<i>primary users</i>	management	management sponsors interested parties
<i>position in organization</i>	integral part of day-to-day management	located in separate evaluation unit

Differences between monitoring and evaluation

Monitoring and evaluation are distinctively different functions, serving different users. Monitoring is focused on providing information to project management in order to guide day-to-day decision making. Evaluation concentrates on providing

information to management, sponsors and other interested third parties in order to facilitate the design, formulation, implementation and monitoring of future development activities.

Monitoring must be integrated within the project management structure, but evaluation, with its wider horizons, is not necessarily such an integral component.

BAIF's monitoring systems are already part of day-to-day management. In formalizing its evaluation functions BAIF may consider establishing a central evaluation facility in Poona on the following grounds:

- it is uneconomical to provide the required specialized technical skills at each State or project;
- it is necessary to compare data from projects from various States;
- it provides a measure of independence and facilitates objectivity.

Although different from monitoring, in carrying out on-going and impact evaluations, one should fully use the data gathered during monitoring. Monitoring should, whenever possible, include data collection for evaluation purposes in order to cut costs, use available manpower as efficiently as possible and minimize the hindrance to farmers.

2 INDICATORS FOR MONITORING AND EVALUATION

Indicators are measurable variables that are correlated with the success and failure of the conduct of a project. Indicators are *markers* of progress towards reaching the project's targets, objectives or impacts. In other words, targets, effects and impacts provide the standards against which to measure or assess the progress of a project while indicators are tools with which the progress towards reaching the project's targets, objectives and aims is measured.

There is little conceptual problem with determining outputs and effects and, if work targets and objectives are clearly and unambiguously defined, they are generally directly measurable. However, the direct measurement of sustainable livelihood or quality of life and other concepts which are normally used in defining the aims of a project, is not feasible and hence indicators are specifically needed in the context of impact evaluations.

Indicators are variables that help to measure change in a given situation. They are tools and should be:

- explicitly related to and derived from the project's aims, objectives and targets;
- unambiguously defined in the project's context;
- consistent, i.e. the indicator values should only change when circumstances change;
- specific, i.e. indicators should measure the specific conditions that the project intends to change;
- sensitive to change in the project situation;
- reliable, i.e. conclusions based on them should be the same if measured by different people at different times and under different circumstances;

- cost effective, i.e. the results should be worth the time and money it costs to apply them.

Few indicators can fulfil all these criteria. But they may still indicate *direction and general magnitude of change* and assist in comparisons over time and among different areas at a point in time. The choice of appropriate indicators requires experience and a thorough understanding of the information needs of the project management at various levels, the process of socio-economic and cultural change and of how best the data for the measurement of the indicators can be obtained. Indicators can not be universal because the ways in which the process of change expresses itself depend on the resource base, the cultural and historical background of the affected population, and the market conditions. Thus, what is an appropriate indicator for one project may not be appropriate for another and what can be measured in one setting cannot always be measured in another. Therefore, indicators for BAIF's development programs may differ from state to state and even from district to district.

The use of indicators in monitoring and evaluation helps focus the efforts devoted to collecting information. It forces the evaluator to think through what is actually to be measured and to state explicitly why a selected indicator is a marker of progress towards reaching the project's targets, objectives or aims. Just because of this, the use of indicators normally cuts down the amount of data that is collected.

2.1 Indicators for monitoring

Indicators for monitoring can assist in assessing whether project inputs are being delivered, are being used as intended and are producing the intended outputs and initial effects. Project management should guide the choice of indicators by deciding what they need to know to manage the project efficiently.

There are four principle categories of monitoring indicators, *input delivery indicators, beneficiary contact indicators, output indicators and explanatory indicators*.

2.1.1 Input delivery indicators

Input delivery indicators focus on assessing whether project inputs are being delivered in time, at the right places, in the right quantities and whether they are being used as intended. Examples of input delivery indicators are

- financial disbursement figures as related to project budget

- semen stock figures as per zone and centres
- number of tree seedlings produced in nurseries
- equipment usage, mileage

The administrative records of a project are the source for these indicators. There is no extra data collection needed. However, good record design and maintenance is required. Computer supported data management systems can cut down dramatically the time needed for, and can improve the quality of collation, analysis and reporting to the project management.

2.1.2 Beneficiary contact indicators

BAIF implements its projects on the basis of arrangements with sponsors in which the exact number of families to be assisted or the exact number of cows to be artificially inseminated is explicitly stated. This beneficiary contact target is expressed as an absolute number and the number of actual participants is therefore BAIF's principle beneficiary contact indicator.

However, BAIF's own aims and objectives for its development programs, under which the various sponsored projects are implemented, are formulated in more general terms. To monitor the overall progress of its development programs, BAIF could use the following beneficiary contact indicators: the *proportion of the target families* that

- *knows* of BAIF's services
- has *access* to BAIF's services
- *receives* BAIF's services and advice
- *understands* BAIF's advice
- *regards* BAIF's services as helpful
- has *adopted* BAIF's services and advice
- has made *repeated use* of BAIF's services

To quickly determine the values of such beneficiary contact indicators for assessing the overall progress of its programs, BAIF needs lists of target families for each of its Rural Development Centres. These can be the *family identification registers* (recommended in VHB's previous report) or existing listings of families at

Table 5: Monitoring (output) indicators for BAIF's Dairy Cattle and Tribal Rehabilitation Programmes

DAIRY CATTLE PRODUCTION PROGRAMME	TRIBAL REHABILITATION PROGRAMME
<ul style="list-style-type: none"> • number of fresh insemination • number of pregnancies • percentage of families participating from weaker section • total number of participating families • expenditures per centre <ul style="list-style-type: none"> • on fuel and oil • per insemination 	<ul style="list-style-type: none"> • number of families which completed <ul style="list-style-type: none"> • wadi land development • raising tree seedlings • wadi tree planting • wadi intercropping and intercultivation • training in wadi work • number of families which received inputs for wadi programme • number of check-dams built in the area • number of mothers who early registered for A.N.C. • percentage of children immunized • utilization of health facilities, i.e. number of patients seeking treatment through mobile clinics • financial disbursements

The monitoring indicators listed here result from discussions in various groups during the workshop. To become formal indicators, they need to be revised and refined on the basis of further discussions and decisions within BAIF.

the village level, provided that these include all families in the area to be served by the Centre. The monitoring records of the project are the primary source for these indicators, specifically for determining whether the number of participating families as stipulated in the sponsoring contracts is achieved. Sample surveys may be required to determine the participation in the wider context of the aims and objectives of the overall programs.

2.1.3 Output indicators

Only if the targets of a project have been unambiguously formulated, is it possible to select relevant output indicators. In other words, if the targets of the Dairy Cattle Production Programme are defined in terms of the number of artificial inseminations, or the number of impregnated cows, or the number of cross-bred calves born, the output indicators could be the number of artificial inseminations carried out to date, the number of pregnant cows to date or the number of cross-bred calves born to date, respectively. BAIF's principle output indicator in the Dairy Cattle Production Programme is the number of pregnancies of artificially inseminated cows. The source of data to determine the value of the selected output indicators is principally the monitoring records.

2.1.4 Explanatory and external indicators

A project is never implemented in isolation. Outside forces, too much or too little rain, occurrence of land slides, pest and other diseases act on the rural families as well. The project cannot control these forces which influence the project operations and the beneficiaries' behaviour and productivity. For instance, exceptional rainfall may have delayed the project's activities, or exceptional drought may have caused temporary migration of part of the beneficiaries. Monitoring these forces have a direct role in that they may reveal that an essential precondition for the success of a project is being removed. In addition, they may help in identifying those forces which contributed to the success of a project.

2.2 Indicators for evaluation

Appropriate indicators for evaluations reveal the nature and rate of change that has occurred or appears to be occurring and enable progress to be compared with planned objectives and aims. They should be determined at the design or early implementation stages of a project so that the collection of the necessary data can be arranged as much as possible part of the data collection for monitoring purposes.

Evaluations can not exclusively depend on indicators: other quantitative and qualitative information, such as the project's institutional setting, related activities in the same area or a change in off-farm prices for agricultural products, should be taken into account to assess the relevance, impact and effects of a project in the context of its stated aims and objectives.

There are three principle groups of evaluation indicators: *effect indicators*, *impact indicators* and *explanatory/external indicators*.

2.2.1 Effect indicators

Effect indicators measure the effects or outcomes of the use of the project outputs by the beneficiaries and play an important role in *on-going evaluations*. In the same way that the selection of output indicators needs unambiguously formulated targets, *the selection and definition of effect indicators needs clearly stated objectives*.

Most projects have not one, but a number of effects. A conceptual framework as to how the process of change, induced by the project, expresses itself over time helps in determining adequate effect indicators.

For instance, a simple conceptual framework for the process of change that is induced by the Dairy Cattle Production Programme could be summarized as follows. The outcome of the first use of BAIF's services is a cross-bred cow which produces substantially more milk than the family's other cows of local breeds. Because of this, cross bred cows represent more capital than local breeds. The farmer prefers therefore to keep his newly born cross bred cow around the house rather than leaving her in the fields and bush lands to graze with the local breeds. This requires a change in the farmer's cropping pattern in order to provide for enough fodder. Meanwhile, he receives - through the milk cooperative - a regular weekly income from his milk sales. After five years, he owns three cross bred cows. He allocates one quarter of his land to fodder crops and his weekly income from his milk sales is so high that he no longer needs the services of the local money lender: he repaid all his debt a year ago. Consequently, he saves the money which he otherwise would have paid for interest and he has more discretion on how to spend his earnings. He has several options to spend his extra earnings: he can improve his house, or send his children to better, private schools, assist family members in paying a dowry, and so on.

This conceptual framework is certainly too simple for the process of change induced by the Dairy Cattle Production Programme. For instance, it does not include possible deviations; a possible transition from mixed farming systems to one that primarily depends on dairy cattle; or, the effects, which the creation of gainful self-employment and the improvement of the quality of life of (a part of) the members of a village community have on the community as a whole. Nevertheless, it may suffice to illustrate how such a conceptual framework can help in determining and specifying effect indicators.

First, the process of change consists of many small modifications leading to a transformation of the farmer's livelihood. In identifying indicators as markers of change, one should look for modifications which can be considered to be thresholds or *points of no return*. For example, in the above conceptual framework, the decision to change his traditional cropping pattern in favour of fodder crops may be such a threshold; becoming independent from the services of the moneylender may be another. Second, change is a process in time: some farmers need more time than others. Therefore, the values of the indicators change in time. In the case of BAIF,

Table 6 Effect and impact indicators for BAIF's Dairy Cattle and Tribal Rehabilitation Programmes

**DAIRY CATTLE
PRODUCTION
PROGRAMME**

effect indicators

- milk collection at village level
- average volume of milk marketed per family
- number of BAIF cross bredds per family
- number of participating families
- costs per conception

impact indicators

- no seasonal migration
- adoption of new economic activities
- no or reduced debts from money lenders
- proportion of boys and girls in school
- expenditures on food and non-food items, eatings habits
- school drop outs and percentage of children in school
- consumable durables such as utensils, housing, etc.

**TRIBAL
REHABILITATION
PROGRAMME**

effect indicators

- reduction of seasonal migration
- utilization of health services
- housing: construction, improvements, quality
- food consumption: quality, diversity, etc
- cropping intensity and farm output
- participation of women and girls as health guides and balwadi teachers
- birth weight: % of low birth weights

impact indicators

- no seasonal migration
- adoption of new economic activities
- no or reduced debts from money lenders
- proportion of boys and girls school
- expenditures on food and non-food items, eating habits
- school drop outs and percentage percentage of children in school
- consumable durable such as utensils, housings, etc.

The effect and impact indicators listed here result from discussions in various groups during the workshop. To become formal indicators, they need to be revised and refined on the basis of further discussions and decisions within BAIF and validated on the basis of field tests.

with a large number of Rural Development Centres it should be possible to decide on a *normative* range of values for each effect indicator for each sequential year of measurement. In other cases, the results of the indicators measurements should be compared with similar projects carried out under similar situations. If these are not available, one should carefully, and as objectively as possible assess the effects of the project against the objectives taking into account what could be reasonably expected under the circumstances under which the project was actually carried out. The monitoring information, which provide a day-to-day picture are important, especially in the last situation.

2.2.2 Impact indicators

The direct measurement of impact is often unfeasible or very costly. For instance, to determine whether a project after 10 years has generated a sustainable livelihood or a better quality of life for its beneficiaries would require not only a detailed description of both concepts but also a lengthy detailed study of the beneficiary group. For impact assessments one usually uses *indirect (proxy)* indicators.

During the workshop, one discussion group made an inventory of possible proxy indicators for measuring the impact of BAIF's development programs. From this list, the impact indicators listed in Table 5 were tentatively chosen as markers of progress towards reaching BAIF's development aims. The values of these indicators will change over time as the impact of the project evolve. As with the effect indicators, BAIF should be able to decide on a *normative* range of values for each impact indicator for each sequential year of measurement based on the results of its many Rural Development Centres. This can be done as part of the pre-testing and validation which is required before the impact and effect indicators are being applied at a large scale throughout the development projects.

2.2.3 Explanatory and external indicators

As for monitoring, the project management should monitor events and developments which it cannot control but which may influence the effects and the impact of the project. Monitoring these forces has a direct role in that they may reveal that essential preconditions for the success of a project were removed during the course of the implementation. In addition, they may help in identifying those forces which contributed to the success of a project. For instance, changes in the off-farm milk price may affect the demand for artificial insemination services; the price to transport mango to the market may influence the wadi program. Other examples of explanatory and external indicators are: ground water levels; recurrent pest and diseases; and, out-migration to urban centres.

3 DATA GATHERING FOR MONITORING AND EVALUATION⁸

3.1 Purposes of data gathering; qualitative and quantitative data

The only justification for collecting data is that they will be used for specific purposes that have been clearly identified and agreed upon in advance. Data gathered, analyzed and interpreted, can provide information that describe or analyze or predict situations. These purposes are not mutually exclusive. Normally, a distinction is made between *descriptive information*, which answers questions of who, when, and where, but not of how and why; *explanatory information*, which requires an extrapolation of a cause and effect relationship to answer how and why questions; and *predictive information*, which should be based on an understanding of the causes of events.

There are two types of data: qualitative and quantitative. Whereas quantitative data is used to produce numerical information, *qualitative data* is utilised to give descriptions of situations, events, people, interactions and observed behaviours, not with numbers or percentages, but *with words*. Qualitative data focus on the meaning and significance of events and circumstances as seen by the target population and is specifically used

⁸ The chapter draws on the chapters 2,3, 4 and 5 in Casley, Dennis J. and Kumar, Krishna (1988) *The collection, Analysis and Use of Monitoring and Evaluation Data*, which provide an excellent, comprehensive summary of qualitative and quantitative data gathering methods.

- for helping to understand the complex ecological, sociological, cultural and economic situations with which the project must deal
- for providing an in-depth understanding of the perspectives, attitudes and behaviour patterns of the target population
- for generating hypotheses and propositions which can then be tested on a wider population using structured questionnaires

Whereas qualitative information is phrased in words, *quantitative data* are best expressed in numbers. Quantitative data are needed when a number, rate, or proportion related to a target population must be estimated or a variable such as milk production must be measured. Examples are the monitoring of the use of inputs such as petrol or semen by Rural Development Officers; the proportion of families in different socio-economic strata who are benefitting directly from BAIF's services; the impact of BAIF's projects on standards of living as measured by income, levels of nutrition and mortality rates.

3.2 Qualitative data collection methods

The most common methods to collect qualitative data are individual and group interviews and participant observations.

3.2.1 Individual and group interviews

There are three types of *individual interviews* which are usually grouped into three broad categories:

- *informal conversational interviews*, in which the interviewer has complete freedom and flexibility to explore a broad subject with the respondents who are encouraged to share their views, experiences, values, and information.
- *topic-focused interviews*, in which the interviewer uses an interview guide which lists the main topics and sub-topics to be covered.
- *semi-structured, open-ended interviews*, in which an open-ended questionnaire is used which lists the specific questions to be asked.

There are two types of *group interviews*, normally categorized as follows:

- *community interviews*, which are interviews to which all members of a community or village are invited. They take the form of public meetings

with limited opportunities for discussion among the attendants. Community meetings can generate general information at the community level provided that the questions are concrete and that controversial or politically and culturally sensitive questions are avoided.

- *focused group interviews*, which are limited to a few, carefully selected individuals. The participants are encouraged to discuss ideas, issues, insights and experiences among themselves. The participants are selected on the basis of criteria which may vary depending on the objective of the data gathering.

Group interviews often disappoint because of the way they are conducted. Good planning, a well designed interview guide and well trained discussion leaders are essential to the success of this method of data collection. They require experienced observers who can separate the chaff from the wheat in what is said and not said by whom during the discussions.

Individual and group interviews as methods to gather information have their limitations. These methods do not generate data that can be summarized to provide statistically valid general estimates. The key informants are a biased selection of the general population and interviewers are often more inclined to listen to the views of the better educated, more influential persons than to those of the poor. This can lead to a further limitation of this data gathering method: the interviewer's own biases which lead to picking up information and ideas that confirm preconceived notions. Nevertheless, the qualitative interview method is under-used and could effectively be applied for generating general (quantitative) information on farm inputs, cropping patterns, production levels, market prices, etc. and for helping to understand reasons for unexpected reactions by BAIF's clients.

3.2.2 Participant observation

Participant observation is a third category of qualitative data gathering methods and requires direct observations of an activity, event, process of work or network of relationships. The direct observations are supplemented both by information gathered through interviews of key informants and data obtained from surveys and secondary sources, such as records and documents.

Participant observation's central concept is the temporary participation of the investigator in the social reality experienced by the individual, group or community under observation. The investigator tries to gain an insider's view without losing his/her outsider's objectivity and attempts to understand the development opportunities, the calculation of profits and loss from the potential adoption of the advice promoted by an organization such as BAIF, from the a farmer's point of view.

There are obvious advantages to using participant observation in monitoring and evaluation. What is studied is observed in its most natural setting. It helps

reveal a phenomenon in its totality, as opposed to the partial reconstruction provided by interviews after the happening. Probably the most important advantage is that this research method takes the investigator from his desk and his data collected by enumerators and cross-tabulations collated by computers and exposes him to the reality of daily life of farmers.

The conventional wisdom in gathering qualitative information through interviews or participant observations is that one should enter into the field with an open mind and without preconceived conceptual frameworks: they tend to bias the observer who will ignore the factors and conditions not included in the conceptual framework. It is said that the investigator should develop conceptual frameworks purely on the basis of their field experience. Such an approach may be justified in academic research projects that are focused on theory development. However, in the context of development projects such an approach may be one of the reasons why rural rapid appraisals, monitoring and evaluations, based on qualitative data gathering methods, have often been so disappointing: a lot of time is spent in collecting irrelevant information; probably even more time is devoted to ordering the information after which it appears impossible to draw any conclusions but the most trivial ones.

An old Indian proverb says that "one does not see what one does not know". The ultimate value of individual or group interviews and participant observations analogously depends on the nature and the quality of the knowledge, experience and judgements of the investigator. In the context of monitoring and evaluation a conceptual framework of the study object before entering into the field is not only an aid, it is a must: it functions as a filter during the interviews or observations; it helps different investigators in a multi-site study to generate information and explanations that are comparable; it assists in collating, analyzing and reporting the gathered information.

A conceptual framework for qualitative data collection should list the indicators, principal issues and the hypothesized relationships among them. Experienced field staff do have their own frameworks for evaluating their work and can normally assess the performance of themselves and their colleagues very well. If made explicit and uniformly applied, these conceptual frameworks can be of great help in conducting qualitative research for monitoring and evaluation.

Qualitative research methods in monitoring and evaluation efforts have their limitations. Recording, compiling, collating and reporting of qualitative information is a problem that is easily underestimated. A good, transparent conceptual framework may be of help, but the very purpose of qualitative research is defeated if an attempt is made to make it all-inclusive: it is often the unexpected comment or the accidental observation of an action that suddenly provides the understanding of the socio-economic reality as perceived by the farmers. It should be realized that this form of research can only be implemented if the decision of what comment or observation is important (and should therefore be recorded) is made by the investigator during the interview or observation. Asking field staff to record

Table 7: A possible conceptual framework for studying the progress of the Dairy Cattle Production Programme in a village

	participation	marketing	cropping patism	moneylenders	housing	schooling
year 1	50 farmers no farmers from weaker section	thr' society in neighbouring village	no changes	no changes	no changes	few girls high drop out
year 2	75 farmers 12 farmers from weaker section	thr' society in neighbouring village	no changes	no changes	no changes	few girls high drop out
year 3	125 farmers 40 farmers from weaker section	establishment of own milk society	2 farmers start to grow fodder crops	no changes	3 farmers start improving their houses	5 extra girls enroll
year 4	160 farmers 80 farmers from weaker section	thr' own milk society	10 farmers grow fodder crops	moneylenders complain to BAIF	15 farmers are improving their houses	10 extra girls enroll
year 5	and so on					

everything that may seem to them to be of interest or to tape whole interviews results in enormous amounts of information that can not be dealt with by the investigator. This implies that this type of data gathering for monitoring and evaluation can only be conducted by experienced and knowledgeable staff whose judgements are respected by the management. Consequently, the scale on which qualitative research methods can be applied in an organization such as BAIF depends on how many experienced staff can be made available for field data collection, processing and reporting.

3.3 Quantitative data collection methods

Quantitative data are often collected through structured surveys with written questionnaires and samples of the target population. However, quantitative information is also available from project records in which daily field activities, supplies, and financial disbursements are logged.

Structured surveys, whatever the size, are time consuming and costly. They therefore need to be carefully planned to ensure that the results meet the expectations. The stages in planning a structured survey are:

- identification of the precise information expected from the survey
- design of the survey: cross section or time series, and selection of the method for selecting respondents
- choice of the concepts and definitions to be used
- definition of eligible respondents
- construction of the questionnaire including pretesting
- selection of the sample
- choice of interviewing method
- establishing of data processing and analysis requirements
- preparation of reporting formats.

3.3.1 Sampling

To reduce the costs of structured surveys, they are usually conducted among a sample of respondents from the total population under study: instead of using information from all members of the population, data are collected from only a part of the population which is taken to be representative of the whole. This is done not only done to economize on the resources that are needed to collect, process and analyze quantitative data, but also to improve the quality of the data through improved management of surveys by limiting the number of respondents and hence enumerators.

There are two ways of selecting respondents, i.e. by probability sampling and informal sampling techniques.

Probability sampling is characterized by clearly defined selection procedures; the use of lists (or equivalent) as sampling frames; the applicability of sampling theory; and, the possibility of estimating sampling error.

Informal sampling is the complement: any sampling procedure that does not give specified values to the selection probabilities.

In determining *the size of a probability sample* one has to take into account the sample error and the acceptable level of confidence.

The *sampling error* is the uncertainty attributable to sampling because estimates are made from a sample rather than the universe. The larger the sample the smaller the sampling error. The sampling error depends not only on the sample size but also on the sample design and on the degree of variation in the universe. *The sampling error depends on the size of the sample rather than on the sampling fraction.*

The *level of confidence* is the measure of the likelihood that the value of a variable, estimated on the basis of a sample, reflects its real value plus or minus the sampling error.

Simple formulas are available for calculating the sample size for any specified levels of the acceptable margin of error and the acceptable confidence level.⁹ Roughly speaking, to halve the sampling error, the sample size must be quadrupled.

There is one unmistakable disadvantage of probability sampling: the need for a list or sampling frame. VHB has recommended in its earlier report to create *family identification registers* for each Rural Development Centre. These registers may assist computerized data management and organize data storage. In addition, these registers could function as sampling frame in sampling procedures in quantitative data gathering work.

Sampling error is only one of many sources of error in structured surveys conducted among a probability sample. *Non-sampling errors* may arise from

- listing errors and omissions in the sampling frame
- interview non-response
- response and measurement errors
- interview recording errors
- errors of coding and data entry
- programming or data processing errors

In small-scale monitoring and evaluation exercises, the most important types of non-sampling error are usually response and measurement errors, arising from:

⁹ VHB developed a simple Lotus program for BAIF that can be used for calculating the sample size of structured surveys.

- memory failure
- uncertainties about units and dates
- misunderstanding of questions
- ambiguities in the measurement task
- complexity of the operations

No formula exists to determine the size of non-sampling errors, but it is likely that a large sample is associated with a large non-sampling error because it increases the work load of the enumerators and their supervising staff. The balance between both sources of error can only be struck in the light of local conditions and experience.

3.3.2 Sampling techniques

There are various sampling techniques, of which the following are important for BAIF:

- *Single-stage sampling.* For a single-stage sample, a list of all families in an area is required. The respondents must be selected *at random* from this list and the probability of any one respondent being selected must be known. A systematic sample may be used by identifying respondents from an ordered list starting at random.
- *Stratified sampling.* Stratified sampling uses a sampling frame that is divided into subsets called strata. Respondents are then randomly sampled from each strata. Stratified sampling is simply a device for improving sampling efficiency, i.e., for allowing the same sampling error to be obtained from a smaller total sample. Sampling efficiency is reduced to the extent that each strata is homogeneous with regard to the variable of interest. Typically, stratified sampling can reduce the required sample size by 10 to 20%. It is important that the strata be created in such a way that the study variable varies less within each stratum than between strata. It is not necessary to use the same sampling fraction in each stratum.

In the Dairy Cattle Production Programme, examples of strata are farm size, proximity to BAIF development centres, and number of cows per family.

- *Two-stage sampling.* In applying two-stage sampling techniques (also called *cluster sampling*), typically a sample of area units (e.g. villages) is first selected. Then a sample of households or holding or project participants within each area is selected. Two stage-sampling reduces the amount of

travelling for interviews and if no prior list of respondents exists, this method of sampling reduces the work of listing. To achieve the same sampling efficiency as a single-stage random sample, a two-stage sample has to be larger.¹⁰

Only selected some aspects of data qualitative and quantitative data gathering for monitoring and evaluation were discussed during the workshop. A comprehensive discussion of data gathering can be found in Casley, Dennis J. and Kumar, Krishna (1988) *The Collection, Analysis, and Use of Monitoring and Evaluation Data* John Hopkins, Baltimore.

3.4 Current data gathering

In discussing possible monitoring, effect and impact indicators, the workshop also reviewed BAIF's current daily and periodic data gathering to assess whether the application of indicators would require substantial extra data gathering.

The current data gathering in the Dairy Cattle Production Programme and the Socio-Economic Rehabilitation Programme for Tribals is substantial and takes place through

- baseline surveys if required by sponsors and funding sources are available
- occasional surveys to gather information on specific subjects, such as feeding, management and health of the cows and animal health
- periodic data collection from a limited number of farmers, such as milk recording
- daily recordings of activities and observations by the administration, the Rural Development Officer and other BAIF officers. The total of these activities is called *monitoring*.

These data gathering activities result in a wealth of information that would meet, to a large extent, the information need to assess progress and impact by means of the tentatively formulated indicators.¹¹ It was concluded that BAIF's monitoring activities include work that would better be categorized under *on-going evaluations*.

10 VHB also developed for BAIF a simple Lotus program for determining the sample size applying two-stage sampling techniques.

11 An analysis of which indicators can be measured on the basis of present data collection is presented in Appenix D.

4 COMPUTER SUPPORTED DATA MANAGEMENT FOR MONITORING

4.1 Introduction

One can start considering the introduction of computer supported data management systems when there is a lot of data to be handled; when repetitive manipulation has to be done on the data; when statistical analysis is required; and, when printed output is required.

Computerization will normally simplify data analysis and reporting and will ensure consistency and systematic organization of the data storage. There are various tools available to achieve this:

- *Database packages*, which are used for structuring data, particularly useful in monitoring. It can organize and store large numbers of data, for example from daily monitoring sheets, for subsequent easy and quick access and analysis.
- *Statistical analysis packages*, which carry out standard routines for data analysis, particularly useful in evaluation. These packages typically cover fundamental statistical procedures such as descriptive statistics, regressions, analysis of variance, discriminant analysis, cross-tabs, and nonparametric tests and allows for more exhaustive, accurate and affordable statistical analysis. Improperly applied, however, it also makes it easier to mishandle statistical analysis.
- *Word processing packages*, which simplify report production where text is used or revised repeatedly, or where high quality output is required.
- *Graphic presentation packages*, which take data from spreadsheets, databases,

or statistical packages and display them graphically to facilitate presentation, understanding and analysis.

Before the introduction of computer supported data management systems the following issues should be addressed:

- budgeting and financial consequences of computerizing
- allocating responsibilities for data entry, program creation and other related tasks
- determining what information is really needed
- training requirements of staff.

Computer supported data management systems need hardware, i.e. computers, printers and other equipment. In designing a system, one has to decide where this equipment is placed and by whom it is operated and whose data will be stored, organized and analyzed. Decisions must be made about whether the data management systems will be centralized or decentralized. Issues to be considered in deciding where to place the data management system are:

- *timing*, i.e. can the raw material be entered, analyzed and reports produced in time to be useful;
- *control*, i.e. will the processing at a central location likely engender a feeling of loss of control of one's own work
- *consistency with the current system*, i.e. is the location of the new system in line with existing processing and reporting procedure.
- *economies of scale*.

Based on considerations regarding consistency with current systems, control and timing, VHB recommended in an earlier report that BAIF start with the design of computer supported data management systems at the zonal level in the organization. BAIF prefers to start with locating computer supported data management systems at the state headquarters level. Further decentralization can begin when the organization is better acquainted with the system at this level and a budget for the purchase of more hardware, the development of additional software and the training of staff has been arranged.

The introduction of computer supported data management systems should always occur gradually, with frequent reviews of the adequacy of the computerized systems. Back-up systems are required, especially during the start-up period. Further, serious thought and effort must be dedicated to training the users of the system and a system must be put in place to deal with hardware, software and people problems

that will emerge.

In summary, computerized data management can be very helpful, where it is appropriate. However, it must be recognized that computers can create problems, as well as being a solution to problems: careful system design and thorough training are essential to successful use of computers.

4.2 Some considerations regarding the design of computer supported data management for monitoring

Issues which affects the design of data management systems for monitoring include the targets of the project, the need for simplicity and flexibility, the necessity of tests and checks for validity and degree of centralization of the operations.

Monitoring is a continuous assessment both of the functioning of the project activities in the context of implementation schedules and of the use of the project's services by the villagers in the context of design expectations. Computer supported data management systems can assist in storing, organizing and analyzing the monitoring data and in preparing reports showing the functioning of the activities and the use of the project services by the villagers. To enable the computer to compare the actual with the desired results, the *targets* of a project must be clearly articulated and the main activities and indicators for measuring the level and distribution of their implementation must be identified. The formulation of unambiguous indicators will make it possible to instruct the computer to carry out assessments of progress. Monitoring indicators that could be formulated are *input indicators* (for example: expenditures per Centre, per pregnancy, per insemination), *beneficiary contact indicators* (for example: number of families participating; percentage of families participating overall and per sector), and *output indicators* (for example: number of fresh inseminations, number of pregnancies, inseminations/pregnancy).

Computer supported data management systems must be an aid to monitoring and therefore simple to use and maintain. The reports, produced by the system, must be easy to understand and must meet information needs of the users. A simple way of assessing whether a computer supported data management system meets these criteria is to look out for staff who keep their own records by hand alongside the computer supported data management system. If such is the case, one can almost always conclude that the computer supported data management system does not meet the requirements of its users.

No organization or project will remain static. Changes in implementation strategies and schedules, additional services, and different reporting requirements develop over time. The system installed must therefore be designed so that it can easily be modified to cope with changing demands.

Computers are machines which sort, match and filter data and do calculations in an high speed according to provided instructions. If the instructions contain a mistake, the computer will make this mistake over and over again until the mistake is detected and corrected. A small instruction mistake may result in a big mistake when decisions are taken on the basis of computer reports containing results of faulty sorting and calculations. Therefore, the instructions have to be tested and validated before the system is being put to work with real data. A small test database should be built and the validity and usefulness of the system thoroughly tested. It further is advisable to built into the system special checks for possible errors in either input or output which alert the user that an error has been made. Such special checks for errors can have the following form:

example 1: more than three artificial inseminations per cow per year is possible but highly unlikely.

if no of insemination > 3 *print: warning message*

example 2: the maximum production of milk per cow per day is 50 litres.

if milk production > 50 l/day *print: error message*

example 3: the number of pregnancies in a certain period can not exceed the number of artificial inseminations.

if insemination_{i,n-1} < pregnancies_{i,n} *print: error message*

4.3 Implementation

The implementation of computer supported data management systems consists of at least four major stages: data collection; data entry; processing and reporting; and, presentation.

Data collection should not be designed just to deal with the needs of the management system. An evaluation of the current data gathering systems is normally part of the design and introduction of computer supported data management system to decide whether any unnecessary data are collected. To save time and money, the gathering of these data can be discontinued when the new system is put to work. The data collection forms should be kept as simple and practical as possible and be consistent in the collection process.

Data entry is a key issue in computer supported data management systems: once the raw data have been entered, processing and reporting are relatively simple and straightforward. However, processing and reporting take place on the basis of

the entered data, even if these contain mistakes. Therefore, data entry systems should be designed to ensure accuracy, ease of undertaking and be appropriate for use by the person who does the actual data entry. Many ways have been designed to increase the accuracy and ease of undertaking the data entry. For example: error checks can be built in; all data can be entered twice and only accepted if both entries are identical; the computer can be instructed to guide the data entry by asking for specific information in sequence; and so on.

Once the data management system has been properly designed, *processing, reporting and presentation* is relatively straightforward. However, certain precautions should be taken:

- care should be taken to make *backup copies of all data and programs* on a regular basis, and particularly before any major changes are made;
- results of the processing should be examined to make sure that they make sense and appear correct;
- reporting should simplify understanding and assist decision-making;
- the results should be visually attractive and therefore memorable;
- presentation should be sensitive to the objectives, interest and level of expertise of the various users groups in the organization.

4.4 An illustrative example

In order to illustrate how computer supported data management systems for monitoring would look like for an organization such as BAIF, VHB developed a demonstration package for *storing, organizing, sorting, matching, filtering and reporting* the monitoring data of three fabricated Rural Development Centres in the Dairy Cattle Production Programme over a period of one month. In developing the demonstration package, it was assumed that BAIF has family identification registers for these three Centre areas.¹²

¹² The creation of Family Identification Registers for each Rural Development Centre area to support monitoring and evaluation was one of VHB's earlier recommendations included in the report *BAIF Research and Development Foundation, Monitoring and Evaluation* September 1989.

The computer supported data management system has two data input forms:

- *the family information form*, which contains the following information: names and code for state, district and village; the house numbers in each hamlet of the village; name of the family head; number of the family house; information on caste, size of land holding, number of cows.
- *the monitoring data sheet* on which the Rural Development Officer records his observations and activities during each farm visit. The *monitoring data sheet*, shown in Table 4,1, is basically the same as the form used by BAIF at present. The difference is that currently the Rural Development Officer records his observations/activities per farmer/per cow and that the presented monitoring data sheet records the information per date/per observation or activity. This change was made in order to ease the undertaking of data entering.

After the data on the family information forms had been entered, the computer sorted the information per state, per district, per village and per house number and compiled the *family identification register* as shown in table This register provides each family with an unique identification number consisting of nine digits:

```
00/00/00/000
| | | |house number
| | | |village code
| | | |district code
| | | |state code
```

In addition, the computer categorized each family in one of three groups on the basis of the caste, the size of the land holding and the number of cows owned:

- B: the stronger section of the village community
- S: the weaker section of the village community
- N: the families who do not have cows.

It should be noted that the computer could have easily provided other lists as presented in Table 4,2. For example, the computer could have compiled a lists with the names of all families which belong to the weaker section; or, with the names of all families with a land holding larger than 25 acres or of families belonging to caste A per hamlet.

Note further the *date of last update*. The system has been designed so that changes can be easily made: families may move from one house to another or may leave the village; families may buy or sell land or buy extra cows; etc. If so desired, these changes can be entered and the *family identification register* maintain current.

**Table 8 Dairy Cattle Development Programme:
Family Identification Register**

State	Maharashtra	01	page	01
District	Pune	05		
Village	Wagholi	15		

Hamlet	01	house	number	001	027
Hamlet	02	house	number	028	034
Hamlet	03	house	number	035	043

Date of last update	25	06	1989
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name family head	state	dist.	vill.	house	caste type	land acres	cows number	category
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Deore, P.A.	01	05	15	001	A	25.0	15.0	B
Sidhaye, D.J.	01	05	15	002	B	4.5	4.0	S
Khopkar, S.A.	01	05	15	003	B	35.0	5.0	B
Kelkar, V.D.	01	05	15	004	A	26.0	12.0	B
Khare, A.S.	01	05	15	005	A	75.0	25.0	B
Ghorpade, A.S.	01	05	15	006	B	3.0	1.0	S
Chavan, N.V.	01	05	15	007	B	4.0	2.0	S
Kelkar, P.N.	01	05	15	008	B	2.5	1.0	S
Bhide, K.N.	01	05	15	009	B	3.5	2.0	S
Kurulkar, J.V.	01	05	15	010	A	60.0	20.0	B
Kanekar, S.C.	01	05	15	011	A	25.0	9.0	B
Karandikar, A.V.	01	05	15	012	C	0.0	0.0	N
Patel, N.J.	01	05	15	013	C	3.0	1.0	S
Natu, H.C.	01	05	15	014	C	2.0	1.0	S
Gaikwad, A.M.	01	05	15	015	C	3.0	2.0	S
Lakade, S.P.	01	05	15	016	C	1.5	1.0	S
Wankhede, S.K.	01	05	15	017	A	28.0	10.0	B
Harris, V.J.	01	05	15	018	B	25.0	4.0	B
Chaudhary, Y.V.	01	05	15	019	B	2.0	1.0	S
Nisal, R.V.	01	05	15	020	B	3.0	2.0	S
Purohit, J.R.	01	05	15	021	B	4.0	2.0	S
Jitendra Arua	01	05	15	022	B	5.0	1.0	S
Bapte, J.D.	01	05	15	023	B	1.5	1.0	S

**Table 9 Dairy Cattle Production Programme:
Monitoring Data Sheet**

Centre _____	L.O. _____	State _____	Year _____
Name FDO _____	36 _____	District _____	Month _____

date	name of farmer	village		tano	insemination		follow up		comments
		house	no		no	batch	code	date	
21/10	Ramesh K.R	5/10/1	393	4/1				10	
21/10	Kapaz R.A	5/10/1	393	2/1	215	6			
21/10	Amin H.D	5/10/1	212	4				10	
21/10	Reddy Q.N.S	5/10/1	111	1/1				05	
21/10	Jayashan R.T	5/10/1	315	1/1	110	10	212		
21/10	Yambati	5/10/1	111	1/1				12	425P
21/10	Sinha P.K	5/10/1	112	1/1				10	
22/10	Shinde D	5/10/1	211	6	212	10	02	01	
22/10	Channa P.K	5/10/1	16	0126				10	
22/10	Devi S.P	5/10/1	102	101	110	10	212		
22/10	Shrivastava	5/10/1	106	6	7	56	02		
22/10	Smith Q.A	5/10/1	16	28	01			11	0110 77P
23/10	Tas K.V	02/01/1	119	2/1				06	
23/10	Shaminathan	02/01/1	211	3				10	
23/10	Maitraman R	02/01/1	150	21	112	012	619		
23/10	Bhat D.D	02/01/1	051	812	11	01	02	212	
23/10	Rajilmanika	02/01/1	132	0				11	
23/10	Sinha C.P	02/01/1	151	11	112	56	02		
23/10	Banerjee A.K	02/01/1	150	11	110	02	21		
23/10	Balasa A.H	02/01/1	11	110				11	0510 77P
23/10	Shah H	02/01/1	55	11	112	02	618		
24/10	Khandale V.D	02/03/1	102	2				10	
24/10	Khandale V.D	02/03/1	12	1	9			11	0810 750P
25/10	Shinde K.S	15/01/1	12	19				10	
25/10	Chavan N.V	15/01/1	102	13	11	01	02	21	

- | | | | |
|----|--------------------------|----|----------|
| 01 | refused for insemination | 07 | spare |
| 02 | not traceable | 08 | retest |
| 03 | observed for estrus | 09 | empty |
| 04 | cow dead | 10 | pregnant |
| 05 | cow dead | 11 | male |
| 06 | problem breeder | 12 | other |

Every month, the monitoring data are entered into the data base. The computer has instructed to assist the undertaking of entering the records and to ensure maximum accuracy. In summary, the data entry follows the following interactive procedure:

Step 1

the computer asks for
the date of the observation and the family identification number

the officer i/c enters
the date of the observation and the family identification number

Step 2

the computer retrieves and displays on the screen

the name of the family head and the name of the village that correspond with the family identification number

then asks for confirmation

the officer i/c

carries out requested check and types "YES" if the names of the family head and the village on the screen and on the monitoring data sheet are the same. He types "no OK", if there is a difference. In latter case, the computer automatically stores the date of observation, the family identification number and name of the family head and of the village as they appear in the family identification register. The computer breaks off this entry procedure and starts again with step 1 for the next observation. *At the end of the data entering, the computer produces a list of all observations which were not accepted. This list can be given to the Rural Development Officer for correction.*

Step 3

the computer asks for

the tattoo number of the cow, and

whether the cow was inseminated during the visit, and

if so: no. of insemination; sire code and batch number of semen.
if not so: what other observation was done.

Directly after the activity/observation has been entered, the computer carries out a number of internal checks. For example: the third insemination of the cow with tattoo 8343 is reported, but the records do not show a first and second insemination; or, the pregnancy of the cow with tattoo number 3483 is reported, but the records show that the cow died three months ago. The computer will only store information that passes all accuracy checks. If the information does not pass one of them, the date of the information, the name of the family head, the family identification number, the observation, and the reason for not passing the accuracy checks is stored in a separate file. *At the end of the data entering, the computer produces a list of all observations which were not accepted. This list can be given to the Rural Development Officer for correction.*

After closing off step 3, the computer automatically starts the entering procedure for the following observation.

After all activities and observations have been entered, the computer stores the information. Many sorting, matching and filtering instructions can now be given producing exactly the type of reports BAIF needs for decision making. Besides the standard monthly progress reports that are now produced by hand, the computer can produce quickly many other reports. In table 1, 2, and 3, three other reports are presented. Table 1, the Status Report of Participation provide participation information per section for the total village and for its separate hamlets. Table 2 shows a status report for an individual family, providing up to date information on all visits, inseminations and other observations. Table 3 is a list of farmers to whom the Rural Development Officer has to pay a follow up visit. This report is a list of all observations previously entered for which the computer did not receive required follow-up information in time.

The number and contents of reports can vary according to BAIF's information needs. For instance, for specific research purposes, BAIF may want to know which farmers have female calves of sire J 256; or, the relationship between batch and number of successful inseminations; and so. The computer can even be instructed to provide activity reports on each Rural Development Officer containing information such as number of visits, number of inseminations carried out, number of faulty reported observations per month and per year.

The computer can be instructed to present reports in graphical form. This encourages the eye to compare different pieces of data and often is more readily understood than pages of tabular data. Moreover, graphical presentations are often more satisfying and memorable and are useful for summarizing a number of points quickly. Table provides all the reported activities and observations reported by the Rural Development Officer for the month October 1989.

Finally, the monitoring data base can serve as a sampling frame for surveys and for specific longitudinal studies such as milk recordings. Data from such studies can be matched with the monitoring data base providing a basis for extrapolations and generalizations regarding the effects and impact of BAIF work.

**Table 10 Dairy Cattle Proudction Programme: Monitoring
Follow-up required**

Centre	0	State	1	Month	10
		District	5	Year	1989
		Village	2		
		FIR Number	Family name	Tatto	Date
Hamlet	2	10502012	Kanwar, J.S.	6721	03-Oct-89
		10502012	Kanwar, J.S.	7611	17-Oct-89
		10502012	Kanwar, J.S.	7721	03-Oct-89
		10502014	Nag, K.N.	2231	23-Oct-89
		10502014	Nag, K.N.	2231	17-Oct-89
		10502015	Singh, C.M.	1117	10-Oct-89
		10502015	Singh, C.M.	1519	23-Oct-89
		10502015	Singh, C.M.	3125	10-Oct-89
		10502015	Singh, C.M.	4215	03-Oct-89
		10502015	Singh, C.M.	6239	03-Oct-89
		10502015	Singh, C.M.	7111	10-Oct-89
		10502016	Acharya, R.M.	9151	17-Oct-89
		10502017	Bhat, P.N.	518	23-Oct-89
		10502019	Banerjee, A.K.	1591	23-Oct-89
		10502019	Banerjee, A.K.	8721	10-Oct-89
		10502020	Nagarcenkar, R.	8150	23-Oct-89
		10502021	Mafatalal, A.M.	8232	10-Oct-89
		10502022	Swaminathan, S.R	7313	23-Oct-89
		10502023	Shah, H.	5911	23-Oct-89
		10502024	Rajadhyaskha, V	1320	23-Oct-89
		10502026	Choksey, C.H.	6312	17-Oct-89
		10502027	Baldota, A.H.	1159	23-Oct-89
Hamlet	4	10502037	Khandale, Y.D.	1829	04-Oct-89
		10502037	Khandale, Y.D.	1872	24-Oct-89
		10502037	Khandale, Y.D.	2718	18-Oct-89
		10502037	Khandale, Y.D.	3931	04-Oct-89
		10502037	Khandale, Y.D.	4142	04-Oct-89
		10502037	Khandale, Y.D.	4636	11-Oct-89
		10502037	Khandale, Y.D.	5515	11-Oct-89
		10502037	Khandale, Y.D.	6404	11-Oct-89
		10502037	Khandale, Y.D.	6917	04-Oct-89
		10502037	Khandale, Y.D.	7126	04-Oct-89
		10502037	Khandale, Y.D.	7218	24-Oct-89
		10502037	Khandale, Y.D.	8535	11-Oct-89

Table 11 Dairy Cattle Production Programme: Monitoring Status Report on Participation

Centre	1	State	1	Year/Mo
Village:	2	District	5	1989/10

Category	Families Participating	Total Families	Percent Participating
----------	------------------------	----------------	-----------------------

Village Total		42	54	78%
	N	0	12	0%
	S	36	36	100%
	B	6	6	100%

Hamlet 1 Total		8	11	73%
	N	0	3	0%
	S	8	8	100%

Hamlet 2 Total		16	16	100%
	B	5	5	100%
	S	11	11	100%

Hamlet 3 Total		0	9	0%
	N	0	9	0%

Hamlet 4 Total		18	18	100%
	B	1	1	100%
	S	17	17	100%

Table 12 Dairy Cattle Production Programme: Monitoring Family Status Report

Centre		State			1	Year		10
1	0	District			5	Month		1989

name family head				Singh, C.M.			Village		Wagholi	
FIR number				0	1	0	5	1	5	0
page: 01										

cow tatto	date visit	insemination			date visit	follow up		
		no	sire	batch		code	date	comments
1117	08-02-89	1	J256	241				
					10-1 0-89	12	0510	female
comments:								

cow tatto	date visit	insemination			date visit	follow up		
		no	sire	batch		code	date	comments
1519	12-06-89	1	H101	110				
	19-06-89	2	H27	124				
	13-08-89	3	J125	112	15-0 7-89	10		
comments:					13-0 8-89	07		
13-08-89 farmer seriously underfeed this cow								

5 BASIC STATISTICS FOR MONITORING AND EVALUATION

Once a survey has been completed or a data set created by assembling monitoring data, it must be analyzed in order to reveal patterns or structures in the data that provides the management with an insight in the efficiency, progress or impact of the programs. For monitoring purposes, simple *exploratory analysis* is in most cases sufficient. Evaluations may require more a complex *statistical analysis*, but exploratory analysis still remains an essential first step. The advantage of exploratory analysis techniques is that they are simple and can be implemented with a pencil and a piece of paper by everybody with elementary education.

During the workshop the following *exploratory* and *statistical analysis techniques* have been discussed:

Exploratory analysis techniques

- ordering data, the arithmetic average, mode and median
- simple graphical examination, patterns of tendency and dispersion
- fitting straight lines, linear relationship between two variables
- seasonal patterns and moving averages

Statistical analysis techniques

- comparison of sample means and the T-test
- comparison of tables of data and the Chi-squared test

- fitting linear relationships and linear regression

The presentations and discussions of basic statistics for monitoring and evaluation were of a technical character. Rather than reporting the presentation in detail, a reference is made to Casley, Dennis J. and Kumar, Krishna (1988) *The collection, Analysis and Use of Monitoring and Evaluation Data*, chapters 7, 8, 9 and 10 in which the authors provide an excellent description of the discussed exploratory and statistical analysis techniques, and give a wealth of advice on how to use these techniques in monitoring and evaluation.

6 PLANNING FOR MONITORING AND EVALUATION

6.1 Implementing monitoring and evaluation

The workshop went beyond discussing theory and made a first step into the direction of planning the structuring and refining of BAIF's monitoring and evaluation systems. In these discussion the following subjects were addressed:

A project approach

Structuring and refining the existing monitoring and evaluation in BAIF could best be considered to be a project in itself: it should be a planned undertaking, a set of interrelated and coordinated activities designed to achieve certain specific objectives within a given budget and period of time.

Plan a project for monitoring and for evaluation

Monitoring and evaluation both involve the collection, analysis and presentation of information. They both need the formulation and validation of indicators; a selection of methods for quantitative and qualitative data gatherings; the actual data collection; the storing, sorting, processing and analysis of the information; and, the production of various reports with appropriate level of aggregation for the field staff, the middle and top management, the policy board members and the sponsors (see ?). However, as illustrated in Table 3, monitoring and evaluation are distinctively different functions serving different users. Therefore, the structuring and formalizing of the monitoring and of evaluation activities are two different, although interrelated projects with different set of aims, objectives and work targets. *BAIF needs therefore one monitoring plan and one evaluation plan for each of its development programs,*

The *general aims of a monitoring project* could be formulated as to gather, analyze and present information that helps to achieve efficient and effective project performance by providing regular feedback to enable project, program and overall management to improve operational plans and to take timely corrective action in case of shortfalls and constraints.

The *general aims of an evaluation project* could be formulated as the collection, analysis and presentation of information to be provided to project, program and overall management and to donors about achieved effects and first impacts and about needed adjustments of work targets, objectives and implementation strategies, as well as providing information for future planning (on-going evaluation) and impacts of the project/program and to provide lessons for design or formulation, appraisal, implementation, monitoring and evaluation of future development projects (impact evaluation).

Both formulations of the general aims for a monitoring project and evaluation project need, of course, to be specified for each of BAIF's development programs.

Institutional responsibilities

Monitoring is an integral part of day-to-day management and its implementation should therefore fall under the direct responsibility of the project management. To ensure uniformity and usefulness of its results for other projects within BAIF, the responsibilities of the design and supervision of the monitoring could be put with in one person in Poona. However, such position, if created, needs a clear set of Terms of Reference and a transparent mandate.

For the ongoing evaluation, a central facility may be considered which can be justified on the following grounds:

- it is uneconomical to provide the required technical skills for each program/project;
- it is necessary to compare data from various projects;
- it provides a measure of independence which facilitates objectivity.

Such a facility, if created, also needs a clear set of Terms of Reference and a transparent mandate. The recommendations to create a evaluation facility separate from the monitoring function does not imply that ongoing and impact evaluations should fully use the data gathered during the monitoring and that monitoring, whenever possible, should include data collection for evaluation purposes.

Input/output relationships between various projects

When BAIF monitors or evaluates one of its development programs, it evaluates the effects and impacts of supporting research and supply projects as well. This is because some of BAIF's projects or activities produce *outputs* that serve as *inputs* of another projects. For instance, the *output* of the Bull Station in Urulikanchan is deep frozen, high quality semen, which is one of the *inputs* of the Dairy Cattle Development Programme.

Table 13 Input/output relationships between BAIF's projects

INPUTS	staff	Wagholi research facilities	funds	staff	Urulikanchan bull station	bulls	funds
PROJECT		research project			semen production		
OUTPUTS		technology			deep frozen semen		
INPUTS		technology	staff	deep frozen semen	transport	funds	
PROJECT			Dairy Cattle Development Programme				
OUTPUT			delivery of semen at farmers' doorstep				

Within BAIF's organization, numerous examples of such *input/output* relationships between various projects can be identified: the output of the applied research projects is adapted technologies, which are used as inputs in the various development programs; the pre-service training programs of the Rural Development Officers improves skill and attitudes of new recruits, who will be among the staff inputs of the development programs (see ?).

The leaders of the supporting projects are direct beneficiaries of the outcome of monitoring and evaluating the development programs: they depend on these results for improving the efficiency, effectivity and quality of their products or outputs. Moreover, BAIF's overall management may also want to use them results when they have to review specific research projects and to decide on their continuing relevance to BAIF's development work. The information needs of the project leaders of supporting projects should be taken into account when deciding on what data is to be collected, how and with what frequency. Consequently, the objectives and targets for the monitoring and evaluation projects of the development projects should reflect their role in the evaluation of the various supporting projects.

Process versus blueprint approach

Not only the size of BAIF, but also these input/output relationships between various projects make the introduction of structured and formal monitoring and evaluation systems a complex task. The implementation may well require adjustments in responsibilities and existing work routines, new activities and additional skill training of current staff. It is therefore recommended to adopt a *process* rather than a *blueprint approach* in formalizing and structuring the monitoring and evaluation functions. It better to immediately begin testing one or two improvements in the monitoring system at a small scale and to replicate them after they have proven to be real improvements and to gradually add other changes in the current systems than studying and planning for one or more year to design a overall system that when put in place may not be efficient and effective.

6.2 The components of a monitoring and of an evaluation plan

Whatever approach towards structuring and formalizing the monitoring and evaluation function in the BAIF organization is adopted, process or blueprint, this approach should be reflected in the monitoring and evaluation plans.

The format of a monitoring and an evaluation can be in broad lines identical because both address the design of a process of data collection analysis and presentation. Each plan should include:

- a description of the development program for which the monitoring or evaluation system is planned. This description should include the aims, objectives and work targets of the program, the inputs, the field activities, the organizational set-up and conditions for success which are beyond the control of BAIF (for example the off-farm prices for milk or mango's).
- a description of the output/input relationships with supporting research and supply projects and of the information needs of these projects.
- a short description of the problems felt with the monitoring or evaluation work currently carried out.
- a detailed description of the information needs of the various beneficiaries inside and outside BAIF of the monitoring and evaluation results.
- an unambiguous statement of the aims, objectives of the monitoring or evaluation project, and concrete targets for the first two years or the period till the first review.
- an indicative long term view on the sequence in which the structuring and formalization of the monitoring or evaluation activities will take place.
- a detailed description of and a time schedule for the activities planned for the first two years or the period till first review (for example how the indicators will be formulated/validated; data collections methods; frequency of data collection; processing and analysis; reporting schedules to different users, etc.).
- if various data collection methods, frequencies etc. are being tried out, a description how and a justification of why this will be done.
- a description of the internal organizational arrangements made within BAIF to accommodate the implementation of monitoring or evaluation plan.
- if a process approach is being adopted, an indicative description of the ways replication of successful work routines, data collection and analysis methods, and reporting will be organized.
- a description of the training needs of the staff and how these will be met.
- manpower and financial budgets.
- tentative Terms of Reference for the first review.

6.3 Tentative monitoring and evaluation plans for the Dairy Cattle Development Programme.

During the workshop not all components of a monitoring or evaluation plan could be discussed. Nevertheless, headway made in the development of a conceptual framework for monitoring and evaluation; the formulation of indicators that can be used for monitoring, on-going and impact evaluations; the methods of qualitative and quantitative data collection for monitoring and evaluation; computer supported data management; and basic statistics and data analysis.

During the discussions a lot of ideas were brought forward. Only a few survived the workshop's critical examination. However, these few were sufficient in number that it was considered to be worthwhile to summarize them in a short report, which was presented and discussed during the closing session of the workshop. This report is presented below.

The format of this report is that of a monitoring and an evaluation plan. Its contents consist solely of the results of discussion and brainstorm sessions during the workshop including the group discussions on what should be the contents of monitoring plans and on-going evaluation plans for the Dairy Cattle Production and the Tribal Rehabilitation Programmes.¹³ Not all components of a full fledged monitoring or evaluation plan could be discussed, the plans as such are therefore incomplete. To become full fledged monitoring and evaluation plans, the contents of the report need to be revised and refined and complemented with the missing information on the basis of further discussions and decisions within BAIF. Nevertheless, the report clearly shows that the workshop made headway in conceptualizing and formulating formal monitoring and evaluation systems for BAIF development programs.

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A summary of the contents of these discussion is presented in Appendix E.

Preliminary--for Discussion Only

BAIF Monitoring and Evaluations Plans

The Dairy Cattle Development Programme

November 1989

**BAIF-VHB Evaluation Training Workshop
Poona, India**

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1. Introduction

BAIF Research and Development Foundation is a sizeable non-government non-profit voluntary organization. The Foundation's focus is on rural development. BAIF aims at creating gainful self-employment to achieve a sustainable livelihood to improve the quality of life of the rural poor.

BAIF implements a wide range of research and development projects under its four major programs: the Dairy Cattle Production Programme; the Animal Health Programme; the Socio-Economic Rehabilitation Programme for Tribals; and the Afforestation and Wasteland Development Programme.

The Dairy Cattle Development Programme is BAIF's oldest and largest development programme. The objectives of this program are:

- to increase the number of high milk producing quality cows per family;
- to increase the milk production per family; and,
- to involve, within the institutional constraints, the maximum number of families possible.

Through 450 local Development Centres in six States, artificial insemination services are rendered to farmers with specific focus on the weaker sections in the village communities. The projects is supported by BAIF's bull station and modern semen production and storage facilities in Urulikanchan. Development Centres have a capacity to tend 1,000 to a maximum of 2,000 breedable cows and are sponsored by various government institutions.

For each Development Centre, BAIF has formulated the following targets:

- to carry out a preset number of artificial inseminations;
- to achieve as preset number of pregnancies;
- to ensure that at least 51 percent of the inseminated cows belong to families belonging to the weaker sections of the village community;
- wise spending of money and a timely reimbursement of expenses;
- an efficient use of semen.

The success of the DAIRY Cattle Production Programme has attracted the attention of policy makers at the national level in India and international donor agencies. Consequently, it is expected that the present number of Development Centres will be increased substantially during the next five years.

To ensure a continuation of the success and high quality of this Programme under such fast expansion, BAIF has conducted two workshops to address possible improvements in the present monitoring and evaluations systems. This report results from the second workshop held in November 1989. the format of this report is that of a monitoring and an evaluation plan. Its contents consists of the results of discussion sessions during this workshop. To become a full-fledged monitoring and an evaluation plan, this preliminary document needs to be revised and refined on the basis of further discussions and decisions within BAIF.

2. Present Monitoring and Evaluation of the Dairy Cattle Production Programme

The rural Development Officers (RDO) record the daily services rendered to farmers. This record includes the name of the farmer, the tattoo or name of the cow, the number of the insemination, sire, the batch number of the semen, pregnancy, abortions, and the sex of the cow. on a monthly basis, RDO's and their supervising Zonal Officers compile the records in monthly abstract reports per Centre. These reports are discussed in monthly meetings of the Zonal Officer and his RDO's. Final versions of these reports are forwarded to the State/Regional office. The reports are also sent to the Central Research Station in Urulikanchan, which uses them to monitor the quality of the semen being produced in the Bull Station. Further, these reports are made available to the sponsors as monthly accounts of the work which have been carried out. All compilations and collations of the records are done by hand. BAIF has formalized and standardized this monitoring system and it is generally felt that it meets the present information needs of the management and the sponsors.

Contrary to its monitoring system, BAIF kept its evaluation systems "informal". BAIF has only recently started with the formalization of the evaluation procedures. The recent workshops were organized to discuss the policies that would guide the further development of this function within BAIF.

3. Approach to Monitoring and Evaluation

BAIF has adopted a goal oriented approach for its monitoring and evaluation functions, i.e. the focus is the assessment of the extent to which pre-set objectives and work targets have been met.

BAIF considers monitoring and evaluation to be two distinctively different functions, serving different users. Whereas monitoring focuses on the assessment of the efficiency of the field work, the evaluation is to assess the relevance, effectiveness and impact of the project. Monitoring is a continuous activity, which uses information sources from within the project only, and the primary users are the management of BAIF. Evaluation is carried out periodically, using information from within and from outside the project and the results are used by management, sponsors and interested third parties. BAIF has therefore formulated two different plans for monitoring and evaluation. (In this preliminary report a plan for on-going evaluation has been included. A plan for impact evaluation has to be added later).

Following the decision to formulate separate plans for monitoring and evaluation, BAIF discussed the responsibility for each of these functions. The desirability of a central facility which could render advice and ensure uniformity with respect to matters such as questionnaire design, sampling, diagnostic surveys and other qualitative data collection was also discussed. With respect to monitoring, it was concluded that it is an integral part of day-to-day management.

BAIF has adopted a process rather than a blueprint approach to the further development of its monitoring and evaluation functions. It intends to develop and try out changes in the present systems at a small scale and to replicate them in other parts of the Programme after they have proven to be adequate and cost and manpower effective.

4. Monitoring Plan

4.1 Indicators for monitoring of the Dairy Cattle Production Programme

Indicators provide insight on the extent to which the targets of the program are being met. The following indicators have been identified for the Dairy Cattle Production Programme:

- the number of fresh inseminations performed
- the number of pregnancies diagnosed
- the number of inseminations per pregnancy diagnosed
- the percentage of families from the weaker sector who are participating in the program
- the total number of families participating in the program
- the expenditures per Centre, per insemination and [per pregnancy diagnosed.

This set of indicators provides all the information required to ensure that the day-to-day operation of the program is proceeding smoothly, and according to the targets set for the program.

4.2 Aims, objectives and targets of the monitoring program

If the monitoring system is effective, it will meet the goals of the monitoring system for the Dairy Cattle Production Programme. These goals can be expressed according to the three levels used for the program itself: aims, objectives and targets.

4.2.1 Aims

Two aims are specified for the monitoring system for the Dairy Cattle Production Programme:

- to assist in ensuring that the program is processing in a way that will enable the aim of the program to be met
- to evolve a suitable monitoring system at each level of the organisation that can be replicated to all operations at that level.

4.2.2 Objectives

The objective of the monitoring activities of the Dairy Cattle Production Programme is to compare actual performance levels of the indicators to the target levels for those indicators, and to take corrective action if actual performance is inconsistent with target performance.

4.2.3 Target

Two targets are set for the monitoring activities:

- to collect, retrieve and summarize activities and progress towards program targets on a day-to-day basis
- to regularly provide the information to appropriate decision-makers to enable day-to-day operations to be improved.

4.3 Methodology for monitoring

In order to regularly provide the levels of the indicators, a number of pieces of information must be collected and recorded on a continual basis. This information includes:

- inseminations performed, including the date, whether it is a first or subsequent insemination, and the section to which the family owning the cow belongs (weaker or not);
- pregnancies diagnosed, including the date of the diagnosis.
- expenditures incurred for fuel, oil, and other goods or services.

The data will be collected and recorded by the Rural Development Officer (RDO) as a normal part of his duties. This information is already being collected and recorded.

In addition, a register must be maintained on the number of families eligible to participate in the program. This register would be constructed from secondary sources, and updated as necessary,

4.4 Data handling, processing and analysis for monitoring

The procedures for data handling, processing and analysis already in place, as described above, require little modification. The data recorded by the RDO on a daily basis will be summarized monthly in a meeting with the zonal officer, and the RDO's performance will be reviewed at that time. The summary form will report inseminations and pregnancies for each village, by sector, and will report expenditures for the Centre. To the extent possible, any identified problems will be discussed by the RDO and the zonal officer, and appropriate corrective actions proposed.

The manually prepared summary form on the month's activities will be sent to Poona where it will be computerized for overall program analysis.¹⁴ Programs to calculate the levels of indicators, to compare them to targets for individual villages, and to aggregate them across villages will be developed by the Information Services Centre in Poona. Computerized village information will be produced and returned to the Zonal Offices. Overall program performance will also be reported for use at the State Office or at Headquarters.

Where the monitoring reports indicate that targets are not being achieved, the responsible manager will be expected to identify the reasons for the deviation (based on more disaggregated data) and to take corrective action. To facilitate these efforts, certain other information will be recorded by the RDO, even though it does not directly contribute to the identified indicators. This information would include such things as servicing required on the motorcycle, village meetings held, pregnancy follow up reporting (calf sex, cow sold, abortion, etc.) vaccinations performed, semen stocks and utilization, fuel and oil use, RDO time investments, stocks of vaccines, and expenses incurred.

¹⁴ This strategy is considered appropriate for the current level of activity (450 Centres); consideration will be given to moving some or all data entry and processing to the State level as the program expands.

4.5 Reporting strategy

Data on activities of the RDO is recorded daily, and reported to the Zonal Officer at monthly meetings. The Zonal Officer in turn provides the (manually prepared) summary report to the State or Poona processing centre, which in turn produces a report for the relevant month.

In addition to the formal written reports, regular or occasional informal meetings will be held at the Centre, zonal, regional/state or Poona level to review progress, problems and possible corrective actions, and opportunities for improving the program design and operation. Workshops may be held in Poona or at the State/Regional level.

4.6 Implementation requirements and schedule

Many of the activities of the monitoring program outlined above are already under way. However, some work remains to be done:

- refinement of the aims, objectives and targets of the monitoring program;
- review and further development of the indicators to be used in monitoring to ensure that they provide the information required by managers and decisions-makers;
- development of the computer processing and reporting tools to generate computerized monthly reports;
- assessment of the feasibility and desirability of decentralizing processing as the number of Centres in the program expands, and the implications for resource requirements (e.g. staff, computers, money, training);

A specific work plan and timetable for these activities have yet to be developed.

5. Ongoing Evaluation Plan

5.1 Aims, objectives and targets

The principal aim of the ongoing evaluation plan for the Dairy Cattle Production Programme is

- to determine whether modifications are required in specific areas during program implementation.

The objectives of the ongoing evaluation plan are:

- to assess the preliminary impacts of the program in relation to the program indicators;
- to review the adequacy of the program budget.

The specific target of the ongoing evaluation plan is:

- to provide periodic, concise, informative reports for decision making.

5.2 Program Indicators

The program indicators have been derived from the aims and objectives of the program (see section 1). These indicators are:

- milk collection at the Centre level
- the average quantity of milk marketed per family

- the number of BAIF cross bred families
- the number of participant families
- the costs per conception.

5.3 Methodology

The basic methodology for evaluating the Dairy Cattle Production Programme will be to utilize data obtained from the monitoring records supplemented by data from the village units, sample surveys and secondary sources. The results for each Centre will be aggregated to the zonal and state levels in summary reports. Centres apparently having problems will be identified separately in these summary reports.

If the reason for these apparent problems cannot be ascertained from discussions with the responsible RDO, a diagnostic study, using qualitative and quantitative methods as appropriate, may be undertaken. Due allowance will be made for the different circumstances existing for each Centre. These circumstances include the age of the Centre, the presence or absence of other AI programs in the area, ease of communication, and any relevant cultural factors.

In most cases, decisions concerning modifications to program implementation will be taken at the state level and transmitted through the Zonal offices to the Centres where implementation will occur. Such modifications could include a reallocation of the RDO's time, acquisition of additional staff and equipment, a reassignment of staff, additional training, etc.

The main feedback from the ongoing evaluation system will be from the State office downwards in the organisation. However, BAIF-Poona will also receive a summary ongoing evaluation report from the State office. Any specific problem areas will be identified in these reports and policy issues arising out of the ongoing evaluations will be addressed to BAIF-Poona. In addition, BAIF-Poona may be asked to provide technical support if diagnostic studies are warranted. BAIF-Poona will also provide technical support in all aspects of survey design for those portions of the relevant information that is to be collected by sample survey.

5.4 Data Sources

The following data sources have been identified for use in ongoing evaluation of the Dairy Cattle Production Programme:

Draft--for discussion only
10 November 1989

- monitoring records: number of cross bred's per family, number of conceptions, number of participants families;
- financial records: budget and disbursements;
- the village unit: milk collection and milk marketed;
- sample surveys: average life of cross bred's, diagnostic studies.

5.5 Data Handling and Processing

Initially, all monitoring data will be collected by the Centres and transmitted through the Zonal Office to the State Office where the analysis will be undertaken according to procedures determined and approved by BAIF-Poona. The use of common procedures and reporting formats will ensure consistency in the implementation of ongoing evaluation across all States.

Once an efficient system of data handling and processing has been established at the State level, consideration will be given to conducting some of the analysis at suitably equipped Zonal offices. This decentralization of data handling and processing will only be possible in so far as trained staff and equipment can be made available and the Zonal office is able to provide an appropriate environment for computers and their operators.

5.6 Reporting

An ongoing evaluation of the activities of each Centre will be performed every six months. (In case of new Centres it may be unnecessary to commence ongoing evaluations until 18 months have passed). This time interval between the reports will be sufficient for trends in the indicators to emerge so that any modifications to program implementation will not be based on inevitable day-to-day and week-to-week fluctuations in Centre performance. Even with bi-annual reporting, it will be important to avoid premature adjustments to program implementation which the further passage of time may show to be unwarranted.

The following reports will be prepared in the State office:

- a report for each Centre in which all ongoing evaluation indicators are reported. Time series data for purposes of comparison will be included in each Centre report.
- a State level report in which all ongoing evaluation indicators are reported for each Zone. Centres that are performing significantly better or worse than expected will also be identified.
- a summary of the State level report will be transmitted to BAIF-Poona with a brief statement explaining any actions to be undertaken in response to the evaluation results. Policy issues will also be identified and requests for technical support and budget adjustments will be included.

5.7 Implementation

Several important steps must be undertaken in order to implement the evaluation plan.

- the indicators require validation: this task is not expected to be difficult since most of the data required for the ongoing evaluation is already available. Nevertheless, further consideration should be given to whether the selected indicators are the most appropriate for ongoing evaluation of the program.
- system design: each component of the ongoing evaluation plan must be defined in detail and responsibilities for its implementation assigned. Forms should be prepared for easy compilation of the data and the reporting formats should be decided upon by BAIF-Poona. Procedures for storage and analysis of qualitative information obtained through participant observation should be developed.
- training: the provision of the requisite information from the Centres will require training of the RDO's so that they understand the aim of ongoing evaluation, their role in the process, and the information they are required to provide.

APPENDIX A: TERMS OF REFERENCE

Purpose

The purpose of this activity is to help BAIF improve the management and delivery of its research and development programs and to enable it to systematically assess the effects of those programs.

Clients

BAIF is both a beneficiary and a client of this activity. As beneficiary, the results will benefit BAIF by increasing the efficiency and effectiveness of its programs and by strengthening its ability to communicate its achievements to other organizations. BAIF is also a client in that the activity must fit its needs and be carried out under its direction and with its participation.

IDRC is also a client in this exercise. It is funding and administering the consultancy, and needs to be satisfied that BAIF's interests are being served. In addition, IDRC required information on the effects of its support on BAIF and on the effects of BAIF's programs on the target communities. This exercise will help produce such information.

Objectives

The general objective is to enable BAIF to use evaluation techniques in the management and delivery of its programs.

The specific objectives are:

- (i) to foster a positive attitude towards evaluation among BAIF management and staff;
- (ii) to identify ways to improve the program monitoring and evaluation functions at BAIF;

- (iii) to train BAIF staff in the use of evaluation concepts and techniques; and
- (iv) to produce an evaluation plan for improving the management and delivery of BAIF programs and for assessing the effects of those programs.

Approach

The approach will be a consultative one in which the ideas and concerns of BAIF staff and the decisions of BAIF management will form and direct the activity. The concerns and perceptions of IDRC staff involved with BAIF will be also taken into account when designing and carrying out this activity.

Outline of Activities

(1) *Review of background information*

In order to gain an adequate understanding of BAIF's philosophy, mode of operation and programs, the consultant will review all relevant documentation. This includes progress reports on the activities being funded by IDRC/CIDA, publications and research reports produced by BAIF, as well as relevant Centre documents.

(2) *Formation of Working Groups*

Working groups to plan and carry out the various tasks will be formed. They will be comprised of the consultants, BAIF staff, and IDRC, as necessary. The drafting and approval by BAIF management of the terms of reference for such groups will take place at this stage.

(3) *Formulation of an Evaluation Plan*

The consultants and BAIF working together in an evaluation planning task force will map out and assess BAIF's existing evaluation procedures. The strong and weak points will be analyzed. Approval will be sought from BAIF management on the description of the current system, on the proposed changes, and on the key evaluation issues which have been identified. On the basis of this work, a comprehensive evaluation plan will be drafted by an internal BAIF evaluation group assisted by the consultants.

(4) *Preparation of Training materials*

Upon approval within BAIF of the draft evaluation plan, BAIF will specify to the consultants the training required to implement the plan. The consultant will then prepare the appropriate training materials, design the training sessions, and submit these to BAIF for review and approval.

(5) Training

The delivery of the training will be planned and carried out jointly by the consultant in cooperation with BAIF staff. The draft evaluation plan will also be discussed and finalized during the training sessions to obtain support for the plan among BAIF staff who will be directly involved in its implementation. IDRC and CIDA will be invited to participate in the appropriate sessions to comment on the evaluation plan and its relevance to their information needs. Training sessions will also include practical exercises and hands-on experience with the techniques required to implement the plan.

(6) Training Follow-up

The final report prepared by the consultant will take the form of a summary of the practical techniques discussed in the training session and case studies of their applications. This document will serve as a reference manual for BAIF staff when designing and carrying out evaluation activities. The report will be submitted for approval of both the BAIF senior evaluation coordinator and the Office of Planning and Evaluation, IDRC.

Travel

The consultants will visit BAIF once in July 1989 to become familiar with the organization, to participate in describing and analyzing BAIF's evaluation system and to help draft the evaluation plan. A second visit in October/November 1989 by a consultant team will be for purpose of finalizing and carrying out the training sessions.

Expected Outputs

In fulfilling its objectives, this activity will produce the following tangible outputs:

- (1) A report analyzing the existing monitoring and evaluation procedures at BAIF;
- (2) A comprehensive BAIF evaluation plan;
- (3) Evaluation training sessions for BAIF staff;
- (4) A practical reference document for BAIF on designing and conducting evaluations.

IDRC
Ottawa
May 2, 1989

APPENDIX B: LIST OF PARTICIPANTS

Dr. Manibhai Desai	President	Poona
Mr. M.P. Marathe	Vice Executive President	Poona
Dr. D.S. Gorhe	Vice Executive President	Poona
Mr. N.G. Hegde	Vice President	Poona
Mr. G.G. Sohani	Research Programme Organiser	Poona
Dr. B.R. Mangurkar	Research Programme Organiser	Urulikanchan
Dr. G.R. Hegde	Chief Programme Coordinator	Karnataka
Dr. B.R. Patil	Chief Programme Coordinator	Gujarat
Mr. S.B. Karvande	Finance Coordinator	Poona
Dr. R.K. Mahuli	Programme Coordinator	Aurangabad
Dr. D.C. Chirmulay	Programme Coordinator	Poona
Dr. S.B. Gokhale	Research Programme Coordinator	Urulikanchan
Dr. A.B. Pande	Research Programme Coordinator	Urulikanchan
Mr. S.C. Kanekar	Jt. Programme Coordinator	Poona
Mr. P.D. Naik	Jt. Programme Coordinator	Gujarat
Dr. G.N.S. Reddy	Research Programme Coordinator	Karnataka
Mr. Bhukshetwar	Regional Programme Coordinator	Karnataka
Dr. M.R. Bhosrekar	Research Programme Coordinator	Urulikanchan
Dr. P.N. Kelkar	Jt. Programme Coordinator	Poona
Dr. P.A. Deore	Research Programme Coordinator	Poona
Dr. V.J. Sidhaye	Regional Programme Coordinator	Poona
Mr. A.S. Khare	Jt. Finance Coordinator	Poona
Mrs. M.M. Dhamankar	Jt. Programme Coordinator	Poona
Mrs. N.M. Iyer	Analysts Programmer	Poona
Smt. A.S. Ghorpade	Research Programme Coordinator	Poona
Mr. V.V. Gadgil	Research Programme Officer	Poona
Mr. N.J. Patel	Development Engineer	Poona
Dr. R.V. Nisal	Resident Medical Officer	Urulikanchan
Dr. Jeetendra Arya	Principal Naturopath Doctor	Urulikanchan

Mrs. Madhuri Newale
Dr. Peter A. Victor
Mr. David W. Heeney
Mr. Rutger J. Engelhard

Jr. Programme Officer
Principal
Principal
Senior Consultant

Poona
VHB/Toronto
VHB/Toronto
VHB/Toronto

APPENDIX C: PROGRAMME OF THE WORKSHOP

November 6, 1989
Monday

1/01	13.30 - 14.00	Plenary	Opening Addresses by Manibhai Desai
1/02	14.00 - 14.45	Plenary	Aims and Approaches to Monitoring and Evaluation by Rutger Engelhard
1/03	14.45 - 15.30	Plenary	Discussions
1/04	15.30 - 16.00		Tea
1/05	16.00 - 16.30	Plenary	Data Collection and Analysis for Monitoring and Evaluation by Peter Victor
1/06	16.30 - 17.00	Plenary	Data Management for Monitoring and Evaluation by David Heeney
1/07	17.00 - 17.30	Plenary	Discussions

**November 7, 1989
Tuesday**

2/01	09.00 - 09.45	Plenary	Monitoring, Ongoing Evaluation and Impact Evaluation: an Overview by Rutger Engelhard
2/02	09.45 - 10.30	Plenary	Discussions
2/03	10.30 - 11.00		Coffee
2/04	11.00 - 11.45	Plenary	The Use of Indicators in Monitoring and Evaluation by Peter Victor
2/05	11.45 - 12.30		Discussions
2/06	12.30 - 14.00		Lunch
2/07	14.00 - 15.30	Group A	Formulation of Indicators for BAIF
2/08	14.00 - 15.30	Group B	Formulation of Indicators for BAIF
2/09	14.00 - 15.30	Group C	Formulation of Indicators for BAIF
2/10	15.30 - 16.00		Tea
2/11	16.00 - 17.30	Plenary	Formulation of Indicators for BAIF

**November 8, 1989
Wednesday**

3/01	09.00 - 09.45	Plenary	Computer supported Data Management for Monitoring by David Heeney
3/02	09.45 - 10.30	Plenary	Discussions
3/03	10.30 - 11.00		Coffee
3/04	11.00 - 11.45	Plenary	Quantitative Data Collection by Peter Victor
3/05	11.45 - 12.30	Plenary	Discussions

3/06	12.30 - 14.00		Lunch
3/07	14.00 - 15.30	Group A	Formulation of Indicators
3/08	14.00 - 15.30	Group B	Formulation of Indicators
3/09	14.00 - 15.30	Group C	Computer Supported Data Management
3/10	15.30 - 16.00		Tea
3/11	16.00 - 17.30	Plenary	Formulation of Indicators Computer Supported Data Management
3/12	17.30 - 19.00	Group C	Computer Supported Data Management

**November 9, 1989
Thursday**

4/01	09.00 - 10.30	Plenary	Basic Statistics for Monitoring and Evaluation by Peter Victor
4/02	10.30 - 11.00		Coffee
4/03	11.00 - 11.45	Plenary	Evaluation Planning: the Components of a Long Terms Evaluation Plan by Rutger Engelhard
4/04	11.45 - 12.30	Plenary	Discussions
4/05	12.30 - 14.00		Lunch
4/06	14.00 - 15.30	Group A	Formulation of an Evaluation Plan
4/07	14.00 - 15.30	Group B	Formulation of an Evaluation Plan
4/08	14.00 - 15.30	Group C	Formulation of an Monitoring Plan
4/09	15.30 - 16.00		Tea
4/10	16.00 - 17.30	Plenary	Formulation of a Monitoring and an Evaluation Plan

November 10, 1989
Friday

5/01	10.00 - 10.15	Plenary	Presentation BAIF Monitoring and Evaluation Plan by Rutger Engelhard
5/02	10.15 - 11.15	Group A	Discussion Evaluation Plan
5/03	10.15 - 11.15	Group B	Discussion Evaluation Plan
5/04	10.15 - 11.15	Group C	Discussion Monitoring Plan
5/05	11.15 - 11.30		Coffee
5/06	11.30 - 12.30	Plenary	Discussion BAIF Monitoring and Evaluation Plans
5/07	12.30 - 14.00		Lunch
5/08	14.00 - 14.30		Filling out Workshop Evaluation Forms
5/09	14.30 - 16.00	Plenary	Workshop Closing Session in the presence of Mr. Vijay Pande of IDRC
5/10	16.00	Plenary	Closure of the Evaluation Training Workshop

APPENDIX D: INDICATORS AND PRESENT DATA COLLECTION

Socio-Economic Rehabilitation Programme for Tribals

monitoring indicators	<i>data available through</i>	<i>data to be gathered through</i>
• number of families which completed		
• wadi land development	monitoring	
• raising tree seedlings	monitoring	
• wadi tree planting	monitoring	
• wadi intercropping and intercultivation	monitoring	
• training in wadi work	monitoring	
• number of families which received inputs for wadi programme	monitoring	
• number of check-dams built in the area	monitoring	

- number of mothers which registered for A.N.C. monitoring
- percentage of children immunized monitoring
- utilization of health facilities, i.e. number of patients seeking treatment through mobile clinics monitoring
- financial disbursements monitoring

effect indicators

- reduction of seasonal migration monitoring sample survey
- utilization of health services monitoring
- housing: construction, improvements, quality monitoring sample survey
- food consumption: quality, diversity, etc monitoring sample survey
- cropping intensity and farm output sample survey
- participation of women and girls as health guides and balwadi teachers monitoring
- birth weight: % of low birth weights monitoring

impact indicators

- no seasonal migration monitoring sample survey
- adoption of new economic activities monitoring sample survey

- | | | |
|--|------------|----------------|
| • no or reduced debts from money lenders | monitoring | sample survey |
| • proportion of boys and girls in school | | school records |
| • expenditures on food and non-food items, eating habits | | sample survey |
| • school drop outs and percentage of children in school | | school records |
| • consumable durables such as utensils, housing, etc. | | sample survey |

Dairy Cattle Production Programme

monitoring indicators	<i>data available through</i>	<i>data to be gathered through</i>
• number of fresh insemination	monitoring	
• number of pregnancies	monitoring	
• percentage of families participating from weaker section	monitoring	
• total number of participating families	monitoring	
• expenditures per centre		
• on fuel and oil	monitoring	
• per insemination	monitoring	

effect indicators

- | | | |
|--|----------------|------------------------|
| • milk collection at village level | | records milk societies |
| • average volume of milk marketed per family | milk recording | sample surveys |
| • number of BAIF cross bred's per family | monitoring | |
| • number of participating families | monitoring | |
| • costs per conception | monitoring | |

Impact indicators

- | | | |
|--|------------|----------------|
| • no seasonal migration | monitoring | sample survey |
| • adoption of new economic activities | monitoring | sample survey |
| • no or reduced debts from money lenders | monitoring | sample survey |
| • proportion of boys and girls in school | | school records |
| • expenditures on food and non-food items, eating habits | | sample survey |
| • school drop outs and percentage of children in school | | school records |
| • consumable durables such as utensils, housing, etc. | | sample survey |