

PD AAP 887

Niger Range and Livestock Project

Project Review Paper

	Page
1. Priority and Relevance	1
2. Project Description	5
A. Sector Goal and Project Purpose	5
B. Project Activities and Outputs	8
C. Project Inputs	12
D. Assumptions	15
3. AID and Other Relevant Experience	18
A. AID Experience	18
B. Other Donor Activity	19
4. Beneficiaries	21
5. Feasibility Issues	23
A. Social Issues	23
B. Economic Feasibility	26
C. Technical Issues	28
D. Financial Issues	29
6. Other Donor Coordination (omitted in this PRP)	
7. Project Financial Plan	32
8. Implementation Schedule	33
9. Project Development Plan	35
10. Attachments	38
A. Preliminary Logical Framework (original only)	
B. Bibliography	
C. Technical Report by Experience Inc.	

Niger Range and Livestock Project Review Paper

1. Priority/Relevancy

Livestock production is a major means of subsistence for the majority of the Sahelian regions of Niger and on the national level a major source of income, employment and foreign exchange. In 1972, the last pre-drought year, Niger's cattle population was estimated to be over four million head and contributed to 12% of the value of the country's GDP and estimated 20-25% of the export earnings. The recent drought has reduced the national cattle population by an estimated 30-40%. Thus the shortfall that already exists in the supply of meat and livestock products can be expected to increase in the foreseeable future. Cattle losses were considerably higher in the zone between the 200mm and the 400mm rainfall isohets referred to hereafter as the pastoral zone. As could be expected, the drought has reduced the potential economic resources of the nation and has left numerous nomad families destitute, without the means of meeting their most basic needs. The current plight of the nomads is a direct result of several years of less than normal rainfall. It has become clear that the effects of the drought were greatly accentuated because the carrying capacity of the rangeland had been exceeded. Without a doubt, Niger will soon be faced with the basic problem of meeting meat demand with clearly limited production resources.

The national development strategy in recent years has acknowledged the potential of livestock production both as a means of income generation

and food production. Prior to the drought the GON had developed a broad based program to increase overall production and per unit productivity in the livestock sector. The first element of the national long term general coverage strategy is the provision of animal health services. To date these have concentrated successfully on the reduction of contagious diseases. The second element of this strategy based largely on several in-depth studies by French research agencies (particularly SEDES*) as determined by agroclimatic conditions.

The project activities that mesh together to carry out this national development strategy are largely area specific projects such as departmental health services, departmental productivity projects, or the creation of basic infrastructure such as marketing improvements, slaughter houses, and the implantation of production facilities required by the planned zonal specialization.

In addition to the long term development strategy briefly outlined above, problems created by the drought are being addressed on a priority basis by the GON. These short term activities involve the distribution of goats, sheep, camels and sometimes cows to herders having lost their animals during the drought.

Because of similarities in climatic and agrostrorological conditions existing between the southwestern United States and parts of the Sahelian pasture zone, AID has been requested by the GON to assist in the development of their livestock sector. It was suggested that AID explore various

*Societe des Etudes pour le Developpement Economique et Social

interventions designed to increase herd productivity in a triangular area delineated by the towns of Agadez, Tahoua, and Tanout.

In response to this request, we are proposing the introduction of range resource management practices which will increase herd productivity. Secondly the proposed project will work toward creating an institutional capacity within the GON which can advise and assist herders to use the existing water and pasture resources to optimize production while observing the delicate limits the existing range can carry.

Restated in slightly different terms, this project will attempt to optimize livestock production within the constraints of a) rudimentary monetarized economy in the area, b) limited supplies of water, c) annual grasses produced by highly variable rainfall and recurring droughts, and d) limited governmental resources to carry on such activities once donor support is withdrawn.

Although this response provides guidelines for a wide range of possible interventions, this project will be limited to those having both a direct impact on and being potentially compatible with traditional herding practices in the Sahelian pastoral zone. The triangular area suggested by the GOM has several comparative advantages for livestock production:

a) it has large expanses of rangeland not suitable for other types of agricultural activity,

b) grazing animals in the area entails a minimum of interference with agricultural production,

c) an indigenous population skilled in livestock production in the fragile environment,

d) animal disease is generally under control,

e) it is the region where calves are born and consequently, animal husbandry failings in this area permanently limit the productivity of the animals in later stages of growth, and finally,

f) interventions in the area will have the greatest direct impact on that part of the Nigerien population most seriously affected by the drought.

The extent of these effects and the rationale for the types of interventions proposed below are discussed at length in the CWR DAP.

In concluding this section, it must be emphasized that progress in the pastoral zone and the long term growth in Niger's livestock sector will ultimately require close interaction with the agricultural zones to the south where rainfall is higher and the possibility of increasing resources for animal nutrition over the long run is greater. Consequently, it is our view that if the initial phase is successful in the pastoral zone, this project may be expanded into an integrated livestock development project involving activities easing constraints on the entire system downstream in the other zones of livestock production specializations.

2. Project Description

A. Sector Goal and Project Purpose

The broad sector goal to which this project is expected to contribute is, increased per unit productivity and total production in the livestock sector. This will not only increase the supply of meat and other livestock products for internal consumption and export but, to the extent that production is increased in the labor intensive traditional sector, will also increase the incomes and standards of living of the poorest and most neglected segments of the Nigerian population.

The benefits to be achieved from this program are summarized in Logical Framework (Attachment B). It is expected that, through reduced calf mortality, better calf crop and more rapid weight gain, the offtake of cattle from the national herds will increase from 245,000 in 1974 to 420,000 head in 1980. While these goals are clearly ambitious, they are achievable in time if the GON can successfully introduce the required improved practices, infrastructure and supporting services on a national scale.

It is proposed that within the context of this project, AID and the GON undertake a project which initially will focus on the traditional herder population in the pastoral zone of Niger. The purpose of the project will be to a) develop and test methods of optimizing livestock production in the pastoral zone while preserving rangeland and water resources, b) reducing the devastating effects of future droughts on the traditional herds, c) developing a national

institutional capacity to carry out these interventions.

It is expected that at the end of the project a package of improved range management and animal husbandry practices will have been tested in the project area and that the means of transmitting this package of improved practices will be institutionalized and can be replicated in other parts of Niger. Although the precise measurement of benefits to be derived from this project is difficult to define and quantify at this time, we expect that some objective indicators of project achievement can be developed in preparing the project paper.

Before discussing the project activities and expected outputs, it is necessary to elaborate briefly on the existing livestock production system, Niger's overall livestock program and the future role of AID. This PRP describes the initial phase of what should be a long-term model program to increase the productivity of all the traditional herders in Niger and possibly in other parts of the Sahel. The objective of the first is to test ways of achieving this goal by working within the existing production system to the maximum extent possible. The traditional herders in the project area are adept stockmen acquainted with and, to varying degrees, practicing reasonable range and herd management principles, such as selection of herd sires and castrating inferior males, deferred pasturing, supplemental salt feeding and maximizing use of water resources in equilibrium with surrounding pasture.

This project will attempt to capitalize on these existing positive elements, increase their frequency of application and, while working within the traditional social structure, develop control and management units operating as a group in managed competition for limited resources rather than as individuals. There exist other means of introducing range management technologies but our view is that any attempt to rapidly impose this technology as a replacement for the existing production system would be socially disruptive and counterproductive. Several of these means of introducing technologies have been examined in the attached technical review (Appendix C). The project proposed herein involves a minimum of coercion (no fencing, no additional government-controlled watering sites) and a maximum appreciation of the traditional approaches to range and water management.*

Within this context, the project will explore improved practices which will increase the output of the rangeland and advance animal production through increased calving rates, reduced calf mortality and more rapid weight gain. Extension agents, working with the existing, loosely-knit clan organizations, will develop range resource management units which should reduce overgrazing, permit the improvement of pasture conditions and develop alternative modes of operation in the event of isolated or general droughts. Thirdly, the project will explore means of organizing public services to assist in the management of rangeland resources and increasing the productivity of herds. The geographical area of extensive activity

*Similar projects carried out in northern Nigeria are reported to have been successful.

will be limited to about one million hectares. However, the traditional grazing patterns, which the project does not propose to interrupt, dictate that there will be considerable movement of nomads and herds in and out of the project area. The benefits resulting from the project will thus be extended in a natural "outreach" manner to a larger area.

If Phase I is successful, an effective low-cost program to assist and improve the productivity of the traditional herder will have been developed, and a follow-up activity will then be possible which will benefit the entire pastoral zone with minimal inputs from outside donors. At the same time it is expected that the Phase I activity will have provided a basis for designing AID financed interventions outside of the pastoral zone which will address the downstream problems of fattening, marketing and slaughter.

B. Project Activities and Outputs.

The first output of this project will be the creation of a package of improved range management and animal production practices which will be aimed at increased productivity in the pastoral zone. This package will be based primarily on a Site Resource Inventory to be carried out prior to the preparation of the Project Paper. The objectives of the inventory will be to:

- select a specific project area
- determine what range and water resources are available in the area and estimate maximum grazing capacity
- obtain data on existing population and herds in the area and their migratory patterns.

This information will provide the basis for determining what range management and grazing control practices will be required in the project area. Efforts will be made during Phase I of the project to institutionalize the capacity to continually enlarge the area of this Site and Resource Inventory until the entire triangular area is covered. At that time, we would hope sufficiently experienced Nigerian personnel could carry on similar studies in other parts of the pastoral zone.

A second output will be the organization of individual herds into management units. Groupings of nomads already exists to some extent in the traditional social system. Some sociological studies and preliminary observations suggest that herd movements are established to some degree by group interaction. There is an awareness of the need for better management of range resources and it was observed by the PRP design team that some wells were voluntarily shut down to protect the adjacent pastures from encroaching herds. In discussions with group leaders, it was found that occasional meetings are held to discuss use of water and pasture resources and thereby lessening the inherent conflict situation. This project proposes to further explore these rudimentary management practices and build upon them instead of replacing them with other means of control.

A third output which will begin at an early stage is the building of a range management and animal husbandry capability at the national level and at the project site. This is the training component of the project. If the training input targets are achieved, six Nigerian professionals will have obtained degrees in non-veterinary livestock-related fields in the

U.S. and another 10-15 will have received shorter term non-degree training. In addition, an institution will have been established in Niger which will have a training capability in range management and animal husbandry. We expect that during the first two years of this project about 40 Nigeriens working in the project area will have received such training. It is hoped that project headquarters can be used to give the majority of the Livestock services staff a brief practical experience on a rotational basis in range management.

It is recognized that in general some development of additional water resources (surface and wells) will be necessary in order to permit full exploitation of all available grass lands. The project will therefore include provisions for installing additional watering points as shown necessary but only in the framework of a fully developed plan for the management of these new water resources designed in conjunction with the nomadic groups and only after having acquired their agreement to enforce this plan. As far as possible, construction and management of these resources will be carried out by the herders themselves.

The on-site activities and outputs of this project fall into two major categories, adaptive research and extension education.

(1) Adaptive research designed to develop, test and evaluate practical interventions to be disseminated by livestock extension agents. This adaptive research will concentrate on the following technical aspects

- range and water management
- fire protection and control

- systems of controlled grazing
- water resource development and management

(Here research will include developing and improving means of retaining greater surface water as well as underground water)

Herd management and animal husbandry

- improved selection of herd sires and castration of inferior males
 - improved calf nutrition
- (2) Modes of transferring improved practices to herders
- training of extension workers
 - formation of individual herders into management units to decrease manpower requirements of extension outreach
 - investigation of additional activities that can be undertaken by existing veterinary service

This is an illustrative list that will need to be refined on the basis of the resource inventory and better knowledge of existing production practices. As improved practices become accepted by herders in the project area, there should be measurable effects on livestock production. We will thus have a series of project results (outputs) relating to increased calving rate, reduced calf mortality, more rapid weight gain and other factors important to the production process.

Closely tied to the introduction of these improved practices will be various types of adaptive research to be planned and coordinated with IRAM. On the range management side there will be range indicator plots, water level

monitoring, investigation of various approaches to surface water development, forage nutrient analysis, and close monitoring of herd movements. With respect to animal husbandry, research will be carried out on animal nutrition, calving rates, calf mortality, weight gain, parasite control, improved breeding, etc. Finally, the adaptive research component of the project will include a number of economic studies related to marketing, herder incomes and consumption expenditures. Although the project seeks to work within the existing system to the maximum extent possible, certain project goals call for some basic motivational changes on the part of the traditional producers. Only by a close monitoring and evaluation of project activities will it be possible to reach conclusions with sufficient certainty to permit widespread applications in other parts of the pastoral zone.

C. Project Inputs

The inputs under this project will consist of personnel, training, commodities and "other costs". In the personnel category, AID will provide a three-man team consisting of advisors in range management, livestock production, and livestock education extension. It is expected that the local staff will perform the bulk of the extension work in cooperation with the extension advisor. The other members of the team will be largely responsible for developing and revising improved practices as well as monitoring and analyzing their effects on livestock production. In addition to the permanent staff,

there will be a need for short-term consultants to carry out such specific tasks as curriculum development, and other specialized skills as required including perhaps two evaluations during the life of the project.

The training inputs fall into three categories. First is long-term degree training (generally about two years) in the U.S. in fields related to range management and livestock production. As noted above, we propose that at least six Nigeriens be sent to the U.S. for this kind of training. Second is non-degree training in the U.S. There will be a number of Nigerien staff in Niamey and at the project site who will require specialized training and first-hand exposure to the various practices to be introduced under the project. This can best be done by organizing a short-term training program, perhaps through a Southwestern university, specifically designed to meet the needs of this project. It is expected that 10 to 15 Nigeriens would be sent for this type of training. Finally, there will be a local training component. Most of the local project staff will not require overseas training but will receive instruction in the various practices to be introduced in the project zone. This can be done using existing training institutions in Niamey. Specifically, we expect that AID will provide the supplies and curriculum development necessary to get the program underway. The training would be carried out by the staff of the institution with assistance from the project team and returning U.S. trainees.

Commodity inputs required by the project activities will primarily be light vehicles for transportation, heavy equipment for field work and construction of roads or firebreaks. It is expected that some supplementary salt and minerals will be provided in the project area.

In order to strengthen the existing veterinary services in the project area, the project proposes to furnish the arrondissement level personnel with the necessary vehicles and medical vaccine supplies they need. The precise needs of arrondissement centers are in the process of being defined and will be included in the P.P.

Lastly, commodities to be used in the adaptive research and training components of the project will be furnished by AID.

The "other cost" category of inputs includes local training, which was discussed above, construction, local salaries and other operating costs. The construction component consists primarily of the facilities at the project center (garages, warehouse, housing for local and American staff, corrals, bore well, etc.) The detailed listing and estimated costs of these items are shown in Section 7 below. Salaries will be provided for the local staff, most of whom will be providing range management and livestock production services in the area, but some of whom will perform equipment maintenance and office duties. Operating costs will consist of such items as fuel, other utilities, vehicle maintenance, etc.

D. Assumptions

In describing this project, it is necessary to make the key underlying assumptions explicit and assess the extent to which they could prevent the achievement of project objectives. At the level of project inputs, the most critical assumption is that personnel, both local and U.S. will be available. In view of the fact that recruiting qualified U.S. technicians for the type of rural development project proposed here is a time-consuming process, it is recommended that as soon as possible AID begin recruiting project staff and initiate discussions with the GON regarding counterparts and trainees. U.S. technicians identified at an early stage could participate in the final design of the project. If trainees became available prior to the start of the project, they could begin their training under the Regional Manpower Development Project. An important task of the P.P. design team will be to make a careful assessment of local manpower which is potentially available to work on this project.

The prime assumptions for achieving the project outputs is that the information needed for testing and evaluating the improved technical package can be obtained. Secondly, we are assuming that by keeping the initial interventions simple and by working as much as possible within the traditional structure that herders will be receptive to the technical practices being proposed. Thirdly, we assume sufficient numbers of qualified trainers can be recruited and trained. Lastly, we assume that the necessary commodities will arrive on a timely basis to permit the project outputs to be achieved.

Whereas the main assumptions with respect to project inputs and outputs are administrative and technical in nature, the achievement of the project purpose depends primarily on social and economic factors. The two key assumptions can be stated as:

(1) the improved range management and livestock production practices are sufficiently remunerative and compatible with the existing social and cultural systems for the traditional producer to accept them on a permanent basis;

(2) the government service personnel will understand the traditional system and its merits and can gain the acceptance of herders.

(3) a grazing control and livestock services organization can be initiated at a cost the country can afford yet which still has sufficient economic benefits to be worthwhile.

The implications of these assumptions and the likelihood of their being achieved are discussed at length in the economic and social analysis sections of this paper. The issues are complex and far from resolved at this time. Some of the work that will feed into the P.P. (the Site Resource Inventory, herder seminars, and an in-depth analysis of the costs and expected benefits of the improved package) will go far in resolving some of the issues noted in conjunction with this project.

As far as the sector goal is concerned, it is assumed that the GON will continue to assign a high priority to development in the

livestock sector and will be prepared to make the policy changes and resource allocations (especially manpower) necessary to achieve that end. As concerns this project, a more critical assumption is that the GON will be sensitive to the potential economic contributions -- and the needs -- of the traditional livestock producers and include them fully in the national program. This second assumption will require further discussion with the GON. However, it is our view that traditional herding in the pastoral zone cannot be ignored if Niger is to fully realize its potential in livestock production. Fortunately, the GON is aware of the economic importance of the pastoral zone and the traditional herder. It is our hope that if the interventions being proposed in this project are successful the GON will undertake the actions necessary to extend them to other areas where they are applicable.

3. AID and Other Relevant Experience

A. AID Experience

Although this will be the first project of its kind for the AID in Niger, an invaluable beginning has been made through the Entente Fund. A \$1 million AID/Entente Fund-financed project to develop Niger's cattle marketing infrastructure, including scales, holding pens and well improvement, is in the final stages of construction.

The GON has asked the AID to finance an integrated rural development project that has a heavy emphasis on livestock production. This \$5 million project, in the northern arrondissements of the Niamey department, would develop the livestock fattening capacity of small farmers and provide important marketing opportunities for the pastoral zone.

Outside of Niger, AID has designed and is beginning to implement major activities in Mali (the Sahel Grazing Activity of the Mali Livestock Sector Grant) and in Mauritania which have some similarity to what is being proposed here. The Sahel Grazing Activity covers 850,000 hectares (3,281 sq. miles) in the Sahel zone and proposes many of the same interventions that are contained in this project. It is also likely that grazing reserve projects financed by AID and the World Bank in Northern Nigeria will provide information useful to the design of this project. The ADO and REDSO will obtain whatever information exists on these various experiences for the use of the P.P. design team.

B. Other Donor Activity

19

There is relatively little other-donor experience in the area. Various studies funded by the FAC and conducted by the I.E.M.V.T. and S.E.D.E.S.* over the past seven years have provided large amounts of basic data on population, herd size, cattle populations and various physical characteristics of the pastoral zone. A development strategy, published by S.E.D.E.S. in 1973 under the title Rapport de Synthese, Projet de Modernisation de l'Elevage en Zone Pastoral, calls for a north-south stratification of the different stages of production (breeding, growth, fattening and slaughter) according to agroclimatic zones.

Four specific pilot "zones of intervention" (Tamesna Sud, Tejira, In Gouchoul, Kadzel Manga) and two fattening ranches (North Dakoro and North Gouré Ranches) have been identified but financing for these projects has yet to be procured.

The FAC finance a 10,000 sq hectare ranch operation north of Niamey which is currently self-supporting and supplies the capital meat market with 100 grass-raised head per week. In the same region, the Germans established a selective breeding station which has developed a greater milk and meat yield in the Azaouak zebu. These animals are currently being distributed on a credit basis to local farmers who participate in a short extension program designed by the station.

*Institute d'Elevage et de Médecine Veterinaire des Pays Tropicaux and Societe des Etudes pour le Developpement Economique et Social.

Within the context of drought recovery, herd-multiplication centers, producing 200 head per annum have been designed for all seven departments. Two, financed by the FED, are under construction and the OPEC countries have tentatively agreed to finance the others. This program has experienced numerous delays and the extent to which the original plans will be carried out is problematic at this time.

The remaining interventions in livestock production are taking place in the agricultural zone. The UNDP is involved in milk production for the Niamey market and is financing an agro-pastoral statistician for the Ministry of Rural Economy. The FED, FAC and Germans are participating in small farmer livestock fattening operations where credit is made available for livestock purchase in areas where agricultural by-products or river-irrigated fodder is available.

At the moment there seems to be very little coordination of these various activities. In preparing the PRP the design team has established that the proposed project does not duplicate and is not in conflict with other aspects of Niger's livestock program. It is not expected that there will be any other donor participation in this particular project but larger follow-up programs could possibly be multi-donor efforts.

4. Beneficiaries

21

The target population for this project consists of livestock producers operating in the pastoral zones of Niger. These are nomadic groups (primarily Fulani and Tuaregs) numbering about 600,000 who have been seriously affected by the drought and depend almost entirely on their herds for their livelihood. In the long run, increased security against drought and higher standards of living for these people depends on the adoption of more efficient range management and animal husbandry practices, such as those proposed in this project.

To the extent that the proposed improved practices are successful, the herders in the project area will be direct beneficiaries. As the practices are replicated elsewhere, larger numbers will benefit from such improvements as reduced calf mortality, higher calving rates, more rapid weight gain in animals, increased milk production. The other direct beneficiary is the Nigerien Government which, as a result of this project, will have better data and an improved capability to carry out a wide range of livestock services. Over the long run, many sectors of the Nigerien economy will benefit. In addition to the traditional herder, Niger's urban population will benefit from more abundant and consequently lower-priced meat, and the country as a whole will benefit from increased foreign exchange earnings, as the value of livestock and livestock products exported increases.

Whether the above benefits in fact accrue to the expected beneficiaries depends on a number of technical, social and economic factors. As was discussed in the project description, key assumptions relating to the social and possibly economic feasibility of certain improved practices

will need to be confirmed through studies and experimentation. This is discussed in greater detail in the feasibility analysis sections below.

5. Feasibility Issues

A. Social Issues

The ultimate beneficiaries of this project will be the cattle producers of Niger's pastoral zone. Once a replicable package of new practices and new inputs has been defined and tested, producers will benefit from the following effects:

- a. An increased and more stable supply of milk resulting from better nutrition;
- b. An increased rate of weight gain and decrease in seasonal weight fluctuations;
- c. Increased calving rate.

The successful development, implementation and replication of a program of improved practices among cattle producers in the pastoral zone depends on the ability of the new program to overcome certain social constraints described below. These social constraints involve the producers themselves and Niger government personnel, especially those extension agents who will be working directly with herder groups.

The producers are primarily semi-migratory Fulani and (to a lesser extent) Tuareg herdsman. These groups are not the only cattle producers, but they are generally the low-income producers, and many of their herds have been reduced or destroyed as a result of the recent drought. These people usually do not raise cattle for meat nor for market. They invest in cattle for prestige reasons, exploit them for their milk, and trade them in order to maintain a complex network of

socio-economic relationships (through marriage, inheritance, traditional loans) rather than to obtain a cash income. They graze their private herds on public lands and are unfamiliar with any payments for land use. They rely on an allocation system for traditional wells but have no effective means of controlling newly developed public wells. This is a generalized overview, but it implies that the introduction of new practices will be based on assumptions, the validity of which must be verified in the course of the initial phase:

(a) Herder families can be formed into effective user organizations which can implement water resource control and range management. To some extent, user organizations formed around family lines already exist. Extension agents should work with these organizations, encouraging them to employ new practices such as setting aside grazing reserves to produce forage for the dry season and managing newly developed wells and watering sites in such a way that there is a minimum of deterioration of pasture around water sources.

(b) Once there is a rise in the natural rate of increase of the herds, herders will market the surplus to avoid exceeding the carrying capacity of the rangeland, as opposed to holding the new animals in their herds. This is basically a problem of whether the national objectives of maximal off-take of cattle from herds and increasing meat supplies on the market are consistent with the current role of livestock in the herders' lives.

Successful resolution of these issues depends partially on the provision of an appropriate set of economic incentives (higher producer prices, better marketing systems), but more importantly on the extent to which the new practices tested under the project will provide real and positive benefits to the herder and his immediate family group.

The teaching process in an environment of this kind will be slow and long-term, and certain basic principles apply. First, the agents must be well trained and familiar with the people, languages and area in which they are working. Second, the package being introduced should be simple, proven and involve a minimum change in existing practices unless the economic benefits are truly outstanding (e.g., a doubling or tripling of family income). Some sectors of the herder population will accept change more easily than others. The smallest herd owners are likely to be the most resistant because they have the most to lose if something goes wrong. They are also the group which is the farthest removed from the market economy. On the other hand, middle and large sized owners (more than 30 head) may be quite receptive to new practices leading to increased income as long as they do not entail overly drastic changes in their life styles or endanger their present preferred positions in society.

This project as discussed in Section 2 involves a minimum of socially disruptive changes, but there are a few which may face social obstacles. One is the need for a more systematic approach to range control. The traditional system may not provide sufficient

control to really take advantage of improved grazing practices, and the herders may be unwilling to change that system. From a technical standpoint, these two activities are in direct conflict, but among traditional producers they are closely integrated. Separating meat production from dairy production may be a tactic which involves too great a change in the social system of these herders, at least in the short term.

Many of these issues and problems will be addressed in the herder seminars, and the findings will be incorporated into the final project design. The final solutions relative to problems of social feasibility, however, may not be forthcoming until the project has been in operation for two to three years.

B. Economic Feasibility

The total cost for this project is estimated to be \$4,739,000 (including a 10% contingency allowance). This includes capital costs (\$1,860,000), operating costs (\$2,009,000), and training costs (\$440,000). A more detailed breakdown of the various cost elements is contained in the Financial Plan.

The benefits of this project are not readily quantifiable at this stage. As discussed in the Project Description (Section 2), the project is designed to generate the type of social and economic information required for in-depth analyses of strategies for improving livestock production in the pastoral zone, and to establish a base of trained personnel to implement these strategies. The Site Resource Inventory

which will take place prior to the formulation of the P.P. will provide some of this information. However, since an experimental package of improvements will not be delineated until after the resource inventory, a more precise cost benefit analysis must be deferred until the P.P. stage.

Although information is lacking on the value added to production which can be expected of a given package of improvement, certain non-quantifiable benefits can be expected upon the successful completion of the project, namely: (1) a tested system of range and water management; (2) a herder-tested system of improved animal husbandry practices; (3) A tested system of non-formal training and organization of herders; (4) research findings related to applicable improved animal husbandry practices; (5) information from land capability surveys which will follow from the initial Site Resource Inventory; (6) information related to socio-economic factors which will form a basis for the continuing evaluation of subsequent programs; (7) a functioning center for carrying out essential work on site surveys and inventorying of rangelands; (8) a functioning center for training personnel of the livestock department in range and herd management; (9) trained personnel available to extend the principles of range/herd management throughout the program area.

C. Technical Issues

There is general consensus that a package of practices exists which will increase calving rate of cows, lower calf mortality and increase the rate of weight gain per animal. (See Attachment C for a more detailed discussion of the technical aspects of this project.) What remains to be resolved, however, are such matters as the best means of introducing the new practices into project areas, the quantitative goals to be set under the project (size of herd, etc.) and other implementation related issues. These will be addressed in the Site Resource Inventory discussed above.

The technology involved in this project is not complex. There is no large-scale irrigation, mechanization, new cattle breeds, or new varieties of grass. The P.P. design team may build operational research on some of these interventions into the project in which case the project will establish technical feasibility prior to initiating widespread application.

From an environmental standpoint, the effects of this project are clearly positive in nature. The goal is to find ways of preserving rangeland in the Sahel while at the same time increasing production to meet rising demands for livestock products. In the absence of projects of this kind it is generally agreed that herd sizes in the Sahel will return to the levels that caused such serious overgrazing prior to and during the drought. Improved range management aimed at improving the balance of resources in this ecologically fragile area of the world is central to all the activities under this project.

D. Financial Issues

The question of whether or not intended beneficiaries can afford the project is not an issue for this phase. The group of direct beneficiaries who may be affected by this project will receive benefits from the project at little or no personal cost. Fees will not be imposed during the initial phase, and new inputs may be provided free or at a low subsidized price. However, as discussed below, if the project continues and the package of improved practices is proven to be successful at low cost and low risk for the herder, the collection of user fees and the elimination of subsidies on inputs may be necessary in order to sustain the ongoing portion of the project.

The only activities which must be financially sustained are research extension and training. 25% of the allocation for operating costs in the Financial Plan will be devoted to the expatriate team, and once the expatriates leave the project, recurring costs will be reduced to approximately \$330,000 per annum (not including salaries for local replacements for expatriates, replacement costs for vehicles, equipment, and facilities, and progressive annual increases in salaries).

We assume that the ongoing projects will maintain the same level of activity as that which existed under the initial phase, and user fees or other forms of taxation will be instituted at the end of the initial phase to provide additional revenue to support the project. Given that the current amount of foreign donor interest in the livestock sector continues, the first assumption is valid. The second assumption is justified in

that the project is intended to find a set of improved practices which are inexpensive to implement and that research needs will be diminished once this goal is accomplished. Also, if revenue derived from the sector were to be channeled back into the sector in the form of improved government services, then increased taxation of the sector would be warranted.

Another issue is training. There is no doubt about the need for increasing numbers of skilled personnel over the years to come. However, "overemployment" in the public sector is a continuing problem: salaries accounted for 64% of the FY75 budget of the GON Livestock Service. With the increased priority being given to the Ag/Livestock sector, it is unlikely that the manpower budget allocations will decrease. It must be noted that training manpower is not sufficient of itself, and in subsequent phases of the project, those Nigeriens trained in the initial phase should be given continuing support in terms of material and supplies. This would pose an additional burden on the GON in terms of recurrent costs for the ongoing project.

7. Project Financial Plan

The cost breakdown of this project is shown by capital cost items, operation costs and training costs for a third-year period. We are previewing a project life of 6 years but funding for the second 3 year phase is not shown in the PRP.

Capital costs include the construction of buildings, equipping these facilities and providing adequate transportation for the project to function as planned. It should be noted that depreciation and replacement costs have not been considered. Operating and recurring costs contain salaries paid to project personnel, equipment and vehicle maintenance and expendable commodities used during the life of the project. Training costs include long-term degree training in the US, short-term training in the US, and local training for the local level extension workers.

Salary increases of five percent annually have been included for the project team. The number of unskilled or semi-skilled personnel is projected to remain constant for the life of the project. On all capital costs, an inflation factor of 7% has been added and finally as a risk factor, 10% has been added across the board because a suitable project site has not been fixed.

<u>1. Project Cost</u>	<u>Total</u>
I. Capital costs (730,000)	\$ 1,860,000
A. Construction	
B. Vehicles (\$605,000)	
C. Equipment (525,000)	
II. Operating or Recurring Costs	\$ 2,009,000
A. Expatriate team (1,070,000)	
B. National project staff (229,000)	
C. Maintenance staff (90,000)	
D. Commodities (215,000)	
E. Other costs (405,000)	
III. Training Costs	\$ 440,000
A. Long-term (120,000)	
B. Short-term (100,000)	
C. Local trg (20,000)	
D. Support to local trg institutions 200,000	
Calculated Project Costs	4,309,000
Contingency 10%	<u>430,000</u>
Total Project Costs	4,739,000

33

I Capital Costs\$1.86 mil x 7%.....1,873,000

A. Construction Costs730,000

I. Project Center 505,000

(a) Warehouse 10,000

(b) Temporary lodging at project site 340 sq. m 90,000

(c) Counterpart housing 5 units @ \$15,000 75,000

(d) Extension personnel housing 30 units @ \$1,000 30,000

(e) Garage 20,000

(f) Field Office 250 sq. m 65,000

(g) Trg. Facility 400 sq. m 110,000

(h) Fuel storage tanks 5,000

(i) Access roads 100,000

II. Expatriate staff housing 225,000

(a) Construction 3 units @ \$50,000 150,000

(b) Furnishings 30,000

(c) Offices 45,000 150 sq m

I Capital Costs (cont'd)

B. Project vehicles605,000

1. Transportation vehicles..... 205,000

(a) 4 4x4 passenger
@ \$15,000.....60,000

(b) 3 4x4 pickup type
w/camping gear
a \$16,500.....50,000

(c) Tractor and 2
trailers60,000

(d) Supply truck
5T25,000

(e) Local transport..10,000

2. Field equipment..... 190,000

(a) 2 cat. crawlers
& 20% add-on
for parts
@ 70,000.....140,000

(b) Field impls.
discs
dirt scraper
packer
back hoe.....50,000

3. Vehicle support to arrondissement level
vet. ser. 210,000

(a) Six 4x4 mobile
health units
@ 20,000.....120,000

(b) Six 4x4 passen.
type
@ 15,000..... 90,000

341

I Capital costs (cont'd)

C. Project equipment.....525,000

1. Animal health equipment	20,000
2. Platform scales	20,000
3. Well/pump/reservoir	20,000
4. Generator project center	25,000
5. Back generator for expat. housing	10,000
6. Camping gear	5,000
7. Office equipment and supplies	15,000
8. Training supplies	15,000
9. Vehicle maintenance equipment	35,000
10. Fencing equipment	12,000
11. Research materials and equipment	100,000
12. Water resource development equipment	250,000

35

II. Operating and Recurring Costs

A. Expatriate Project Staff - - - - - 1,070,000

1. Project Team (000) - - - - - 845,000

	<u>Y0</u>	<u>Y1</u>	<u>Y2</u>	<u>Y3</u>
a. Proj Mgr/Range Mgt Advisor	50	100	100	100
b. Extension trainer		80	80	80
c. Livestock advisor	—	<u>80</u>	<u>80</u>	<u>80</u>
	50	260	260	260

2. Short-term consultants - - - - - 180,000

34mm @ 7500/mm		90	45	45
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3. Local support personnel - - - - - 45,000

3 translators, 1 secretary		15	15	15
3 drivers @ \$2000 annually				

B. Local Project Staff - - - - - 229,000

1. Counterpart personnel - - - - - 49,000

4 persons @ \$3,600 pa		15	16	18
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2. Local extension agents - - - - - 180,000

40 @ \$1500 pa		<u>60</u>	<u>60</u>	<u>60</u>
		75	76	78

310

II Operating and Recurring Costs (cont'd)

C. Capital facilities maintenance staff..... 90,000

	<u>Y1</u>	<u>Y2</u>	<u>Y3</u>	<u>Total</u>
1. Project center maint. staff 4 @ \$1200 pa	5	5	5	15
2. Vehicle maint. staff				
a. TCN Supervisor (1)	10	10	10	30
b. Local mechanics 3 @ \$2000	6	6	6	18
3. Chauffeurs 6 @ \$1500 pa	<u>9</u> 30	<u>9</u> 30	<u>9</u> 30	27

D. Commodities.....215,000

1. Vet supplies	5	5	5	15
2. Salt/mineral feed supplements	5	7	8	20
3. Vet supplies for arrond. vet. service	<u>60</u> 70	<u>60</u> 72	<u>60</u> 73	180

E. Other Costs.....

1. PQL.....				405,000
a. Light vehicles @ 5,000 pa+	35	35	35	105
b. Field equipment & heavy trucks, 4 @ \$8,500 pa	35	35	35	105
c. Project center generators/wells	5	5	5	15
d. 12 light vehicles arrondiss. level vet. service @ 5,000 pa.	<u>60</u> 135	<u>60</u> 135	<u>60</u> 135	<u>180</u>

325

III Training costs.....440,000

	<u>Y1</u> (000)	<u>Y2</u>	<u>Y3</u>	<u>total</u>
A. Long term US degree trg 6 for 2 years (1 m/yr \$10,000)	60	60		120
B. Short-term US nondegree trg 10 pa for 6 mo duration (6 mm/\$5000)	50	50		100
C. Local trg. 20 participants @ \$2000	20			20
D. Support to local training institutions	50	100	50	200

258

226
39

PROJECT SUMMARY---AID APPROPRIATED FUNDS

(in \$000 or equivalent)

Country: Niger PRP New X

Project # 638-11-130-XXX Title: Niger Range and Livestock

	BUDGET YEAR		Total
	Direct Aid	Contract Other Agency	
<u>Cost Components</u>			
US Technicians	400		400
Participants	110		110
Commodities	370		370
Other Costs	859		534/ 325/ 859
Total			1739

8. Implementation Schedule

- a. PRP approval Early January 1976
- b. Site resource inventory Start: February
End: May - June
- c. Herders seminars mid-February
- d. Determination of project site Early March
- e. Identification of PP design studies mid-March
- f. PP design team technological feasibility studies May
- g. Project Document design team Start: Early June
End: Early July
- h. Negotiation with GON on project management structure Late June

The management structure of the project undoubtedly will raise several issues. The Livestock Service does not now have field officers other than the veterinary service. An appropriate office answering directly to the Director of the Livestock Service should be established.

- i. Submission of PP to AID/W Early July

To minimize time delays and lag times, we hope that AID/W can give the Mission an early indication of project components in which they are in agreement. This will permit PIDs to be prepared and tentative bidding on construction to be done if possible.

j. Early indication from AID/W on project approval. Early August

k. Negotiation with US universities for training needs. mid-August

Long-term degree training programs can be designed to better fit the training needs of the participants.

l. PIO's written pending PP approval. mid-August

Participants identified and can begin English training in-country facilities. Bids for construction can be tendered pending PP approval. Identify possible project team.

m. Project approval AID/W Late September

n. Project Agreement drafted and negotiated with GON. mid-November

o. ProAg signed early December

p. Construction contracts finalized. February 1977

q. Contracts with project team members finalized. February

r. Project commodities ordered. March

s. Project team in language training. May-June-July

t. Project team arrives at post. September

u. Project activities begin October-November

9. Project Development Plan

Assuming the PRP is approved in January, several studies should begin in February or as soon thereafter as possible. The most important of these is the site resource inventory described in the project outputs section. The results of this study will establish the technical feasibility of the project and provide the basis for the package of practices and services to be carried out under it. In our view this study should be undertaken by the Bureau of Land Management (BLM) in the Department of Interior. While we are not in a position to describe precisely what is involved in a study of this kind, we are estimating that two experts will be required for a period of 3 to 4 months. This needs to be taken up with BLM as soon as possible so that the necessary funds can be made available.

A second study that should be completed prior to beginning final design is a series of herder seminars using the approach developed by REDSO and utilized in the design of rural development projects in Upper Volta, Chad, and Cameroon. In a project of this kind which attempts to build on existing practices to the maximum extent possible it is essential that the views and desires of the intended beneficiaries be incorporated into the project design. Such seminars should go far to answer some of the questions raised in the social analysis sections of this paper. If a qualified sociologist or anthropologist can be found in time, this study should be carried out in February.

30
43

Once the studies by expatriate teams with the assistance of Nigerien trainees have been completed, hopefully in July, a design team should proceed with the preparation of the Project Paper. In our view the design team should consist of a range management expert, a livestock production specialist, an agricultural economist, a rural sociologist, and a design officer. The main tasks of this team will be to:

- prepare a package of practices and services to be introduced into project area and specify the various activities to be undertaken,
- select the project area and design the project center,
- design the operational research component of the project, i.e., data to be obtained, analysis to be conducted, sampling techniques, etc.,
- carry out detailed technical, social and economic feasibility analysis. (These analyses may need to start prior to the actual preparation of the PP,
- draft the Project Paper for submission to AID/W.

It is not likely that a design effort of this size can be carried out in less than six weeks. If the team begins work on August 1, the Project Paper will be submitted to AID/W in the latter part of September. This hopefully would permit a first quarter FY 77 obligation which is clearly desirable in view of the large amount of training and construction that must be undertaken before activities in the project area can begin.

The cost of the project development leading to a PP is estimated at \$120,000 consisting of:

- Site Resource Inventory \$80,000
- Herder Seminars 10,000
- Design team (3 contract members) 30,000

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PRELIMINARY PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

All figures will be supplied during the PP design

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

IMPORTANT ASSUMPTIONS

SECTOR GOAL

Increase livestock production through improved productivity of available resources and of traditional herders and small farmers raising livestock.

PROJECT PURPOSE

Define and apply in the project area replicable methods of 1) optimizing livestock production in the pastoral zone while preserving rangeland resources, and 2) alleviating the adverse effects of future droughts on production and herder welfare.

PROJECT OUTPUTS

1. A system of range management and livestock production designed to:
 - increase productivity of cows,
 - reduce calf mortality,
 - increase weight gain,
 - make more efficient use of resources available for animal nutrition,
 - provide protection against effects of future droughts.
2. Capital improvements in project area:
 - firebreaks,
 - access roads,
 - project center

Measures of Goal Achievement

- % growth in national cattle herd,
- increase in extraction rate,
- % increase in exports of livestock products.

END OF PROJECT STATUS

1. An approach to range mgmt and livestock production which is applicable to other parts of the pastoral zone will have been developed and tested.
2. Herders in the project area will be following improved range management and livestock production practices as recommended and tested under the project.
3. As a result:
 - fertility of cows will have increased by _____,
 - calf mortality will have dropped by _____,
 - _____ hectares of grazing reserves will be in place.

MAGNITUDE OF OUTPUTS

1. Plan will specify:
 - system for control of water and range,
 - maximum herd sizes,
 - necessary changes in herd composition,
 - necessary changes in feeding practices,
 - water development needs,
 - fire control needs.

ASSUMPTIONS FOR ACHIEVING SECTOR GOAL

1. GON continues to place a priority emphasis on livestock sector development.
2. GON is sensitive to the needs and economic importance of the traditional livestock producer in the pastoral zone.

ASSUMPTIONS FOR ACHIEVING PROJECT PURPOSE

1. The project area is sufficiently representative of the pastoral zone for project findings and results to be replicated.
2. & 3. The package of improved range management and livestock production practices will be sufficiently remunerative and sufficiently consistent with the social and cultural system for the herders to adapt on a permanent basis.

ASSUMPTIONS FOR ACHIEVING PROJECT OUTPUTS

1. The information is available or can be obtained to provide a sound technical, social and economic basis for the package of practices proposed.
2. Commodities arrive on schedule and personnel are available for installation and maintenance.
3. Herders are receptive to practices being proposed, and sufficient numbers of qualified trainers can be recruited and trained.

NARRATIVE SUMMARYOBJECTIVELY VERIFIABLE INDICATORSIMPORTANT ASSUMPTIONSPROJECT OUTPUTS (contd)

3. Upgrade animal husbandry and range management skills of traditional herders.
 - Establish user organizations to control water and rangeland.
5. Build up administrative and technical capabilities relating to livestock both at the national and project area levels.
6. Research and studies which will lead to a better understanding of livestock production in Niger and eventually to a comprehensive and realistic livestock development strategy.

PROJECT INPUTS

1. Personnel
 - project manager
 - technicians
 - short-term consultants
2. Participant training
3. Commodities
4. Other costs
 - local training
 - construction
 - operating budget

MAGNITUDE OF OUTPUTS (contd)

2. The following capital improvements will be put in place:
 - ___ km of firebreaks,
 - ___ km of access roads,
 - buildings, cattle pens, scales, etc.
3. Herders receive instruction in improved animal husbandry and range mgmt practices.
4. Organizations will be formed along clan lines, ___ clans and ___ herders for the purpose of controlling the use of ___ watering sites _____ hectares of rangeland.
5. a. At the government level:
 - ___ mm of long-term training in animal sciences and agri. engineering,
 - ___ livestock technicians sent abroad for non-degree training in range mgmt & livestock production.
6. b. At the project level:
 - ___ trained in Niger in animal husbandry, range management and extensions
7. Research will be carried out on the following subjects:
 - Animal health, fertility, growth, etc.,
 - Rates of offtake from herds in area,

ASSUMPTIONS FOR ACHIEVING PROJECT OUTPUTS (contd)

4. There are no sociological obstacles of cooperative arrangements implied in the organizations.
5. Qualified trainees are available in required numbers.

47

NARRATIVE SUMMARY**OBJECTIVELY VERIFIABLE INDICATORS****IMPORTANT ASSUMPTIONS**

MAGNITUDE OF OUTPUTS (contd)**7. contd**

- Herd size and composition,
- Role of small ruminants and camels in project area,
- Demographic characteristics, changes,
- Marketing studies,
- Household budget surveys in project area,
- Consumption studies,
- Detailed cost effectiveness studies on each aspect of the program being tested in the project area.