

# 1

## A review of PRA methods for livestock research and development

Kate Kirsopp-Reed

### • Introduction

During the past six or seven years a range of methods for participatory rural appraisal (PRA) have been tried and tested in the field by development professionals from a wide variety of backgrounds. Most of these methods are continually being refined and adapted to cope with the diversity of local ecological conditions and cultures. This paper reviews a selection of PRA techniques that are either currently in use or which are believed to have potential application with communities who depend on livestock for their livelihood.

Detailed examples of many of the PRA methods outlined in this paper can be found in the case studies in this issue. While many PRA techniques are simple, others are more complex to implement, requiring concentration, organisation and full participation. The best results are often achieved when they are used flexibly and in sequence. Ultimately they provide a means of stimulating better discussion, rather than an end in themselves.

The following list of techniques is by no means exhaustive. It has been drawn up merely to illustrate the range of methods available.

### • Methods

#### Direct observation and village walks

Perhaps the easiest and least time-consuming methods of learning about the local livestock management and production system are through first-hand observation and the recognition of key indicators. Direct

observation, often combined with informal questioning, can yield a substantial amount of general and specific information and should not be overlooked when conducting a PRA. They can give an indication of a number of important aspects of the local farming system including:

- The health and nutritional status of the livestock;
- The members of the family responsible for the livestock;
- Livestock housing system;
- Grazing/feeding strategy;
- Milking regime; and,
- Care of young stock.

Walking with farmers around their fields or homesteads will often draw the researcher's attention to local innovations or animal husbandry techniques which might otherwise have passed unnoticed. Visiting a watering place or a communal dipping site also provides ideal locations from which to observe types, breeds and numbers of livestock that are kept in, or pass through, the region.

During village walks and informal discussions it is important to be able to recognise key indicators of the status and well-being of livestock. M. Ghirotti (p.78) explains that knowledge of these parameters could help development professionals quickly assess the local livestock situation. This knowledge should also help to understand and interpret qualitative data collected through PRA techniques.

#### Indigenous knowledge

Knowledge of local calendars and classification systems often provides important

information about local farming systems. An initial understanding of these can avoid unnecessary questions later. David Hadrill and Haroon Yusuf (p.106) describe and explain the basis of a herders' calendar in Somaliland. It is governed by the different celestial formations and seasonal climatic variations. Disease incidence and nutritional management practices are strongly linked to this calendar. This knowledge was important in the subsequent planning of an appropriate primary animal health care programme.

Raul Perezgrovas, Marisela Peralta and Pastor Pedraza (p.69) discovered how little they and their colleagues knew about the indigenous sheep production system used by Indian shepherdesses in the Chiapas, Mexico. They were surprised to learn about the success and efficiency of the traditional management system and the extent of local knowledge of sheep production. They only discovered this by living with the shepherdesses and helping them with their daily chores and husbandry practices. This provided them with opportunities to ask questions, carry out some of the daily tasks for themselves and encouraged them to respect traditional practices.

### Semi-structured interviews

Interviewing is one of the most important methods of gathering information, and often forms the core of a good PRA. Used to explore issues arising from participatory exercises, and to generate discussions which may lead to more visual techniques, semi-structured interviewing complements most participatory research methods. Interviews and discussions can be carried out with selected or randomly chosen individuals and groups.

Although practitioners should have a written or mental check-list of the minimum data to be collected, they should also be flexible. Thus if new aspects of animal production or socio-economic conditions crop up during the course of the questioning, she/he will be prepared to pursue these.

The following information is thought to provide the minimum data needed for livestock development planning (Swift, 1981):

- Total number of livestock species;
- Herd and flock demographics: herd structure, fertility, mortality;
- Output data: quantity and seasonal distribution of milk or eggs; and,
- Offtake rates: age and sex of animals sold or slaughtered, rates of weight-gain in young animals, days/hours worked by draft animals.

### Case histories/animal biographies

It is often difficult to obtain data on livestock output or mortality and fertility. However, by systematically recording full animal life histories and genealogies, one can obtain this data in more detail and with greater accuracy. Often livestock owners remember their animals' life histories accurately and are not reluctant to part with this information. By simply shifting the emphasis of an interview away from the owners and focusing on the animal, the discussion becomes much easier and the information more detailed and reliable. In effect, livestock owners are used as translators for the animals<sup>1</sup>. Swift (1981) suggests that a researcher visit the herd or flock with the owner and record, on a standard form, the major facts and events of each female's life, including:

- How it entered and left the herd;
- Any partial property rights;
- Reproductive history; and,
- Fate and health status of offspring and siblings.

Figure 1 is an example of a form for interviewing cattle used by Getinet Lemma, of SOS Sahel, during a PRA Training Course (IIED and ActionAid Ethiopia, 1992).

<sup>1</sup> Kassaye Hadgu, Mohammed Yissehak and Girmay Tekle present a cartoon in *RRA Notes 15* which gives details 'of an interview with a cow'.

**Figure 1. Form for interviewing cattle**

Interviewer:  
 Date: Peasant association:  
 Agroecological zone: Awraja:  
 Farmer: Cow number:  
 Cow age:

Let us discuss this cow.  
 How many times did she calve?  
 Let us discuss the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> etc. calf.

| Calf no. | M/F | If dead, what cause and at what age? | Where is this calf now? | If now in herd, what age? | If sold, to what sort of person, at what age? | If otherwise disposed of, to whom, at what age? |
|----------|-----|--------------------------------------|-------------------------|---------------------------|---|---|
| 1        |     |                                      |                         |                           |   |   |
| 2        |     |                                      |                         |                           |   |   |
| 3        |     |                                      |                         |                           |   |   |
| 4        |     |                                      |                         |                           |   |   |

Is this cow your own property, or are you looking after it for someone else?.....

If someone else, what relation are they to you?.....

If it is your own property, how, when, and from what sort of person did you acquire it?.....

**ADULT MALES**

| No. | Age? | How acquired? | If not born in herd, purpose of acquisition? | If not born in herd, age at acquisition? |
|-----|------|---------------|--|--|
| 1   |      |               |  |  |
| 2   |      |               |  |  |
| 3   |      |               |  |  |
| 4   |      |               |  |  |

Source: IIED/ActionAid Ethiopia 1992. *Look Who's talking*. PRA Training Course.

Case histories can be used with all types of stock. When used to investigate longer time periods, case histories can lead to related discussions on change. Older animals make the best informants. The process could start with where they were born and what significant things happened to them during their lives. These can then be marked on a time-line (see below) and explored further.

Karen Iles (p.71) presents a case study of a progeny history which she carried out in Kenya on behalf of ITDG. She includes a structured question list which can be followed when interviewing farmers. John Young et al. (p.58) used progeny histories with farmers in Nepal to investigate the fate of offspring from

adult female livestock and to explore the disease problem. From this information they were able to calculate the rates of offtake through sale, slaughter and gifting, and loss through disease.

It is also possible to calculate fertility, calving intervals and mortality within different years from information collected through a case history. Case histories give researchers an idea of the entire range of fertilities and mortalities. Thus they should provide more realistic data than averages collected from many livestock in a single year. Furthermore, using animal histories to gather data allows dynamic models of household herds, rather than aggregate herds, to be constructed. This makes it

possible to compare the herding efficiency, management strategies and consequential loss of animals between individual households.

### Ethnoveterinary question list

Animal health is often ranked as one of the major factors limiting production by communities who depend on livestock for their livelihood. Therefore the collection of local information about disease causation, prevention and treatment is a basic requirement of an animal improvement programme. Barbara Grandin and John Young (p.39) describe a systematic method for the collection of such data. They recommend that it be carried out in two stages:

1. Gathering background information on the local production system; species and breeds; the local calendar; and local disease names; and,
2. Use of a questionnaire to gather detailed information about each disease.

This information can provide considerable detail on the local perspective of disease, which can vary greatly between and within communities.

### Participatory maps and models

Maps and models are simple, visual devices for representing information in an understandable format. They capture, analyse and present information which would probably be less precise, less clear and much less succinct if expressed in words. Instead of outsiders asking questions and recording answers in notebooks, maps are constructed by the informants themselves.

Maps often make a good 'ice-breaker' at the start of a PRA because they can create a common consensus and aid communication between different people. A map should act as a focus for discussion and should be bold and simple in design. Being three-dimensional, models can promote even greater discussion. Box 1 describes participatory mapping techniques:

#### BOX 1

#### PARTICIPATORY MAPPING

Maps are best drawn on the ground - this allows more people to see what is happening, and paper may restrict the drawing of boundaries;

The mapping exercise should begin with the drawing of two local reference points, since the concept of north at the top of the map is not universal;

Farmers are then asked to draw, mark and colour maps using local materials (sticks, stones, grass, wood, coloured sands and soils). This should be done with the minimum of interference and instruction from outsiders, other than to stimulate activity by open-ended questioning about the map or model;

During the mapping exercise it is often useful to note which features were drawn in first and by whom, and the discussions which arise around modifications of the siting of particular features;

Once complete, the map can be transferred onto paper for further discussion and to enable it to be re-used or cross-checked with others. A key should be added to either identify various topographical features or to represent agricultural products;

It is important that the exercise is repeated with informants representing different interests.

James Mascarenhas (*RRA Notes No. 12*) describes mapping and diagramming techniques in greater detail.

There are several types of participatory maps and modelling exercises. They can have many uses for learning about and explaining the local livestock management practices, constraints and potentials, as well as the socio-economic factors that affect livestock-keeping communities. Some examples are discussed below.

### Social and wealth mapping

Social maps are often used near the beginning of a PRA to locate and record household members and social features in a village. They can be adapted to gather census material on the local livestock population. Using a map which shows all the households in a given area, local people can mark in the number of animals in each household, irrespective of ownership. Using arrows, the owners of these animals (if not owned by the household), can be indicated. If several types of sharing relationship exist, these can be marked onto the map using different colours or thicknesses of lines. If the map is big enough, it may also be possible to mark those stock owned by individual household members. Also the number of sick animals in each household can be illustrated. Alternatively, several maps could be produced, each focusing on a particular theme.

Social/livestock assets mapping can easily be done in sequence with wealth ranking exercises (see below). Wealth ranking can be carried out directly onto a community map, usually in conjunction with a group discussion of the main factors that constitute wealth and well-being so that researchers can gain an understanding of local wealth criteria. Anabela Braganca (p.157) describes and illustrates a participatory wealth ranking exercise that was carried out directly onto a map in Mozambique.

Social and livestock assets mapping can help to work out approximate populations, and can generate discussions on sharing ownership of livestock or livestock products within households. Mapping can also lead on to participatory network or systems diagramming techniques (described below).

Figure 2, taken from ActionAid and IIED (1992), is an example of wealth ranking using a social map. It was drawn by two Ethiopian women who could read and write. They were asked what was available in the *tukuls* (huts). This prompted them to describe and draw livelihood assets and family members. The map yielded information on family size and composition, and numbers of chickens, goats, sheep, cows and oxen. The same exercise, carried out with men, gave slightly different information.

John Devavaram (p.133) explains that the SPEECH team carried out a social modelling exercise with villagers in Tamil Nadu. This revealed that the existing caste system denies *Daliths* (members of the 'untouchable' caste) access to key resources in the village. It is unlikely that this information, although vital for the success of the project, would have been learned during a formal question and answer session.

### Opportunities and services maps

Figure 3 shows a map, drawn by a facilitator and local farmers in Dilapa, Ethiopia, to investigate opportunities and services in the area (IIED and ActionAid Ethiopia, 1992). This could equally be applied to livestock - to investigate the availability of veterinary care or local healers, marketing opportunities, reserve grazing areas available during periods of shortages etc.

Figure 2. Social and assets map of 46 households

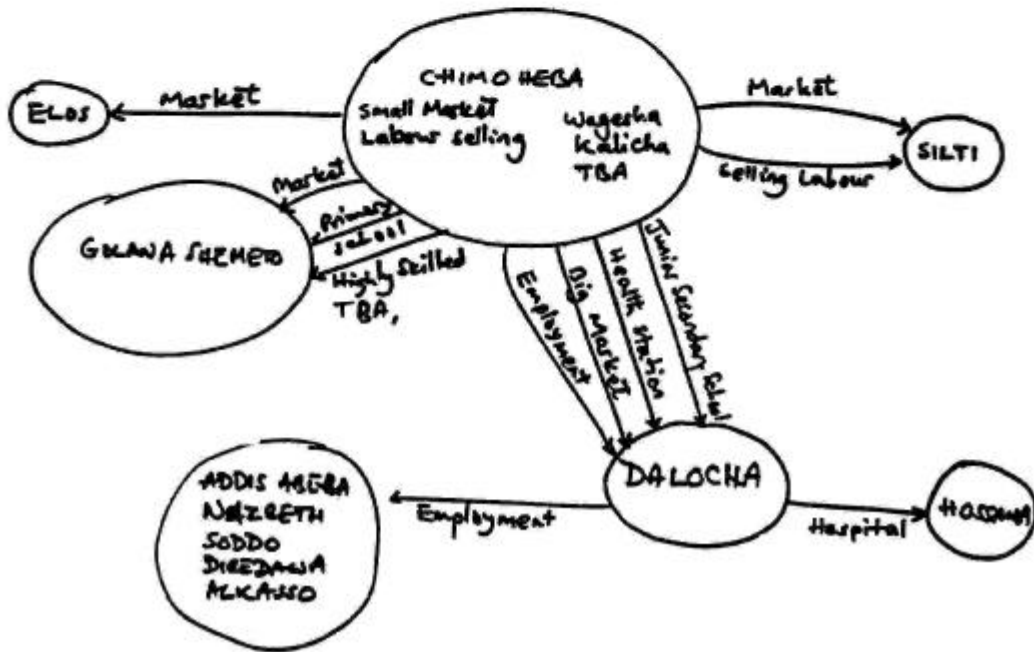
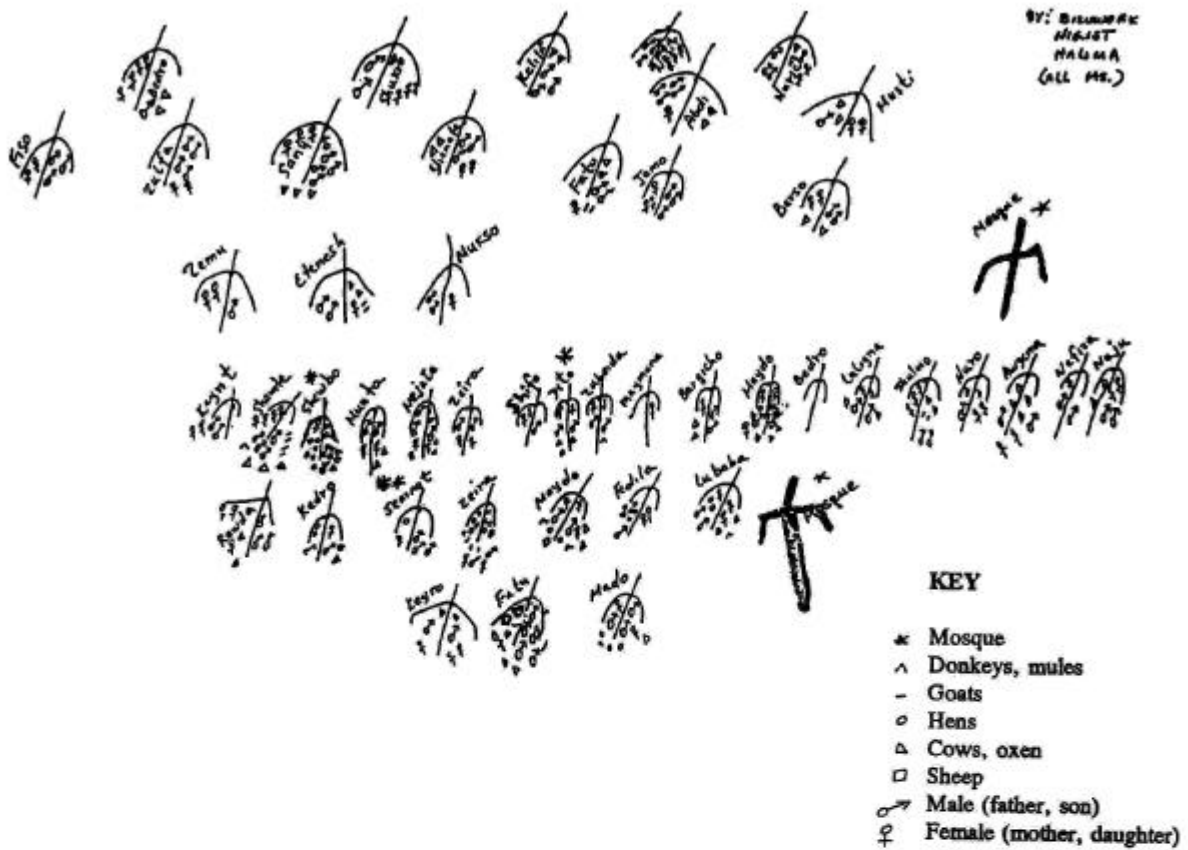


Figure 3. Opportunities and services map: Dilapa, Ethiopia

## Resource maps

Resource maps and farm maps, drawn by local people, can be used to indicate which natural resources in the area are used by livestock. They are often used in conjunction with a transect walk across grazing areas. These maps can provide a valuable source of locally-specific information relevant to livestock management. For example they may reveal the browse and fodder species found in the region or the areas that farmers associate with disease.

Further suggestions for the use of resource maps include:

- Drawing separate resource maps for each different season;

- Mapping small areas of key resources to explain the factors that determine seasonal grazing patterns (e.g. the use of patches reserved for dry season grazing); and,
- To compare local ecological conditions before and after a significant historical event or the introduction of a technical innovation.

Lively discussions and large amounts of information can stem from resource mapping exercises. They can also lead into other activities such as preference ranking of feed types and seasonality analyses. Resource maps can become complex and detailed so it may be beneficial to draw separate thematic maps. Listed below are a number of examples of how resource maps can be used:

| Use of map             | Description  |
|------------------------|--|
| General Resources      | John Young et al. (p.58) asked villagers to draw a map of Pyutar village. It shows a wide range of local resources: crops, livestock, grazing, forests, springs, houses, fodder trees and topographical features.  |
| Grazing Resources      | Robin Mearns et al. (p.95) include a map drawn by a group of Mongolian women. It denotes the differing qualities of the grazing resources and their relation to disease incidence. It also shows winter and summer shelters and pastures.  |
| Key Resources          | Robin Mearns et al. (p.95) provide a map showing the location of key seasonal grazing resources, drawn by a group of local farmers.  |
| Topical Maps           | These are often drawn by local experts, e.g, the soil, tree or water specialist.   |
| Pastoral Grazing Cycle | Both David Hadrill and Haroon Yusuf (p.106), and Robin Mearns et al. (p.95) asked herders to document their seasonal movements. Mearns et al. show actual distances travelled on a separate diagram. The herders' movements are drawn by the facilitators on a map showing key topographical features such as rivers and highlands. Watering points could also be plotted. |
| Impact Monitoring      | A map could be drawn to record the past, and expected future, impact of pest and disease incidence, livestock breeds and species, pasture quality, fodder resources etc.   |

## Mobility mapping

This mapping technique is described in detail by Heather Grady et al. in *RRA Notes No. 10*. Mobility maps are used to determine where, why and how often men and women travel, either with or without their livestock. They are particularly useful with pastoral communities. The informant's community is drawn at the centre of the map, and other points represent possible locations where he/she might travel. Concentric lines are drawn between the community and the destination. Separate maps are drawn for each individual and notes are taken on the frequency of and reason for travel.

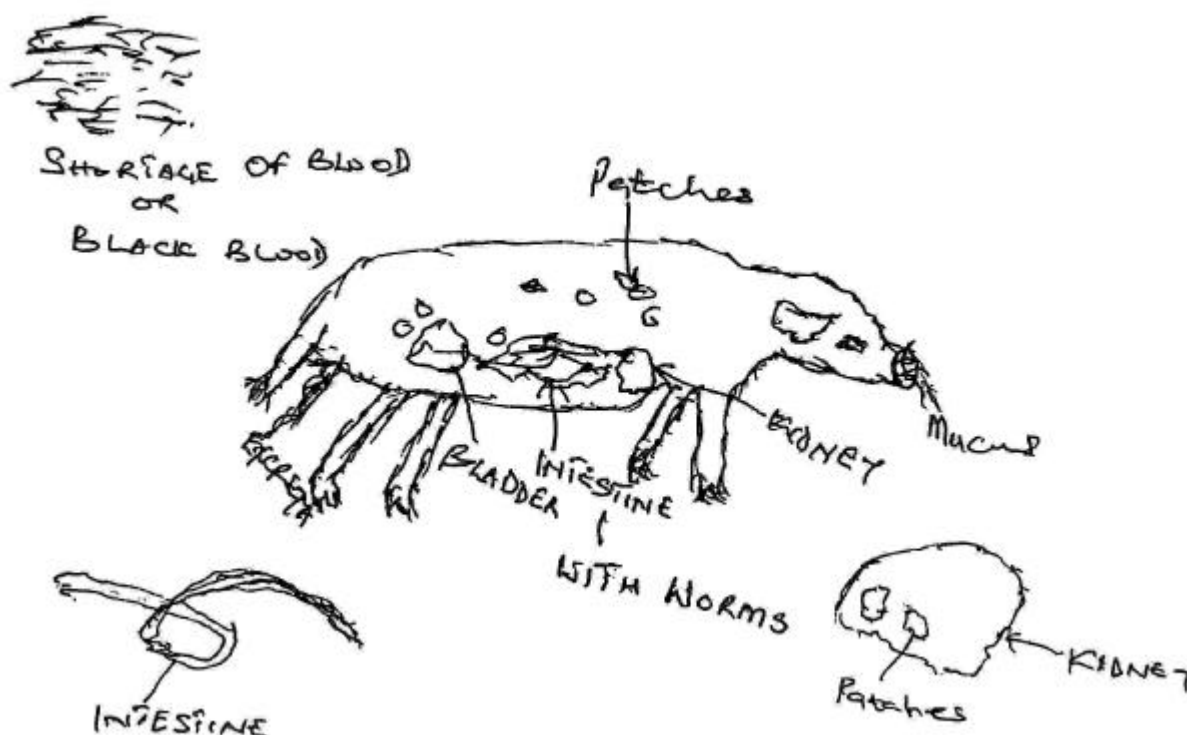
Louise Cooper and Narangerel Gelezhamstin (p.115) describe their experience with mobility mapping in Mongolia. Their maps illustrate

the relative distances travelled by herding men and women in the area.

## Body maps

Andrea Cornwall (*RRA Notes No. 16*) used body mapping as a way of understanding people's knowledge and perceptions of their anatomy, physiology and the internal effects of certain diseases or treatments. This method can also be used with livestock (Figure 4). People are asked to draw an outline of an animal, then mark in where the food goes, where offspring develop etc. It is important not to lead by asking for structures, but to let people indicate them for themselves by focusing on processes. From this diagram further interviewing can lead to the marking in of other structures and processes as well as to explanations and theories of disease causation and treatment.

**Figure 4. Body map of pig illustrating symptoms of Elede Alarun**



## Transects

Transects are systematic walks taken with farmers or key informants through an area. They are useful when carried out near the beginning of a PRA to give an overview of the farming system and natural resources in an area and focus attention on the different zones or micro-environments. They can follow a loop, a water course, straight line or S-shape to fit in with the local topography.

Transect walks are recorded using sketches in the form of a matrix table with the relief of the transect walked along forming the top of the table and the studied criteria listed in the left-hand column. Field notes and comments are entered in the appropriate box.

In the context of livestock production, transects can be used to discover types and quality of grasses and fodder trees, crops and by-products available as livestock feeds, communal grazing lands and water sources.

Figure 5 shows the results of a transect carried out with villagers in Mongolia (see also p.95). The aim was to gain a general introduction to the area and to begin to identify grazing and other key resources.

## Participatory diagrams

Diagrams can be an important tool for summarising, recording and analysing farmers' information. As in mapping, it is necessary to repeat diagramming exercises with a cross-section of informants representing different interests. Discussed below are a number of different participatory diagramming techniques.

## Systems analysis diagram

A systems diagram can prompt discussions on the details of the livestock production system, including:

- Inputs;
- Outputs;
- Opportunities;
- Services; and,
- Constraints, together with solutions developed to cope with them.

The diagrams are usually drawn by individual farmers or household members and tend to work best if done after farm or resource mapping, or once the farmer has listed his/her livestock assets and available resources.

A central circle is drawn to indicate the number and type of livestock in the household. From this, inputs and outputs, markets and services are mapped and discussed. Flows of resources between the different parts of the system can be indicated by arrows. The researcher asks open-ended questions to encourage the informant to analyse the system thoroughly. Different colours or thicknesses of lines can be used to mark labour inputs derived from different ownerships rights for livestock products.

A household system analysis, shown in Figure 6, was carried out by ActionAid (1992) with the assistance of an Ethiopian farmer. The farmer was asked to draw his farm plots then list all the inputs and outputs of the system. He included the labour of himself and his wife separately.

Figure 7 shows a system diagram, drawn by a facilitator, to show the causes and treatments of human diseases (IIED and ActionAid, 1992). However this could just as easily be applied to livestock.

Figure 5. Transects Through Hukh Nuur Brigade, Mongolia

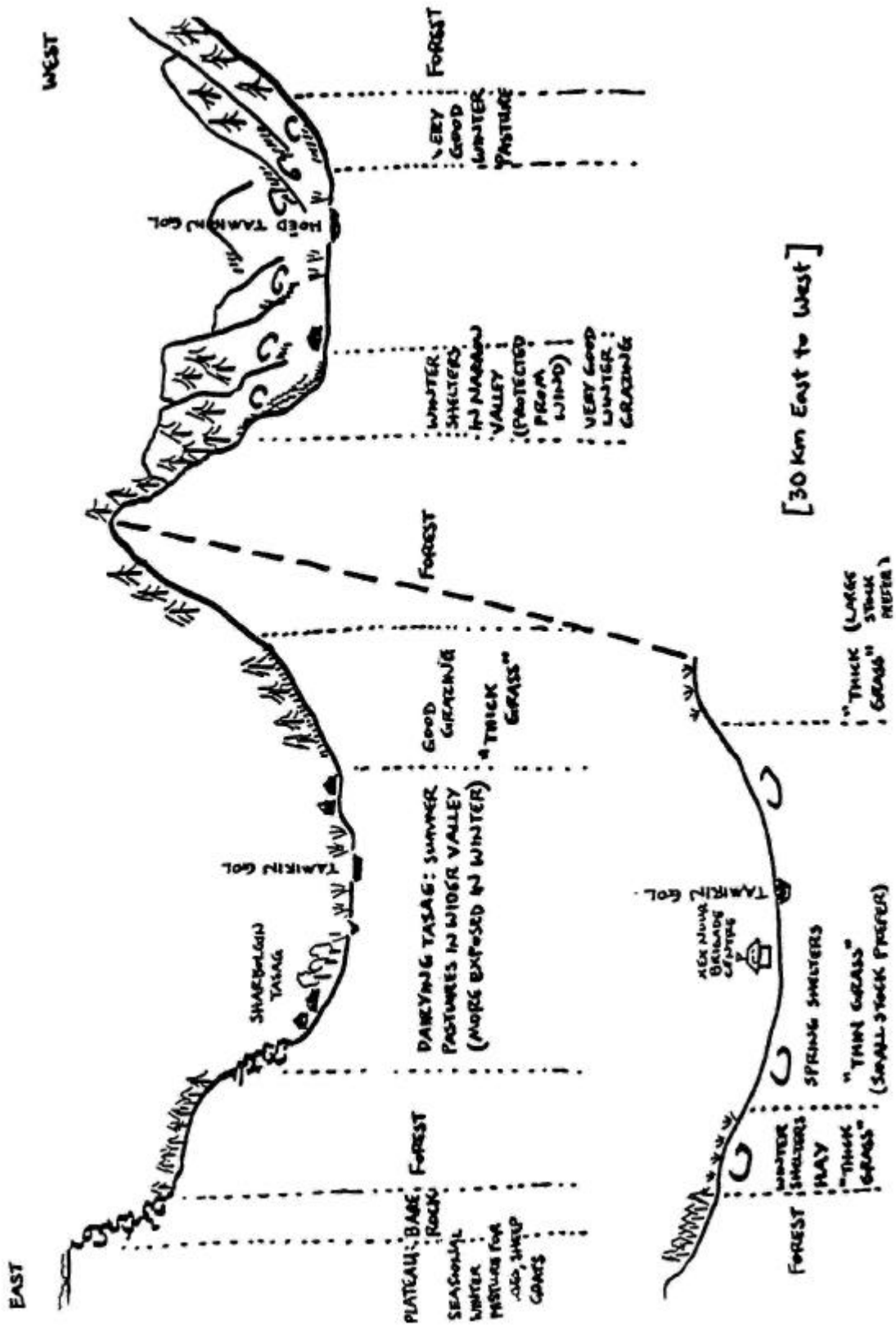
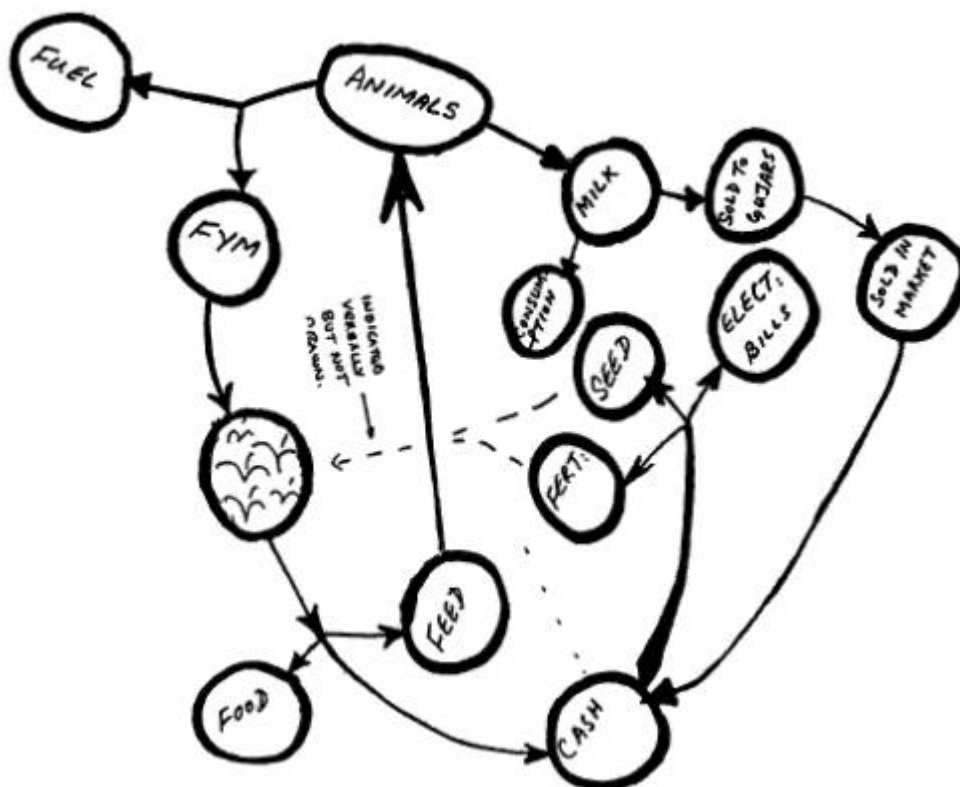






Figure 8. Systems flow diagram, Pakistan



### Venn diagrams

Venn diagrams are mostly used to explore the relative importance of services and institutions to a community. The technique uses circles, drawn in various sizes, to represent the relative importance and range of individuals or institutions. Livestock owners are asked to position the circles according to the relationship between them, i.e. the degree of contact and overlap in decision-making. An alternative method is to draw lines between circles and the village circle, with the thickness of the line representing the strength of the relationship.

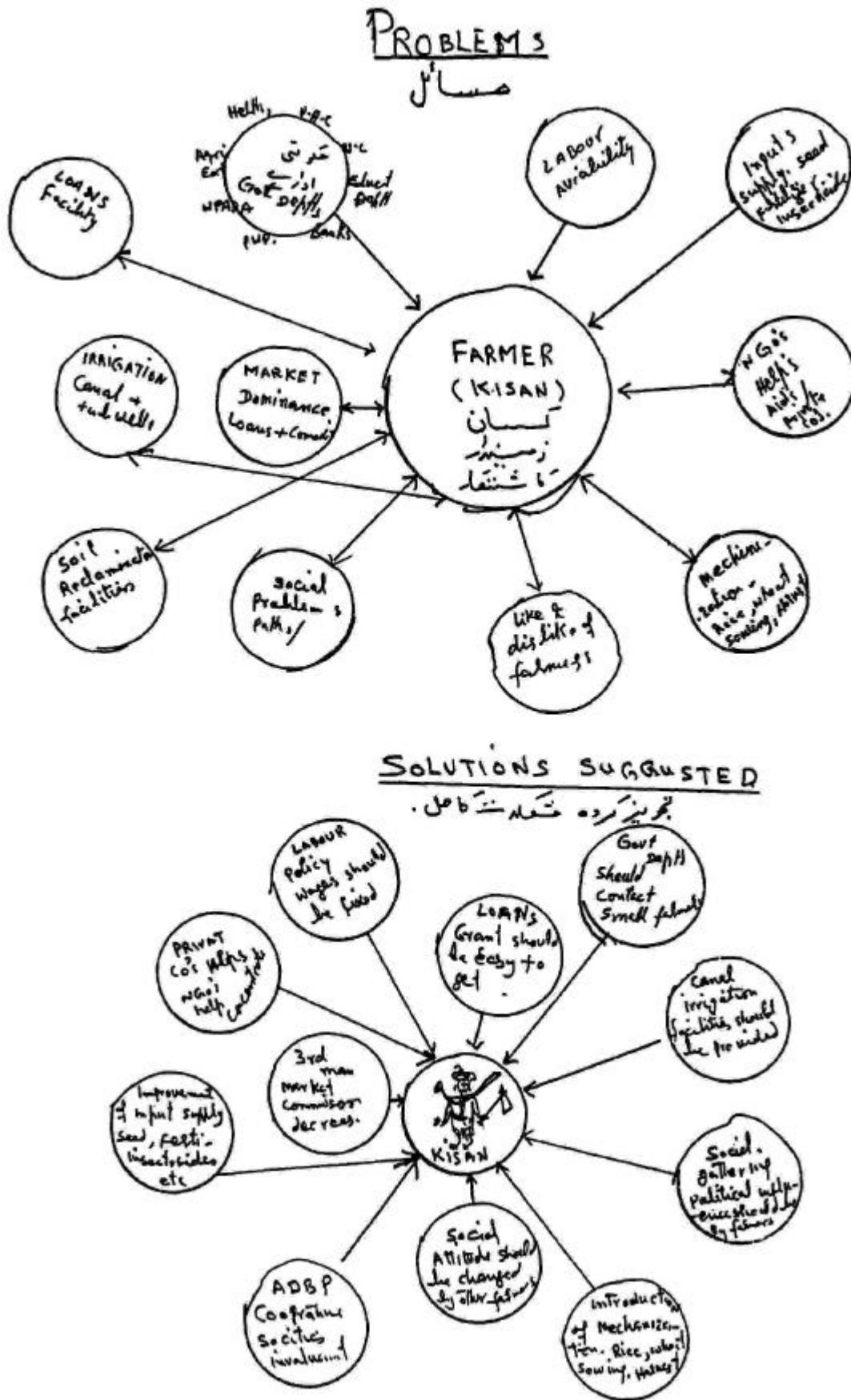
Venn diagrams can also be used to gather information on the relative importance of various livestock diseases and the relationships between them. Perceptions vary with the position of the person representing these

relationships, so Venn diagrams could be repeated with a range of different people, including owners of different types of livestock, vets, ministry and NGO staff. Braganca (p.157) used Venn diagrams in Mozambique to explore the relationship between villagers and government/non-government institutions before and after the civil war.

### Network diagrams

This technique can be used to investigate the different networks surrounding livestock production. For example, the livestock of one household can be taken as the central focus and the human network around them explored. Alternatively, livestock can be plotted onto a map showing households. Links are then drawn to indicate sharing relationships and animal or product ownership.

Figure 9. Farmers' problems and solutions diagram: Pakistan



## Decision trees

Decision trees are useful for discussing the range of strategies available to livestock producers. Decision trees can also be used to discuss the issues surrounding new strategies before they are implemented - for example the decision-making process and consequences of adopting a cross-breeding programme or a cut-and-carry feeding system. A tree could also be drawn to illustrate interlinked production problems or solutions.

## Livelihood analysis

This exercise encourages people to consider their sources of income and expenditure and reflect upon past and present coping strategies in times of shortage. John Devavaram and his research team (p.133) carried out a livelihood analysis with project beneficiaries in Karaikeni village, Tamil Nadu. This revealed which activities provided the greatest source of income and gave an idea of typical expenditure patterns.

## Problem and solution diagrams

Figure 9 provides an example of a problem and solutions diagram drawn by a group of farmers in Pakistan. The farmers started by drawing themselves in a circle in the centre and marking in the different problems they faced. A separate diagram was then drawn for perceived and actual local solutions.

## Diagrams to investigate change over time

### Seasonality analysis calendars

These are simple diagrams (Figure 10) that indicate the seasonal distribution of activities. They are often used to explore constraints and opportunities. The months/seasons can be written along the top of the diagram (according to the local concepts of time), with the activities relating to livestock management entered below. Calendars normally represent a 12-month period but can be extended to 18 months. This allows for the seasonal agricultural cycle and denotes differences between years. Calendars can also take on a circular pattern (IIED and PSPDP, 1992a).

Seasonality analysis calendars can be used to indicate trends over an average year, an adverse year or the present year. A similar technique can be used to explore relative change across longer time periods - years or decades. This may be done, for example, to investigate the effectiveness of the introduction of veterinary services, dipping operations or by-product feeding programmes. Calendars generally portray management or production criteria but they can have many different and specific themes. A selection of these themes is listed below, and some are outlined in further detail in the case studies in this issue of *RRA Notes*.

Figure 10a. Seasonal calendar: availability of fodder and grazing, Ethiopia

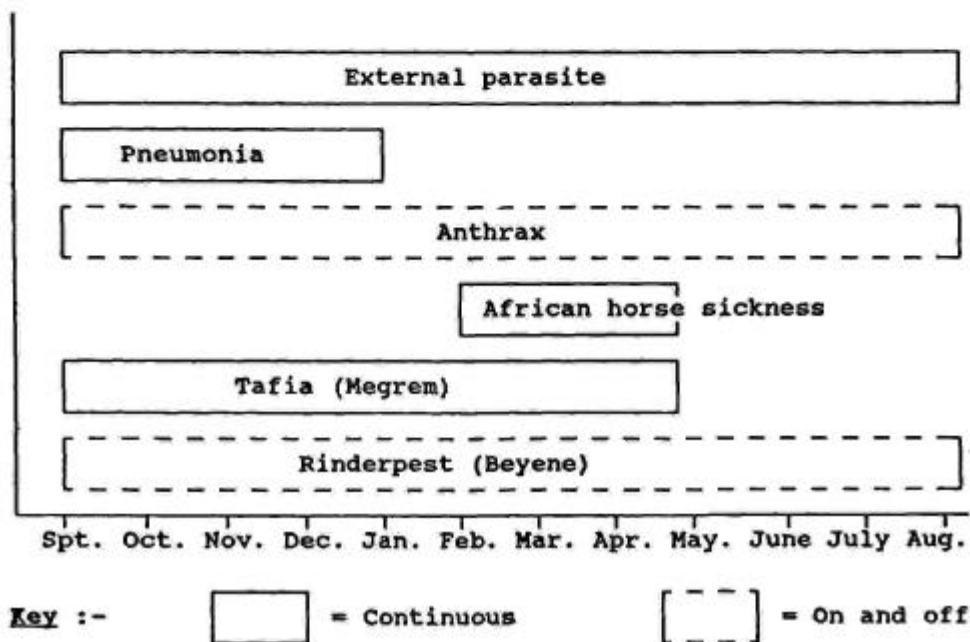
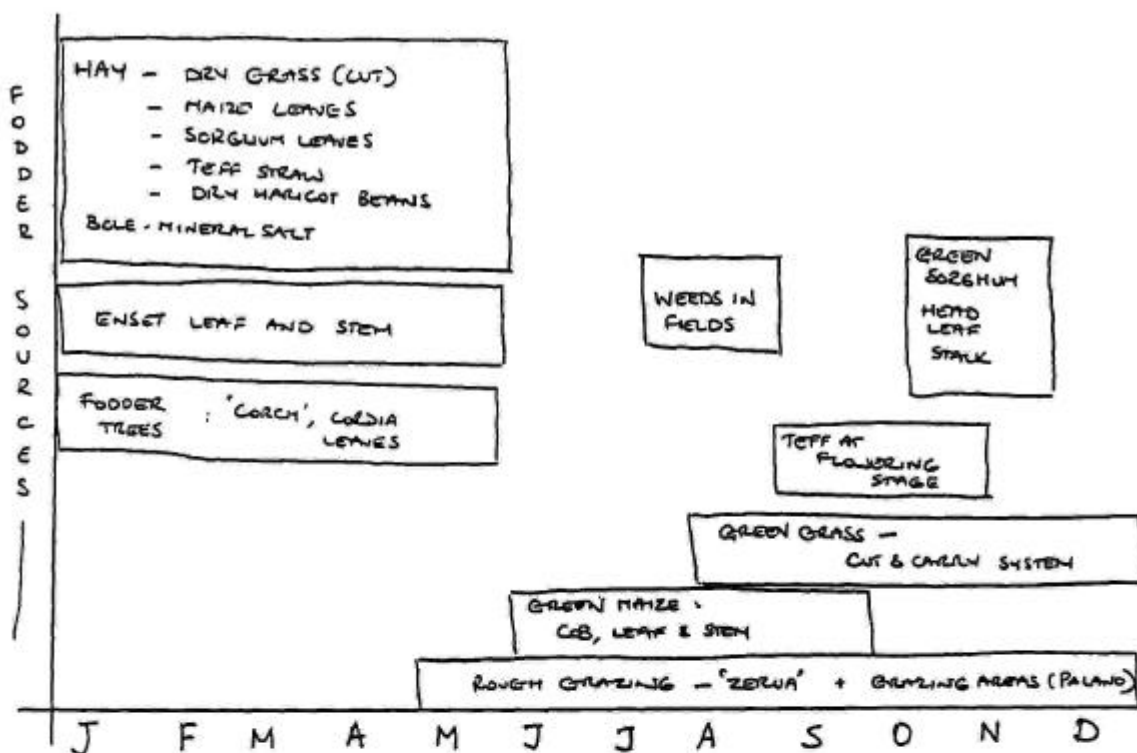


Figure 10b. Livestock disease calendar (Source: Konde, 1993)

| Type of calendar                             | Description   |
|--|---|
| Availability of fodder/<br>grazing resources | Shortage of fodder was identified as one of the major problems in Girara, Ethiopia. A calendar was drawn by 12 farmers to investigate the situation further (IIED and Farm Africa, 1991). This is shown in Figure 10a.  |
| Disease incidence                            | David Hadrill and Haroon Yusuf (p.52) set up a matrix showing local seasons along the top, above a list of the main livestock diseases. They asked informants to score the different diseases to show which seasons they occurred in. See also Figure 10b.  |
| Seasonal production                          | Factors affecting livestock production, including inputs/outputs, constraints and opportunities. The following case studies all include seasonal production calendars drawn by farmers: John Young et al. (p.58), M. Ghirotti (p.78), Robin Mearns et al. (p.95).   |
| Seasonal food availability                   | Neela Mukherjee (p.127) prepared a calendar with villagers in Botswana to show the type and quantity of food available in a typical year. This shows the seasonal importance of livestock products in the villagers' diets.   |
| Income and expenditure                       | John Devavaram (p.133) asked farmers to include details of their income and expenditure in their seasonal calendar.   |
| Work pattern/division of<br>labour           | Louise Cooper and Narangerel Gelezhamtsin (p.115) use a monthly calendar to show the amount of time spent by men, women and children on livestock related activities throughout the year. Distinct seasonal activities, such as lambing, haymaking, shearing etc., are clearly marked on the calendar. Livestock related activities are plotted alongside domestic activities to help illustrate and explain the gender differences in labour allocation. |

### Activity profile

Daily activity profiles can be used to explore typical activities and routines, including livestock and household duties. They should be carried out with different farmers (male and female) during the various seasons of the year. Activities are charted during each hour of the day and the amount of effort, time taken and location of work are recorded. Louise Cooper and Narangerel Gelezhamtsin (p.115) did this in Mongolia, by asking women to describe their typical day.

### Time lines and time trends

Time lines are often a good starting point for further PRA activities and exercises. They

illustrate diagrammatically past events which the community remember as being significant. Historical information can often be elicited by encouraging people to recite songs, poems or plays. Time-lines can also be used to show the changes that have occurred in a community. For example, it can indicate changes in farming systems (e.g. access to community resources) or monitor the impact of an introduced technology (e.g. destocking/restocking initiatives, dipping programmes). Ato Metenas was interviewed by researchers about his livestock (Figure 11). He chose to begin his story in 1954 and he explained every event in the past responsible for the loss or reduction of his livestock (Farm Africa and FFHC/AD, 1992).

Figure 11. Time-line: the history of Ato Metena's cattle herd, Ethiopia

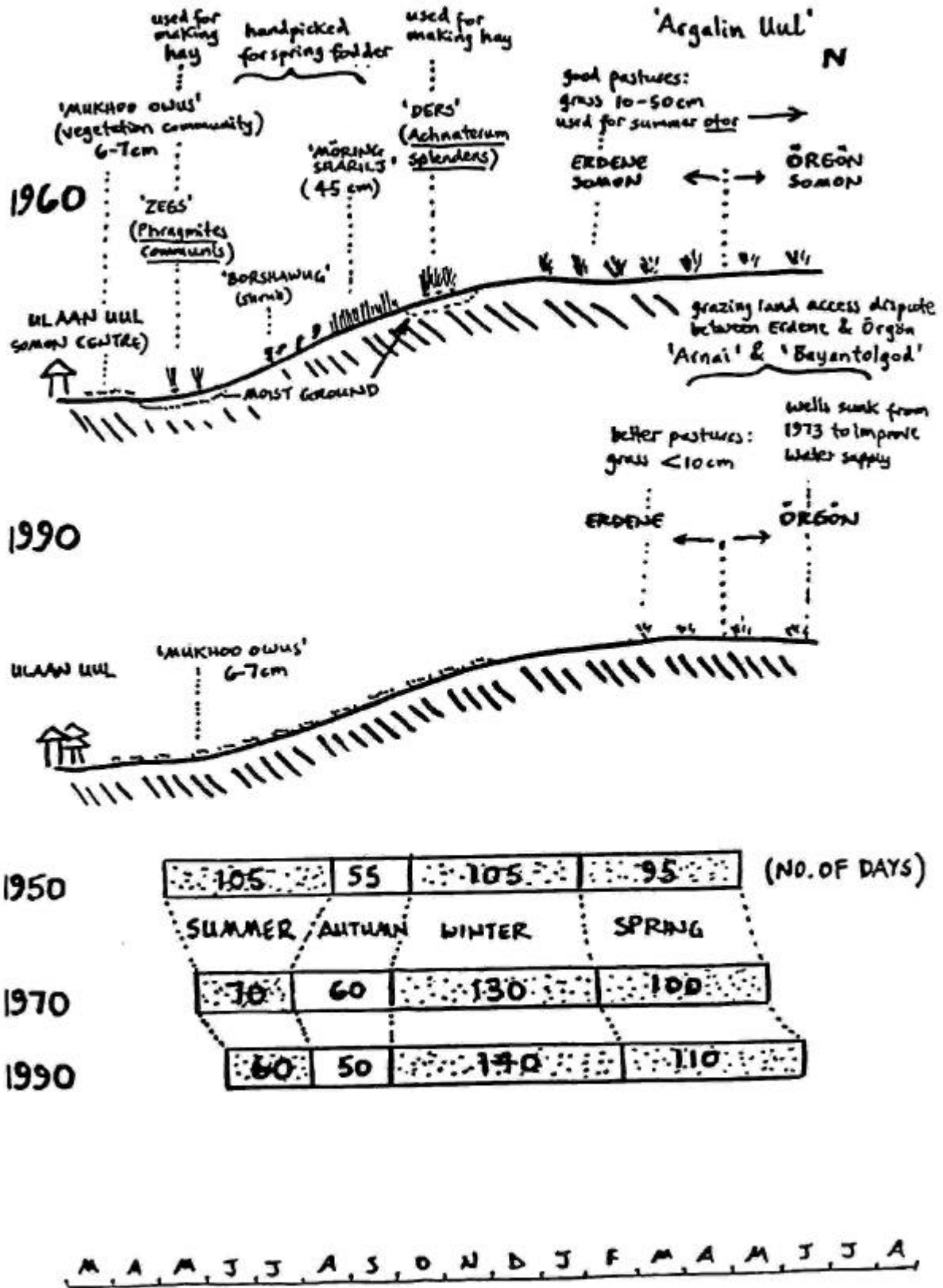
| Constraints         | Time line EC. | Effect on livestock   |
|---------------------|---------------|---|
|                     | 1954          | 2 ha farm land<br>2 family size<br>2 cows (after crop yield selling)<br>increased the No. by 1 M & 1 F calf |
| Died CBPP           | 1959          | loss of 1 heifer<br>L.S size 2 cows & 1 young bull  |
|                     | 1960          | 2 cows gave birth to 2 F calves<br>L.S size 2 cows 1 young bull 2 F calves                                  |
|                     | 1963          | increased the No. by 1 M calf from 1 cow<br>L.S size 2 cows 1 ox 2 heifers 1 M calf                         |
| Died abortion       | 1964          | 1 cow died<br>L.S size 1 cow 1 ox 2 heifers 1 M calf  |
|                     | 1965          | 2 heifers gave birth to 1 M & 1 F calves<br>L.S size 3 cows, 1 ox, 1 young bull, 1M & 1F calves             |
| Sold for land tax   | 1966          | 1 young bull & 1 cow sold<br>L.S size 2 cows, 1 ox, 1 M & 1 F calves  |
|                     | 1967          | Increased the No. by 1 calf (F) from the cow<br>L.S size 2 cows, 1 ox, 1 young bull, 1 heifer               |
|                     | 1970          | Increased the No. by 1 M & 1 F calves<br>L.S 2 cows, 2 oxen, 1M & 1 F calves 1 heifer                       |
| Killed Black leg    | 1971          | Loss of 1 M & 1 F calves (died)<br>L.S size 2 cows, 2 oxen 1 heifer   |
|                     | 1973          | Increased the No, by 2F & 1M calves<br>L.S size 3 cows, 2 oxen 2F & 1M calves                               |
| Lost due to drought | 1974          | Loss of 1 cow (death)<br>L.S size 2 cows, 2 oxen 2 heifers, 1 young bull                                    |
|                     | 1977          | Increased the No. by 2 M calves<br>L.S size 2 cows, 2 oxen 2 heifers, 1 young bull<br>2 M calves            |
|                     | 1981          | Increased the No. by 2 F & 1 M calves<br>L.S size 4 cows, 5 oxen 2 F & 1 M calves                           |
| Expired CBPP        | 1982          | Loss 1 ox, 2 calves 1M & 1 F (death), 1 cow<br>L.S size 4 cows 4 oxen, 1F calf                              |
|                     | 1983          | Increased No. by 1 M calf<br>L.S size 3 cows, 4 oxen, 1 F & 1 M calf  |
|                     | 1984          | L.S size 3 cows, 4 oxen, 1 M & 1 F calves   |

### Historical maps and transects

Historical transects, resource and social maps can be a valuable resource for exploring change over time. Firstly, people can be asked to draw maps of the present situation, and then of what the area was like as far back as they can remember. This can also lead into mapping and perceptions of the future appearance of the area.

Maps and transects with specific themes (e.g. livestock production) can be drawn to give an insight into how and why a situation has arisen and assist with discussions on constraints and opportunities for owners of livestock. Anabela Braganca (p.157) asked farmers to draw a transect to illustrate the effect of the civil war in Mozambique on crop and livestock production and natural resources in the area. Robin Mearns et al. (p.95) asked herders to draw a transect to demonstrate perceived seasonal and ecological changes in Tsagaan Khutul, Mongolia. This is shown in Figure 12.

Figure 12. Historical transect: ecological and seasonal change, Tsagaan Khutul, Mongolia



## Historical matrices

Historical matrices are useful for understanding communities' livelihood and coping strategies, past and present. They can help to explain why changes have taken place and often lead into discussions on what people felt may happen in the future.

Karen and Mark Schoonmaker Freudenberger (p.144) discuss the use of historical matrices in the context of livelihood strategies, coping strategies in times of crisis, and natural resource use. The informants choose the time period and name some significant past events. These form the top of the matrix. The components of the issue being studied (coping strategies, resource use etc.) are listed horizontally. Beans, seeds or stones can then be used to show the relative importance of each activity or resource in each historical period. It was found that people put their minds in a certain time period and remembered how things were then before moving on to the next time frame. Louise Cooper and Narangerel Gelezhamtsin (p.124) also used matrices to record changes in consumption patterns in Mongolia.

## Preferences and proportions

### Wealth ranking

Wealth can be a sensitive topic, especially in pastoral societies and herders may be suspicious of questions coming from outsiders about livestock ownership. Wealth ranking methods ensure that individual households do not feel targeted by researchers. Wealth ranking by sorting cards was pioneered by Barbara Grandin (1988) during work in Kenya with pastoral communities.

It is done by interviewing informants individually and asking them to list the households in the community. The name of each household is copied onto a separate card. The informants then sort the cards into groups according to the relative wealth status of the households. By using a number of informants, and cross-checking their answers, a fairly accurate picture can be obtained. The informants' own positions in the ranking can be determined through cross-checking with the

other informants. Robin Mearns et al. (1992) discuss wealth ranking with herders in Mongolia in *RRA Notes 15*, which is a special issue on wealth ranking.

Wealth ranking is an essential starting-point for most PRA activities. By grouping the community into different wealth strata, it allows the research team to be aware of how attitudes, decision-making criteria and production priorities are affected by wealth. It reveals much about local terms for wealth and the factors which distinguish the different groups. It also leads easily into discussions on livelihoods and vulnerability and provides a baseline against which the impact of future interventions can be measured.

### Preference ranking and scoring

Preference ranking and scoring methods are effective participatory tools for learning people's categories, criteria, choices and priorities with respect to agricultural issues. They work best if used after wealth ranking exercises. Ranking lists items of interest (e.g. browse species, livestock breeds) in order of preference. For example, from a list of six fodder types, informants are asked which is the best and why. They are then asked which type is second best, and so on.

Scoring differs from ranking in that informants are asked to give each item a score, using beans, stones or seeds, according to how popular it is. The higher the number of beans assigned, the more popular the item. John Young et al. (p.58) used preference ranking methods in Nepal to determine the relative importance of farmers' problems.

### Matrix ranking and scoring

If the researcher wants to carry out preference ranking and scoring for a number of variables, this can be simplified by using a matrix. Matrices enable a range of different items to be assessed against selected criteria. Local criteria are listed in the rows of a matrix, and items in the columns. The items can either be given a score, or ranked against each criterion.

For example, for fodder species, informants would be asked to decide which are the most and least palatable, nutritious, available etc.

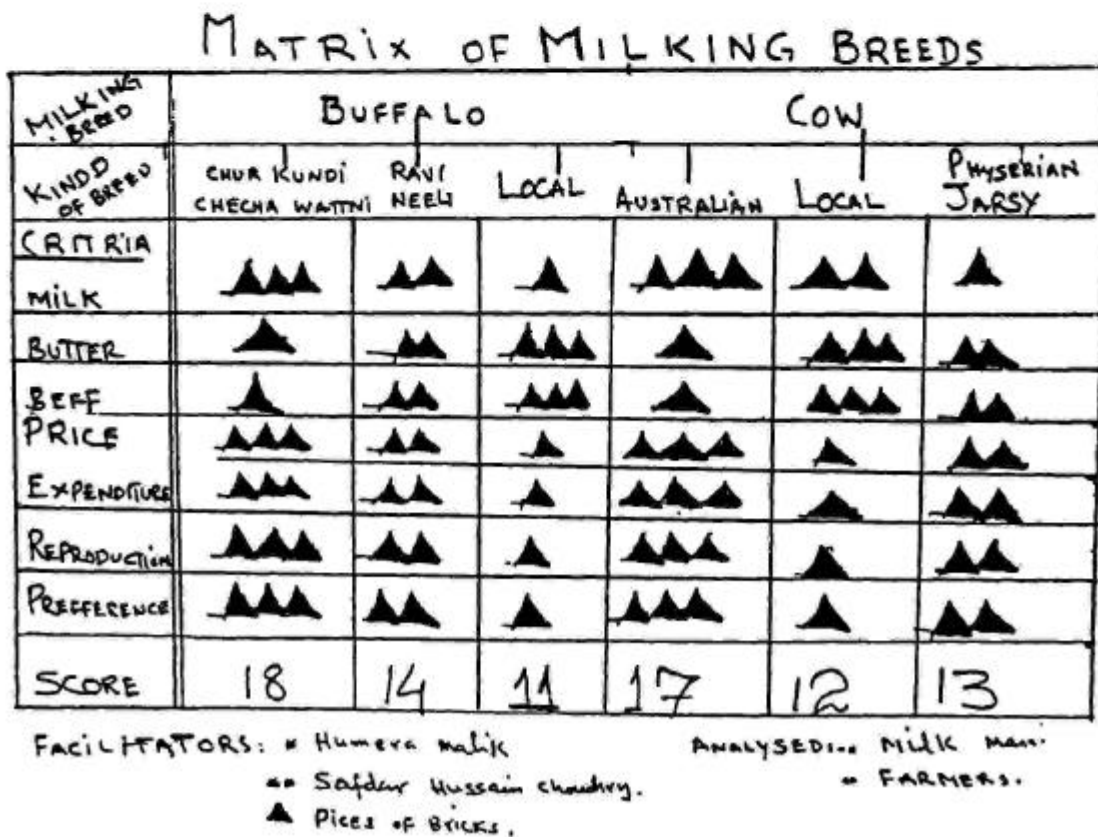
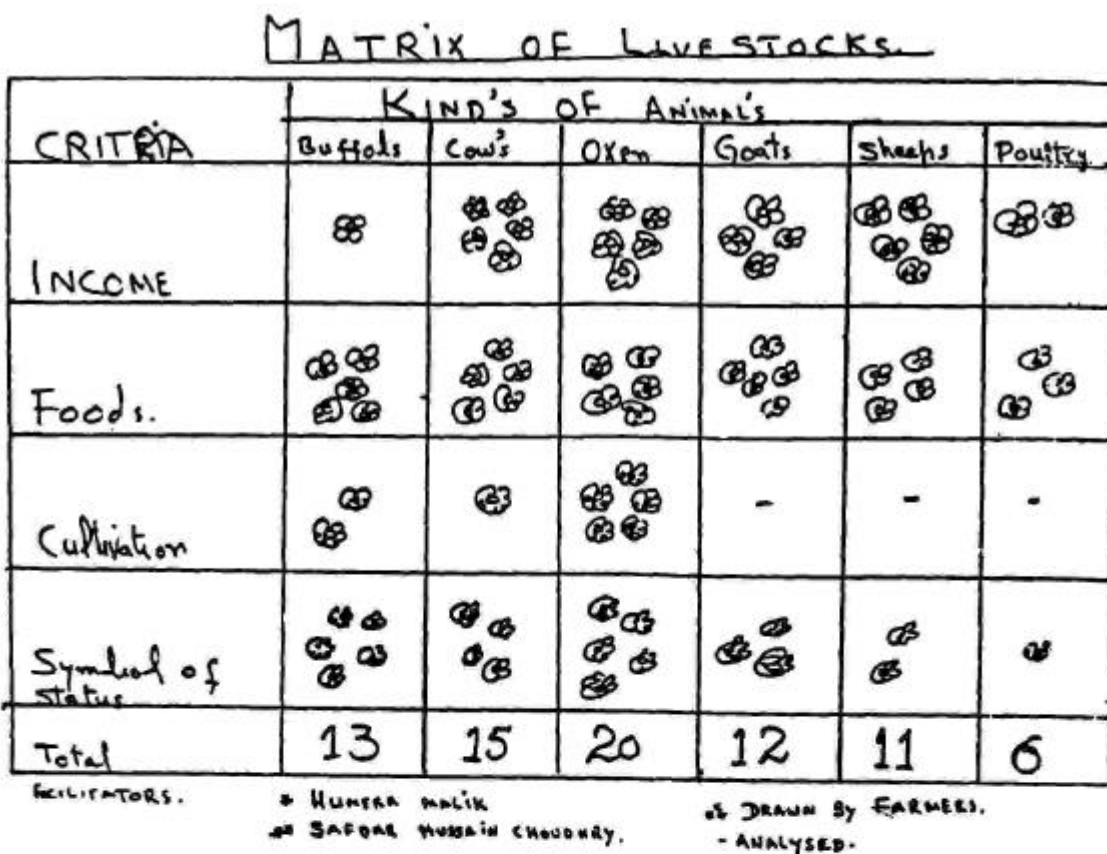
Alternatively participants may put piles of stones, seeds etc. into boxes for semi-quantitative scoring. The criteria themselves can also be ranked to show which are considered to be of most importance.

Figure 13 shows how preference scoring matrices were used by researchers in Pakistan

(IIED and PSPDP, 1992b) to compare the different attributes of a variety of livestock. Matrix ranking can be used for a variety of planning purposes. Listed below are examples of how researchers have used matrix ranking to gather livestock-related information, and their location in this issue:

| <b>Theme</b>                   | <b>Researcher</b>             | <b>Page No.</b> |
|--------------------------------|-------------------------------|-----------------|
| Institution Ranking            | Robin Mearns et al.           | 154             |
| Livestock Preferences          | Anabela Braganca              | 157             |
|                                | Neela Mukherjee               | 127             |
| Fodder Preferences/Constraints | Anabela Braganca              | 157             |
|                                | Ian Scoones                   | 91              |
| Wild Fodder                    | Neela Mukherjee               | 127             |
|                                | Tim Leyland                   | 47              |
| Disease Issues                 | Tim Leyland                   | 47              |
|                                | Grandin & Young               | 39              |
| Animal Losses                  | Adrian Cullis                 | 87              |
| Problem and Solution Ranking   | Jeremy Swift & Abdi Noor Umar | 138             |
|                                | John Young et al.             | 58              |
| Success Ranking                | Stella Maranga                | 142             |
| Household/Livestock Tasks      | Cooper & Gelezhamtsin         | 115             |
|                                | John Young et al.             | 58              |

Figure 13. Preference matrices for livestock: Pakistan

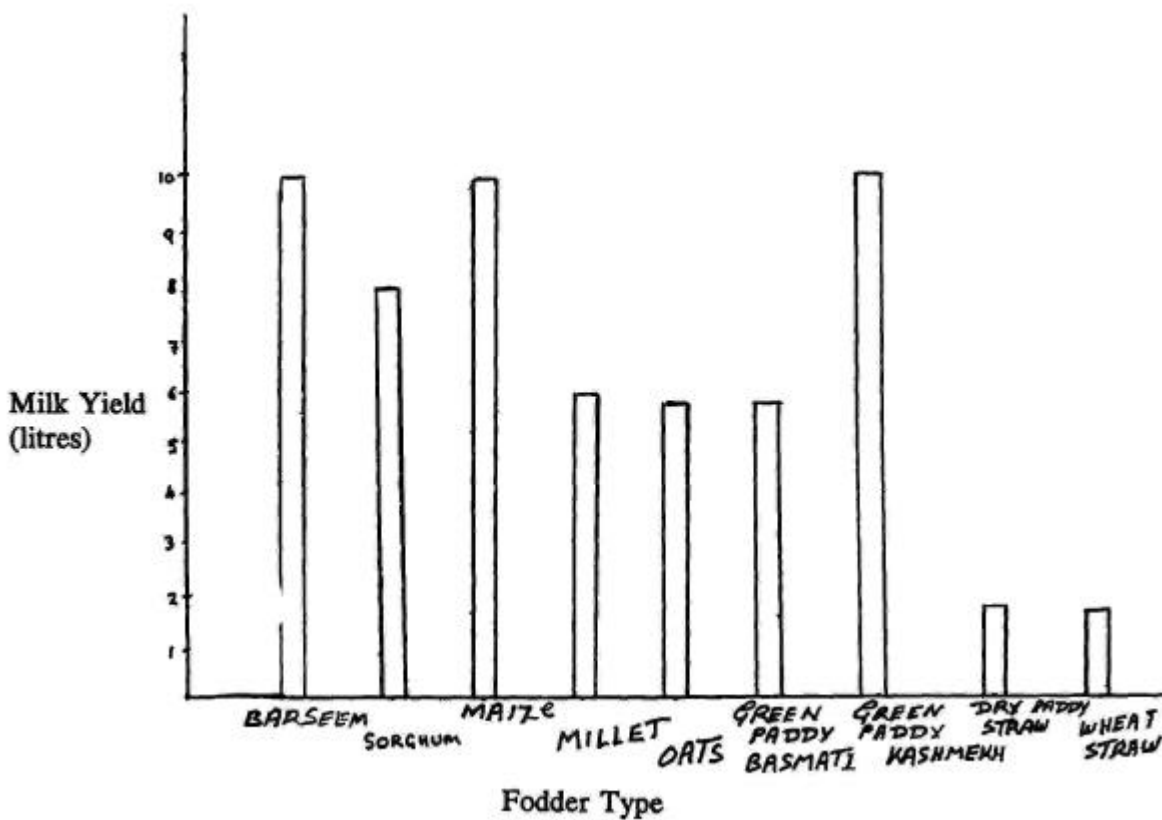


### Proportional piling

A range of livestock issues can be examined in this way, including the distribution of livestock mortality among households, percentage of income from different sources, estimates of stock numbers in the area etc. Local natural materials, such as beans or seeds, built into piles, can be used by informants to illustrate their perceptions of relative proportions. Pie charts, bar charts and diagrams can then be drawn from these piles.

Figure 14 shows a bar chart, drawn on the ground by Gama Gujar and his mother using chalk and small stones. It illustrates the effect of different fodder types on milk yield (IIED and PSPDP, 1992a). The concept of litres was suggested by the facilitators. Cathy Watson (p.131) used proportional piling to investigate the relative contribution to household food supply of the different economic activities in which Turkana households are engaged.

**Figure 14. Proportional piling: effect of fodder on milk Yield, Pakistan**



## Summary

Summarised below is the range of production information that could be gathered with the help of local informants using some of the participatory tools described in this section:

- Seasonal trends in mortality, morbidity and nutrition;
- Estimates of mortality and morbidity among large livestock populations;
- Perceptions of the internal anatomy of various types of stock;
- Local knowledge of disease causation and treatment;
- Processes and preferences in the treatment of sick animals;
- Resources available to livestock, through seasonal resource mapping;
- Time-line issues that affect livestock;
- Time trends in livestock, through seasonal resource mapping;
- Daily activity profits for larger stock; and,
- Browse and fodder preference.

Further information can also be gained on the wider economic and social systems of which farmers, as owners and carers, are a part:

- Livestock population assessment, by livestock mapping;
- Distribution of livestock per household, by social mapping;
- Stock loaning and sharing relationships;
- Modes and sources of acquisition and disposal of livestock;
- The perceived status of livestock in relation to other assets;
- Opportunities and services mapping for livestock purchase, sale and vet care;
- Systems analysis of inputs and outputs based around livestock and concerning both beneficiaries of livestock labour and products, and the environment;
- Seasonal or daily labour inputs to livestock care by different household members;
- Livestock preferences;
- Matrix of veterinary care providers, by disease;
- Proportional income from livestock products; and,

- Ranking of uses of livestock products to the household (differentiated by users);

• **Kate Kirsopp-Reed**, Old Town Farm, Otterburn, Northumberland NE19 1JZ, UK

### NOTE

This paper draws on a PRA methods outline prepared by Andrea Cornwall, Department of Anthropology, School of Oriental and African Studies, London, for VetAid, Scotland.

### REFERENCES

- Cornwall, A. 1992. Body mapping in health RRA/PRA. *RRA Notes 16*: 69-76. IIED, London.
- Farm Africa and FFHC/AD. 1992. *Report of a Diagnostic Survey: Using RRA Techniques with Zenga Awande Peasants Association in Zenti Awraja, North Omo, Ethiopia*. Farm Africa, Addis Ababa
- Grady, H., Daqqa, A., Hassanein, F., Soboh, F., Muhana, I., Louzon, M., Fayyad, R., El-Beheisi, N., El-Tibi, S. and Theis, J. 1991. Assessing women's needs in Gaza using participatory rapid appraisal techniques. *RRA Notes 10*: 12-19. IIED, London.
- Grandin, B. 1988. *Wealth Ranking in Smallholder Communities: A Field Manual*. Intermediate Technology Group Ltd., London.
- Hadgu, K., Yisehak, M. and Tekle, G. 1992. Interviewing cows. *RRA Notes 15*: 52-53. IIED, London.
- IIED and Farm Africa. 1991. *Farmer Participatory Research in North Omo, Ethiopia: Report of a Training Course in Rapid Rural Appraisal*. Sustainable Agriculture Programme, IIED, London.
- IIED and ActionAid Ethiopia. 1992. *Look Who's Talking: Report of a Training of Trainers Course in Participatory Rural Appraisal in Dalocha, Southern Shewa, Ethiopia*. Sustainable Agriculture Programme, IIED, London.
- IIED and Pakistan-Swiss Potato Development Project (PSPDP). 1992a. *Participatory Rural Appraisal for Farmer Participatory Research in Punjab, Pakistan: Report of a Training Workshop for the Pakistan-Swiss Potato Development Project (excerpts edition)*. Sustainable

- Agriculture Programme, IIED, London.
- IIED and Pakistan-Swiss Potato Development Project (PSPDP). 1992b. *Participatory Rural Appraisal for Farmer Participatory Research in Punjab, Pakistan: Report of a Training Workshop for the Pakistan-Swiss Potato Development Project (full edition)*. Sustainable Agriculture Programme, IIED, London.
- Konde, A. (ed.) 1993. *Report of Diagnostic Survey Using Rapid Rural Appraisal Techniques of Debre Medhanit Tabia in Dedešana Derga-Agen Wereda*. Farm Africa.
- Mascarenhas, J. and Prem Kumar, P.D. 1992. Participatory mapping and modelling: user's notes. *RRA Notes 12*: 9-20. IIED, London.
- Mearns, R. (ed.) 1991. Policy alternatives for livestock development in Mongolia. *Working Paper No. 2. Transformation of a Pastoral Economy: A Local View from Arkhangai and Dornogobi Provinces*. IDS and Mongolian Research Institute.
- Mearns, R., Shombodon, D., Narangerel, G., Turul, U., Enkhamgalan, A., Myagmarzhav, B., Bayanjargal, A. and Bekhsuren, B. 1992. Direct and indirect uses of wealth ranking in Mongolia. *RRA Notes 15*: 29-38. IIED, London.
- Swift, J. 1981. Rapid appraisal and cost-effective participatory research in dry pastoral areas of West Africa. *Agricultural Administration 8*: 485-492.