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LINKAGE KARI - IEMVT

THIRD MISSION REPORT

OF PROJECT LIAISON UNIT

(20th May to 1st June 1991)

September 1991

INSTITUT D'ELEVAGE ET DE MEDECINE VETERINAIRE DES PAYS TROPICAUX

DEPARTEMENT DU CIRAD

10, rue Pierre Curie, 94704 Maisons Alfort Cedex (France)

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I N T R O D U C T I O N

For various reasons, the third PLU mission has been effected later than was originally planned. A great improvement on the previous missions was the fact that the national co-ordinator for range research in arid and sub-arid regions, Dr. H.K. Cheruiyot, and the KARI liaison officer between EEC and KARI, Dr. G. Hinga, accompanied the team everywhere. We are also grateful to the directors and staff of both centres for their full cooperation.

Our comments in this report take into consideration not only the results of our third visit, but also the proposed work plans and the annual reports produced at Kiboko and Marsabit. Comments on the work plans have already been sent separately, but will be integrated again into this report. This time we have been able to consider not only research proposals, but also evaluate actual activities.

NATIONAL RANGE RESEARCH CENTRE K I B O K O

Staff

8 scientist posts are filled (out of a theoretical 25). Kiboko remains unattractive as a posting: problems of schooling, medical care, salty water, heavy malaria challenge ...

The research staff list is:

KIBET, P.F.K.	-	Director
MWORIA, J.K.	-	B.Sc.
EGO, W.	-	B.Sc.
MBAKAYA, D.S.	-	M.Sc.
GITUNU, A.M.M.	-	B.Sc.
CHIWE, J.	-	Range officer (B.Sci.) Newly arrived
MUSEMBI, D.K.	-	M.Sc. On overseas fellowship
TOO, D.K.	-	M.Sc. On overseas fellowship
OGEGA, B.D.	-	Laboratory technologist

Furthermore: 9 technical assistants, 10 clerical officers, 4 mechanics, 12 drivers. There are 220 employees in all.

Mr. A.R. ALI has been posted elsewhere.

General impressions

We are pleased to note considerable improvement in activities, motivation of the research officers and working atmosphere at Kiboko NRRC. This is also shown by the 1990 Annual Report. Most of the present research proposals are satisfactory and should be approved. For some proposals certain activities can at least be initiated until sufficient staff is available.

The present staff is insufficient for implementing the whole work plan as presented, within a reasonable time. With more staff various activities could be integrated for more in-depth observations on the interface between programmes (examples: environmental studies associated with the wildlife experiment, erosion within the grazing/burning programme, consequences of bush control on water budgets...).

Research Projects

1 - Moisture patterns and range productivity

In the absence of Mr. Musembi, on overseas study, Mr. Mbakaya is running a meteorological network with 13 weather stations. Measurements of grass production are delayed, although occasional data obtained in other programmes can be used to relate primary productivity to the climate. The decision to concentrate on recording climatic parameters is correct, and the present stations are sufficiently equipped for general purposes. The lack of soil thermometers will not seriously affect other activities.

However, we cannot recommend approval of the proposal as written in the Work Plan, with its long term illusory objective of being able to forecast drought. (See also our remarks in the March 1989 report, p. 11.) The objectives should be rewritten before approval for a formal project should be given, although of course meteorological recording should continue, as a general service to various projects.

2 - Effect of stocking rates on physical properties of the soil in a range environment

A good proposal, planning to describe the water budget according to the plant layer, including data on soil and nutrients losses and on the influence of grazing. Provided two more parameters (slope and organic matter content of the soils) are measured, the work will in particular provide new insights in water efficiency and the consequences of trampling by livestock, two subjects which are poorly documented.

Since funds were not available to establish proper plots, Mbakaya has used a rainfall simulator for preliminary observations and was able to obtain some initial results. His decision and work deserve congratulations, and we strongly recommend that the programme be fully implemented.

3 - Response of vegetation to grazing by livestock and and controlled burning at Kiboko

This programme, now in its 10th year, is a continuation of a long-term experiment and its design is quite good. We wish to point out that such an experiment does not exist elsewhere in Africa and that its results are important for ensuring proper range management. Burning was not perfectly controlled in the past, and livestock pressure should be better described in future (number of heads, grazing periods in each paddock). The fire-breaks must also be rehabilitated as soon as possible. (The waterpump of the Fiat crawler needs to be replaced, but a new one has not yet been obtained. There are a few other problems as well, which need to be solved.)

We recommend continued approval.

4 - Increasing primary productivity in the semi-arid and arid rangelands through bush control and reseeding

This project has been approved and 10 plots have been established and described. Some details in the proposals may be over-ambitious: 61 plots located in 5 different plant communities, of which 3 communities only are densely wooded. Use of herbicides: 2-4 D was tested by D. Pratt many years ago. Reseeding using 2 species: a mixture of grass inflorescences cut at the vicinity of the plots could be envisaged. The trials will give more benefits than stated, including bush tolerance to cutting, woody regrowth or "invader" grasses.

Continued approval is recommended.

5 - Associated research: Seeding of range pasture and value of forages and crop residues (not included in the work plan)

These are Katumani or ICRISAT trials, with little relevance to the overall Kiboko activity. The feeding value of the grasses, legumes and shrubs concerned is known. What may be more important is how to use them and how to conserve them. The value for Kiboko scientists lies in observations on the germination and establishment of these plants, for application to range situation such as in projet no. 4 above, where reseeding failed this year.

6 - Forage utilization by wildlife and livestock under conventional livestock management system

Semi-quantitive data on the composition of their diet can be obtained from faecal samples, but also from direct visual observations, identifying which plant species are eaten, at regular time intervals.

As far as vegetation is concerned, the proposed transects are not likely to provide very good information on the influence of game animals. Plant cover along the transects can, at best, be an indicator of depletion of feed on offer; it will not measure either intake by animals, or diet selection by a mixed

herd, because different plants have different growth patterns and because many other factors intervene throughout the years, or in different years.

There appears to be a problem with inbreeding in the few available eland and fresh blood is probably needed (Kabete? Kenya Wildlife Service?).

We advocate approval in principle, but Mr. Ego should first discuss the project thoroughly with the Range Department of the University in Kabete (where an appropriate laboratory for faecal examination is being created) and specialists at Kabete.

7 - Factors affecting livestock marketing in Kajiado and Machakos districts

A questionnaire has been devised to describe the livestock characteristics and dynamics, the labour force of producers, the facilities they use, various elements of household budgets and the livestock trade. The questionnaire was tested with small farmers (average farm size 20 to 30 ha) in the Makindu and Mtito Andei areas and should now be used to analyze true rangeland situations, in neighbouring group ranches. A few improvements are proposed for better information:

- household budgets: all sources of income (and not only sale of livestock) must be considered, to understand the breakdown of expenditures;
- emphasis should be laid on the seasonal variations of both livestock and commodities prices;
- additional information is to be collected on livestock movements and on the build-up of herds: origin of animals, history of females and of their products...

The subject is obviously important and we advocate continued approval.

8 - Improvement and study of productivity of some indigenous small East African shorthorn zebu cattle

This project, which has not yet been funded, had been prepared by Dr. B.A.J. Mwandotto, who has since left Kiboko but can still cooperate from his present post at Naivasha. It has been rewritten, taking into account to some extent the advice given during the PLU visits and, extensively, in our March 1989 report. It has been discussed again in detail during our visit to Kiboko this year.

In its present form and considering the available staff, the proposal still is clearly over-ambitious: select as many as 5 types from various areas; qualify and quantify resistance not only to climatic conditions but also to disease vectors. The latter aspect (disease resistance) can certainly not be carried out by the Kiboko staff and is the domaine of specialized institutes, such as KARI/Muguga, ICIPE, KETRI, ILRAD... ; a fair amount of data is already available, scattered in publications and reports (e.g. the interesting reports by the GTZ-funded

project in the Trans-Mara, previously led by Dr. G. Moll). The proposal is also not clear as to the protocol (will selection be on station or on farm?)

To summarize our point of view:

* More information on the indigenous zebu types is highly desirable, as it is the most extensively used animal in the rangelands of Kenya.
* Initially, various types should be identified and characterized ***in the field.***
* One or at most two superior types may then be studied ***on station.*** This a very long-term study and should in fact be considered as a second proposal!
* Once on station, a comparison with the Boran living in the same environmental circumstances would appear desirable to us (p. 18 of our April 1990 report); it should be kept in mind however that the Boran is known to be much more susceptible to ECF (not present at Kiboko) than the small E.A. shorthorn zebu.
* The final aim should be to identify and select the best animal for the semi-arid lands. We agree that the animal should be dual purpose, one should not only look at the beef potential, but the animal should also provide sufficient milk for the owner's need, the main purpose of traditionally kept cattle being the provision of milk for family use. If some upgrading with Boran blood is useful, one should not shy away from this, without forgetting that resistance to diseases, such as tick-borne diseases and tick infestation, as well as to adverse environmental conditions, must be retained.

This is a major and very long-term undertaking, which will require more staff and sustained funding. The initial field characterisation of types can be carried out by one good zootechnician.

We advocate approval of initial activities, taking the above observations into account. Initial activities are: a thorough literature review on indigenous zebu types (all aspects); the beginning of a field survey of various types. On-station activities will not start for the first two years or so.

9 - <u>Effect of mineral supplementation on performance of weaner cattle in the rangelands</u>

The project, which intends to look at the value of natural mineral licks and compare it with commercial mineral supplements, has not yet been approved.

A great deal of information on mineral supplementation in various tropical regions is available in the literature. There are also known data on the composition of natural salt licks in Africa. It is therefore unlikely that the proposed activities will discover much what is new.

We advocate a literature review before it is decided whether such a project is needed, and if so, how it should be carried out. A list of references on the subject has been sent to Dr. Kibet.

We wish to add that preliminary work has looked at dry matter content of herbage and browse in the growing stage. The conclusion presented to us was that the dry matter content of the samples is too low. However, this is certainly not justified on the figures presented during our visit and those in the Annual Scientific Report for 1990, NRRC Kiboko, p. 29. On the contrary, the values are excellent (25 - 35 % for herbage and 36 to 40 % for browse)!

Livestock at Kiboko:

There are at present 547 cattle of which 153 are calves. The Boran stud herd has 40 cows and 3 bulls, 24 heifers, and 30 calves (half being males, half females); animals are sold to farmers (for subsidized prices).

There are 46 sheep (Masaai and black-headed) and 196 goats (Galla, Masaai and crosses). Furthermore 8 eland and 16 zebra.

There is still no veterinarian at Kiboko.

Trypanosomiasis remains a major problem. The use of pour-on against tsetse has little effect because of the presence of many wild hosts. KETRI staff have looked at the tsetse situation, also a private Japanese firm, but so far there has been no follow-up. As soon as a veterinarian is appointed to Kiboko, a start should be made with a control project (see pp. 18-21 of our March 1989 report). A tsetse officer from the tsetse control station at Kiboko was present at our meeting of 23rd May and expressed interest.

Ticks and tick-borne diseases (but not ECF) are also considered to be a problem (but there has been no proper diagnosis).

Half of the ranch has been burned on purpose, in order to decrease tsetse, ticks and bush, which has been an increasing problem. Tsetse and tick populations have not been monitored however.

Other problems are pneumonia in small ruminants. We suggest that Dr. F. Rurangirwa be contacted for this problem, in particular to see whether ***Mycoplasma*** strain F 38 is involved.

Photosensitization of white cattle and white parts of cattle is supposedly due to a certain salty ***Acacia*** species.

Theft and predation remain problems, as does the invasion by Masaai during drought periods. There is only one security guard.

The PLU has not visited the **BUCHUMA SUBCENTRE**. Mr. W.N. MNENE is still the officer in charge and the only KARI scientist there. (Mr. KIMANI is in the Ministry of Livestock.) We remain in favour of avoiding dispersal and of ending KARI activities at the subcentre (p. 10 of our March 1989 report, p. 3 of the April 1990 report). Moreover, the facilities of the subcentre are now very old or broken-down. The electricity is not functioning any more, so the electrical waterpump is also not working.

The upgrading cross-breeding programme at Buchuma, by the use of Sahiwal, Boran, Friesians, Charolais, is not relevant to the mandate of the N.R.R.C., and creates animals which are even more susceptible to diseases and environment than the Boran and the Sahiwal!

For the time being KARI intends to just maintain the station, in charge of a technical officer. As Mr. Mnene is a nutritionist, he should be a welcome addition to one of the other KARI livestock centres. N.R.R.C. might try to use the subcentre in the meantime for commercial production of livestock, to generate income.

Mr. Mnene has submitted two project proposals for Buchuma:
- Establishment, phenology and value of grasses and shrubs and
- Studies on bush reduction. To some extent these are duplications of the work at Kiboko and in our opinion no research work at Buchuma is to be recommended in any case. So far there has been no report of scientific results obtained at Buchuma over the last years.

NATIONAL ARID LANDS RESEARCH CENTRE M A R S A B I T

Staff

The permanent water problem in Marsabit town is still as great as ever. Water has to be collected from the roof and stored, and every house needs to be equipped for this.

10 research posts are filled (2 of these 10 research officers are on fellowships).

The research staff list is:

WOIE, B.M.	-	Director
KEYA, G.A.	-	M.Sc.
GACHIMBI, L.N.	-	Land and water management (M.Sc.) Newly posted
MULINGE, W.M.	-	B.Sc.
WAMUGI, I.K.	-	B.Sc.
NDATHI, A.J.N.	-	B.Sc.
DOYO, G.J.	-	B.Sc.
OUDA, J.O.	-	Livestock production officer (B.Sc.) Newly posted
ETHURO, D.E.	-	B.Sc. On overseas fellowship
KARIMI, S.K.	-	B.Sc. On overseas fellowship

There is no veterinarian, after Mr. KARIMI left for his fellowship.

Mr. S.G. FAYO resigned. We do not know what became of Mr. M.K. MBUI (M.Sc. Pastoralism), who was still on last year's staff list.

General impressions

As for Kiboko, the presented work plan as a whole is over-ambitious and cannot be fully implemented with the available staff.

The staff is mostly well motivated. Many of the activities are rather small-scale and could be considerably improved. For many of the activities, the available data should be analysed now and a new start made after that.

Research projects

1 - <u>Environmental degradation and its control in Marsabit district</u>

This is a new project aimed at evaluating water harvesting techniques, but the economic viability of such interventions in very arid rangelands is disputable. No details of the proposal are given in the work plan. It is meant to evaluate water harvesting techniques and try to control erosion. The proposed location, in the vicinity of Marsabit, concerns a situation which is not typical of the centre's climatic mandate. However, erosion (including wind erosion) can be very severe in the very arid zone and the utilization of water by plants is obviously worth studying. In addition, the collection of metereological data is presently insufficient around Marsabit, where no evaporation pan exists.

The most urgent recognized need seems to be a preliminary assessment of water budgets in various situations, such as in

bare or vegetated grounds, with or without surface stones, comparing ***Indigofera*** and ***Duosperma*** communities, describing the influence of surface sealing, or grazing, etc. Only then can the initial findings be used to derive proposals for a study of erosion and of potential interventions.

We consequently suggest that Mr. Gachimbi spend several weeks in Kiboko to familiarize himself with the relevant investigation techniques and decide how they can be adapted to arid, sometimes stony soils. The proposals should be redrafted accordingly.

2 - Tree and shrub productivity (NDATHI) (not included in work plan)

A very valid subject, since browse is a major component of the arid plant communities and because the productivity of woody plants is poorly known. Discussions during the PLU visit provided the following conclusions:

- measurements will include data on tree density and descriptions of the populations;
- 10 trees are to be sampled for each species, to cover the whole range of sizes;
- ***Acacia reficiens***, ***A.tortilis*** and ***A.mellifera*** will be given priority;
- the suggested approach is to relate the biomass of twigs to the stem diameter of trees, then to express the weight of leaves, pods or flowers as a percentage of twigs' biomass at various periods periods (or phenological stages) during the year;
- complementary observations on twig growth and litter accumulation will also be made.

3 - Taxonomy of Acacias (DOYO) (not included in work plan)

Although plant taxonomy should be seriously studied by all specialists of environment, this proposal cannot be accepted as a research topic, since acacias are well known and a collection of plants has already been gathered at Marsabit (and should be given more attention).

Two other subjects have been proposed:
- a monograph on ***Acacia senegal*** (distribution, ecology, growth, gum production,...);
- the distribution and ecology of some common trees along a gradient from Marsabit to Ngurunit.

The second subject is probably better adapted to the situation, as it will require a shorter time to produce results on the habitat of trees and shrubs in the arid zone according to climate and soil types, with comments on the woody populations and densities. The results can be expressed in a series of short papers, each dealing with one species or with one given environmental type: arid sands, lava flows, lower slopes, drainage lines, very arid rocky soils, etc. Such papers will be an asset for an M.Sc. degree.

Mr. Doyo should approach Dr. Njoka to decide on a strategy acceptable to the University and to produce detailed work plans which fit within the general framework of research at Marsabit. It should be noted that ICRAF (International Council for Research in Agroforestry) in Nairobi has started in May 1991 a "tree bank", a database on multipurpose trees used in agroforestry, which he should consult.

4 - Response of *Indigofera* to simulated grazing (WAMUGI) (not included in work plan)

The aim is to relate the productivity of *I.spinosa* to the height of clipping, with a periodicity of six weeks. One merit of the proposal is its simple and precise design, and we trust that good data will be obtained. Minor modifications are proposed:
- select a site close to Kargi instead of Olurot;
- record the number and length of new shoots;
- use a larger number of plants and monitor their total cover;
- measure the nitrogen content in the regrowth.

5 - Seasonal biomass production dynamics in selected plant communities of northern Kenya

This programme has been pursued for 3 years after its initial 2-year establishment and is intended to provide "information on seasonal feed availability". However, the measurements are only made in 3 sites with 12 replicates in highly heterogeneous plant communities, so that both precision and representativity of the estimates cannot allow extrapolations to the whole district of Marsabit. The pluri-annual variability in plant response to climate and the seasonal fluctuations of biomass could be approximated from climatic data together with considerations on NOAA images, or other monitoring exercises.

Table 2 in the Annual Report is a perfect example of difficulties associated with an interpretation of biomass curves in relation to rainfall, with rains concentrated from mid-November to April and a peak standing crop at the end of April. In an exclosure, the biomass will regularly decrease during the dry season (the recorded fluctuations seem meaningless), then faster at the onset of the next rains in spite of the new growth. The bio-mass must be broken down into its components before conclusions are derived.

Table 1 confuses productivity and biomass.

Before continuing, a thorough analysis of all data collected so far is urgently needed, in order to ascertain the value of the programme and decide on a potential reorientation of the work.

6 - Range condition and trend assessment of key range units in south western Marsabit, as affected by human settlement and livestock utilization

Plant cover and (peak?) biomass have been recorded for 3 years along 19 transects located in 9 range units, and the

selected results in the annual report are surprising indeed: They suppose a 70 % decrease in biomass and a 30 % decrease in total plant cover, as well as a slight increase in desirable plant cover between 1982 and 1989. Other anomalies also need further screening and, as for the preceding project (no. 5), we advise that all results obtained during the period are immediately documented in a comprehensive report, in order to see where we are going.

The study obviously has important potential implications. We advise continued approval, with the above conditions. Mr. Keya has agreed to produce the necessary documents. The outlines of two papers were worked out during the PLU visit and the manuscripts will be forwarded for comments to Dr. Bille (one at the end of 1991, one by mid-1992).

7 - Range rehabilitation and woodland management studies in the arid lands of northern Kenya

The selected site is close to Ngurunit, located within a corridor between mountains, having a rainfall of around 1 m/year, and therefore not representative of arid zones! The three treatments were established in plots where the initial tree populations differed widely in terms of structure and density, so that the present status is not a consequence of experimentation. The interest of these Ngurunit plots is in complementing a different study conducted at Kargi with measurements on natural recovery of woody vegetation:
- very young tree stand with complete protection in Kargi;
- mature protected stand in Ngurunit (T2);
- grazed young and mature stands in Ngurunit (T1 and T3).

Monitoring of all 4 plots will provide data on the rate of tree infestation, on the optimum spacing of trees at different ages, on their growth with or without browsing, on the achievement of an equilibrium in the woody population, on the trends in young and older stands, ...

We advocate approval in principle of this combined long-term study proposal, for which proper plans must be proposed.

8 - Monitoring and evaluation of livestock marketing activities in South-West Marsabit

The objectives are worthwhile and important, for the future of pastoralists in northern Kenya, as well as for the supply in meat of Kenyan towns and the economy of the country as a whole. One page (£ 38) of the project was unfortunately missing in the copy we received.

The project was discussed with Mr. Mulenge, who is highly motivated. This was the first time we had the occasion to meet him, as he was posted last year at Ngurunit, which we could not reach then. However, we advise postponement:

* Mr. George K. Njiru has carried out a study of Rendille and Arial family economics and should soon obtain a Ph.D. degree in the USA on the basis of this study. In order to avoid duplication, publication of his work should be awaited (and in the meantime a thorough literature review of the subject be carried out).
* Mr. Mulinge has been selected for a fellowship in Canada (M.Sc.) by CIDA and was hoping to start in August 1991. He should be able to present an improved project proposal after his training. However, his absence does not mean that all activities in the field of socio-economics have to be stopped: It is expected that a socio-economist (KARIUKI, M.Sc.) is posted at Marsabit this year. The M.Sc. ETHURO is doing at present is also in economy.

9 - Monitoring of gum arabic production and marketing

The idea is good. Results so far have been disappointing, yields are too low for establishing an industry.

There may well be a number of reasons why the results are bad, such as: the climate is possibly too arid, the variety of *Acacia senegal* may not be a suitable one, the tapping is possibly not carried out correctly (and as carried out might even kill the trees in a few years!). Before continuation of the project is approved, a thorough literature review is essential to provide indications as to whether it is worthwhile to continue the effort. A number of literature references have been sent to Marsabit.

10 - Participation in monitoring of range rehabilitation activities

Some actions on proposed improvement packages were not successful (live fences, tree plantation), some were barely accepted (stone enclosures), some seem artificial (painted trees). Reasons for approval or rejection are not explained, the variability in reactions was not studied. We question the rationale of advocating dipping small stock for tick control, before establishing its economic value and need. Experiments carried out in Narok district led to the conclusion that the impact of tick control on small ruminants was virtually nil. (Muenstermann and Tome: Influence of regular tick and helminth control on productivity of small ruminants in the Lolgorien area, Narok District, Kenya. *Trop.Anim.Hlth Prod.*, 1989, 21: 247-255.)

It is debatable whether the project should still be part of KARI's activities, or whether it has now moved beyond pre-extension into the extension field. The activities can probably be continued even during Mr. Mulinge's absence, by other staff members. However, we do not advise to maintain it as a formal project, but to demonstrate the use of these interventions (at least those that have proved successful) as the occasion arises,

at little extra cost to other activities. One positive result is in any case the establishment of good links with the population.

11 - The performance of camel calves kept at Olturot station

The objectives are important and worthwhile. However, the project as carried out in the past did not allow definite conclusions to be drawn as to the influence of each factor (milk intake, veterinary care and crossbreds versus Rendille) on birth weight, growth rate and calf mortality. One factor should be addressed at a time: All calves should be given the same veterinary care and be treated similarly in all ways except in milk off-take from the dam. Also, only calves of the same breed should be compared with each other.

The project has been discussed extensively at Marsabit with Mr. Ouda, who will carry on the work started by others on livestock production, as Mr. Karimi is away on his fellowship. The proposal as written in the latest workplan apparently takes these discussions into account and we advocate approval.

The bibliography on camels, edited by Dr. Saint-Martin of IEMVT (2 volumes), has been sent to Marsabit.

12 - The production performance of Rendille and Somali camels and their crossbreds in survival, milk yields and growth rates

The comparison, as carried out so far in the KARI herd, is based on few pure-bred animals and very few sires used for cross-breeding. The results cannot be extrapolated for the two breeds in general. The project has been discussed extensively with Mr. Ouda, who also takes over these activities; comments have also been given in our first report, of March 1989.

Agreement was reached that initially the breeds be characterized and compared in their natural surroundings: measure, describe, take pictures. This is however not reflected in the work plan. Photographic equipment will be needed for this field work.

The comparison of typical specimens of each breed and their offspring under identical conditions is only the next step. This should show whether the differences in size and performance are determined by genetics or by environmental factors.

We advocate that the proposal be rewritten as discussed during our visit. As conditions in parts of North Eastern Province may make it difficult at present to travel extensively and freely in the districts where the Somali breed is mainly kept, there is no harm in continuing in the meantime present observations, as there are few extra costs on top of those necessary for other work on the KARI camels.

13 - The effect of mating on camel milk production and its implications on breeding practices

The project, taken over by Mr. Ouda, yields useful information on the reproduction and milk production of camels and should be continued.

14 - The production performance of Rendille, Somali Galla goats and their crossbreds under arid conditions in Northern Kenya

The objectives are worthwhile. However, we question the need for comparing crossbreds separately, as the Galla goat also hails from an arid region. If it proves superior, one could presumably move straight into the developmental phase, and use the Galla for upgrading. It was agreed that Mr. Ouda will analyze the data obtained so far on both breeds and then decide whether a separate crossbred herd is needed.

The project might be enlarged by replicating it in less extreme conditions at Kiboko (see our March 1989 report, p. 38), but the necessary staff has not yet been recruited at NRRC Kiboko.

Livestock of NALRC

The camels, goats and sheep at Olturot were in good condition. The sheep (black-headed Somali) are not in use any more.

Camel bulls are kept at Ngurunit, for servicing females of local Rendille owners. Diarrhoea appeared to be a problem and the condition of several was not good. Thick blood smears were taken to be examined for trypanosomes at Kabete. (Ngurunit is not an arid area!)

Various observations

The staff must be aware of the necessity to shape the environmental programmes into a global project with better coordination and links between the different components. The programme should not consist of a mere continuation of scattered measurements. Some of the proposed new programmes seem to have been set up for reasons of convenience, as new staff joins in the group, without ensuring a common and global target for the centre.

The decision to abandon the most remote subcentres (Gatab and Olturot) is in agreement with the PLU's past suggestions, and has implications for the programmes, considering that the activities are to be concentrated nearer to Marsabit, although within the arid and very arid zones.

During the field trip the PLU could evaluate the facilities offered in Ngurunit and was shown a zone between Korr and Logologo, where a few observations are already underway and where more could be done. This is part of the Kaisut area and quite representative of the drier Kenyan ecozones (similar to Olturot, some 200-250 mm average rainfall). The location has many advantages from an ecologist's point of view:

* It includes at least 3 different and typical environments: sandy undulated plains, rocky volcanic grounds and temporarily water-logged drainages or bottom lands.

* It is less than a 2 hours drive from Marsabit (some 70 km), as well as from Ngurunit, and in the middle of a remarkable climatic gradient ranging from subhumid at both ends to very arid in Kaisut.

* Many other landscapes can be found close to this location: isolated hills to the south, a few temporary rivers, degraded grounds around Korr ...

* The area has been little utilized by livestock because of lack of water. This is an advantage because measurements can be obtained from undisturbed vegetation for comparison with intensively grazed rangelands, and because the land can be used without depriving pastoralists of their resources.

* The location appears to be ideal for concentrating most activities within a restricted area, so that for instance climatic data can be used for all programmes, and some programmes can be associated (for instance plant production and water budget, or camel performance and productivity of woody plants...).

We support the establishment of the Kaisut site as the main experimental site for the NARLC, where many environmental studies could be started with minimal infrastructure: a shelter for housing a watchman to take care of the weather station. Moving livestock to Kaisut will of course require the provision of water in the future, but a small tank is enough to start. If water cannot be obtained locally, it could be brought in from Logologo (about 25 km to the east of the site), where there is enough. A thorough soil and vegetation survey is the first step, to decide on the location of experimental plots and on the organization of research activities. The District will have to give the permit for the use of the site.

The headquarters will have to remain at Marsabit because of communications, schooling and amenities, although the climate is not typical of the zone for which the NALRC has a mandate.

Four fistulated camels will be given to NALRC by the Marsabit Development Programme (ex Camel Extension Project). They could be used by M.Sc. students coming to the centre in the context of the agreement between KARI and the University of Nairobi. They can also use the sheep of NALRC, which are not included in any project at the moment.

The project leader of the Marsabit Development Programme, Dr. Schimann, was on the point of leaving during our visit. We have not met his likely successor (Prof. Saidi, who had not yet been definitely appointed at the time of our visit). Close collaboration between NALRC and this project is clearly indicated.

GENERAL CONSTRAINTS

* A serious general financial constraint for KARI is the fact that the EEC support for recurrent costs is now beginning to be phased out. (100 % in the 1st and 2nd years, 75 % in the 3rd, 50 % in the 4th, and 25 % in the 5th year.)

* Recruitment of scientists: Apart from the fact that few scientists are happy to be posted at Kiboko or Marsabit, it is also clear that the resources of KARI are insufficient to recruit an infinite number of scientists. Meeting the cost of salaries is a major problem for KARI.

* ***There are no funds left for EEC fellowships.*** We had been given to understand that training was an important component of the EEC support to KARI (see p. 4 of our April 1990 report), and we were severely disappointed when we learned this year that the fellowship of Dr. Karimi to Glasgow remains the only one available for all of the KARI scientists in Kiboko and Marsabit.
  There appears to be a budget line left for local training (including Ph.D), at universities in Kenya.

* The equipment orders for both Kiboko and Marsabit are on tender and greatly delayed.
  The Kiboko staff would like to have an atomic absorption spectrophotometer, but we do not see the need of such expensive and sophisticated equipment for the present projects and projects proposals.

GENERAL OBSERVATIONS AND PROPOSALS

- No proper literature searches and reviews have been carried out (see p. 8 of our second report, April 1990). We have insisted from the beginning that this is essential for a sound basis of the proposals and for increasing the competence of the scientists. We submit that every proposal should have an appendix consisting of a summary of such a literature review, and should not be approved unless there is such a summary.

- Results are generally insufficiently expressed in statistical terms (mean values with standard deviations, level of significance, considerations on sample size, etc.).

- The quarterly station and programme reports are being sent regularly by the staff of Marsabit. The staff at Kiboko has announced they do will do so from now on.

- EEC-funded fellowships are, unfortunately, no longer available for improving the average scientific standard of the staff. The idea of temporarily appointing European scientists (pp. 4 and 6 of our April 1990 report) has not been followed through. However, KARI and the University of Nairobi have actively followed through on collaborating by opening the centres to M.Sc. students of the Department of Range Management. A separate agreement on this collaboration is established directly between KARI and the University. The students have to submit a project to be approved, at one of the centres. The presence of the students and their supervision by University staff, should be stimulating and increase the potential of the centres. KARI will sponsor a number of M.Sc. students with a view to recruiting them for employment. We plead for priority to B.Sc. degree holders now employed at Kiboko and Marsabit.

  The M.Sc. student programme has started already at Kiboko with 3 students, who have worked there for 9 months.

- Furthermore, it has been agreed in various meetings to establish a new subcontract between the Department of Range Management and the PLU (IEMVT) for a continued backstopping role in between the PLU missions. The document has been agreed upon by KARI, the University and the PLU and we expect that the EEC Delegation will give its approval or has done so already at the time of writing this report. The subcontract is to last until the end of 1993, to coincide with the end of the KARI/IEMVT linkage. At present, the strong fields of the Range Department are rangeland ecology and livestock, but not socio-economics. The terms of reference are given in Appendix II.

  There are EEC funds available for financing full-time resident experts at Marsabit.

- Opportunities should be given to the research officers for participating in (international and national) conferences and local training workshops and seminars, as part of their normal activities. Mr. Ceuppens (EEC Delegation) suggested that KARI might be able to obtain funds for seminars from ISNAR.

- Library services: The ODA report (p. 3 of our April 1990 report) is said to have been prepared, but we have not seen a copy so far. Dr. Cheruiyot has promised to send it.
  We believe that the suggestions we gave in our first and

second reports (P. 41 and p. 3-4, respectively) should go a long way towards alleviating the problems. We may add that not a single request for computerized literature surveys based on keywords (p. 4 of our April 1990 report) has been submitted.
There is a provision in the budget for library services. (For each of the two centres 50.000 Ecu over 5 years.) It should be used for a few key journals and books in the centres (each centre should prepare a list of its wishes) and for strengthening the central KARI library.

- We support suggestions to produce information brochures in Swahili on various topics, such as bush control etc.

- Camels are moving southwards in Kenya. We were told that camel keeping is starting in Masaai-land. If the trend continues, Kiboko should monitor it.

- All activities in Kenya on rangeland management and livestock in arid and sub-arid zones should be coordinated: research, pre-extension and extension. This includes both centres, the Ministry of Livestock Development and all other relevant organisations and institutions. KARI intends to take the initiative by organising a seminar.

WORK PLANS FOR 1991-1992

Proposed inputs by IEMVT for the 1991-92 financial year

1) **Regular mission of 15 days by Drs Bille and Uilenberg:**

Marsabit, its active subcentres and field sites, as well as Kiboko, are to be visited, and discussions are to be held in Nairobi with KARI and the EEC Delegation. We would highly appreciate again the presence of the national coordinator, Dr. H.K. Cheruiyot. We propose to carry out the mission in the second half of January 1992 and to start at Marsabit (see below).

The budget (uncorrected for devaluation) for this mission is 540 671 K.Sh. (see p. 78 of linkage agreement).

2) **Subcontract with the University of Nairobi:**

If the consultancy contract with the University of Nairobi is signed in the meantime, we would be accompanied by the Department of Range Management team. The cost will depend on the height of the consultancy fees and per diem for the University of Nairobi consultants, which remained to be definitely agreed upon at the time of preparing this report. If the proposal is approved by the EEC delegation, the cost of the contract is 9450 Ecu in 1991 and 22050 Ecu in 1992.

3) **Consultancy by Dr. G. Saint-Martin:**

We propose that Dr. Saint-Martin, coordinator of the UCEC (Unité de Coordination pour l'Elevage Camelin, an international network of camel research, based at IEMVT) accompany the mission to advise on research activities and proposals involving camels.

Dr. Saint-Martin will attend an Internation Camel Symposium in Dubai, starting on February 3. This is one of the reasons for proposing the mission before that date, another reason being that there is less chance of heavy rains at that time. We suggest that the PLU mission could start at Marsabit and leave Saint-Martin there while the two others visit Kiboko. The three could meet again in Nairobi for final discussions.

(There are at least two flights a week between Nairobi and Dubai.)

The budget for the consultancy (based on the 1988 linkage agreement, uncorrected for devaluation, inflation and salary increase) would be:

In Kenya	(15 x 4324) =	64 860
Homebase	(15 x 2838) =	42 570
Airfare		25 000
Hotel rooms	(15 x 1000) =	15 000
		K.Sh. 147 430

APPENDIX I

ITINERARY AND OFFICIALS MET

13.5.91 Arrival in Nairobi of Dr. UILENBERG. (Participation in ILRAD Workshop on recent developments in the control of anaplasmosis, babesiosis and cowdriosis.)

17.5 Arrival in Nairobi of Dr. BILLE. (Visit to KREMU and discussion with French remote sensing team.)

20.5 Start of mission.
* Meeting at KARI headquarters with Messrs. H. K. CHERUIYOT (National Coordinator), G. HINGA (KARI/EEC Liaison Officer), P.M. GATONGI (temporary Head of Animal Health), Mrs. A. ABATE (standing in for Dr. WACHIRA, Deputy Director, Livestock Production), and Mrs. L.W. KIMANI (Officer in charge of all KARI training).
* Meeting at Department of Range Management, University of Nairobi, with Prof. C.N. KARUE and Dr. Th.J. NJOKA, as well as Dr. CHERUIYOT.

21.5 * Meeting at KARI headquarters with Drs. J.D. WACHIRA and CHERUIYOT.
* Meeting at EEC Delegation with Messrs. CEUPPENS (EEC Delegation, who has taken over this programme from Mr. Van Helden), WACHIRA, CHERUIYOT, Prof. KARUE and Dr. NJOKA.
* Travel by road to Kiboko, with Messrs. CHERUIYOT and HINGA.
* Meeting with director and staff at Kiboko NRRC.

22.5 Meeting at Kiboko with director and staff (including Mr. MNENE of Buchuma subcentre). Presentation of proposals, projects and results. Visit of station.

23.5 * Final discussion with staff at Kiboko.
* Travel by road to Nairobi.
* Meeting at EEC delegation with Mr. VAN HELDEN (standing in for Mr. Ceuppens).
* Discussions on subcontract with University of Nairobi with prof. KARUE and Dr. NJOKA.

24.5 Travel by air to Marsabit, with Messrs. CHERUIYOT and HINGA.
Meeting with director and staff at NALRC. Presentation of proposals, projects and results.

25.5 Meeting at Marsabit with director and all staff. Continuation of presentation.

26.5 * Travel by road Marsabit - Kargi. Visit of substation.
* Travel by road Kargi - Olturot. Visit of substation.
* Travel by road Olturot - Ngurunit.

27.5 Presentation of Ngurunit station and activities in the area.

28.5 * Travel by road Ngurunit - Marsabit. Visit of proposed new field station in Kaisut desert.
* Visit of buildings of NALRC Marsabit.

29.5 Discussions at Marsabit with staff.
Wrap-up meeting.

30.5 Travel by air to Nairobi.

31.5 * Meeting at KARI Headquarters with Messrs. WACHIRA, CHERUIYOT, MIYOGO (Deputy Director Planning, Finance and Administration), WAFULA (new head of animal health), and VAN HELDEN.
* Final discussions with Dr. NJOKA and Prof. KARUE.
* Departure for Paris of Dr. UILENBERG.

1.6 Departure for Paris of Dr. BILLE.

APPENDIX II

SUBCONTRACT WITH UNIVERSITY OF NAIROBI

TERMS OF REFERENCE

1. Background

In order to support the Livestock Component of the Agriculture/Livestock Research Support Project, a linkage arrangement has been established between the Kenya Agricultural Research Institute (KARI) and the Institut d'Elevage et de Médecine Vétérinaire des Pays Tropicaux (IEMVT).

The Project Liaison Unit (PLU) of IEMVT has now carried out three missions, in 1989, 1990 and 1991. One of the recommendations put forward during the first mission was to establish a subcontract with the Department of Range Management of the University of Nairobi. The Department was to centralise existing relevant documentation in Kenya, prepare a state of knowledge report, organise workshops, identify problems and prepare a final report, including priority research programmes which are within the mandate of the two KARI centres on range and livestock research in arid and semi-arid regions of Kenya (NARLC, Marsabit and NRRC, Kiboko). This task has now been accomplished and the PLU has recommended in 1991 that a new subcontract be established with the Department of Range Management, this time to provide backstopping to research in both centres, complementary to the activities of the PLU.

2. Work Schedule

The Department of Range Management, under the leadership of Dr. Njoka (present Chairman) and Professor Karue, undertakes in both centres to:

i) Review progress and problems in the various research projects with the scientists concerned.
ii) Assist where required, in methodology, data analysis, reporting and publishing, solving constraints and problems where possible.
iii) Assist in obtaining relevant literature and in establishing contacts between individual scientists in the centres and specialists in relevant national and international institutions in Kenya.

In order to carry out these tasks, two visits of two weeks each will be paid to each of the centres, one visit of which is to coincide with the annual PLU mission. Moreover, a third visit of one week will be paid to one of the centres only, preferably on an alternating basis, during which the scientists of both centres will be united for work discussions, in order to achieve coordination and an exchange of ideas between both centres. The Department will report after each visit on their findings and activities to the PLU, with a copy to KARI, and outline problems which may be beyond their competence.

The first visit by the Department will be started in August/September 1991. Thereafter a joint visit with the PLU is scheduled for January/February of 1992 and 1993, followed by a visit of two weeks to each centre in May/June, and a week of work discussions in one of the centres in the first week of August 1992 and 1993.

The Department identifies Prof. C.N. Karue to lead the Livestock Production team, and Dr. Theuri J. Njoka to be in charge of the Range Resource Manafgement and Ecology team. One of these two team leaders, accompanied by a second specialist as appropriate, will carry out the backstopping services at each centre.

3. Duration of the Subcontract

The subcontract will start on 1st August 1991 and end on 31st December 1993, to coincide with the KARI/IEMVT linkage on research and training.