

SOMALIA FUNDS-IN-TRUST



TECHNICAL ASSISTANCE TO THE NORTHERN RANGELAND PROJECT

SOMALIA

PROJECT FINDINGS AND RECOMMENDATIONS

S O M A L I A F U N D S - I N - T R U S T

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PROJECT FINDINGS AND RECOMMENDATIONS

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the Government of Somalia
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1. INTRODUCTION

1.1 ORIGIN OF THE PROJECT

In 1972 the Government of Somalia, with the assistance of UNDP and FAO began a programme of research and training in rangeland conservation and development. This programme was carried out by the UNDP/FAO Rangelands Conservation and Development Project (SOM/72/033), which was based at Hargesia from 1972 to 1976 and largely confined to the climatically favoured West Galbeed Region.

As a result of the activities of SOM/72/033 and the effects of the disastrous drought of 1972-74 a much more extensive rangeland development project was proposed, and was appraised by a World Bank/International Development Association (IDA) mission in 1975. This project, the Northern Rangeland Development Project (NRDP), became operational in 1976 after the National Range Agency (NRA) was established in mid-1975.

The Northern Rangeland Development Project is executed under the supervision of NRA and has the objective of strengthening both the range and veterinary services of the Togdheer, Sanaag and Nugaal Regions, which cover a total area of 140 000 km², with a human population of 725 000 (as reported in the 1981 census).

In both 1977 and 1979 NRDP was modified to include an input from FAO, which then provided technical assistance in non-formal education, range training, range ecology, range management, animal health and forestry. At the same time the Kuwait Fund for Arab Economic Development (KFAED) provided loans for water conservation and stock water ponds, the construction of stock-holding reserves, and also for hydrology and agronomy projects. The FAO and KFAED components of NRDP operated in parallel from 1979 until 1981, when KFAED phased out, with the FAO component phasing out in 1982. Since 1977, the World Food Programme (WFP) project 719 'Reforestation and Rangeland Development' has directly assisted in the demarcation and protection of range reserves and the maintenance of forest nurseries through the provision of labourers and guards who receive daily rations.

The present project became operational at the beginning of March 1983 and was conceived as a two-year bridging phase, through which FAO would play a leading technical role in the continuation and consolidation of the

experimental field programme that emphasized range management, range training, fodder production, forestry and veterinary services, as previously initiated in the first phase (1979-82) of project UTF/SOM/022.

1.2 PROJECT OBJECTIVES

The purpose of the project, as stated in the Project Document, was to continue and to strengthen the activities already initiated in the first phase of the Northern Rangeland Project UTF/SOM/022 Phase I with a view to preparing sound technical guidelines for future range development programmes in northern Somalia.

The immediate objectives of the project were as follows:

- the continuation of existing and the initiation of new operational and experimental field programmes concerned with range management, range training, non-formal education, forage crops trials, forestry and veterinary services;
- the strengthening of the institutional infrastructure for range training;
- the preparation of terms of reference for the inventory and compilation of baseline resource data on the northern rangelands and the economic assessment of the viability of fodder production units in northern Somalia.

1.3 OFFICIAL ARRANGEMENTS AND REVISIONS

The project was executed under a Trust Fund Agreement between the Government of Somalia and FAO with funds provided by KFAED. NRA was named as the government counterpart agency. The starting date of the project was indicated as May 1982 and the Project Document was signed on 4 September 1982. In February 1985 an amendment to the Project Document was signed by the Government of Somalia and FAO. The purpose of this amendment was to extend the bridging phase until the end of December 1985 and to provide financial support for increasing expert personnel services by 30.5 man-months, as well as raising the financial allocation for training and the procurement of additional items of equipment and supplies. KFAED did not sanction the amendment, however.

In order to implement and guide the various technical activities of the project the Government requested that FAO provide a 12-man team of international experts, including a principal for the Burao Range Institute who might strengthen its organizational structure. A total budget of \$US 2 900 000 was allocated to cover the costs of the international component, of which the sum of \$US 1 474 000 was to be used for personnel services.

2. RESULTS AND CONCLUSIONS

2.1 GENERAL

All technical activities in the project area were seriously hindered throughout the project period by a lack of counterpart funds for the general operation of the project and for the purchase of equipment, spare parts, supplies and materials. Unfortunately, these counterpart funds depended on withdrawals from a KFAED loan established for this purpose, which could not be drawn upon for various reasons. Another constraint which curtailed field activities was the acute shortage of fuel for project vehicles. Travel was also intermittently restricted or prevented for security considerations in the project area. Although many of the counterpart staff were highly motivated, the absence of adequate salary remuneration for all national staff working in the remote and difficult conditions of the project area acted as a disincentive to maintaining a well-trained core of staff on a long-term basis. A further constraint was the absence of the National Project Director, often for long periods, from the project area. This situation was unfortunate for the project, particularly because the National Director has long and deep experience of the conditions of the Northern Rangeland Project, having served with it since its inception in 1976. Although the recruitment of FAO staff was generally according to schedule, recruitment difficulties caused delays in the arrival of the range ecologist and the microbiologist. The range ecologist post took ten months to be filled and, at the time of writing, over one year has elapsed since the microbiologist left and the post still remains vacant. Details of project staffing are given in Appendix 1.

2.2 RANGE MANAGEMENT

Principal activities in the field of range management included the development of terms of reference for the inventory and compilation of baseline resource data, to be used as guidelines for a possible second phase of the NRDP and the introduction of improved grazing practices inside established grazing reserves while maintaining livestock performance.

The terms of reference referred to, involving data collection, standards and guidelines, were formulated for land adjudication; mapping and aerial photograph needs; a range vegetation survey; a range survey handbook; an animal health survey; agroclimatology; livestock production systems; and a forestry resources inventory. These took longer to develop than anticipated, because the input from FAO personnel, who were late in joining the project, was also needed. However, the completed terms of reference were finally submitted to the Government and FAO in early 1984. Although they received general acceptance, they have not yet been utilized to prepare a follow-up second phase to the project because an interested donor has not yet been identified.

With regard to the introduction of improved grazing practices inside established grazing reserves, a grazing management plan for the Jaleelo Demonstration Reserve was developed, which indicated grazing schedules and range treatments to improve the range. Unfortunately, the plan was not implemented because of the project's inability to control livestock movement and use. This, in turn, was due to the difficulty experienced in obtaining the cooperation of the graziers, who destroyed the fence enclosing the grazing reserve. In order to correct this problem, project emphasis was changed from that of a demonstration approach to one of teaching the graziers the principles of proper grazing management. This was accomplished by holding short seminars for nomadic elders at the regional, district and village levels. Accordingly, a range-management seminar, planned and conducted in the Toghdeer Region, was attended by approximately 85 elders and 6 women from various districts in the Region. This week-long seminar was followed up with additional one- and two-day seminars held in ten villages covering the various districts. Through this extension programme it was possible to reach a broad representation of the livestock owners using the rangelands and to make them more aware of their overgrazing practices, which were having a detrimental effect on the environment of northern Somalia.

However, it is accepted that if funding had been available to replace the broken fencing around the Jaleelo Reserve, a range management demonstration would have proved more effective than teaching the principles of range management - a less favourable, but necessary alternative - which nevertheless was essential for obtaining the full participation of the livestock owners in an agreed grazing-management programme.

In addition to these activities, a detailed range management plan was developed, in conjunction with Somali Action Aid, for the Fodder Production Unit at Yufleh in the Sanaag Region. For the Tuyo Reserve also, situated in the western part of the Togdheer Region, the range management plan was revised to change the grazing system so that grazing could be used as a management tool for preventing the spread of woody species into the Tuyo Plain. Additional water developments were also located and planned in conjunction with this revision.

2.3 RANGE ECOLOGY

The original terms of reference and work plan for the project called for the preparation of a range site map and the establishment of monitoring sites throughout the project area. However, since research management and research consultants, under a contract with the National Range Agency, had already completed these tasks through their preparation of a range unit map of the northern rangelands at a scale of 1:250 000 and also indicated carrying capacity, it was decided that rather than duplicate this work it would be more practical to utilize the data already available for range management planning. Accordingly, a new work plan was developed for range ecology, which focused on range survey and planning, teaching and the collection of plants to enhance the development of the range herbarium.

Range survey and planning work was conducted on selected cooperative ranches and grazing reserves in the project area. A survey of the Aroori Holding Grounús in the Aroori Plain, located 25 km southeast of Burao, led to the preparation of a draft report that provided recommendations on the use and development of the area for quarantine, and animal production/health and grazing trials. A plan was also prepared which indicated carrying capacity, improvements needed and a proposed grazing system. However, although this plan was submitted to the National Range Agency for approval, it had not been implemented by the end of the project period, owing to lack of funds. Preliminary work in the preparation of a management plan for the Hudan Cooperative Ranch in the Nugal Region, involving the collection of production data and interviewing cooperative members, was undertaken. In order to ensure that any management plans or proposals made for cooperatives and grazing reserves were not in conflict with traditional grazing practices and management, two separate questionnaires were prepared, one for nomads and villagers and the other for animal traders. These questionnaires

were used to obtain information on how animals and land were managed and how animals were bought and sold.

At a later stage of the project, a grazing management plan based on earlier range-management planning was developed for the Haber Heshey Cooperative Ranch in the Toghdeer Region. The grazing capacity was eventually estimated to be 566 Somali Animal Units, after meetings with the members of the cooperative who had initially proposed a grazing capacity of 1 250 Somali Animal Units. In order to facilitate the determination of a viable management plan, a map was prepared of the ranch indicating the basic features and also the different vegetation units. This map incorporated information gained from the 1952 aerial photographs (1:250 000) and the 1981 range unit maps prepared by research management and research consultants in 1981, with the addition of appropriate ground checking.

Because meaningful production data from cooperative ranches and grazing ranches and grazing reserves in the project area were not available, some 40 fenced plots were established covering different vegetation units in the Sanaag (Erigavo and El-Afwein Districts) and Toghdeer (Burao and Odweine Districts) Regions. These plots, which comprised 25 m² for grassland and 400 m² for shrubland, were needed to obtain reliable data on range production through the clipping and weighing of the native vegetation. The generation of such data is of special importance for assisting in the establishment of new grazing reserves and cooperative ranches.

The range ecology programme also gave major support to the Burao Range Institute through an ecology course for the students there that was organized by the project's two ecologists. To assist the range-management seminar held in the Toghdeer Region in March 1985, separate presentations on cooperative ranches; grazing and drought reserves; land clearing; range laws; and nomadism were also made, to provide orientation training for the participating elders.

The establishment of a herbarium at the Burao Range Institute, initially with 66 important native range plants comprising the vegetation of the northern rangelands, also provided a useful teaching tool for the resident students as well as for visiting range managers from the National Range Agency.

2.4 FODDER AGRONOMY

The fodder agronomy programme included field-scale trials of introduced and native forage crop species, forage-crop seed multiplication trials, an economic evaluation of fodder-crop units and evaluation of existing agricultural equipment.

The first two components of the programme were located at the Quoita Fodder Production Unit. For the forage species trials, 32 half-hectare plots were established and planted with different species both in pure stands and in combination. Data were collected from these plots at different intervals after planting. The results obtained confirmed those of previous trials and showed that Cenchrus ciliaris was the best adapted of all the species planted. Past seeding trials were evaluated along with those of the project and should be adequate to guide future reseeding efforts without recourse to additional trials. Small-plot forage-crop trials were also established in the Burao Nursery, where irrigation was provided, and trial results were sent to project headquarters.

For the seed multiplication trials considerable quantities of seeds of the native perennial grasses Andropogon kelleri, Cenchrus ciliaris, Chrysopogon aucheri, Sporobolus rusopolianus and Themeda triandra were collected from protected range areas and more than 1t of exotic fodder crop seeds, including the perennial grasses Cenchrus ciliaris and Chloris gayana, the annual grass Sorghum sudanense and the perennial legumes Stylosanthes guianensis and Stylosanthes hamata, were introduced from Australia.

A 150-ha area of rangeland at the Quoita Fodder Production Unit was harrowed in preparation for these trials, but immediately after the seeds were planted, the area was subject to a heavy ant infestation which reduced the seed numbers. Although some of the seeds germinated during the 'Gu' rains, a caterpillar infestation further decimated the seed numbers, which were then even further reduced by the subsequent drought. As a consequence, the results for the seed multiplication plantings were disappointing, although even with these constraints, Cenchrus ciliaris still proved to be the most adaptable species. Seed multiplication trials utilizing a restricted number of native and exotic species were also established on small plots in the Burao Nursery and the seeds were harvested for further planting.

A number of native and exotic fodder trees and shrubs also received preliminary attention. At the Quoita Fodder Production Unit a 3-ha plot was planted with the native tree Cordeauxia edulis to determine its

suitability for propagation outside its normal area of distribution, the central rangelands on the reddish, Haud-type loamy sands. Germination and growth results were satisfactory until native squirrels found the plantation and destroyed the seedlings. This experience emphasizes the need for rodent-proof fencing to protect new plantations. At the Burao Nursery seedlings of other native and exotic fodder trees and shrubs, including Acacia nilotica var. indica, Acacia saligna, Atriplex canescens, Atriplex coriacea, Atriplex nummularia and Pithecolobium dulce were successfully raised.

The construction of fodder production units became an important aspect of development in the Northern Rangelands Project. However, the two consultancies undertaken during the project concluded that fodder-crop production is not a cost-effective practice and that better use could be made of the heavy machinery already committed to this task, for example in constructing water ponds. The main problem currently affecting the development of viable fodder-production areas is that work has been undertaken before the necessary basic information was collected on soil properties, rainfall frequency or intensities from which bund design could be more precisely calculated in order to withstand the inflows of water they are likely to receive. Also, no range-productivity data were collected prior to construction of the bunds to determine whether or not forage production was likely to be significantly increased by the development work. In fact, some evidence suggests that protecting a range area from grazing alone will achieve almost the same increase in forage production as that produced by fully-developed fodder production sites. If this proves to be the case then alternative and cheaper soil and water conservation measures, such as soil scarification and pitting, could prove equally as effective as bunding and therefore merit future investigation.

One of the main purposes of the Fodder Production Units is to feed livestock en route to the port of Berbera where they are shipped for export. The private sector, with its own enclosed natural grassland areas such as those near Odweine, also provides substantial quantities of fodder in the form of hay for livestock being trekked to Berbera. There is clearly an opportunity to encourage and expand this practice, since the private farmers involved have demonstrated their willingness and ability to do it.

Although a complete inventory of all agricultural equipment was made it did not prove possible to test the various machinery available, such as

cultivators, mowers and balers, for their suitability for soil scarification and the mechanical harvesting of hay in the Fodder Production Units.

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2.5 RANGE TRAINING

The range training programme necessitated the revision of the curriculum at the Burao Range Institute, and the provision of technical books, teaching aids and audiovisual equipment. A further requirement was the provision of a greater practical emphasis when training students, in order to complement the theoretical component of the course work.

The revised range training curriculum encompassed the use of simple surveying instruments, the identification of plants in the field, planting methods and vegetation survey methods. Machinery capability and use was also included in the curriculum, for example, the use of tractors, ploughs and discs etc. Most of the practical field work was carried out within walking distance of the Institute because of the lack of transportation. Thus the students were unable to see other vegetation and soil types, or past and present range-improvement practices.

In order to overcome the shortage of teachers, teaching aids and textbooks, the range training programme provided support for the Burao Range Institute by teaching a regular series of classes organized by the project's range training specialist and assisted by other specialists in the FAO team. Typed copies of all lectures and presentations were distributed to the students. The lack of textbooks and visual and teaching aids was partially overcome by purchasing them abroad, but this did not meet the entire needs of the Institute.

Although the Burao Range Institute was less than satisfactorily equipped and staffed, approximately 30 students graduated from it in each year of two years of the project. The majority of these graduates were employed by the Government in the agencies where a relevant need existed. Despite budgetary constraints, approximately 60 students received diplomas from the Institute and these will increase the country's ability to deal with resource management.

However, if the Burao Range Institute is to operate more effectively in the future more attention needs to be given to the age at which students are accepted at the Institute and their proficiency in English.

At present, students are accepted directly from intermediate schools and can therefore graduate at the age of 16, which is a very young age for someone to be able to act with confidence as a range administrator and to deal effectively with nomadic pastoralists. Furthermore, because many of the students coming to the Institute have minimal proficiency in English, much of the time in the first year of their course is devoted to language teaching.

2.6 FORESTRY

The forestry programme was intended to establish new or reactivate old forestry nurseries at Burao and Berbera and to assist other nurseries in the project area with technical advice; to initiate field-scale forest-tree trials in at least one fodder production site by planting native and introduced species; to demarcate and survey the boundaries of existing forest reserves; and to map and compile an inventory of a pilot forest area in two reserves.

During the project period significant progress was made in revitalizing the nursery activities at Burao, Berbera and Hargesia, and to a lesser extent at Erigavo and Halin. Forestry workers were employed, soil and fertilizer obtained and seeds planted. The work resulted in tree seedlings being produced for outplanting.

However, due to the failure of the 'Gu' rains in 1984, the nursery stock raised in the Berbera and Hargesia nurseries was not outplanted, although voluntary agencies at Hargesia were persuaded to plant nearly 20 000 tree seedlings in their project areas, where supplementary irrigation was available. At Sheikh, Debbis, Erigavo, Halin and Garowe the 'Gu' rains were sufficient to permit nursery stock to be outplanted as planned. At the Burao Nursery the 1984 production of tree seedlings was outplanted in the Qoita Fodder Production Unit, but the tree seedlings were severely grazed by trespassing livestock in spite of the close proximity of range guards. In order to provide additional nursery space at Burao a new nursery site was planned but could not be developed because of budget constraints.

The field-scale forest tree trials were concentrated at the Qoita Fodder Production Unit where the species planted included Acacia cyanophylla, Acacia nilotica var. indica, Acacia tortilis, Atriplex canescens, Atriplex

nummularia, Azadirachta indica, Eucalyptus camaldulensis, Leucaena leucocephala, Pithecolobium dulce, Prosopis juliflora and Ziziphus mauritianus. Although it was too early to draw any conclusions from the survival data collected during the project, these field trials are expected to identify the most appropriate species for establishing village woodlots, as soon as funds are available for protecting such plantations. Test plantings of Simmondsia chinensis (jojoba) were also made in the Burao Nursery for a private cooperative/government project.

In the absence of local staff with the required technical knowledge and available time, the task of surveying and demarcating forest reserves was not undertaken. Instead, efforts were devoted to the establishment of a seed-testing laboratory, which was considered to have a higher priority. A seed collection, testing and storage programme was set up at Burao, which provided seed for all the nurseries in the project area. Phenological data were collected on most of the native trees in the region and ample quantities of seed of all the important fodder tree and shrub species mentioned above, and also Acacia salicina, Atriplex coriacea, Cassia siamea, Cassia struthii, Conocarpus lancifolius, Eucalyptus gomophocephala and Parkinsonia aculeata, were stored or distributed as necessary. All the seeds collected were subjected to germination, viability and longevity tests, and then dried to controlled limits. Seed distributions were accompanied by full instructions (in English and Somali) on the best pre-treatment and nursery techniques for raising the seed.

In support of the teaching programme at the Burao Range Institute, a forestry course was taught for two or three school terms and a forestry seminar for all the forestry staff in the Northern Rangelands Project was held in December 1983 to teach forest nursery practices.

2.7 ANIMAL HEALTH

A general programme for the control of important animal diseases in the project area was the main objective of the veterinary services component of the Northern Rangelands Project. In order to accomplish this, a principal requirement was also that of strengthening the veterinary diagnostic facilities, utilizing the laboratory equipment already available at the Burao Veterinary Laboratory. In the early stages of the project,

major efforts were expended for testing and installing the necessary laboratory equipment and arranging for supplies and materials to make the laboratory fully operational.

A major achievement of the programme was the establishment of a disease surveillance system based on field and slaughterhouse surveys located principally in the Toghdeer Region. Information from other regions of the project area was obtained during outbreak investigations, routine visits and through the cooperation of livestock coordinators located in different parts of the project area. The results of the general disease surveys conducted in the field, as well as the serology slaughterhouse survey and relevant information from epidemiological intelligence, confirmed the presence of economically important diseases in the project area that warrant immediate control measures (see Section 3.7).

The programme also prepared a detailed handbook on laboratory procedures for analysing and isolating most of the common diseases in northern Somalia, as well as a plan for prevention and control of livestock diseases, both of which should prove invaluable aids for improving animal health in northern Somalia. The laboratory and field training provided to national counterparts should also make it possible for the important task of livestock disease survey and control to be continued, based on the now fully functional diagnostic laboratory at Burao.

2.8 MACHINERY WORKSHOP

The work programme for the establishment of the machinery workshop gave priority to devising an ordering and inventory system, analysing of the need for specific tools and equipment, making the workshop fully operational and providing training for national counterparts on the maintenance and management of project equipment.

An inventory of the condition and maintenance needs of all project equipment was first undertaken. In addition, an inventory of all spare parts was begun using a Cardex system in order to record the quantity and disbursement of all spare parts and equipment. A storekeeper was trained to maintain the system. As the inventory progressed, a new spare-parts store at the machinery workshop was established and all spare parts placed in bins for easy access. The workshop floor was relaid, which allowed for easier cleaning, all equipment was installed and tested and a washing facility constructed.

Training of mechanics and national counterparts progressed throughout the project period. However, the training was necessarily restricted to the repair and maintenance of equipment for which spare parts were available. Although the training of fully qualified mechanics was hindered by their lack of knowledge of English, it was still possible to impart much practical knowledge through visual demonstrations on various types of equipment. A further contribution of the programme was the completion of preventive maintenance plans for all project equipment and vehicles and the preparation of instruction manuals for welding, electrical systems and the use of calipers (see Appendix 4).

The machinery workshop programme gave valuable support to the accomplishment of both the fodder crop and forestry components of the project, especially after the departure of the two experts in charge of these areas.

Certain tasks, however, such as the installation of heavy workshop machinery (lathe, grinder, hacksaw etc.) on permanent solid foundations; the linking up of the workshop to the Burao town water and electrical supply; and the establishment of a permanent petrol, oil and lubricant supply for workshop use could not be carried out, owing to budgetary constraints.

3. RECOMMENDATIONS

3.1 STAFFING AND MANAGEMENT

Because the northern rangelands of Somalia cover a very large area with a poorly established infrastructure, their future improvement will require the highest priority in the Government's development plans. This also implies a long-term commitment in terms of personnel and management and, in addition, a realistic goal with regard to the number of regions that can initially be covered.

In these circumstances it is recommended that full consideration be given to fielding a well-supported and motivated multidisciplinary team of national specialists who, with the full agreement and participation of the range users, will implement over at least a five-year period a viable range development plan initially covering one selected region of the northern rangelands area.

3.2 RANGE MANAGEMENT

There is an urgent need to implement appropriate range management measures to overcome the adverse effects of the serious and widespread overgrazing that continues to occur throughout the northern rangelands area. Essentially, this requires balancing the number of grazing animals with the existing range feed supplies. It also implies that the traditional practice of uncontrolled grazing must be brought under control and a system of rest-rotation grazing be established, so that the process of restoring the vegetation cover based on sound ecological principles can begin. However, such measures are unlikely to succeed without the full support and participation of the pastoralists.

In order to gain the confidence of the pastoralists and to strengthen the effectiveness of the existing grazing reserves it is recommended that a properly-controlled grazing demonstration be carried out at a selected grazing reserve in the northern rangelands area, which ensures that the number of livestock are correctly balanced with the range capacity, and that an effective monitoring programme be implemented that prevents the trespassing of unauthorized livestock.

3.3 RANGE ECOLOGY

The continuing deterioration of the northern rangelands through widespread overgrazing and prolonged periods of drought is also leading to a rapid decrease of their carrying capacity. This means that the range management plans already prepared over the past four to five years for various grazing reserves and cooperative ranches, but not implemented, almost certainly need to be reviewed and updated. In fact, many cooperative ranches and even grazing reserves have been established without a satisfactory determination of their carrying capacity and demarcation of their boundaries. This also results in encroachment of cooperative ranch livestock onto open communal ranges and by nomadic livestock on to cooperative ranches.

In the light of all these factors it is recommended that grazing capacity determination and demarcation of the boundaries of established ranches and grazing reserves be completed. This should ensure that the cooperative ranches are large enough to allow for future increases in livestock numbers arising from the growth of existing families of cooperative members. Range management plans already prepared for existing cooperative ranches and grazing reserves should, after discussion and agreement with their members, be implemented before preparing any new range management plans for other ranches and reserves.

3.4 FODDER AGRONOMY

Despite the considerable efforts already expended for the establishment of fodder production units on favourable range sites in the northern rangelands area, their viability and usefulness has still not been properly demonstrated. In addition, no decisions have yet been taken on how and by whom the fodder produced should be utilized. Clearly, more concentrated inputs are needed to demonstrate how both artificially reseeded and native grassland fodder production units can be effectively managed and utilized on a continuing basis.

In view of the importance of fodder production units for providing surplus fodder, particularly in times of drought, it is recommended that an early decision be taken on which pastoralist groups should be given rights of fodder use in each of the existing fodder production units, and that a controlled fodder production utilization demonstration be set up at two fodder production units, one with native grassland and one with

reseeded grasses, in order to compare the performance obtained when harvesting the fodder produced for hay and when grazing the fodder with different types of livestock.

3.5 RANGE TRAINING

Although the Burao Range Institute continues to play a central role in helping to fill the need for trained national staff in the field of range management throughout Somali, it has not so far been provided with sufficient facilities, equipment and teachers to function effectively. In particular, better housing, living and teaching facilities are required for the students. Furthermore, the students should be more carefully selected for entry, with regard to their age and experience.

In these circumstances it is recommended that priority be given to upgrading the housing, living and teaching facilities of the Burao Range Institute, as outlined in the Skull Report (see Appendix 4), and that the entry criteria for students be raised to include only secondary level students who speak and understand English, or alternatively to change the medium of instruction to the Somali language. This second alternative should attempt to provide lectures and presentations which would also directly benefit any seminars or orientation courses for nomadic pastoralists.

3.6 FORESTRY

Although considerable progress was made in propagating native and exotic tree species in nurseries and planting-out tree seedlings in field-scale forest-tree trials in the northern rangelands area, the difficulty of providing adequate protection for newly-established forest plantations still poses a major problem. In addition, deforestation still continues at a considerable rate in this area and the wide-scale destruction of native forest stands, which are a valuable forest resource, already poses a serious threat to the environment.

In view of the urgent need to protect existing and newly-established forest plantations, and to provide further support for an expanding forestry programme, it is recommended that priority attention be given by the National Range Agency to enlisting the support of the pastoral

population for providing, through the recruitment of resident forest guards, on-the-spot protection of forest plantations; this should be done in close liaison with the Charcoal Cooperative. Furthermore, the establishment of new forest plantations should concentrate on the planting of multipurpose tree species, those useful for fodder, fuel and the enrichment of the soil. These measures should be properly reinforced by well-run forest nurseries and the establishment of a fully operational seed storage and testing centre at Burao headed by a trained seed technologist.

3.7 ANIMAL HEALTH

Despite the short duration of the animal health programme, the establishment of a disease surveillance system enabled the economically important livestock diseases in the northern rangelands area to be properly identified through the use of field and slaughterhouse surveys and diagnostic techniques using the Burao Veterinary Laboratory. However, in order to mount effective control measures in the future, a constant review procedure to provide vigilant surveillance of existing and emergent animal diseases needs to be established that incorporates the strengthening of outreach clinical services and the keeping of up-to-date records and the processing of survey data. These activities should be devoted to rinderpest, CBPP/CCPP 1/, tick-borne diseases, helminthiasis, sheep pox, camel pox, bronchopneumonia, anthrax, foot-and-mouth disease and trypanosomiasis.

In order to promote the disease intelligence infrastructure required, it is recommended that the training of specialist staff at the Burao Veterinary Laboratory be intensified and that particular attention be given to gaining the cooperation of the pastoralists in implementing outreach vaccination services. This measure should involve, wherever possible, the selection and practical training of promising livestockmen who could act as animal health assistants, as well as ensuring that a ready supply of drugs is available to treat the major livestock disease outbreaks, which in turn will help to ensure the continued support of the livestock owners for the overall animal health programme.

1/ Contagious bovine pleuropneumonia/contagious caprine pleuropneumonia

3.8 MACHINERY WORKSHOP

Despite the good progress made in devising a preventive maintenance programme for a wide range of machinery, the Burao machinery workshop still lacks some specialized tools and equipment as well as spare parts, which could not be ordered owing to lack of funds. Moreover, the workshop is still not connected to the Burao Town main water and electricity supply. The need also exists to make more efficient use of the workshop staff through the reallocation of personnel, in order to provide sufficient staff to operate the field-oriented preventive maintenance programme and to allow other staff to be trained to operate the specialized sections of the workshop dealing with electrical, hydraulic and fuel systems and components.

To assist in meeting these needs it is recommended that priority attention be given to recruiting fully qualified mechanics as well as further workshop mechanics and helpers from the Burao Technical Institute. These can assist with the reorientation of the work programme of the Burao machinery workshop. Provision also needs to be made for: procuring a heavy duty service vehicle with a manual hoist for shifting heavy loads; erecting a proper lubricant store; and ensuring that the workshop is connected to Burao Town's main water and electricity supply.

Appendix 1

PROJECT STAFF

<u>Name</u>		<u>Dates of service</u>	
		<u>Starting date</u>	<u>Concluding date</u>
<u>International</u>			
J.L. Mower	Team Leader	April 1983	June 1985
V. Raman	Administrative Officer	April 1983	June 1985
B. Hatlebrekke	Workshop Mechanic	March 1983	June 1985
D. Richards	Agronomist	April 1983	April 1984
F.M. Madlangbayan	Laboratory Technician	April 1983	Jan. 1984
T. Jayatileka	Veterinary Officer, Epidemiologist	Feb. 1984	June 1985
H. Hariharan	Veterinary Officer, Microbiologist	Aug. 1983	June 1984
O. Okafo	Forestry Officer	July 1983	March 1985
M. Hassenan	Range Training Officer	Sept. 1983	March 1985
M. Tas	Range Ecologist	Oct. 1984	June 1985
J.R. Maconochie	Range Ecologist	July 1983	Jan. 1984
<u>Consultants</u>			
P.M. Finlayson	Farm Management	Nov. 1983	Dec. 1983
D. Layzell	Soil and Water Conservation	Dec. 1983	Dec. 1983
<u>National</u>			
H.A. Darqooshe	Secretary	Jan. 1984	June 1985
M.A. Robleh	Driver	June 1983	June 1985
H.M. Jama	Driver	June 1983	June 1985
Y.S. Jaamac	Driver	June 1983	June 1984

Appendix 2

FELLOWSHIP

One application for a fellowship was submitted, and the candidate, Abdullahi Abdi Mohamed, was approved by the Somali Government, cleared by FAO headquarters, and accepted by Utah State University. It was not, however, possible to implement the fellowship during the project.

Appendix 3

MAJOR EQUIPMENT PROVIDED BY THE PROJECT

<u>Item</u>	<u>Quantity</u>	<u>Value \$US</u>
Landrover station wagon	6	57 160
Ink duplicator, Gestetner	1	1 797
Prefabricated houses	2	36 219

Appendix 4

DOCUMENTS AND REPORTS PREPARED BY THE PROJECT

Nursery Techniques (Ziziphus mauritianus)
 Nursery Techniques (Leucaena leucocephala)
 Nursery Techniques (Azadirachta indica)
 Field Planting Methods (Forestry)
 Haber Heshey Grazing Management Plan
 Tuyo Grazing Management Plan
 Strategy for Control of Major Animal Diseases
 Veterinary Laboratory Methods
 Range Inventories Training Manual
 Gas Welding Training Manual
 Arc Welding Manual
 Instruction Manual for Sliding Caliper and Micrometer
 Instruction Manual for Vehicle Electrical Systems
 Recommendations for Seeding Trials

Reports

FAO Interim Evaluation Report UTFN/SOM/O22/SOM Northern Rangeland Project,
 1984 Somalia, Mimeo

Finlayson, P.M. Farm Management Consultancy Report, Mimeo
 1983

Hassanen, M.S.R. Final Report on Range Management Training, Mimeo
 1985

Hattlebrekke, B. Final Report on the Machinery Workshop, Mimeo
 1984

Layzell, P. Soil and Water Conservation Consultancy Report, Mimeo
 1983

Okafu, A.A. Final Report on Forestry, Mimeo
 1984

Richards, D.M.V. Final Report on Fodder Crops, Mimeo
 1984

Skull, M. Consultancy Report on the Burao Range Institute, Mimeo
 1982

Tas, M. Final Report on Range Ecology, Mimeo