DCI ETHIOPIA

Operational Research and Capacity Building for Food Security & Sustainable Livelihoods

FARM RECORDING

A Manual for Woreda Specialists, Development Agents and Researchers

CATC	Canolfan Astudiaethau Tir Cras
CAZS	Centre for Arid Zone Studies

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A Manual for Woreda Specialists, Development Agents and Researchers

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WHY FARM RECORDING?

The keeping of FARM RECORDS is an essential component of good farm management providing the information needed for day-to-day decision-making and long term planning.

The development and maintenance of simple and easily usable on-farm recording schemes was recognised in the UK one hundred years ago by Dymond (1901) as the main means of improving agricultural productivity[1]. In 1914, an embryonic farm-recording scheme for dairy farmers was started with a view to increasing the productivity of the ordinary farmer.

By 1921, the scheme had developed, through the provision of grants to interested farmers, into a national Milk Recording Service with 55 associations serving the needs of 3690 farmers. The service, whereby farmer-collected records were collated, analysed and interpreted, was extended and developed by the Milk Marketing Board after its formation in the 1930s to encompass all aspects of dairy farming, and later copied by agencies such as the Pig Improvement Development Agency, the Potato Marketing Board, the Meat and Livestock Commission and the Home Grown Cereals Authority in their respective areas, to provide the cornerstone of the efficiency of modern agriculture in the UK.

In Denmark, the first farm recording societies were established in 1910, and by the late 1950s a system of farmer recording and account keeping, supported by 2-3 visits per year by specialist advisers, was established throughout the country to such good effect that by the 1960s planners felt that farmers recording for more than 5 years were atypically efficient and that their data should not be used for planning purposes.[2]

Farm Recording in contemporary agricultural development programmes is, unfortunately, noticeable by its absence. This general omission connects to a lack of confidence of planners in farm family literacy and numeracy levels, a lack of awareness of the range of performance that exists at village level, and the propensity of planners to work either on averages or, more recently, on focus group appraisals that mask both the true concerns and real successes within communities. This often leads to a sequence of irrelevant research programmes, which, in turn, lead to irrelevant and, therefore, unadopted extension ideas. Consequently, Farm Recording is developing agriculture's missing link to efficient modern systems.

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[1]Dymond, T.S. (1901) Journal of the Farmers Club, London

[2] Saxon, E.A. (1960) Management and Policy: Experience in Denmark. Quarterly Review of Agricultural Economics, Canberra, Vol. 14 No 2

WHAT IS FARM RECORDING?

Farm Recording means keeping regular records on-farm of all technical and financial activities and events that may be used for:

- measuring livestock and crop performance;
- identifying bottlenecks, constraints and production problems;
- comparing technical performance against peers and standards;
- comparing enterprise economics within and between farms;
- determining profit and loss making enterprises;
- making the right decisions when planning for the future.

Farm Recording involves farmers or members of the farm family keeping daily records of:

- income and expenditure in cash and kind;
- related records of physical activities and events covering land use, use of other home resources including labour, use of external inputs including labour, changes in crop and livestock state and condition, and the outputs obtained, used, sold or otherwise disposed of.

Farm Recording involves development agents and subject matter specialists in:

- the regular collection of records for review and analysis;
- the interpretation of the analysis and the production of regular returns for individual farm families advising them on their performance;
- the preparation of ACTION PLANS to implement recommendations.

On small farms this is most easily achieved by a member of the farm family keeping a **daily diary** in which all actions and transactions are noted in a way that is simple to follow, accurate and, above all comfortable to do. Farmers may then be assisted by Development Agents to sort the daily information into useful clusters of data for analysis and interpretation by specialist advisers, who will provide the family with regular returns offering a review of what has occurred, explanations and advice.

Properly conducted by the farm families themselves with regular analytical support from specialists, farm recording will achieve its **goal,** which is to improve productivity and farm-family welfare without inhibiting long-term returns from the watershed.

GETTING STARTED

Farm Records may be started by making a series of marks on a wall, by collecting stones or tokens in a container, by twisting plaits of straw around a stick or by noting figures in well-designed tables. In all cases, the purpose of such actions is to record events, tasks or transactions in such a way that they will be accurately remembered for assessment, evaluation or discussion at a later date.

The actual style and format used will depend on the many conditions and circumstances prevailing in the watershed. In this project, Farm Recording has been identified as a major component to the extent that computers powered by solar panels have been introduced at *kebelle/tabia* level for data storage and analysis. However, the process begins and ends at farm level. It is at farm level where the degree of success or failure of the system will be determined.

Plate 1: Solar panel installation in Dobotuto, Gurage

The installation of the equipment at village level requires an understanding of the technology, an acceptance of the idea at local level and the imagination to place the solar panels in the best place with regard to energy capture, accessibility and security.

Similarly, the positioning of computers at village level requires more than the funds to buy the technology the knowledge to use it wisely, it also requires an acknowledgement from the community that the equipment will be safe and respected as a village asset.

Given these assurances the programme can GET STARTED.

Plate 2: DA in her office in Dobotuto, Gurage

Getting started means:

- identifying the importance of FARM RECORDING;
- determining the level of intervention;
- soliciting funds to support the introduction of the system;
- obtaining a long-term commitment from the administrations concerned to provide the required logistical and technical support the farmers need;
- obtaining assurances from the community that the equipment will be protected and recognised as a village asset;
- identifying the farmers who wish to be involved.

Once the farmers have been identified, recording may begin with the derivation of a suitable system to suit the prevailing conditions. The introduction of the system to be used should involve all villagers and each 'step' should be fully explained, including the role of the equipment. This may then be followed by the appropriate training for the farmers and DAs involved.

In the case of the Operational Research and Capacity Building project, a 5-Step system incorporating a "scroll" pick-up of data and delivery service of returns was derived as is indicated below.

STEP 1 Farm Family Level

In the five watersheds identified by the two consortia, 80 families volunteered to keep records. Farmers attending the initial focus group meeting who volunteered to participate were asked to undergo two simple tests:

- find today's date in an "Agenda" (daily diary) and explain how they had found it;
- write their names and addresses on the first page of the agenda keeping the letters and words in the correct places.

In all but five cases, the levels of functional literacy and numeracy of the farmers themselves was shown to be sufficient to keep written records on a regular basis. In the remaining five cases, family members volunteered to write on behalf of the family.

Plate 3: Testing farmers for functional literacy and numeracy in Umbalawacho watershed

Once the selected farmers became familiar with the agenda, the concept of summarising their daily activities was explained.

- Farmers agree to do the following: List all activities undertaken, events noted, inputs used and outputs obtained related to crop and livestock production.
- Do this each day in your own language and using your own local measures and terms.
- Keep all records on the appropriate daily page in the agenda.

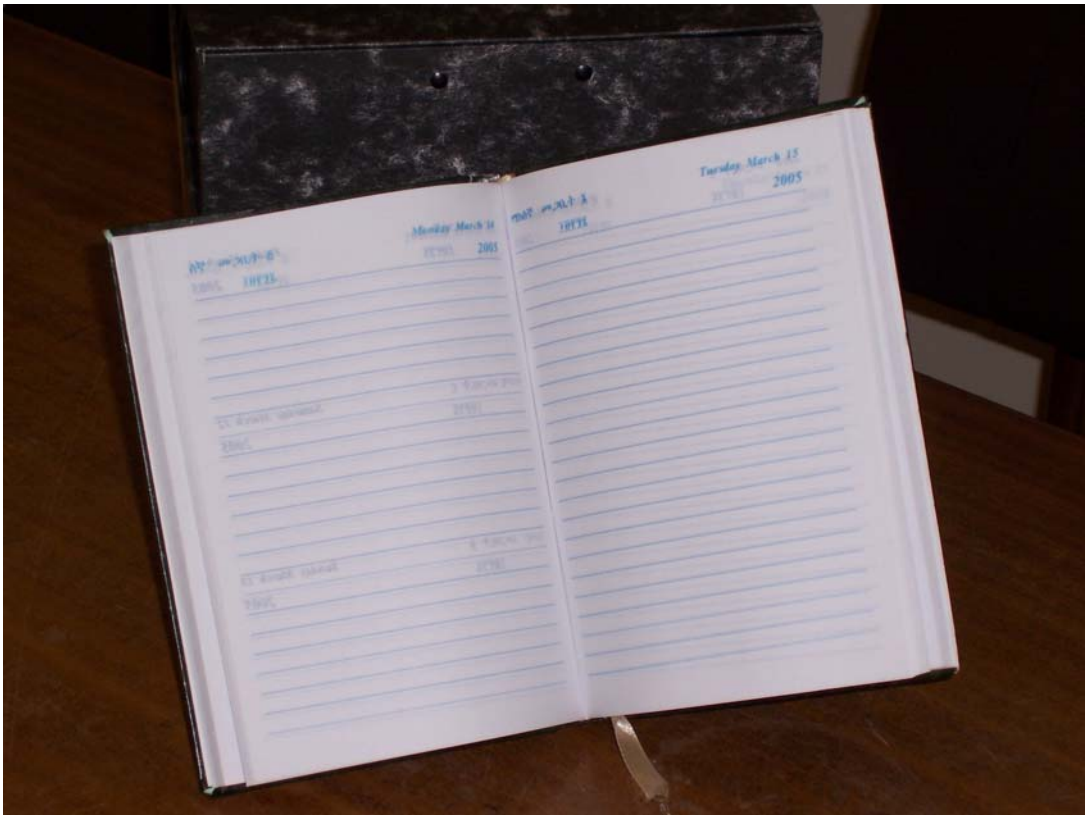


Plate 4: An example of the farmers' agenda showing two single pages for two days' information.

In all cases it is MOST IMPORTANT to stress the following principles of engagement:

- THE AGENDAS BELONG TO THE FARMERS,
- THE AGENDAS WILL NEVER BE REMOVED FROM THE FAMILIES,
- THE INFORMATION KEPT IN THE AGENDA IS A PERSONAL RECORD OF THE FAMILY FARM AND IS STRICTLY CONFIDENTIAL,
- PARTICIPANTS AGREE TO ALLOW THE DEVELOPMENT AGENT ACCESS TO THEIR AGENDAS ONCE A MONTH TO COPY THE INFORMATION FOR REVIEW AND ANALYSIS,
- ACCESS TO THE INFORMATION IS THROUGH THE DA/HA ONLY AND APPEARS IN THE SUBSEQUENT PROCESS UNDER A NUMERICAL CODE, <u>NOT UNDER THE NAME OF THE FARMER</u>
- ALL RECORDERS WILL BE SUPPLIED WITH AGENDAS, PENCILS AND ERASERS ON AN *"AS REQUIRED"* BASIS.

STEP 2 Development Agent Level

In the five watersheds, farmers have been grouped by location and assigned to the DA in their locality.

Plate 5: A group of farmers with their DA in Umbalawacho watershed

After an initial visit during which the DA will note the OPENING STOCK of each farmer, to be compared at the end of one year with their CLOSING STOCK, the DAs will visit their farmers in accordance to a pre-arranged schedule at the end of each month AS PART OF THEIR REGULAR DUTIES. The DAs will collect data by dis-aggregating the daily information and re-aggregating the data as monthly totals or monthly summaries depending on the nature and content, for each farm enterprise. At this stage the DAs will copy the information into their own notebooks in tabular form designed to match the computer formats to be used for storage and analysis at the next stage. That is to say, each DA notebook will follow the same format noted below in BOX 1, using however, local languages, measures and terms.

Each DA cluster will prepare a lexicon of commonly used local terms and measures with parallel international units, tried and tested *in situ* and it is with this lexicon that the DA s will change the farmers' terms and measures into international units.

At this early stage in the development of the scheme most DAs will have no more than 10 or so farmers each. However, as the scheme matures and more farmers choose to join, far more farmers may be managed by one DA.

BOX 1 FORMAT FOR DEVELOPMENT AGENT NOTEBOOK

PAGE 1 Name of watershed and constituent *kabelle / tabia;* Name and address of DA, date of initiation of recording scheme and declaration of OPENING STOCK.

PAGE 2 Blank page to accommodate changes in boundaries and DA postings.

PAGE 3 List of farmers and farm locations in DA group, with identity numbers.

PAGE 4 The first page of a series of pages for the first farmer on the list. Divide the page vertically-left hand side OPENING STOCK, right hand side CLOSING STOCK to be completed exactly one year after the declaration of the OPENING STOCK which should include-land owned, rented and shared, cows milking, cows dry, heifers, calves (male and female) bulls, adult sheep and goats, (male and female) young sheep and goats (male and female) oxen, horses, donkeys and camels, chickens, ducks, bees and bee hives, stacks of straw/hay, quintals of grain in store, ponds, pumps and carts.

PAGE 5 Blank page to accommodate dramatic changes to the farm family circumstances.

PAGE 6 A double page to accommodate the 12 monthly summaries of inputs, outputs, events and activities of the main crop enterprise in a series of columns for the whole year from January to December. The entries to be made in the local languages using local terms and measures. The content, however, is identical to the tables inputted into the farmers' files in the computer as shown in BOX 2 (NB no grand total column is necessary in the DA notebook, grand totals will be compiled by the computer programme).

PAGE 8 A double page for the next crop, the sequence to be repeated on double pages to accommodate all cereals, pulses, oilseeds, irrigated crops, tree crops and then all livestock enterprises also entered on separate double pages.

PAGE 8++ After all the enterprises for the first farmer have been tabulated in the manner prescribed, information for the second farmer on the list should be included in a similar manner, starting with a repeat of PAGE 4.

PAGE 8++++ The process continues until all farm enterprises are tabulated for all farmers in the DA group.

In all cases it is MOST IMPORTANT to stress the following principles of engagement:

- THE DA VISITS THE FARMER ON HIS FARM ON THE APPOINTED DATE AT THE APPOINTED TIME.
- THE DA READS EVERY PAGE OF THE AGENDA FOR THE MONTH UNDER EXAMINATION, DOES HIS/HER CALCULATIONS WITH THE FARMER AND AGREES ON THE CONTENT USING LOCAL LANGUAGES, TERMS AND MEASURES.
- DAS MUST RECORD THE REAL DATA EVEN IF IT VARIES FROM THEIR RECOMMENDATION, I.E. IF FARMERS USE 10KG NOT 25KG OF MAIZE SEED PER HA THE REAL FIGURE (10KG) MUST BE ENTERED, NOT THE RECOMMENDED FIGURE.
- THE AGENDA REMAINS WITH THE FARMER.
- THE INFORMATION REMAINS CONFIDENTIAL.

Each DA enters the information transferred from the farmers' agendas to their notebooks into the data base tables on the computer kept at watershed level in the DAs' office. These entries MUST be in international units and in the English language conforming to the layout shown in the following boxes for each enterprise.

BOX 2 TYPICAL RAINFED FIELD CROP ENTERPRISE TABLE

OPERATIONAL RESEARCH-TIGRAY BEGA SHEKA, KOLA TEMBIEN FARM RECORDS 2005								SHEET 1 HAGOS MOHAMED					
FARMER 1 RAINFED FIELD CROPS													
WHEAT ha	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT	OCT	NOV	DEC	TOTAL
Plough/sow oxpairdays													0
Seed variety,source													
Sowing date													
Seed used, kg													0
Fertiliser date													
Fertiliser DAP,kg													0
Fertiliser urea,kg													0
Fertiliser labour,mdays													0
Spray type													
Spray used,kg or l													0
Spray labour mdays													0
Weeding dates													
Weeding mandays													0
Harvest dates													
Harvest mandays													0
Threshing dates													
Threshing mandays													0
Threshing oxen days													0
Area harvested,ha													0
Production,quintals													0
Sold, quintals													0
Price obtained,Birr													0
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT	OCT	NOV	DEC	TOTAL

The table in Box 2 is for a wheat enterprise. It anticipates the entire crop being harvested at the same time. Adjustments for other field crops with specialist husbandry techniques, and for the serial harvesting of green and mature crops need to be made in the tables for maize and sorghum enterprises.

BOX 3 TYPICAL TREE CROP ENTERPRISE TABLE

EUCALYPTUS	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT	OCT	NOV	DEC	TOTAL
Digging mandays													0
Plant var.,source													
Planting nursery dates													
Planting mandays													0
TransPlanting dates													
TransPlanting mandays													0
Plant spacing,m.													
Fertiliser date													
Fertiliser DAP,kg													0
Fertiliser urea,kg													0
Fertiliser labour,mdays													0
Weeding date													
Weeding mandays													0
Other task dates													
Other task mdays													0
Harvest dates													
Harvest mandays													0
Area harvested,ha													0
Poles produced													0
Poles sold													0
Price obtained,Birr													0

The table in Box 3 is for a typical tree crop. Eucalyptus is the example chosen and includes rows for nursery use, transplanting and pruning/trimming that would be placed under 'other tasks'. Other tree crops such as enset or coffee need rows for processing as well.

BOX 4: TYPICAL IRRIGATED CROP ENTERPRISES TABLE

TOMATOES	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT	OCT	NOV	DEC	TOTAL
Plough oxpairdays													0
Bed,bund making mdays													0
Seed variety,source													
Sow/tplant dates													
Sow//tplantmdays													0
Seed used, kg													
Fertiliser date													0
Fertiliser DAP,kg													0
Fertiliser urea,kg													0
Fertiliser labour,mdays													
Spray type													0
Spray used,kg/l													0
Spray labour mdays													
Weeding date													0
Weeding mandays													
Staking dates													0
Staking mandays													
Harvest dates													0
Harvest mandays													
Irrigation interval													
Irrigation mandays													0
Diesel & oil used, l													0
Area harvested,ha													0
Production,quintals													0
Sold, quintals													0
Price obtained,Birr													0
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT	OCT	NOV	DEC	TOTAL

The table in Box 4, where tomatoes are used as an example of irrigated crops, includes rows for water management and the extra costs of diesel and oil.

BOX 5 TYPICAL LIVESTOCK ENTERPRISE TABLE

ANIMAL PRODUCTION													
COWS/BULL..Nos.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT	OCT	NOV	DEC	TOTAL
Husbandry,mandays													0
Herding,m or c, days													0
Straw fed,kg													0
Straw source													
Price/kg													0
Hay fed,kg													0
Hay source													
Price/kg													0
Sugar cane byprod,kg													0
Sugarcane byprod source													
Price/kg													0
Enset fed,kg													0
Enset source													
Price/kg													0
Watering, time or litres													0
Vet. Treatment													
Nos treated													0
Price charged, Birr													0
Heat, date/number													0
Mating, date and number													0
Calving,date and number													0
Weaning date and number													0
Drying off date and number													0
Milk prod litres													0
Milk sold litres													0
Price per litre													0
Milk process, litres													0
Process. Sold kg													0
Price per kg													0
Calf born													0
Calf sold													0
Price													
Calf dead													0
Adults bought or sold													0
Price													0
Body condition scores													
Adult dead													0
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT	OCT	NOV	DEC	TOTAL

The table in Box 5 is for a dairy enterprise, whether milking or not, and contains the information related to breeding bulls as well as cows and herd replacements. Other livestock enterprises with a single non-processed product such as eggs or animals for slaughter are less complicated.

The tables shown in the boxes above are typical tables connected to the range of enterprises existing in the programme's watersheds.

- not all farmers carry all crops or all livestock,
- their actual enterprises will be identified during the listing of the OPENING STOCK.

Therefore, although the tables will be present in the database ready to receive information from each farmer, in many cases the tables will remain unfilled, as no data will be available.

Plate 6: Opening stock of straw ricks in Hawzien, Tigray. Jan.2005

STEP 3 *Woreda* Level

Once the farm records are safely entered into the database in the English language and in international units, they are in a position to be analysed by the Subject Matter Specialists at *woreda* level.

The SMSs assigned to the programme are responsible for the collection of data and information from the DAs' computers, the summation of accumulated totals of inputs and outputs, the presentation of significant events and activities and the identification of variations from normal or standard procedures in each case.

Plate 7: Woreda office equipment supplied by project in Borrichu

These tasks, to be accomplished on a monthly basis, should become PART of THEIR REGULAR DUTIES and will involve:

- visiting the DA offices once a month specifically to copy the tables from the DAs' data-bases and to discuss content with the DAs;
- entering the farmers' information into their own data-bases;
- entering the monthly totals and adjusting the accumulated totals for each farmer;
- preparing *woreda* based tables showing monthly, seasonal and annual averages with standard deviations, by aggregating the individual farm data for each enterprise;

- identifying qualitative departures from the norm in terms of dates of activities, planting material varieties used, sequences of events;

- identifying quantitative departures from the norm with regard to labour use for all tasks, inputs used and outputs obtained;

- calculating technical and financial indicators with which to judge farm performance against peer group performance and other standards. For crops to include but not be limited to differences from peer group and variations from advice in terms of timing of tasks, indicators of cost and technical efficiency, i.e. price range, gross margin, margin over fertiliser costs, margin over labour (ox and man days) costs, and seed use, husbandry tasks used and yield. For livestock enterprises to include but not be limited to dates of heat, dates of service, dates of weaning and drying off, illness, untimely or extreme events, theft, predators, margin over feed costs, margin over labour costs, returns to service, running and final birth and death percentages, milking index being nos. of cows milking / nos. of milch and dry cows and changes in body condition score;

- anonymous ranking performance of individual farms against the performance of their peers in the same and in other watersheds;

- identifying constraints and remedial measures for each farm family;

- preparing hard copy (on paper and in local language) monthly returns for ALL FARM FAMILIES, summarising the findings for the month, the season and the year;

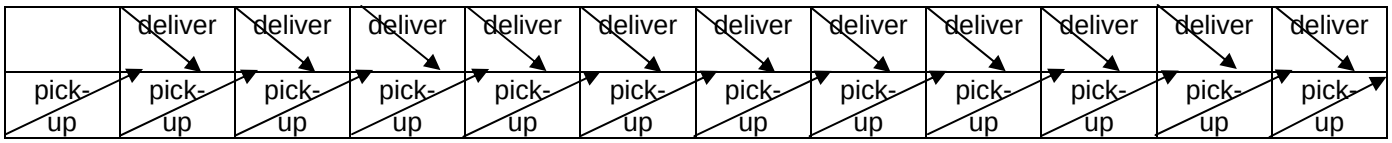
- filing copies of the monthly returns in English on the database.

The analysis and its interpretation should become the pivot point for advice to farmers. It will allow the SMSs to move away from the concept of packages whereby "one size fits all". The advice needs to take into consideration the real farm circumstances and their actual performance *vis-à-vis* their peers and this will require MUCH MORE THAN THE REITERATION OF FIXED IDEAS to be successful.

The format for standardised monthly returns is included in BOX 6, in English, the form in which the returns should be filed. The actual returns to the farmers must be in a language they can understand.

The FARMER RETURNS should be delivered at the same time that the *woreda* SMSs pick-up the MONTHLY TABLES in a SCROLL delivery service, this style of protocol means no pickup without delivery as indicated in the diagram below in Figure 1.

Figure 1 Scroll delivery service



In all cases it is MOST IMPORTANT to stress the following principles of engagement:

- THE *WOREDA* SMSs COLLECT AND ANALYSE DATA ON TIME;
- THE *WOREDA* SMSs PREPARE AND DELIVER THE FARMER RETURNS BEFORE THEY PICK-UP THE NEXT MONTH'S DATA;
- THE FARMERS REMAIN ANONYMOUS IN ALL TABLES AND DOCUMENTS;
- FARMER RETURNS CONTAIN MEANINGFUL TECHNICAL AND FINANCIAL ADVICE BASED ON THE INDICATORS AND PEER GROUP RANKING LISTS PLUS ADVICE THAT REALLY PERTAINS TO THE SPECIFIC FARM FAMILY; NOT REITERATED EXTENSION MESSAGES;
- THE *WOREDA* LEVEL DATABASE IS KEPT UP TO DATE AND IS MADE ACCESSIBLE TO CONSORTIUM MEMBERS.

Plate 8: Cattle in Debub, in foreground body condition score 1.5 (based on cover of transverse processes of lumbar vertebrae); white heifer on right hand side body condition score 3.5.

BOX 6: FARM FAMILY MONTHLY RETURN

1

To be translated into local languages[i]

DEBUB **FARM RECORDING 2005**
FARMER MONTHLY RETURN **MONTH JANUARY/TIR**
WATERSHED DOBOTUTO **FARMER IDENTITY NUMBER……**

CROP PRODUCTION:

INPUTS DURING MONTH.

INPUT	CROP 1[ii]	CROP 2	CROP 3	CROP 4	CROP 5 Enset	CROP 6 Eucalypt	CROP 7 Chat	CROP 8 Coffee	TOTAL MONTH	TOTAL ACCUM.
Task type										
Labour,md[iii]										
------cost										
Ox days[iv]										
Seed var										
Seed rate kg										
Seed cost										
DAP kg										
----cost										
Urea kg										
----cost										
Spray type										
-------kg										
-------cost										

OUTPUTS DURING MONTH

OUTPUT	CROP 1	CROP 2	CROP 3	CROP 4	CROP 5 Enset	CROP 6 Eucalypt	CROP 7 Chat	CROP 8 Coffee	TOTAL MONTH	TOTAL ACCUM.
Grain kg										
---sold kg										
---price										
Straw kg										
--sold kg										
--price kg										
Fruit kg										
--sold kg										
---price										
Veg kg										
---sold kg										
---price										
No.of Trees hrvtd[v]										
…proc. kg										
…proc. kg										
…sold kg										
…price										

CROP EVENTS/ACTIVITIES SUMMARY REMARKS[vi].

CROP POINTS FOR DISCUSSION[vii].

2

ANIMAL PRODUCTION:

INPUTS DURING MONTH.

INPUT	DAIRY/ BEEF/ BULL	OXEN/ OTHER DRAFT	SHEEP/ GOATS	CHICK.	BEES	TOTAL. month.	TOTAL. accumulated.
Task types							
Labour,md							
------cost							
Herding,md							
------cost							
Straw, kg							
---Source							
----cost							
Hay, kg							
---Source							
----cost							
Cereals kg							
---Source							
----cost							
Others[viii]							
-----kg[ix]							
Heat/Mating							
Births							
Dry off							
Sickness							
Deaths							
Vet activity							
-----cost							
Water quantity							
-----cost							

OUTPUTS DURING MONTH

OUTPUT	DAIRY/ BEEF	OXEN/ OTHER	SHEEP/ GOATS	CHICK.	BEES	TOTAL. MONTH.	TOTAL. ACC.
Milk kg[x]							
---sold kg							
---price							
Milk pro							
--sold kg							
--price kg							
Workdays							
--income							
Eggs laid							
-----sold							
---income							
Anim.sold							
-----price							
Other prod.							
-----price							

ANIMAL EVENTS/ACTIVITIES SUMMARY REMARKS[xi].

ANIMAL POINTS FOR DISCUSSION[xii]

3

OVERALL POINTS FOR DISCUSSION[xiii]

[i] farmer return should NOT EXCEED three sides of A4, and should be presented in a sealed envelope.
[ii] crops to be included in order of importance for each specific farmer
[iii] md= mandays(man=woman, child<10=0.5md)
[iv] ox days= no of oxen working the local day, pair counts as 2.
[v] trees hrvtd=trees harvested for fruits, berries or cut for stems, poles, timber or firewood.
[vi] include actual dates,varieties,pest challenges,untimely/extreme events.
[vii] differences from peer group, variations from advice,indicators of cost and technical efficiency, i.e. price range, gross margin, margin over fertiliser, margin over labour (ox and man days), yield.
[viii] include type/s of feed tree branches, enset, sugar cane by products, brewer's grains, oil seed waste, millsweepings, endings.
[ix] include estimated weight of different other feeds
[x] milk produced is all milk hand milked from cow,
[xi] include dates of heat, services, weaning and drying off, illness, untimely or extreme events, theft, predators,
[xii] include margins over feed, margin over labour; returns to service; running birth and death percentages;
milking index=cows milking/milch and dry cows; ranking of performance with peers and against standards,
[xiii] to include general issues regarding land, labour, marketing and access to finance.

STEP 4 Development Agent/Farmer

The MONTHLY RETURNS to individual farmers, culminating in the seasonal and annual returns provide the key elements to establish and nurture the DA/Farmer relationship. Consequently the DA MUST deliver the MONTHLY RETURNS for the previous month when he/she visit the farmers to collect and discuss the information from the farmers' agendas for the current month. Once again a "SCROLL" delivery service is necessary to maintain farmer interest.

The farmer groups assigned to each DA also provide a ready–made forum for group discussions on matters of common interest or concern. The DAs should involve the *woreda* SMSs in such meetings, particularly at the end of the seasons when enterprise results, technical and financial indicators and peer group rankings are available.

IT is MOST IMPORTANT to stress the following principles of engagement:

- DAs MUST THINK BEYOND THE EXTENSION PACKAGES AND RECOGNISE THE INDIVIDUAL NATURE OF FARM BUSINESSES.

- AT FARM LEVEL THE SMSs' ADVICE SHOULD BE REDUCED TO A SIMPLE ACTION PLAN TO BE IMPLEMENTED BY THE FARMER WITH HELP FROM THE DA.

- AT GROUP LEVEL, THE CONTENTS OF THE MONTHLY RETURNS REMAIN CONFIDENTIAL.

- DISCUSSIONS IN THE GROUPS SHOULD BE BASED ON ANONYMOUS RECORDS/ INDICATORS NOT ON HYPOTHETICAL CASES.

- CONTACT WITH THE FARMERS PROVIDES THE OPPORTUNITY TO CORRECT FORMATS OF RECORDING SHEETS AND TO ENSURE THAT ALL THE FARMERS HAVE THE MATERIALS TO SUSTAIN THE SYSTEM. THESE SHOULD BE FREELY AVAILABLE ON REQUEST.

- AT THE END OF THE YEAR THE PROCESS IS CLOSED WITH THE ASSESSMENT OF THE CLOSING STOCK. IT THEN BEGINS AGAIN WITH THE PROVISION OF NEW MATERIALS AND THE ASSESSMENT OF THE NEW OPENING STOCK.

- NEW FARMERS SHOULD BE RECRUITED TO REPLACE DROP OUTS AND EXPAND THE COVER.

STEP 5 Consortium Level

The previous steps have concentrated on the role of Farm Recording as a tool to improve on-farm performance, relying heavily on the technical capabilities of the DAs and the *woreda* SMSs. However, that is only the simplest level of benefit that may be obtained. Farm Recording systems have other dimensions that offer greater macro-level advantages.

Firstly, the accumulated data from all *woredas* can provide a database from which national performance standards, for different farm systems, may be accurately determined in both financial and technical terms. The data may also be used to establish meaningful indicators with which to judge key components of enterprises. Such indicators are not yet available in Ethiopia for livestock or crop production but form the basis of all modern agricultural industries. This technique currently referred to in the literature as BENCHMARKING[3] may be applied along the whole length of the food supply chain. At *woreda*, zonal and regional levels, such information and data are invaluable to planners and this point has been recognised by the Heads of Rural Development in the Bureaux in the *woredas* where the Farm Recording schemes have been introduced.

- IT BEHOVES THE CONSORTIA TO MAKE SURE THAT THE IMPORTANCE OF THE INITIATIVE IS SIMILARLY RECOGNISED AT REGIONAL LEVEL.

Secondly, university and institute agricultural researchers are still firmly attached to the campus. The Operational Research conducted through the programme is only just starting and is viewed with some suspicion by the proponents of formal/traditional research practice. Operational Research must reach beyond being viewed as an extension of institution-based plots. Currently, the positing of questionnaires/methods at DA level by a series of individual researchers pursuing their own interests, with instructions how to fill in the form and how send the results back to the campus to be written up as “participatory” research, must change. A database of Farm Records, available to all researchers will reduce the need for such exercises. The steady stream of meaningful data will provide the required base-line data. The authenticity of the data should ensure that Operational Research takes on a more farmer-centric tone as discussions based on indicators derived identify the real problems at farm and community level.

Thirdly, researchers interested in studying farm systems/enterprise economics will have access to a body of data which may be used to prepare models and to “truth” linear programmes that may be used to inform and test policy decisions on a regular basis at the end of the each season and each year of operations.

To facilitate these advantages, the Farm Record keepers, the farmers and the front line operators need to be supported. The solar panels and the computers are only the beginning, continuing regard needs to be paid to identifying the changing training and material requirements as the Farm Recording scheme develops.

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[3] Franks, J R and Harvey MJP, Journal of Farm Management, Vol.12 No. 3