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NIGER RANGE AND LIVESTOCK

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EVALUATION

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CHAPTER I

THE LIVESTOCK SECTOR IN NIGER: ITS CHARACTERISTICS AND EVOLUTION

This chapter provides a brief overview of the livestock sector in Niger. It begins with a sketch of the sector as it was perceived in 1976, at the time when the Niger Range and Livestock (NRL) Project was formulated. It was in that context, of course, that major decisions about the project were taken: a decision to begin with a phase of studies and tentative interventions; a decision not to provide heavy support to the traditional veterinary and hydrological services of the government; a decision that range management, and an overall adjustment of herd numbers to herd resources, was an immediate and overarching need in the circumstances of the Sahel. This description of the sector is taken largely from the Project Paper and from World Bank reports.

The second section of this chapter traces the evolution of the sector since 1976. It explains current government policies for the livestock sector in general and for the pastoral zone in particular. It is interesting to note that the sense of immediacy about the issue of range management has receded as time has passed since the drought. Instead, the focus is much more firmly set on ways of increasing productivity in the sector, on general development strategies for the pastoral zone, and on the extension of government services. Further, the elaboration of three major projects in the pastoral zone has meant that a strategy for providing development services has begun to crystallize. Planning for a second phase of the NRL will have to take full account

of all these developments.

The last section of the chapter provides further commentaries on the two other major pastoral zone projects besides the NRL. In a sense they are competitors of the NRL, in terms of performance, flexibility in response to newly perceived needs, and their general image in government circles. This competition is useful, but as this section also points out, the three project zones are quite differently endowed, their needs are diverse, and the strategies appropriate to each need not be similar. At the same time, the three projects have major goals in common, and the common program for all of them involves a long struggle to find appropriate mechanisms and "packages" to engender genuine social and economic development for the local populations. The staff of all three projects realize fully that there are no easy answers, and they are working together to share ideas and experiences. The work of the NRL, analyzed in detail in the subsequent chapters of this evaluation report, must be seen as part of the much larger struggle by Government and by the pastoralists themselves to define a viable future.

This chapter is organized as follows:

The Livestock Sector and the Pastoral Zone: The Situation in 1976

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A. The Livestock Sector and the Pastoral Zone: The Situation In 1976

1. The Livestock Sector In 1976

Niger has 5.3 million inhabitants, of whom three-quarters live in rural areas. The territory, which covers 1.3 million km² (500,000 mi²) is nearly three-quarters desert; 15 percent of the land is semiarid, and less than 10 per cent is cultivable. Nearly half the population lives in the southern tier of the country along the border with Nigeria, in the "agricultural zone" which receives between 500 mm. and 800 mm. of rainfall. There, the principal crops are millet, sorghum, cowpeas, groundnuts, and some cotton. Herds of cattle, sheep, and goats are kept as well. As one moves north and rainfall levels decline, cultivation becomes more precarious and extensive livestock raising gains in importance.

1.1. Background

In 1970, the rural sector contributed 60 percent of the GDP of Niger and 80 percent of the value of exports. By the late 1970's, as the mining sector grew, the contribution of rural production fell to about 40 percent of GDP and 30 percent of exports. In the meantime rural production had also been severely dislocated by disease and world price fluctuations for the groundnut crop, and by the great Sahelian drought of 1973. Animal production was also gravely disorganized: according to official

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estimates the national herd fell from 4.2 million cattle to 2.2 million, and from 9 million sheep and goats to 7 million. It was estimated after the drought that it would take at least ten years to rebuild the herds to pre-drought levels. At the same time the scarcity of livestock products on the market drove up their prices, offsetting some of the loss in volume: by 1978 the livestock sector represented 12 percent of GDP and 20 percent of exports.

1.2. Livestock Production

Livestock is of major importance in Niger as a means of livelihood for a large percentage of the population, as a source of food, as a source of revenue for rural investment, as a source of foreign exchange, and as an important element in the evolution towards a modern agricultural system.

If one excepts a handful of State-run ranches and some peasant fattening programs in the south of the country, livestock is raised according to traditional methods. There are both nomadic and sedentary herders, but traditional husbandry methods nearly everywhere involve transhumance, with the herds moving northward with the rains and southward during the dry season. More than 90 percent of the herds are managed, but not necessarily

owned, by Tuareg and Fulani herders, who constitute between them nearly the total population of the "pastoral zone" north of the limit of cultivation. The possibility that ownership and day-to-day management of herds are increasingly separated is being examined by the NRL, since this separation has profound development implications.

There are few mixed cropping-herding enterprises in Niger. The form of integration widely practiced in the agricultural zone is for herders and cultivators to contract for herds to feed on crop residues on the fields in return for milk and especially for the manure that is thus left behind. Animal traction is little used except to draw water, but in recent years there has been a moderate expansion of the use of ox-ploughs.

In the pastoral zone animals are raised in more fully transhumant systems. Many herds only rarely go as far south as the agricultural zone. Animals are watered at shallow pit-wells or at hand-dug or government-dug deep wells at least eight months of the year, while ponds and other surface pools serve for the remaining months. Sheep and cattle decrease as a proportion of the herd mix as one moves north; goats and camels increase. A few donkeys are kept for transport, and sometimes for

water-pulling. Even within the pastoral zone there is a general north-south transhumance. In the short rainy season, animals and nomadic camps move north, especially toward the areas of naturally high mineral salts. As water and grass diminish, southward movement toward dry season home areas begins, and herds stay in these areas unless the dry season is prolonged, in which case herders are forced to make opportunistic moves to wherever some grass remains. There is much night grazing, and watering is cut down: hardness for all this energy expenditure is thus a key selectivity feature in local animal breeding practices.

The effects of the drought were enormous. In 1974 it was estimated that 75,000 families had lost all, or virtually all of their animals. Many were forced, of course, to leave the pastoral zone. Even before the drought, per capita income was estimated at less than \$100 per annum.

1.3. Productivity and Production

The animal health situation in Niger is reasonably good, government services having largely controlled the major bovine epidemic diseases. But losses to other causes are high: the calving rate was estimated at between 50 and 60 percent beginning only when cows attained four years

of age; calf mortality in the first year was running at 20 percent or more, and immature mortality at another 5 percent. There was little "improved" production in the country: offtake rates from the traditional systems currently operating were about 10 percent for cattle. Attention to the diseases of camels and small ruminants was rare, and not much was known about their productivity. Studies in nearby countries suggest offtake rates of 25 percent for sheep, 35 percent for goats, and 9 percent for camels.

1.4. Commercialization and Revenue

Animals are marketed through an extensive system of private traders. Herders sell to intermediaries or to agents of big merchants, as well as within local markets. Most markets have no special animal-handling facilities, nor is there extensive veterinary control. Except for a minimal amount of refrigerated meat, export is on the hoof, all but a small part to Nigeria. Perhaps half of all cattle sold are exported, but less than 10 percent of small ruminants. The tannery at Maradi processes nearly half a million hides and skins per year. Taxation of the livestock sector is at the point of sale: no personal or animal ownership taxes are collected, and the largest amount of government revenue from the sector

comes from export taxes. Herders thus receive such services as they get--epidemic disease vaccinations, scattered human health facilities, and bore-hole construction--"free" from the government.

1.5. Services and Institutions

At the time that the Project Paper was written, the Livestock Service consisted of about 300 technical staff members, of whom 15 were veterinary doctors. The Service vaccinates against major diseases in an annual campaign; at veterinary posts it dispenses curative services; it has little capacity to address the matters of animal production. A Herd Reconstitution Service was created in 1976 to provide loans to herders wiped out in the drought. Other government services are also involved in the livestock sector: OFEDES (the Groundwater Office) constructs and maintains wells; CNCA (the National Agricultural Credit Agency) finances credit operations for fattening programs and animal traction; UNCC (the Nigerien Cooperatives and Credit Union) encourages cooperative formation and supplies inputs and extension advice. These latter two agencies are only slightly active in the pastoral zone. Other Livestock Service functions in the mid-1970's included vaccine production and the running of the special school for technical

assistants and technical agents in livestock. The number and levels of training of personnel available in the Livestock Service have formed one major constraint to the mounting of new programs.

2. The Pastoral Zone in 1976

Between the 200 and 400 mm. isohyets, the "pastoral zone" of Niger is a vast area stretching across the country. Vegetation is sparse even in good time. During what are believed now to have been exceptionally good rainfall years in the early 1960's, and with the construction of deep wells by OFEDES from the 1950's, and with grazing lands farther south diminished by crop intensification, herd and population numbers increased substantially. Starting in 1968, the French funded studies of the resources of the zone, with a view to "modernizing" it. The well-known IEMVT study of 1972, "Modernisation de la Zone Pastorale du Niger: Etude Agrostologique," noted increasing overgrazing of both the pastures and the browse. The study estimated that at least 80 percent of the theoretical carrying capacity of dry season pastures throughout the zone had been reached, and figures of over 100 percent occurred in some areas.

2.1. The Drought and Pastoral Planning

The 1973/74 drought was a national calamity in every sense. The national herd was decimated, a vast relief program had to be mounted, government revenues were starkly diminished. The weakness of the institutional

structure was a matter of deep national distress. After the drought, the government began to plan more fully to intervene in the rural sector to increase productivity and income security. It was clear that this task was enormous: in the pastoral zone, low productivity, weak services and communication links, dispersed natural resources, and poverty would all have to be addressed in planning for the future.

The key issue in that planning appeared to be better management of the rangelands, with a view to protecting and preserving them from overgrazing. "Desertification" seemed imminent. As the Project Paper stated (pp 11-12) there was agreement on this issue among "most observers of the livestock situation in the country." The CILSS/ Club du Sahel livestock strategy paper made the same point, that there was "a need to protect pasture land against overgrazing [that] will require immediate action not only to understand the situation but to manage a relatively large area in a relatively brief period of time."

In this context the RN drafted, early in 1977, a statement on guidelines for planning the modernization of the pastoral zone. It expressed the following policy requirements: an overall system of range management in

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the whole zone; increased animal productivity, in particular through modifying herd composition to specialize production toward reproduction of young animals to be fed out farther south; self-management of herds and the range by the herders themselves; a new office in the Ministry of Rural Development to be charged with the modernization of the zone, including extension and information work; credit and extension aid to herders to form associations; structures for marketing, finishing, and fattening animals; greater emphasis on cattle and sheep raising; social actions such as health, literacy, education; and the supply of primary consumption goods at reasonable costs.

3. Summary

The formulation of the NRI Project Activities took place in a situation highly charged with the emotional after-effects of the drought, frankly cognizant of the weaknesses of knowledge and of the relevant institutions, but optimistic that a new pledge of will and of funds could raise living standards and conserve and develop all the resources of the pastoral zone. USAID's willingness to cooperate with the RN in this new effort by funding the Niger Range and Livestock Project was the first major financial commitment in support of development in the zone.

B. The Evolution of the Livestock Sector Since 1976

1. National Policy in Livestock Raising

1.1. Its Objectives

They remain the same:

- a. Satisfy the needs of the country in animal products, and develop exports.
- b. Increase the revenue of the herders by replenishing their herds and by improving the productivity.

1.2. Its Orientations

The aims are:

1.2.1. Specialization of the Different Zones of the Country

This will be attained by developing:

a. The Pastoral Zone as the Zone of Birth

The focus for the extensive raising of stock is to increase the birth rate of the herds. But every year, after weaning, the excess young males and non-productive females are to be sold, to leave sufficient pasturage for the reproductive animals.

b. Feeding in the Intermediate Zone

The state and the agropastoral populations

buy the animals from the pastoral zone. This stock is raised in private or on the government ranches, then sold for fattening.

c. Fattening In the Agricultural Zone

With the different productivity projects (which cover all the departments that have agricultural potentialities), and with the extension of the hydro-agricultural development, the region will dispose of increasing agricultural and agro-industrial by-products.

The farmers will use them to fatten animals on a larger scale. The government wants to do the same kind of operation by producing grain for industrial fattening.

1.2.2. Loans to Herders that are Members of a Cooperative

This will help the herders to rebalance their herds and to buy all the necessary inputs to make their operation profitable.

1.2.3. Organization and Management of the Pastoral Zone

Pastoral units will be created. They will be based on the equilibrium "water-animals-forage". They will be managed by the herders that are beneficiaries of these structures.

1.2.4. Supply of Different Services to the Herders

During the transitional period which will terminate when the pastoral units are operational, the government will provide different services necessary to the herders. These tasks would be carried out through "pastoral unit centers." These service centers would comprise, notably:

- a. The supply and commercialization of food materials and the products of primary necessity (staple consumption items).
- b. The supply of and commercialization of inputs for animal production.
- c. Human health protection.
- d. Animal health protection.
- e. Organization of the protection of the rangelands and management of the pastures.
- f. Commercialization of the animals.

This national policy for livestock is already in action through the implementation of livestock programs and projects.

2. Livestock Programs

2.1. Health Program

This is the preliminary action before any livestock development. It is done by the livestock service.

a. The Technical Personnel of the Livestock Service

<u>Category</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Veterinarians	17	15	18	23	21	21
Technical Engineers	1	3	4	3	6	9
Technical Assistants	13	11	11	11	13	11
Livestock Assistants	71	71	76	91	126	126
Technical Agents	60	68	83	94	113	134
Veterinary Nurses	68	139	131	119	120	99
Inspectors	59	60	76	82	112	118
T O T A L	289	367	399	423	511	518

b. The Budget of the Livestock Service (see table page 18).

c. Veterinary Infrastructures

Since 1976, 15 new veterinary posts have been or are being constructed. As well, 15 vaccination corrals were constructed.

BUDGET OF THE LIVESTOCK SERVICE (IN FRANCS)

	Salaries (354-1-10)	Operating Cost (354-2-12)	Technical Material (354-2-22)	Vehicle Repair (354-3-12) (gasoline not included)	Livestock School in Maradi (354-2-42)	E.A.A.T.E. ¹ (354-1-10) (354-2-17) (354-2-47) (354-2-27) (354-3-17)	TOTAL
1968	123,600,000	10,630,000	25,550,000	15,000,000	-	-	174,730,000
	//////////	//////////	//////////	//////////	//////////	//////////	//////////
1977	232,405,034	12,143,000	40,000,000	21,900,000	3,000,000	17,232,531	326,630,565
1978	271,954,460	13,143,000	42,000,000	23,500,000	3,500,000	18,310,740	372,408,200
1979	301,169,963	19,143,000	49,500,000	32,000,000	5,000,000	19,768,176	426,581,139
1980	347,734,000	29,500,000	49,500,000	33,000,000	4,000,000	23,701,000	487,435,000
1981	419,234,604	29,500,000	49,500,000	33,000,000	4,000,000	24,243,300	559,477,904
TOTAL	1,572,498,061	103,429,000	230,500,000	143,400,000	19,500,000	103,255,747	2,172,582,908

NOTE: 1. E.A.A.T.E. = The School of Livestock Assistants and Technical Agents

The indications such as "354-1-10" represent references from budget chapters

d. Central Livestock Laboratory

It is charged with producing vaccines and with diagnosis. Placed under INRAN in 1975, it has been under the Livestock Service since 1980.

It is still not well equipped to cover efficiently the national needs for current vaccines: against rinderpest, bovine pleuro-pneumonia, pasteurellosis (bovine and ovine), black leg and anthrax.

e. VETOPHAR

The office of the Veterinary Pharmacy opened its doors in 1980 and is based in Niamey with 3 departmental pharmacies located in the following 3 cities: Niamey, Tahoua and Zinder. It is in charge of the extension of veterinary products and vaccines.

But, the operation cannot yet supply the 3 departmental antennae and is unable to create an efficient channel for the commercialization and covering of operating costs.

f. Annual Vaccinations

Vaccinations in Thousand Heads

Year	R.Pest	Bov. Pleuropn.	Black leg	Anthrax	Pasteur-eliosis	Sml ruy. pleuropn	Rabies	Poultry	
1976	1570	1041	26	76	117	8.5	0.8	3	
1977	2085	1480	201.4	60.2	48	9.5	0.5	7.3	1886.4
1978	1804	1064	305.9	169.2	117.8	1.5	0.2	4.6	3487.2
1979	2140.3	1379.7	265	219.7	120.5	3.6	0.8	32.6	4162.2
1980	2676.4	1703.7	213.5	234.7	180	9.3	0.5	NP	5016.1
1981 (1)	1908.7	1425.4	244.3	90.9	14.5	2.7	0.2	-	3686.7

(1) Up to the end of May, 1981

g. Size of the Herd (Unit=1 Head)

Estimation of Livestock

Year	Cattle	Sheep	Goats	Camels	Donkeys	Horses
1972 ¹	4,110,000	2,650,000	6,100,000	330,000	N.A.	N.A.
1976	2,671,000	2,354,000	5,946,000	283,000	206,000	383,000
1977	2,850,000	2,556,000	6,540,000	345,000	224,000	428,000
1978	2,990,000	2,650,000	6,700,000	352,000	227,000	437,000
1979	3,257,000	2,764,000	6,871,000	359,000	230,000	446,000
1980	3,354,000	2,875,000	7,043,000	366,000	234,000	455,000
1981	3,421,000	2,900,000	7,219,000	373,000	238,000	464,000

NOTE: 1. Figures for 1972, from the NRL Project Paper, have been added for comparison. 1972 was the year before the peak of the last major Sahelian drought.

2.2 Herd Reconstitution Program and Multiplication Centers

The Program is to provide loans to the herders and also to create and manage bovine multiplication centers and calf salvage units. It controls also the old livestock stations (such as Toukounous and the goat center). Since 1974 and through this program, the government helped more than 15,000 families who received animals as reimbursable loans. 1,350,000,000 CFA have already been spent in this operation.

In addition, between 1976 and 1980 the following infra-structures have been created and are currently operational:

- a. The multiplication center of Ibecetene in the Department of Tahoua. It also has a unit for calves.
- b. The multiplication center of Fako, Department of Maradi.
- c. The multiplication center of Bathé, Department of Zinder.
- d. The multiplication center of Sayam, Department of Diffa.
- e. The multiplication center of Dereki, Falwel and Batako, in the Department of Doukko.

- f. The calf unit of Yatakala in the Department of Niamey.
- g. Sheep holders cooperatives in the Arrondissement of Tchir Tabaraden.

These ranches have been created to gather and care for the animals during generalized or localized droughts in the pastoral zone. At the same time, each center tends to be specialized in the selection of the following cattle species that are to spread amongst herders of the same geographic area:

- Azawak (Ibecetene)
- Bororo (Fako)
- Goudali-Sokoto (Deréki, Falwel, Batako)
- Kouri (Sayam)

Bathe has animals from all species.

The justification of these centers resides in the fact that they are also destined to contribute to the feeding of the young stock born there or taken from the pastoral zone.

2.3. Cotton Seed Program

Every year since 1974 the Government insures the commercialization of 2,000 to 4,000 tons of cotton seed through the Livestock Service. This tonnage is sold throughout the country, mainly in the pastoral zone. The needs are estimated after the evaluation of the forage available

throughout the country at the end of each rainy season.

It is subsidized (about 50 percent) and tends to familiarize the recipients with the supplementary feeding of stressed animals, or those which have a newborn, during the dry months.

2.4. Farmers' Cattle Fattening Program

Different financing sources, national and foreign (see table of aid from foreign sources), contribute to the development and the carrying out of this operation in the Departments of Niamey, Dosso, Zinder and Maradi.

5 Industrial Cattle Fattening Program and Commercialization of the Animal Products

The ranch of Tiaguirire (220 ha) produces green forage and has been in operation since 1980. Together with the ranch of Ekrafane it is the first link in the production machine of SONERAN.

Two other infrastructural elements have not yet begun: North Dakoro and North Gouré ranches. But the multiplication centers are there to do the same thing, at least partly.

SONERAN is also organizing its commercialization by:

- a. Construction of 3 refrigerated slaughter houses in Zinder, Maradi, Tahoua
- b. Modernization of all the major livestock markets in the country and equipping them with radios
- c. Maintenance of animal trails

2.6. Poultry and Animal Feeds

The following new actions have been undertaken since 1976:

- a. Supplementary equipment to the primary poultry stations of Zinder and Maradi
- b. Continue the building of the new primary aviculture station in Niamey
- c. Construction and operation of the SONAL poultry farm in Kolo
- d. Construction of the secondary poultry station at Dogho
- e. Set-up and operation of 2 feed mills in Niamey and Zinder
- f. Creation of new private poultry farms around Niamey, with the support of the poultry section

2.7. Dairy

The changes are very modest:

- a. The capacity of the milk factory in Niamey has been increased from 5,000 to 10,000 liters of milk a day.
- b. A feasibility study has been undertaken in 1980 for the establishment of a new factory in Niamey, capable of meeting all the dairy needs of the capital city. Funds are not available yet.
- c. The modernization of the peasant cattle-shed program on the perimeter of Kirkinsoye is continuing.
- d. OLANI started to collect milk from Toukounous in 1980. The amount collected was around 1,000 liters every 2 days.

In brief, the whole dairy program remains to:

- create dairy factories in the big cities.
- establish milk producing perimeters around populated areas and agro-hydrological developments.
- collect milk from the multiplication centers.

2.8. Training

- a. The construction of the new Elevage school is to start soon in Kulo. It will board 200 students and

will train technical livestock assistants in addition to the assistants and technical agents. The program has been set to meet the new imperatives of the livestock service.

- b. A few numbers of technical livestock engineers come out every year from the ESAE.
- c. The DVM's (Departmental Veterinary Directors) are being trained in many foreign countries. This is true also for the higher staff in animal production.
- d. Young herders' training continues in Toukounous: after 3 months of studies and practical activities, 50 young herders receive, when they leave the school, 5 cattle (sometimes with a few small ruminants): it is just a loan and there is a followup program.
- e. The livestock projects are generalizing the experience of the veterinary securists.
- f. Seminars are organized for the livestock agents; 3 have been organized in 1977 on:
 - Reconstitution of the herd in Tahoua
 - Modernization of the Zinder pastoral zone
 - Cattle fattening in Dosso

2.9. Pastoral Hydrology

The national approach is to provide all the villages in the agricultural and intermediate zones with cemented wells for drinking water. For the pastoral zone the policy is to have adequate numbers of water points, well-distributed in order to use all the range, regardless of the annual herbaceous cover. It is also the basic condition for the attribution of pastures and water points, by creating functional large-scale pastoral units.

The program consists of:

- a. Creation of sufficient water points in the South Tamesna region to render this project feasible. CISS is financing the operation.
- b. Search for finances for the establishment of water points in the pastoral zone of the Department of Niamey and in the intermediate zone of Dosso.
- c. A project to dig 30 pastoral wells equipped with solar pumps in the Department of Diffa.
- d. Continuation of the hydraulic section of the livestock projects being implemented.

3. Livestock Projects in the Pastoral Zone

As with all the livestock programs, the analysis will be dynamic and not descriptive.

3.1. Bureau of the Pastoral Zone and Support Unit

a. A bureau with a support unit is to control the implementation of the pastoral livestock project. These two organizations are not operational yet. Nevertheless, the Directorate of the Livestock Service monitors these projects directly, notably through its pastoral section. This work is facilitated by different meetings with the different Project Directors and the consultants to the projects.

b. The initial strategy was modified: it consisted of testing pilot actions for the modernization of the traditional livestock activities at 4 locations: Ingouchoul, Tejjira, Manga, and Sud Tamesna.

Instead of that approach, different projects were created. They cover important areas and sometimes several departments. They are carrying out varieties of studies and actions on a large scale (socio-economic, animal production, agronomy).

3.2. Agro-Sylvo-Pastoral Project (Niamey Department)

It concerns three zones, agricultural, intermediate and pastoral, of the Department of Niamey. Its activities will touch different sectors of the economic and social life of the population.

A study has been done to identify the appropriate actions. We are waiting for a full project dossier team to come in.

3.3. World Bank, NRL, and Sud Tamesna Projects

For details and commentaries on these projects, see the next section of this chapter.

LIVESTOCK SERVICE - MDR

AID FROM FOREIGN SOURCES (IN MILLIONS OF FRANCS)

Name of the Project	Source	Total Amount	Amount for the Year	Period	Description - Observation
Niger Range and Live- stock	USAID	1172	46.9	77 to 81	Zone: Triangle-Tahoua-Tancout-Agadez. Phase I: general study and experimentation. Two years later.
Centre Est	IBRD	3375	starting date 10/79	79 to 83	Zone: Pastoral zone of Maradi, Zinder and Diffa. Signing of credit agreement 9/15/79.
Cattle Fattening	OXFAM	60		76 to 80	Zone: Region of Ouallam. Project includes livestock and social extension.
Unit for Calf Sal- vage	OXFAM			78 to 80	Zone: Tatakala - Téra
Farmers Cattle Fatten- ing	Switzerland	100	6.9	77 to 80	Zone: Boupon - Dembou
Cattle Fattening - Phase I	FED	410	42.8	77 to 80	Zone: Niamey-Dosso-Tahoua-Zinder. Equipment, operation, technical assistant

LIVESTOCK SERVICE - MDR

AID FROM FOREIGN SOURCES (Cont'd.)

Name of the Project	Source	Total Amount	Amount for the Year	Period	Description - Observation
Diaguiriré Forage Ranch	AGRO PROGRESS	1870	225.2	79 to 81	Putting into operation the infrastructure and the creation of tracts of land (parcelles) at Bourgou.
Eradication of bovine pneumonia	FED	375	99	77 to 80	Zone: National
Development of Cattle	FAC	139	36	78 to 80	Zone: Desser. Introducing and propagating of the Sokoto Goudali breed.
Veterinary Pharmacy	USAID	776	227	78 to 80	Construction of the Central and Departmental Pharmacy of Niamey. Ordering of medicine.
Dairy Operation	ONG	28	?	79 to 00	

NATIONAL INVESTMENT FUNDS

The funds derived from national sources in 1979 were:

F. N. I. 1979	IN MILLIONS F
Feed mill	170
Equipment for Toukounous	50
Grant OLANI	46
Support to the Sanitary Section	20
Abattoir of Niamey	8
T O T A L	294

In 1979 18 projects were presented to the FNI Commission for 577 million CFA, but only 5 were supported, for a total of 294 million CFA.

The comparison of the FNI funding for the years 1978, 1977, and 1976 were as follows:

F. N. I. 1978	IN MILLIONS F
Vaccine Production	21
Sanitary Section	20
Feedmill	115
Glossin Eradication (Niger Counterpart) Fund to the Project FAO/NER/75/005	6
T O T A L	162

F. N. I. 1977	IN MILLIONS F
Feedmill	80
Vaccination: bovine pleuropneumonia	20
Extension - Toukounous	19
Poultry Program	50
Construction and Equipping of Veterinary Posts ..	45
Niamey	5.2
Glossin Eradication	4
Repairs to the School of Hides and Skins of Maradi	3
T O T A L	226.2

F. N. I. 1976	IN MILLIONS F
Management of North Kirkissoye	17.4
Livestock Extension, Toukounous	10
Poultry Station Mirriah	15
Poultry Center, Niamey	35
New Perimeter, Kirkissoye	25
Boundary-marking of Multiplication Center ..	4.5
T O T A L	106.9

C. Water Projects in the Pastoral Zone

Generalities

The contribution of rural production (livestock, agriculture; fishing) to the gross national product of Niger was 60.6 percent in 1961, 51.9 percent in 1969, 53 percent in 1972, 47.1 percent in 1977 and is less than 30 percent at present. This progressive decrease is not only due to the rapid development of the mining sector, with the uranium mines being exploited in the northern part of the country, but also to the great changes that intervened in the rural sector during the long period of drought which took place in the region between 1965 and 1975 and was at its worst in 1973. This drought seriously affected the Nigerien rural sector, notably animal production. The national herd, which represented one of the main resources of the country, was decimated, although there was variation among different species and regions. In spite of the fact that the livestock potential of the country was not fully exploited, livestock contributed one-fourth of the gross national product in 1972. In 1977 this contribution was no more than 18 percent, and by 1979 it fell to one-half of what it was in 1972 (12 percent). If a five year herd reconstitution program established in 1976 has achieved good results, it remains true that (a) only the previous rate of livestock production will have been attained after several years, (b) this result will be achieved only by the use of considerable resources, and (c) it is due

to an elaborate livestock policy aimed during the last few years at reorganizing the sector toward modernizing stock raising. In this view several significant actions have been undertaken:

- Systematic vaccination campaign against rinderpest and bovine pleuropneumonia
- Promulgation of the law No. 61.5 dated May 26, 1961, determining the northern limit of croplands, and therefore implicitly determining a pastoral zone between the isohyets 400 mm. and 150 mm.
- Establishment of a pastoral water policy which resulted in the construction of a number of water points (pumping stations, combination bore hole/well, cemented wells). Thus in 1979 the pastoral zone had 1189 wells and 83 bore holes. The five year plan (1979-83) will provide 796 more wells in the zone.
- Implantation of livestock projects which serve as the base of national policy in the livestock economy. The guidelines for these were laid out in studies which established four intervention zones called pastoral production areas. They were to be the basis for a rational utilization of the pastoral zone, the essential objective being the increase in the rate of production, with better utilization of available natural resources

and the reduction or suppression of the vulnerability of the economy to climatic and hydraulic conditions. But implementing such a policy implies that the herd must first be reorganized (without being disequibrated), the pastoral zone becoming the calving zone and the intermediate and sedentary zones being the feeding and fattening areas.

It is evident that such an enterprise requires substantial resources, above all the implantation of national services by means of both adequate infrastructure and specific actions. That is why livestock projects have been established from west to east: Sud Tameana, the NRL Project, and the World Bank Project. An agro-sylvo-pastoral project for the northern part of the Department of Niamey will be developed in years to come, and will complete the list of projects covering the whole pastoral zone.

2. Characteristics of the Three Major Livestock Projects Being Implemented

2.1. World Bank Project

It is in its third year of implementation. Its concrete actions, immediately beneficial to the herders, are already spread in the 3 Departments of Zinder, Maradi, and Diffa.

The project has changed its initial program to adapt itself to the realities of the field:

- a. Pastoral supply centers ("relays"), initially not included in the program, have been organized to provide the herders with food staples and basic commodities.
- b. The previous attribution of the pastures and water points to the herders has been postponed to a subsequent stage of the project.
- c. Pastoral centers have been established before any delimitation of the pastoral units. All the 5 centers are being implemented now, rather than being spread over the 3, 4 and 5th year in the life of the project as originally envisaged.
- d. Veterinary securist training continues and has given encouraging results.

The support to the Livestock Service continues and it allows at the same time, a better vaccination covering, a better followup of the securist, and a greater number of sanitary interventions in the herd.

f. Construction is going on normally:

- the headquarters in Zinder of the project, 3 veterinary posts (Birnin Kazeu, Damagaram Takaya and Goudoumaria), and the departmental veterinary service of Diffa, are already finished.
- To be built in 1982: 5 veterinary posts, 5 pastoral centers, a livestock laboratory, and 20 vaccination corrals are to be built.

These facilities will allow the project to undertake the organization of the herders much more easily and to schematize pastoral units by also adding new water points as a complementary action.

NRL Project

Its research program continues, but is two years behind what was initially planned. This was due to the delay in the starting date, which was late in 1979 instead of early in 1978.

The project adopted the strategy of undertaking in-depth research before going into a Phase II, which will have practical, specific, and applicable activities on a larger scale, to the herders, their herds, and the pastoral zone. The advisability of such an approach will be known in 1982, when the results will be published.

Nevertheless, with different pressures, the project also added to its initial approach by:

- Constructing 4 veterinary posts in Abalak, In Gall, Gadabeji and Aderbissinat. The first three are almost finished.
- Veterinary securists' training
- An in-depth study of the post-like diseases in the small ruminant.

This evaluation report discusses the NRL Project in depth.

2.3. Sud Tamesna Project

- a. It started in April, 1980, with a lack of sufficient funds, notably for water points. Because of this, pastoral units foreseen in the course of the first phase of 3 years are not to be realized. With funds from the CILSS, the project can now pursue its normal activities.
- b. Pastoral supply centers have been set up and they operate normally.
- c. They have conducted a trial veterinary securists' training program.
- d. The three antennae of the project will be built in 1982 at Tilia, Telemcôn and Dig-Diga.

They will play the role of pastoral centers even though two of them are located in two big villages (Telemeèk and Tilia) and the third one does not have a dispensary.

- e. Five pens/vaccination corrals have been built and placed in the zone.
- f. The project has helped the Livestock Service in the vaccination campaigns and in the diffusion of cotton seed in the zone.

3. Commentaries on the Three Major Projects

3.1. Differences Among the Three Projects

The three projects aim at the same objectives: increase in animal production and productivity and improve the way of life of the herders, but they are different in their respective conception, philosophy and strategies. We can point out three basic differences. First, they differ in the importance of their zone of intervention, number of people and animals:

- Sud Tamesna: 9,000 km², 27,000 inhabitants, of which two-thirds are Twareg and one-third are Fulani and an animal population estimated at 40,000 animal units.
- Niger Range and Livestock Project: 40,000 km², triangle Tahoua-Tanout-Agadez. It covers essentially the Arrondissements of Tchir-Tabaraden, Dakoro, *

Tanout, and Agadez. In this zone around 50,000 Twareg and Fulani were estimated to live, with an estimated herd of 150,000 animal units. (The recent aerial survey of the NRL enlarged zone estimates 230,000 people and 412,000 UBT; the original figures were at best rough estimates.)

- Niger Centre Est (World Bank Project): consists of 320,000 km² covering the Departments of Maradi, Zinder and Diffa. The population is estimated at 2,000,000 inhabitants of which 400,000 are herders, mainly Fulani, who use 280,000 km² which is unfit for farming. The animal population, sedentary and nomad, is estimated at 1,785,000 animal units, about one-half of the national herd.

Secondly, with respect to geographic factors, the hydrological, human and social conditions of the different projects seem favorable to the achievement of the government objectives. For example, in the Sud Tamesna area the water table can only be reached by bore holes to a depth of 400 to 700 meters, in the NRL zone the problem is a matter of quantities, while in Niger Centre Est, there is a lack of well-equipped modern water points, and traditional wells do not last long (caving in after six to eighteen months due to the geological structure and inefficient construction techniques).

Finally, the scope and ambition of three projects vary greatly. The Sud Tamesna Project appears to be a modest project in financial terms (500,000,000 CFA for Phase I), but the other two are quite important in terms of financial inputs and financing conditions: the NRL Project, financed by USAID, is a grant (\$5,329,000 = 1,385,000,000 CFA for Phase I) while the funds for Niger Centre Est (\$15,000,000) come mostly from a loan of \$12,000,000 from IDA, a subsidiary of the World Bank.

3.2. Sud Tamesna and Niger Centre Est Compared: Funding, Organization and Intervention

3.2.1. Background and Objectives

The Sud Tamesna project based in Tahoua started in July, 1980, although the general accord was signed between FAC and the Government 6 months before (January 5, 1980) and the accord to open a credit account (440 million CFA) at the Caisse Centrale de Cooperation Economique (France) was signed on May 31 the same year. To that we should add a grant from Fonds ~~d'~~Aide et de ~~de~~ Cooperation (France) for 110 million CFA, and from the Fonds National d'Investissement of Niger, 5,000,000 CFA to cover allowances and other expenses. In addition, CNCA (Niger) gave

a 20 million CFA credit as revolving funds to provide the population with basic commodities at low prices. The first phase is essentially a pilot program for 3 years, meant to acquire and elaborate demographic, economic, social and veterinary knowledge in order to insure better chances of success in achieving the objectives.

For Niger Centre Est, the accord was signed on April 27, 1979 and put into operation on October 12 of the same year, while the management unit was set up in Zinder two months before (August 15). The breakdown of the 15 million dollars fund is as follows: World Bank: 12 million dollars, the RN 1,514,000 dollars, CNCA 972,000 dollars and the beneficiaries 514,000 dollars (approximate contribution). The project started effectively in 1980, 4 years after its initial programming (1975-79). It is aimed at improving the efficiency of the Livestock Service by integrated action centered around three main themes: (a) increase animal production and productivity with the effective participation of the herders in the rational management of their environment, (b) in the

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long-term, create pastoral units, which would have traditional range utilization as a base, and (c) in the short-term, introduce modern herd utilization methods by providing veterinary inputs (medicine, food supplements, new vaccines, etc.).

3.2.2. Organizational Structures and Human Resources

Each project has Nigerian personnel, assigned or recruited locally, and expatriate contractors supplied by the financing organism or consulting firms. In the Sud Tamesna project there are 13 Nigeriens including the Director, and two expatriates from SEDES, a veterinarian and a sociogeographer. A very good initiative ought to be noted here: a person has been recruited to serve as a contact with the herders, namely a retired livestock agent who spent 20 years of his career in the project zone.

The personnel of Niger Centre Est are much more numerous: 45 persons, including 3 expatriates.

The differences in the means and the availability of the personnel entails differences in the organization. The organigram of Niger Centre Est is as follows:

- a. The Directorate, managing the project. With this title, the Director coordinates the project and is in charge of the relations with the other services of the government. He plans the activities, the annual budget, briefings, and various reports, indispensable juridical tests. It is also his mission to prepare a phase II project. It has to be noted that the project has already elaborated and turned to the authorities a general juridical test for the creation of herders' associations.
- b. A Pastoral Activity Section (DAP) headed by an expatriate sociologist. His work consists of two aspects: (i) the identification of socio-geographic groups to be the framework for structural and infrastructural innovations that the project would like to introduce in the zone; and (ii) the training and animation of the herders in order to get their effective participation in the management of their environment. The DAP also has a unit studying pastoral behavior, a credit unit, an animation and training

unit and a cartography unit. The importance and the detailed nature of the work requires frequent field trips. For example, in the last quarter of 1980, the members of this section were out in the field for a total of 148 days. Omitting four days for the documentalist, the head of the section and each of his 3 collaborators spent an average of 36 days on field trips.

- c. A Section for Animal Production (DAZ). Since 1980 it has been headed by a Nigerien veterinary doctor. It comprises a unit for fattening and commercialization, a section for animal nutrition and a section for animal health. Its role is to promote and spread the use of inputs in animal production, to train veterinary auxiliaries, to help improve the annual or exceptional vaccination campaigns undertaken by the veterinary services of the Departments by giving them logistic support, to supervise the fattening process supported by a credit unit, and finally to record commercial statistics and improve the data system related to this last

task. The average time spent out in the field for the 7 members of the section was 26 days in the last quarter of 1980.

- d. An Administrative, Commercial and Financial Section. (DACF). Its role is to manage the funds and the personnel. It comprises 3 services: financial, commercial, and administrative.

We also note that when necessary, the project hires a consultant for a specific work. In this way an agronomist of IEMVT has been contracted by the project, and a convention was signed with SEDES to monitor the first year activities and to propose new orientations suggested by the results of supervision, analysis and programming missions. The SEDES is to give quarterly reports to the project.

Even if the hierarchy is not well-defined in the Sud Tanesna Project as in the Niger Centre Est Project for reasons that one can imagine, we suppose that the veterinary activities are related to those of DAZ, that the socio-geographer takes care of the pastoral activities and the work of the Nigerian accountant coincides with

that of DACF. The Director of the project plays the same role as in the Niger Centre Est, but one can imagine that the structure of his position would impose many more chores upon him.

3.2.3. Material Means of Intervention

The materiel available to the two projects' reflects the finances that they have. At the present time the basic difference appears in the means for efficient intervention. The Niger Centre Est is in its own building (provisional cost 29,800,000 CFA) while the Sud Tamesna Project is leasing an office awaiting the construction of its own, in an area which is already acquired. The provisional cost for Sud Tamesna of the various infrastructures, office and pastoral centers, which was 96 million CFA, will finally be 152 million CFA. It amounts, nevertheless, to 5 times less investment than what is to be done in the first five years of the Niger Centre Est Project in construction (859 million CFA).

In addition, while the Niger Centre Est Project allotted 293 million CFA for vehicles and various

equipment, 25 altogether at the end of 1980 including 2 trucks, the possibilities of the Sud Tamesna allows them to use only 8,300,000 CFA. To begin with, they were able to buy 4 Toyota vehicles, seemingly the best suited to the physical conditions of the environment.

The two projects have also acquired veterinary materials and some agricultural equipment (tractors). The Sud Tamesna will dig a bore hole combined with a well at Aouguesarou. This is not the case with the Niger Centre Est Project, which seems satisfied with the determination of OFEDMS to demand a stricter participation in any decisions to put in water points in a region, since water rights constitute a fundamental but delicate aspect of any development strategy.

Finally, the Sud Tamesna Project constructed 6 portable vaccination pens/corrals while the Niger Centre Est plans to construct 20 corrals.

3.2.4. Comparative Evolution and Present Situation

The first investigations at the Niger Centre Est Project convinced the officials of this project that concrete actions should immediately be

undertaken in order to prepare the population. These actions were identified under the form of supplies of basic commodities (cereals, tea, sugar, etc.), in order to have the sympathy and collaboration of the herders. The creation of mobile sales centers for the basic commodities, called pastoral supply centers or relays, in areas judiciously selected, was suggested to the World Bank and was accepted after modification of the initial terms of reference which did not include these operations. Fifteen supply centers are presently functioning under the leadership of persons selected by the herders themselves. The products are sold at cost which is 25 percent superior to the purchase price, to take account of transport (but not vehicle amortization) and a 10 percent commission for the relay manager. After an observation mission, the officials of the Sud Tamesna Project also decided to create pastoral relays for basic commodities. Four supply relays were placed in four major villages in the zone, since the Sud Tamesna Project does not have the same logistic means as the Niger Centre Est Project. The latter resupplies the

centers once a month with 500,000 to 1,000,000 CFA worth of commodities. In both projects, the NRL evaluation mission was assured that the recuperation of the funds does not cause any problems.

The great resemblance of the strategies of the two projects is the pastoral centers. These are advanced organizational centers where the agents of the Livestock Service will live and work, as well as agents from UNCC or the Health Service. The pastoral center thus appears to be a prime instrument for intervention. There will be 5 in the Niger Centre Est and 3 in Sud Tamesna. Before their locations are determined, a thorough examination of the conditions of the environment as well as the imperatives related to the life of the civil servants in these remote centers (school, dispensaries, etc.) is carried out to insure their efficiency. In the Sud Tamesna Project each center will have a vehicle, which they hope will allow them to carry out the interventions more rapidly and more incisively. It is also interesting to note that the creation of pastoral centers at this phase of the projects is

inverse to the initial plans, which gave priority to the creation of pastoral units, socio-economic and territorial entities imagined by experts of the World Bank, but whose establishment would have been laborious, even utopian, due to the juridical and socio-political implications.

Finally, if the two projects are anxious to increase animal productivity by way of concrete actions and the diffusion of inputs in animal production through human and veterinary health auxiliaries, it appears also that credit is an essential preoccupation of the herders. Its introduction and development condition the chances of success of the different interventions. The officials of the two projects are searching for a mechanism for credit in their respective zones in order to gain their confidence and consequently the participation of the herders in the proposed innovations.

3.2.5. Problems

The two projects being in an experimental phase, we can identify a number of problems for which appropriate solutions are required. These include:

- 3.2.5.1. Great diversity in the social and geographic situations, which demand a certain prudence in the search for solutions to the serious problems of the livestock in the pastoral zone.
- 3.2.5.2. The intervention zones of the projects may not correspond to relevant areas which can be used as a frame for development actions. For this reason, the Sud Tamesna Project was obliged to include the administrative post of Tillia in the zone of the project, in order to work in a homogeneous pastoral economic region comprising nomadic dry season and rainy season zone.
- 3.2.5.3. The problem of training appears to be essential at all levels. In neither project have human securists been trained, due to the lack of collaboration with the local services; there is no way to control and follow up the veterinary auxiliaries that were trained and to evaluate the impact of their action; again, there are problems of

information and sensitization which are important; and again, no traditional birth assistants could be given additional training, due to the specifics of the environment and to the fact that there are no Nigerian counterparts who work with the experts.

3.2.5.4. The juridical instruments of intervention of the projects appear to be artificial. It appears clearly that it would be a great mistaking of the facts of the pastoral zone--its geographic, climatic, socio-political and economic characteristics--to try to give private water and pasture use rights by confining the herders into pastoral units which could not permanently give even minimum insurance of the survival of the populations and the livestock. To that we can add the complex problem of the agropastoral populations and their status in an area which was traditionally devoted to livestock.

3.2.5.5. The creation of the herders associations must come after the elaboration of their status and the search for a strategy that is adaptable and flexible enough to be respected. (The search for this formula is presently underway in the NRI Project.)

3.2.5.6. Finally, it is necessary to point out that sometimes the projects are seen as foreign bodies compared to other RN services, because their missions are often times misunderstood due to the lack of adequate information.

CHAPTER II

A HISTORY OF THE NIGER RANGE AND LIVESTOCK PROJECT

This chapter traces the evaluation of the Niger Range and Livestock Project from the origin of its conceptual focus to its implementation in the field. The focus is on organization and management while analyses of the technical work of the project follow in the next chapter. It is based on interviews with the parties involved, on a substantial documentation, and on the fact that the principal author here was a member of the original design team for the project. It is arranged as follows:

- A. The Project Goal
 - 1. The Project Concept
 - 2. The Project Design
 - 3. Expected Project Output
- B. Constraints on Implementation: The NRL as an Example of Sahelian Programming
 - 1. Intergovernmental Understanding
 - 2. U.S. Experience in the Sahel
 - 3. Supplies and Logistics
- C. Overcoming Constraints: The Emergence of the NRL Structure
 - 1. The Senior Consultancies
 - 2. Project Management: The U.S. side
 - 3. Project Management: The Nigerian side
 - 4. The Technical Staff Assistant (TSA) position
 - 5. Summary

D. Moving the Project to the Field

- 1. The lag before Field Operations**
- 2. Headquarters at Maradi**
- 3. The Project Zone and Project Action**
- 4. Relations with RN Administrators**
- 5. Field Team Operations**

E. The Work of the Project: Images, Decisions, and Responses to Opportunities and Needs

- 1. Omissions in Project Activities**
- 2. New Project Actions**
- 3. Problems of Implementation: Image, Reality, and the Project Purpose**

A. The Project Goal

The goal of the Niger Range and Livestock (NRL) Development Project (683-0202) is "to increase the income and well-being of the traditional herders in the pastoral zone" of Niger "while preserving rangeland resources." At first glance, this statement may appear to be straightforward, and to be consistent with many other such statements in rural development projects elsewhere. To the contrary, the phraseology is in no sense bland or routine. The agreement of USAID and the Government of the Republique du Niger (RN) on this objective, especially when considered in conjunction with the careful program by which the purpose was to be achieved, represented a remarkably progressive approach to the small-scale pastoral producers of the vast central region of the Republic of Niger. The better to understand this enlightened accord and program, this section will trace the emergence of the NRL project design.

The NRL project was created against a background of severely limited knowledge of, or strategies for dealing with, Sahelian pastoralist populations. Four such limitations are worth noting. First, Sahelian governments interacted with their own pastoral zone populations in sporadic and often strained relationships--indeed Niger's immediate neighbors, Mali and Chad, had had long military confrontations with their pastoral northern areas well after independence. Niger had a peaceful administration in the pastoral zone, but social services were embryonic aside from yearly mobile

vaccination and health campaigns. Second, Niger government revenues, like those of other Sahelian countries, had been heavily dependent on the export of live animals and of hides and skins, and the country might well have set the improvement of its export industry first among its livestock sector priorities. Third, of course, Niger had just emerged from the worst drought in living memory, and there was a strong sense that the country was in a state of full emergency, both as to its food supplies and its broader social and economic security. Fourth, the United States government (USG) had had only limited assistance programs in Niger until the 1973 drought and the U.S. itself had an extremely narrow range of accumulated expertise on Nigerian conditions.

Within this context, the RN and the USG were able to fashion a project which was focused squarely on improving the lot of the small producer (rather than focusing on livestock exports), on studies that would guide careful and appropriate actions (rather than a program of potentially negative but immediate interventions), on evolving a broad framework for conservation-oriented action in the whole pastoral zone (rather than limited interventions in favored or well-known localities), and on working with small producers themselves in a collaborative and exploratory manner (rather than on simple extensions of government control and direction of the zone).

For the USG, the New Directions legislation of 1973, and its implementing policy formulations, directed USAID to formulate such

emphases in its projects. For the RN to have moved in the same direction reveals a strong and confident concern for the fundamental and long-term welfare of all the people of Niger.

1. Project Concept

The goal of raising the living standards of the population of the pastoral zone in an ecologically conservative manner was immediately seen to be a long-term process. Achievement of that goal was divided into project phases, the first of which, given the restricted knowledge referred to above, was to consist of studies and pilot interventions. These were meant "to (1) provide information on the existing livestock production systems, (2) measure the impact of various productivity-increasing interventions, and (3) establish the technical and social feasibility of preserving the Sahelian rangeland" (Project Grant Agreement: Article 2). A second phase, if agreed and funded, was to implement a long-term action program based on the findings of Phase I. This concept--a phase of studies and pilot interventions--was as remarkable in terms of the patience being shown by development practitioners in both USAID and the RN as it was perhaps obviously necessary in the view of development scholars for whom patience is an easy virtue. Above all, the RN and its Ministry of Rural Development (MDR) are to be congratulated for the risks they took in postponing the impulse to act forcefully despite the strong pressures they must have felt to do so.

2. The Project Design

The project called for a diverse set of activities. The major components were to be led by four long-term expatriate specialists, one each in the disciplines of range management, animal production, development sociology/anthropology, and livestock economics.

The project design outlined a large number of studies and pilot interventions to be undertaken under the leadership of these four specialists, working with Nigerien and other U.S. staff. Other activities of the project included construction, training, and commodity acquisition to support the goals of the project and its four basic components. Technical analyses of the assumptions underlying each of these design components and the degree to which component outputs have been attained appear in Chapter III of this Project Evaluation Report.

3. Expected Project Output

The project was conceived in the aftermath of the Sahelian drought. It was a time of strongly held, though never convincingly documented, convictions about the advance of massive desertification and of widespread environmental degradation caused by the overgrazing of Sahelian rangelands. Over the last few years these fears ^{as well as the drought} have receded as the data have proven ambiguous, but at the time, they were critical assumptions upon which some aspects of the project were based.

With these (and other) assumptions, the overall output formulated for the project was to be "a cost-effective and implementable

range management plan and livestock productivity program that meets technical needs of the area and is compatible with traditional grazing practices." (PGA Article 2, Section 2.1).

It was frankly realized by everyone concerned with formulation of the NRL that this was a tall order. It represented a hope that (a) all the planned studies could be carried out effectively, (b) the pilot interventions planned would yield rapid feedback for concrete management strategies, and (c) that project management could aggregate and synthesize the results into a coherent final package that would be, in effect, the design for NRL Phase II. Analysis of the progress of the project toward this objective is to be found in subsequent sections of this nation.

The Project Grant Agreement was signed on September 26, 1977.

B. Constraints on Implementation: The NRL as an Example of Sahelian Programming

From the outset of the project it was clear that implementing the NRL would not be an easy task. Because this project shared many features with other major projects across Sahelian Africa, it is worth discussing major aspects of the problems that were already foreseen. These may be grouped under three headings: (1) the level of intergovernmental understanding; (2) American resources for Sahelian programs; and (3) commodity and logistics problems for getting projects moving.

1. Intergovernmental Understanding

The Project Paper was written by a group of American specialists, only some of whom spoke French or had read the then existing materials on Sahelian pastoral systems. There were, during the design, strong differences of opinion as to some important components of the project with the RN staff with whom the team was working. These revolved not so much around what became the NRL program as around additional project components that the MDR wished to see included but the PP team and USAID/Niger reluctant to support. Voices were understood to be heard on both sides (and from beyond the two parties involved: see the Project Paper, pp. 89-91, for indications of the differences of strategy with the IBRD, which was planning its project with the Service d'Elevage at the same time) that counselled against agreeing to the project, even to within weeks of the project agreement. Mutual unfamiliarity with personnel and procedures, as well as language problems, prevented narrowing the range of differences or the deepening of areas of full accord. It was also true that the project would be breaking new ground for a Service d'Elevage (a) without much experience or expertise beyond veterinary matters and (b) with limited knowledge of the area of the country in which the project would work.

2. U.S. Experience in the Sahel

The NRL was designed and came on stream at a time when dozens of other projects across francophone Sahelian West Africa were also

being created. Even had there been only a few projects competing for the resources, it was simply the case that there was probably less American expertise available for Sahelian Africa than for any other region in the world. Only a small handful of American scholars in any discipline had worked in Niger before 1975. American private investment was insignificant, and most of the few U.S. products that were distributed or serviced in-country were there as small sidelines to French operations. Nor had knowledge of the region or the country from government or French sources penetrated far into the U.S. institutional capability--the lack of foreign language capabilities in U.S. universities and consulting firms meant that the literature in French had not been digested by those who might want to try to start operations in this new geographical area.

2.1. The decision to use U.S. expertise had a lasting effect on the NPL. AID/Niger and the Project Co-ordinator were determined to make the project succeed, and were prepared to search hard to insure that the best possible implementation team was found for the project. A first attempt was made to secure a team through the Title XII program, and in due course a single proposal was received, from one of the arid-land-based universities in the American west. The proposal was weak in several respects, above all in identifying the actual field team which would carry out the work under the general

regis of the senior personnel whose names were given in the proposal, and who themselves had no Malian experience or language capability.

A second search was organized, this time in the private sector. Two proposals were received, only one of which could be entertained seriously. In addition to mounting an otherwise interesting proposal, the firm involved claimed its key person had exceptionally good French language capability. Only by chance did information come to the NRI that the claim was inflated, but when a test was then demanded, the potential key team member scored an "E" (zero) level in French! Shortly thereafter, the firm discontinued communication with the project.

- 2.3. A third alternative, and one that suggested itself strongly to USAID/Niger management because of the inadequate ability of U.S. institutions to come up with capable teams, was to try to recruit individual contractors for the major positions in the project. Here, too, limited prior U.S. expertise hindered the identification of appropriate persons. Some pre-Ph.D. students were identified for the sociology section, but this component, like the others, was deemed too important not to have a senior and experienced person fully in charge. Section C.1. below

traces the identification of the senior consultants, who were finally hired as individuals and not through any institutional contractor.

3. Supplies and Logistics

USAID requirements for the purchase of American commodities and technical assistance have affected project implementation in several ways. The evaluation team lacked expertise to analyze or compare the performance of the U.S. vehicles (International Harvester Scouts) or other commodities (scales, camping gear, office machinery, etc.) with non-U.S. makes more widely available. Further, so no comments will be made here on such matters. (For the vehicles it is rather a moot point anyway, since Scouts are no longer being manufactured. The Scouts, ordered in 1977 and in-country only in mid-1979, were finally joined by their spare parts only in early 1981). Two other points, however, are worth noting:

- 3.1. The choice of Maradi as Project Headquarters was a controversial one, given that Maradi was obviously far away from the zone in which the project was to work. The choice was made because it was felt that, with at least one other USAID project based in that city, both the U.S. personnel would feel more comfortable and the U.S. vehicles would be more effectively serviced. The U.S. requirement had the effect of lengthening the supply lines and distancing project direction from project

field work. That only one American family ever came to Maradi under NRL could not, of course, have been foreseen. The upshot, though, is that the Project Director has fullest administrative liaison with other government services whose relevance to the project is at best marginal, while contacts with Tahoua Department personnel, in whose area much of the project work goes on, are non-continuous. This problem may be corrected, however, since PL 480 Counterpart Funds are being used by the RN to construct an office complex in Tahoua which is also meant to serve as a possible headquarters for NRL Phase II, if NRL continues.

3.2. At two points in the Project, once at the level of a senior consultancy and once for a junior person, non-U.S.-citizens with obviously outstanding qualifications were identified as candidates for service with NRL. Waivers for recruitment of both these individuals were ultimately secured, but not before several valuable months of their potential work-time had been lost to the project. By the time the waiver for the senior person was secured, he had been forced by other commitments to reduce the total time he could give to this project, and the result has been a cost in his time for supervision and above all in his ability to see his management initiatives through to their conclusion both with the RN and with USAID/Niger. It is the understanding of the evaluation team that authority

to grant the waivers which would have secured both these individuals has now been delegated by AID/W to Mission Directors. If this is true, the waiver authority is a valuable tool for acquiring the best--and sometimes the only viable--resources for accomplishing the goals of projects being implemented in the difficult conditions of AID's Sahelian programs.

C. Overcoming Constraints: The Emergence of the NRL Structure

The Organigram reproduced as Appendix E of this evaluation report graphically reveals the existing structure of the NRL Project. It shows both the strengths and the weaknesses of the organization. Many of its features represent significant departures from the implementation structure foreseen in the Project Paper. Four major aspects of the structure require discussion, because they are and will be major determinants of the outcome of Phase I. These are:

(1) The evolution of the senior consultancies; (2) Directing the USAID side of the project; (3) Staffing the Nigerien side of the project; and (4) The "Technical Staff Assistant" (TSA) position.

It should be said at the outset that the deviations from the project design have, for the most part, been creative and flexible responses to the heavy constraints under which the project began operating.

to the credit of the Project Co-ordinator, Paul A. Daly,
an eventual structure emerged at all, especially one which is
in such an excellent position to achieve the major purposes of the
project. The tolerance and support of this flexibility, both from

USAID/Niger and the RN, have also been important contributions to the many successes of the project.

1. The Senior Consultancies

The project design envisaged four long-term, senior staff members, a range management advisor, an animal husbandry advisor, a development sociologist, and a market economist. Over the three-year life of the project each of the first three of these technicians was to have spent two and one-half years in the country, while the fourth was to work for one and one-half years.

1.1. Through 1978 and into 1979 the project co-ordinator continued his attempts to contract with U.S. institutions for these project technicians.

Early in 1978, Dr. Jeremy Swift, who became senior consultant for the socio-economic studies, was identified, and because he was a U.K. citizen, the first attempts were made to get a waiver to secure his services. Although first identified for the sociology position, Dr. Swift also had training in economics and extensive experience in Sahelian Africa.

As contract negotiations with institutions wore on, it seemed valid to consider Swift as the person who would lead both the sociological and the economic activities in the project. This intuition was a good one, and the result has been close coordination among the social and economic research activities. Nonetheless, by the time

Dr. Swift could actually be contracted, in mid-1979, he had committed himself to work in Mali as well as Niger. The evaluation team agreed that in his role as leader of his field team he has done a superior job in setting substantive directions, supervising, and motivating. The cost of his limited presence in Niger, however, appears to have been relatively attenuated ability on his part to follow through on the upward management and outward communication tasks (with project headquarters, and with mission and government staff) required in running a research program within this particular bureaucratic context.

2. Dr. Robert Bement was identified early in 1979 as a potential leader of the range management aspects of the project. Despite his lack of French or of specifically Sahelian experience, his seniority, his thirty-years experience as Scientist-in-Charge of the Central Plains Experimental Range in Colorado, his buoyant enthusiasm and especially his herd management decision-oriented approach to range management made him a good match to the requirements of the Project design. It is reliably reported that during his first short trip to Niger the Service d'Elevage was easily convinced that his research orientations were much more preferable than those of traditional range theories, especially those that generated static stocking rates for

given rangelands. Dr. Bement was thus contracted, with confidence that he could manage his research within the few months a year that he could be in Niger.

At the same time, it became clear by mid-1979 that no viable institutional contractors were forthcoming. The project coordinator also felt that some of the animal production studies and interventions predicated in the project design could not be accomplished. Dr. Bement was thus given a parallel doubled chore to that of Dr. Swift, that is, of filling the shoes originally designed for both the range advisor and the animal husbandry advisor.

- 1.3. The two senior consultants finally chosen were thus the end products of a long and hard search for viable contractors. The costs of having two people for shorter times rather than four for long periods have inevitably been: (a) to reduce the range of separate perspectives that there might otherwise have been; (b) to give each of them responsibilities for a broad array of studies, interventions, and short-term consultations, some of which they were inevitably unable to pay as much attention to as even they might have liked; (c) to cause problems of the coordination of activities, the synthesis of programs, and the choice of the pace of project activities to float upward to central project management.

2. Project Management: The U.S. Side

This section is not an evaluation of job performance by anyone in project management, but rather a comment on project structure. In 1977, the project design team could not resolve an internal argument as to who among the technicians might assume overall direction of the substance of the project as "Chief of Party." The agreement to disagree was left hanging, with the hope that the most senior and capable of the four technicians to be chosen would be made chief. Had a single institution supplied the technicians, this might well have happened. Instead, with two part-time senior consultants, the position (or function), clearly marked on the organigram, of "advisory team coordinator" (i.e., Chief of Party) has been left vacant. In these circumstances, the upward flow, to the USAID Project Manager level, of control over the pace and schedule of project inputs has been matched by ongoing control of project substance, for example of work plans, report reviewing, refereeing of internal differences of opinion on substantive directions to take within project activities, and so on. Paul A. Daly, the USAID Project Manager (internally redesignated the Project Liaison Officer) has had an enormous role to play.

3. Project Management: The Nigerian Side

After the project grant agreement was signed, the RN chose as Project Director the then current Livestock Service Departmental

chief at Maradi, where the project was to be headquartered. A year and a half later, with no project activities yet in the field, the Director moved to Zinder, to become soon thereafter the Director of the IBRD-funded Projet Centre-Est. His replacement was Dr. Ali Dankintafo, chosen because he was the one senior person in the Livestock Service who had a good command of English. Dr. Ali presented other advantages: he was educated in the U.S. and had familiarity with those U.S. approaches to range management that informed the NRL design but are unfamiliar to many Nigeriens (and European-trained technicians); and he was a specialist in animal production in a Service without many non-veterinarians, obviously a plus for a non-veterinary-oriented project. On the other hand, he came into the project just as the senior consultants were being finally chosen (and the potential institutional contractors were being eliminated). As well, he was based in Maradi, far from either the central project field activities or the central actors in his Ministry and in AID in Niamey; he was unfamiliar with USAID (or other project) management systems. These circumstances, then, added a third set of conditions that left the US project manager with day-to-day control of the project and responsibility even for seeing project problems through with the MDR. At the same time, it has left the Project Director in a particularly isolated position, with only hazily defined responsibilities for the substantive, fiscal, or decision-making work of the project.

4. The Technical Staff Assistant (TSA) Position

One of the most creative responses of NRI project management to the problems of securing well-trained and experienced project staff was the creation of the TSA position. The TSA is generally a young person, with demonstrated commitment to and stamina for work in the field, often with local experience and language capability, and with at least some technical expertise for his or her assignment. The position was pioneered by earlier USAID/Niger projects that used ex-Peace Corps Volunteers as project assistants, but in the NRL the position was upgraded, divorced from whatever image it had of being connected with Peace Corps experience, and made an integral part of project implementation. The NRL has had to date, eight TSA's, who have worked as research assistants, work team managers, and administrators. Each one has been a significant contributor to the work of the project. Had project management not gone this route, it is doubtful that either the senior consultants or the short-term consultants who come later would have been able to carry out their mandates. The TSA position should be replicated for beyond USAID/Niger for effective field operations.

5. Summary

In the NRL, recruiting and fielding an implementation team meant overcoming enormous constraints far beyond project control. Overcoming those constraints required constant vigilance and the

seizing of passing opportunities. The structure that emerged (and not simply the personalities who were involved) yielded a great freedom of action to the USAID Project "Liaison Officer," or Project Manager. The evaluation team is not in a position to say whether Project Managers of other projects have as significant a role in their projects, or at what relative costs and gains. The NRL structure that has emerged is one in which (despite the organigram) many short-term consultants, and some TSA's, report--in their own minds and/or actions--directly to the Liaison Officer, and not necessarily either to the senior consultants of whose "team" they are shown to be members, or to the Project Director.

D. Moving the Project to the Field

The last section dealt with problems of creating the operating structure of the NRL team. While the team was still "under construction," project management also had the task of moving the project into actual field operations. This section will discuss five aspects of managing this transition: (1) the 1977-1979 lag, (2) the creation of headquarters at Maradi, (3) defining the zone, (4) relations with RN administrative authorities, and keeping the work going.

1. The Lag Before Field Operations

The Grant Agreement was signed in September of 1977, but project field operations did not begin until September of 1979, with

the arrival of the first major contingents of both the range/livestock and the social/economic team members. (One internal report for the project refers to September 1, 1979, as the project starting date). Much of the explanation for the long lag has already been given: the inability of AID, in any timely manner, to identify credible contractors and secure their services. The evaluation team was unable to explore the relative contributions of the project, USAID/Niger, the RN, and AID/W to the dragging out of this process. In the meantime: vehicles were ordered in December, 1977, but arrived only in June, 1979; participant trainees began departing for U.S. universities in the summer of 1978; some short-term consultancies were carried out (the report on the Southeast Sector, e.g., in late 1977); and a headquarters building in Maradi was leased and occupied in July, 1979. In one attempt to start some field work, five Peace Corps Volunteers were assigned to the Project, trained in Niamey in January of 1978, and organized for work in range studies at the ranch in North Dakoro. For a variety of reasons, including lack of support and supervision, this reasonable initiative failed (and, in fact, four of the Volunteers returned to the U.S.). It is the understanding of the evaluation team that a two-year lag of the sort encountered in this project has not been uncommon in the Sahel, and that some other projects have even longer to staff up.

2. Headquarters at Maradi

Logistical and administrative support of field work is provided to the entire project staff from headquarters at Maradi. An administrative/financial section processes vouchers and payments and pays salaries to 67 people of over 2,000,000 FCFA per month; the mechanical yard has done a superlative job of keeping the vehicles roadworthy; a moderately large library of background and related materials was organized, although it is not now in much demand; comfortable office space for the staff and counterparts of range management and socio-economic teams is provided; and a small laboratory has from time to time operated for biological work. All but one of the TSA's have houses (some shared) in Maradi, to which they repair from stints in the field. Finally, but most importantly, the Director works in Maradi, supervising this entire operation.

An open question is whether an Administrative Assistant might have run this Maradi office. If so, the Director might have been based in Niamey, where he would be closer both to the MDR and to USAID/Niger project management. Alternatively, the USAID Project Manager could have been resident in Maradi as well as the Director. As noted in Chapter I above, the other two major livestock projects in Niger have, like NRL, field headquarters (at Tahoua and Zinder) with resident Directors. The problem with NRL seems to be the weight of USAID/Niger on project operations:

unlike the IBRD, for example, which has no Niamey mission, the NRL Niamey office (and USAID/Niger in general) is no crucial to current project operations that Maradi pales in significance.

3. The Project Zone and Project Action

The "project zone" has gone through many changes since its original definition. Years before the Project Paper was written, and in the Project Grant Agreement, it was defined as the triangular area of 40,000 square kilometers bounded by the towns of Agadez, Tahoua, and Tanout. A map of the "Project Area" in the Project Paper (p. 16b) shows a somewhat different area perhaps one-fourth smaller. The air survey carried out in mid-1981 covers an area fifty percent larger than the original triangle, while the water point survey that has been undertaken covers more or less the original zone. On the ground, the NRL, like other projects, concentrates its actions in a few areas. These have been the southern and eastern portion of Tchir Tabaraden Arrondissement in the Department of Tahoua (socio-economic work in several areas, range and livestock work at Ibecetene Ranch), Madaoua Arrondissement also in Tahoua Department (socio-economic work), and the Arrondissement of Dakoro (range and livestock work North Dakoro Ranch, and socio-economic work elsewhere) in the Department of Maradi.

The areas where the more intensive work is going on are key areas because they represent different vegetation zones, economic patterns, ethnic groups, and herd types. Whether information generated and pilot interventions undertaken in these areas can be extrapolated to the whole zone remains to be seen. Comments on specific issues of representativeness will be found below, in the technical analyses. In general, the evaluation team agreed that the distribution of work on the ground was an appropriate one given project issues and resources.

4. Relations with RN Administrators

Notwithstanding the concentration of intensive actions, the NRL project has operated in four (of the seven) Departments in the country and in the administrative zones of ten subprefects, chiefs of post, and districts of other administrative and technical officers. Project staff has done a remarkably effective job of keeping all these administrators well-advised of their commitments, contacts, and work-plans. The multiplicity of zones of action has had some distinct advantages for the project: when an administrator has been less than enthusiastic about a project action, the project has been able to move the focus to another district or arrondissement. On the other hand, no single set of administrators feels obliged to foster the project goals, and many are not sure where the project is headed in the long run. With project headquarters in Maradi, the Project

Director has become a member of the technical advisory team in a Department whose services are focused on the agricultural zone. If headquarters move to Tahoua, there may be a greater integration of the project into the development vision of the Departmental administration. The cooperation of the Departmental technical services may thereby be enhanced, at least for Tahoua. In the long run, however, the project will always be working across several administrative boundaries.

5. Field Team Operations

The project has done an excellent job of keeping field operations moving. First, a TSA organized an effective administrative/financial section to keep track of the time and effort given to field work. He has left, but if his records are updated by his replacement, there will be a revealing record of the deployment of material and personnel in the pursuit of project goals. Second, retention of an excellent and resourceful mechanic, Shaibou Moussa, has proven crucial to keeping the vehicles moving the bush--the TSA's report showed no significant losses of time to downed vehicles, even though the frequency of repairs is of course annoying. Housing in Maradi has been more than adequate. Payments have been promptly made.

The major hindrance to field work has been the lack of provision of per diem allowances to Nigerian staff. Whether due to a

misunderstanding when the Project Agreement was written or not, the fact that neither the Project nor the RN has been able to pay per diem allowances has led to an understandable level of resentment among people who are in any case on low salary scales. In these circumstances, a few of the Nigerian counterparts have been less successfully utilized than might otherwise be the case, while others are gamely doing their work in the knowledge that the expatriates in their own project, and all staff in some other projects, receive such allowances. Certainly an NRL second phase design team will have to address this question anew, if steps cannot now be taken to rectify this situation.

E. The Work of the Project: Images, Decisions, and Responses to Opportunities and Needs

In the next chapter of this evaluation report, the technicians on the evaluation team analyze the substantive work of the project. The bulk of these analyses speak to work which was programmed into the Project Agreement, was organized by the implementation team, and is moving ahead on schedules determined by the needs of the studies and interventions themselves. On the other hand, there are activities that have been dropped from or added to the Project Grant Agreement as project management has deemed it reasonable to do so. These modifications require discussion.

The evaluation team does not believe that the Project Grant Agreement should be a rigid program for management to follow mechanically.

To the contrary, the project design should probably be seen as a vision of development meant to be so attractive that highly imaginative contractors will come to implement it. If that happens, they will respond to the changing environment and improve the understandings of the design team in ways that will make the project even better than its design. It is in this spirit that the following assessment is made.

1. Omissions in Project Activities

As noted earlier in this chapter, the merging of the planned four separate senior advisorships into two had inescapable consequences for project actions. While project management went ahead contracting most of the shorter-term studies that were designed, the two senior consultants had a harder job--given their time limitations--generating all of the studies and pilot interventions that were to have comprised the total work plan of the larger team. The most significant departures from the Project Agreement have been in the livestock production activities, but some aspects of the range management component have been neglected as well. (See Chapter IV for a table of outputs projected and achieved.)

It was not clear to the evaluation team in most cases why project management had dropped these activities and not tried to find other means of carrying them out. Statements were offered that an activity was seen to be "not worth trying",

that it was based on incorrect assumptions, or simply that it was a bad idea. There may indeed have been cases where this was true. What seems to be missing is evidence that the omissions were carefully justified, or--more importantly-- that there was consideration of the degree to which the project purpose might be compromised if the activity did not take place. Individual technical analyses pick up particular cases of these missing pieces in project implementation. In addition, the recommendations section of this report attempts to focus on those items which might still be carried out and which would be most important to reaching project objectives.

On the socio-economic side of the project, the major missing is the creation of pilot herders' associations. The r consultant has consistently tried to operationalize this project activity, which is seen by the Project Grant Agreement (Annex 1.B.3.d. and e.) to be critical for the long-term self-management and development of the pastoral population. To date no full go-ahead from project management has occurred despite repeated requests from the senior consultant. The RN, in April of 1981, finally published the mini-aterial "arrêté" which provides the legal basis for establishing these associations. As will be seen below in the section on recommendations, the evaluation team gave highest priority to getting on with this crucial project activity.

The omissions in project activities reflect the great latitude left in the project liaison officer's hands by the evolution of the structure of the project. The question arises whether the RN, through the Project Director, or USAID/Niger, should have foreseen the need for careful review of how the leadership of the substantive work of the project could be exercised or reviewed in the situation in which the two main implementers were in country only a few months each year. We return to these questions below.

2. New Project Actions

The gaps in project activities are compromising achievement of the project purpose in various ways. On the other hand, project management has been creative in adding new activities not originally designed into the project. Foremost among these have been three: (1) human health research and interventions; (2) para-veterinary training; and (3) aerial surveying of pastoral zone.

2.1. Human Health Activities

The accident that one TSA was accompanied to Niger by her physician husband offered a unique opportunity to study and test health conditions and interventions in the pastoral zone. Previously, the health services of Niger had encountered nearly impossible obstacles in reaching out to the pastoral populations except during the annual,

vaccination campaign. Other services attempted had largely reached only the two-based populations within the zone. With Dr. Loutan added to the NRL Project and spending much of his time with the herders, it became possible to undertake a variety of nutritional, medical, sanitary, and ethno-medical studies. This work has already been important to many other team members. As well, human health "secouristes" (auxiliaries who are themselves herders) have been trained who are now at work in their communities. This concrete action is seen by all who know of it to be a most welcome addition to the project, and involved successful cooperation with the national services unseen in other project activities. Further analysis of its problems and prospects appears in Chapter III.

2.2. Veterinary Activities

The project envisioned little activity in the veterinary area, in part because, at the time of the drought, improved animal health was seen to be a potential part of the problem, not the solution, of Sahelian pastoralism. That attitude has changed, and in any case demands on the project for veterinary interventions have been strong at every level. The decision to use one of the project counterpart livestock agents to assist in the formation

of para-veterinary workers on the general model of the widespread human health auxiliary system in Niger was a most happy one. Again, problems present themselves and are addressed in Chapter III below. But the Service d'Elevage and the other two major pastoral zone projects in the country are looking to the NRI as the model for such programs.

In addition, requests for veterinary assistance by the RN in 1980 resulted in the contracting of an experienced veterinary consultant in 1981. His collaboration in thinking through additional studies and health interventions is forming a useful complement to the work of the senior consultants.

2.3. Aerial Surveying

NRI management decided not to move forward quickly with aerial photography or the purchase of extensive satellite photography of the project zone. At this stage of the project, there was as yet no demand or obvious immediate use for the extensive information that these technologies might have provided. In the meantime the International Livestock Center for Africa (ILCA) was developing the methodology and capability for aerial surveying (involving low-level flight and careful observation) of large areas like the project zone. Because the NRI zone was of interest to ILCA's basic research mission, the

survey plane and technical services were secured by the NRL at ILCA's own cost. The first part of the survey was completed early in 1981, and the second part is now scheduled for later in the year. The maps and tables which have resulted are clearly of major significance. Knowledge of the human and livestock populations, of cropping patterns, of vegetation types and associations, and of water points has all been broadly extended by this new technique.

2.4. Summary

Project management has been alert to many new and creative possibilities as implementation has proceeded. Participant trainees have been brought back to Niger for the summers to work within the project, and have spent other summers observing within their disciplines in various situations in the U.S. A new TSA was added in 1981 to the socio-economic section so that important questions of the articulation of the pastoral zone to the southern agricultural zone of the country could be researched. Peace Corps Volunteers recruited for the range management team on the project have often on their own initiative but in the spirit of project experimentalism, begun to test new ideas for development in the zone. Livestock Service and NRL personnel have been sent on short-term observational trips

or to conferences to extend their knowledge of other projects or activities in their fields. A flexible project manager, always searching for activities that might help project implementation efforts, has been crucial to project evolution.

3. Problems of Implementation: Image, Reality, and the Project Purpose

The project history recorded above reveals a pattern of sustained energy spent in pursuit of a large variety of project activities. Mounting and servicing these diverse activities without the benefit of an implementation team Chief of Party has taken a constant vigilance on the part of Project Management that is unusual in such projects. Added to the original Project Agreement have been new activities which have responded to the opportunities and newly perceived needs presented to Project Management. In the field, the Peace Corps Volunteers, the TEA's, the consultants, the counterpart staff, and the rest of the team have begun a real dialogue with the herders themselves over paths toward self-managed development.

Yet, for all this, the NRE project appears to have a reputation with the RN and TEAD/Niger of being somewhat irrelevant to the needs of the country, of only doing studies when "concrete actions" are necessary, and of being inflexible in the face of requests for new activities. Accounting for this image is not easy, given the vagueness of some of the perceptions, but the

evaluation team found it necessary to try to uncover what is image and what is reality. Both Nigerian and USAID perceptions will be discussed.

3.1. Nigerien Perceptions

On the side of the PN, there is an image that the MRI project is only a set of studies, that there are concrete actions to undertake that need not await any further collection of information, and that the project should therefore move as quickly as possible toward the anticipated second phase, when remedies will be forthcoming. When the MRI is compared with the IBEP funded Projet Centre-Est, the image is further reinforced.

Is it correct? The evaluation team found reason to doubt the validity of the image and the inferiority of the MRI to the Centre-Est Project. First, the zones of action are not comparable: Centre-Est is working in the sedentary zone (as well as in the pastoral zone) and is thus engaged in some concrete actions like the funding of peasant animal fattening programs that are also carried out south of the MRI zone, but by other projects. Second, and more importantly, when one looks at the pastoral zone (itself), the MRI has probably taken as much concrete action as Centre-Est. MRI has trained human health auxiliaries, Centre-Est not. MRI has trained and begun to supervise veterinary auxiliaries who are true pastoralists, while

Centre-Est auxiliaries have more frequently been non-pastoralists and may not be as well supervised. NRI has built four livestock posts in the pastoral zone, while Centre-Est intends to build about the same number (but more outside the pastoral zone). The Centre-Est project also intends to build pastoral service centers and to dig or improve wells, but these are not yet in service. Whatever the fine details of the comparisons, it is simply not true that Centre-Est is building in concrete while NRI is only building theories. Third, and most important, NRI is acknowledged to be moving directly toward the goals of the Development Society, the RN program for Niger's future. Based on self-managed local units in collaboration with government services, the mechanisms that will lead to the Development Society are only beginning to be evolved. The NRI research program is seen by many administrators in the field and by technicians in other projects to be the leader in devising or revealing those mechanisms for the pastoral zone. The evaluation team thus sees the NRI as a complex program leading to both economic and social goals in Niger, and is confident that these goals must continue to be pursued together. Chapter IV will elaborate this theme as it encumbers the planning for a second phase of the project.

As for the image of inflexibility in the face of RN requests for in-stream changes of direction, the evaluation team found it difficult to discern exactly what had been asked, what had been refused, or what was impossible to do on the grounds of USAID policy. Could per diem allowances be granted? (Are they in other USAID/Niger projects? The amount involved is said by Nigerien management to be less than \$15,000). Did the USAID-funded Vetophar Project not provide some of the items that the RN seems still to be asking for? If, because of budgetary stagnation, Livestock Service funds to equip Livestock posts are much more limited than was anticipated, is the NRL prevented by the terms of the grant from responding? Perhaps NRL management and the MDR should confer over a carefully-justified list of additional items that the RN would like to see funded. The advantage to NRL, especially to clearing the air before a second phase design team arrives and is subjected to heavy pressures, might be salutary.

3.3. AID/Niger Image

AID/Niger appears to share the RN image of a project which in all "studies". As indicated in the last section, the danger in this image is that the planning process for a second phase will reject any studies. Pilot, or even wide-scale, interventions may well be planned, and they

will have to be monitored closely and evaluated as they happen. Additional range, livestock, and/or social studies may be necessary, since the last four years--in the Sahel at large, not just in the NRL-- have only begun to enable the kinds of work on which large-scale changes can be based. That one senior consultant brings with him the perspectives of over thirty years of research and experimentation should itself be a caution to those who might wish that "studies" should end with NRI Phase One. Niger will have to institutionalize a permanent capacity for pastoralist research.

3.4. Project Responses

The complexity of NRI activities occupies management fully just in terms of getting the back-stopping done. The research is in mid-passage, and does not yet show results that are clear-cut or remarkably novel. But despite these constraints, the total NRI team shares responsibility for not having done an effective enough job of communicating its successful actions, its research goals, or its projected final outcomes to any of the many audiences which it must address. There are many concrete actions. There are novel forms and methods of research that are themselves lessons from the project. There is an agreed-upon document

which outlines in detail a final phase one synthesis report to be entitled "A Pastoral Development Strategy for Central Niger." There is a readiness to begin the important work of forming the initial herders' associations. And there is a project-in-process which is engaged not just in "organizing space," as another project was characterized, but in working daily with the people of the zone to help them define and address their own options for the future. In this sense, the project suffers from having its short but eventful history not yet fully told to the people who must hear it, by the project team itself. We return to the question of communication in Chapter I.

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CHAPTER III

PROJECT IMPLEMENTATION: TECHNICAL ANALYSES

This chapter provides the technicians' analyses of the substance of the work of the NRI. The studies and interventions of the project are so wide-ranging that it was impossible for the evaluation team to assess all aspects of the work in the time available to it. If there are individuals whose work is slighted, the evaluation team regrets its oversight. The technical analyses are as follows, with individual outlines appearing at the beginning of each analysis:

- A.1. Livestock Production
 - 2. Veterinary Interventions
- B. Range Management
- C.1. Socio-Economic Studies: Research Objectives
 - 2. Socio-Economic Studies: Research Methodology
 - 3. Social Interventions

A.1. Livestock Production

This section of the evaluation is organized in terms of the livestock production elements as listed on pages 14-16 of the Project Grant Agreement, plus one item on water point improvement listed with the Range Management elements. These are as follows:

- 1.1. Proposed Cost and Benefit Study of a "Package of Improved Services"
- 1.2. Recurring Cost Study
- 1.3. Existing Livestock Program Support
- 1.4. Construction of Livestock Posts
- 1.5. Extension Program Design
- 1.6. Market Study
- 1.7. Water Point Study

1.1. Proposed Cost and Benefit Study

1.1.1. The importance of a cost and benefit study of any intervention cannot be overemphasized given the limited resources available. All potential interventions must be evaluated to identify the most cost effective ones for preferential consideration. However, in this case, the scale of the study and the assumptions of willing herder cooperation may have been over-optimistic. While the PP gave justification for the absence of an internal rate of return analysis, the partially complete cost and benefit estimates might have been used to identify weaknesses in the production package. The additional information may have made possible the simplification of the study. The recommended animal production package would have a high probability of increasing production, but the cost may exceed the benefits in some cases.

1.1.2. It was decided by the NRI Project management to eliminate this study due to an anticipation that data collection difficulties which might occur would result from the inequitableness of giving treatments to "test" herders and not to the "control" herders. Given the known cost of parts of the package and the probable maximum benefits, there was in any case a justifiable

reservation of its appropriateness.

It should be useful to present some simple calculations of the probable cost-effectiveness of some of these interventions using empirical data as presented in the PP.

- (a) Feeding calves in dry season as recommended would cost \$9.45 per calf fed, not including transportation and labor from veterinary post to camp. Total projected salvage of calves due to the supplement and health care is 10 percent of the calves fed. This calf saving would only be worth \$9.38 per calf fed at one year of age. The salvaged value could only pay for the feed, at best, leaving the other cost and labor as a loss.
- (b) Mineral supplementation as recommended would cost \$8.60 per animal unit before transportation and labor. This would require an increase of 21 percent of the total production value of meat and milk or 35 percent of the meat value alone. While the projected 30 percent increase in reproduction from the total package might cover this expense, the margin would be small.

(c) Given that the potential added value of production could easily be spent on the supplements, it could be predicted that the other expenses of vaccinations, and parasite treatments would likely result in a negative net outcome of the cost and benefit study.

1.1.3. Ongoing alternative studies have been initiated to provide data on livestock production parameters.

(a) Herd composition data have been collected on 1005 herds in the northern area. This should be continued and expanded to obtain representative samples throughout the zone. Care should be taken to assure that all data collectors are using the same criteria for selecting sample herds and for judging age.

(b) Herd composition and production data are also being collected on an intensive basis by the socio-economic teams on the herds of the Wodaabe and the Twareg being studied. This data will provide herd compositions, reproduction, mortality, milk production, family consumption, marketing and price received by month, season and age. These data will be analyzed with the other social data during early 1982.

(c) An animal health study is being conducted to better define the diseases and parasites which are important in the zone and to determine practical means to economically combat them.

Judging from the written proposals of specific studies, the short-term technician trip report and personal communication with the technician, it appears that the most common diseases and parasites will be identified. And, a qualitative relationship between parasite infestation and condition of forage and livestock will be obtained for a limited part of the zone. However, information concerning level of incidence of the diseases or parasites in the herds, the degree of morbidity in terms of production, the degree of mortality and the level of economic effectiveness of recommended treatments does not appear to be forthcoming.

Determination of the cost and benefits of the recommended means to combat these maladies should be done to the best degree possible. Since the data being collected are not sufficient at the epidemiological level to evaluate treatment strategies and costs,

other available data should be used. These data might include Livestock Service statistics, West African Experiment Station data and/or literature from somewhat similar areas.

(d) An Aerial Survey has been conducted in the dry season and another will be conducted in the rainy season. The data being collected on animal numbers by species, breed, season and concentration will provide a means of verification and supplementation of the Livestock Service statistics which can then be more effectively used to extrapolate the limited herd production data to all the zone. Use of these data by the range management team to optimize forage utilization could be potentially very important to production efficiency. Results of the dry season survey agree with Livestock Service statistics within the margin of error, thereby giving more confidence to locally available data.

(e) Hay production is going to be studied superficially by mechanical and hand methods during this growing season. These experiences should

include labor time, cost, yield, storage loss and feeding value. While there is little thought that the transhumance herders can regularly use hay making and storage, the time and cost requirements need to be established to evaluate the practice as a potential means of storing a dry season reserve at sedentary and/or government organized centers. The relative cost of hay vs. other emergency supplements should be known. For example, the limited use of cotton seed to feed lactating females to increase milk production for family consumption in the dry season and to save weak animals could likely be cost effective, but because of the high cost of cotton seed it is not cost effective as a general herd supplement (nor is it readily available). We need to know the cost and value of hay so similar judgments can be made relative to its use and promotion.

Additional studies should be conducted to support the alternative studies in order to obtain as much as possible of the original information to have been developed from the Cost and Benefit Study.

- (a) Conduct an intensive herd production study in conjunction with range study of grazing habits.

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This should be conducted in at least one Tuareg and one Wodaabe herd for a complete year.

Data should include herd composition, reproduction, morbidity, mortality, milk production and animal health care by date, age, and weight of animals (either by spring scale for small animals or tape measure for large animals).

This study should be coordinated closely and effectively with the socio-economic team herd studies so the data can be extrapolated over their herds with the extensive data.

- (b) A review of production and cost-benefit parameters on the Nigerian Government ranches should be conducted and used as an estimate of production resulting from improved practices. (They have a vaccination and parasite control program and they feed minerals and supplement.) While these herds have some other advantages as well as disadvantages which could not be accurately estimated, it would give a rough estimate of what production might be expected from the improved production package. This ranch data should be compared with that obtained in the

traditional herd production studies, along with cost data to estimate the cost effectiveness of the package. Additional parameter estimates might be obtained from a review of IEMVT research in West Africa.

- (c) It is strongly recommended that a consultant be contracted for the last six to twelve months of the project to consolidate and analyze the animal production and range data being collected and utilized by the socio-economic team, the veterinary team, the animal production and range team and the marketing teams. A person versed in African animal production, range management, economics and computer science is needed to bring this data together to define the overall flow of inputs and outputs of the present production system, while testing the applicability and cost effectiveness of technical interventions such as feed supplements, mineral supplements, specific animal health care, water development and range management.

This type of person would have been very helpful from the beginning to help coordinate the animal production studies with the other related

studies in range management and socio-economics. Unfortunately, a person was never found to fill this position on a long-term basis.

Texas A&M University and Winrock International have had experience with herd input and output flow as it relates to production. It is suggested that Dr. Tom Cartwright of Texas A&M or Dr. Henry Fitzhugh of Winrock International be contacted for recommendations on who could provide this service.

- (d) It is recommended that the findings of this project be presented as a seminar along with a published report available to other Sahelian countries as was the Primary Production of the Sahel Study in Mali.

Recurring Cost Study

- 1.2.1. A short-term consultant was contracted to conduct a marketing survey and the recurring cost study. He conducted the first phase of the marketing study and recommended that the recurring cost study be made following completion of the Phase II design. Based on the poor quality of his first report, this second study was discontinued.

- 1.2.2. This recurring cost study should be conducted by consultant or a staff economist as soon as a plan for Phase II is presented. There should be an interaction of this consultant with the socio-economic team to evaluate probable feasibility of means through which the RN can recover cost.

Support for the Existing Livestock Program

- 1.3.1. Some operational funds have been supplied to the Livestock Service general fund for fuel, materials etc. No specific use was noted.
- 1.3.2. It is recommended that such operational support be specified for use for post refrigerators, and local transportation to facilitate travel of the post personnel to the herder camps for periodic or special treatments. This might range from fuel supply, purchase of appropriate transportation (car or molyette) and maintenance fuel or feed. This should be determined by consultation with post personnel.

Construction of Facilities

- 1.4.1. The four planned livestock posts are under construction and near completion. Unfortunately, the furnishing of the posts with refrigeration, furniture and means of operation apparently has not been

anticipated by the RN.

1.4.2. It is recommended that the NRE equip these posts with refrigerators, minimal furnishings and fuel budget support to assure their functioning during the following year.

1.4.3. The 10 vaccination parks have not yet been constructed, but supply of portable corrals is planned. These should only be supplied in areas where operational funds are sufficient to assure their use. Outposts which vaccinate or treat a limited number of animals should depend on local methods of animal constraint.

Design of a Livestock Extension Program

1.5.1. Twenty veterinary auxiliaries have been trained at the village/camp level to apply minimal animal health care. Sixteen are working under continuing supervision.

1.5.2. It is recommended that this type of extension efforts be limited to animal health until such time as significant management changes are proven more cost effective than traditional management. There must be a proven "package" before risking project credibility with the herders. Only if such information

is developed should additional extension efforts in livestock production be considered.

Study of Major Livestock Markets

- 1.6.1. A study of markets from north of the zone to Maradi was conducted very superficially by a short-term consultant. Due to the poor quality of the report, the consultation was terminated. This data is not considered useful.
- 1.6.2. Studies of markets at Margaria and Chadawanka in the agricultural zone and the intermediate zone have recently been initiated with plans to collect data during the following year.
- 1.6.3. The socio-economic teams are collecting marketing data at markets within their study area which will be related to the larger studies.
- 1.6.4. A CRED marketing study team is scheduled to start a study in September, 1981. It is understood that this study will tie all the markets of the zone together with agro-pastoral markets to identify livestock and commodity flow.
- 1.6.5. It is not clear to this evaluator how these different studies will be combined to give an overall picture.

of the zone market movement. This coordination should be specified if not already planned. See the chapter below on general recommendations for further comments on such synthesis documents.

Water Point Survey

1.7.1. Questionnaires have been completed on 1,062 water points in the zone, estimated to be about 50 percent of the total water points. Subsequent analyses of these data should give a basis for determining whether or not water is a limiting factor to livestock production and what corrective actions might be indicated, if any. These data will have to be supplemented with forage availability data to determine to what degree water may be effecting the distribution of forage utilization.

1.7.2. The aerial survey will provide some additional information, along with the RN hydrology studies to complete a current map of water points in the zone.

1.7.3. The TSA in charge of the water point survey should be delegated immediately to identify, from these materials and from further field work, any potential sites for water point interventions as described in the Project Grant Agreement or otherwise. As

soon as such sites are located, Mr. Keith Magee, an engineer with highly successful and directly comparable experience of such water point development in Senegal, should be brought in on a reconnaissance and costing trip.

4. If areas are identified as being under-utilized due to limited water point distribution, the proposed water point development interventions should be initiated in the next year. Records of water use and increased range utilization should be measured to estimate the cost effectiveness of each water point intervention. Following are rough estimates of what might be expected from water point development where needed:

(a) Catchment tanks should be tested if under-utilized areas are located.

Estimated Cost

Digging catchment (8000 M ²)	\$20,000
Amortization @ 10% over 40 years and annual maintenance	\$ 2,000

Estimated Benefits

Animal capacity	438 UBT years
Total annual value of production	\$17,780
12.5% increased production efficiency due reduced stress	\$ 2,190

The increased production efficiency would pay for the catchment tank, leaving any increase in stocking capacity as profit in the amount of up to \$ 17,000 per year.

An added advantage of the catchment tank is its temporary nature which requires abandonment in the late dry season; thereby resting the pasture, reducing parasite and disease infestation and discouraging sedentarization in marginal areas.

- b) Traditional wells should be repaired where the need is indicated and consideration should be given to credit for construction of new wells to improve grazing distribution where the need is identified.

Estimated Cost

Digging well	\$ 600
Amortization @ 10% over 5 years and annual maintenance	\$ 170

Estimated Benefits (Annual)

Animal capacity	500 UBT years
Total value of production	\$20,000
12.5% increased production efficiency due to reduced stress	2,500

This is a small investment for the potential increased efficiency and production.

(c) The more expensive concrete wells and/or deep wells combined with concrete wells may be the only alternative in some areas where shallow water is not available or dependable. While these may be a last choice due to expense, they should be considered both as a means of correcting identified underutilized areas and as a security water supply for severe drought years.

Estimated Cost

Concrete well	\$ 3,000 to \$30,000
Deep well/Concrete well	\$100,000 to \$200,000
Annual Cost/Concrete well	\$ 2,000
Annual Cost/Deep concrete well	\$15,000

Estimated Annual Benefits of Each

Animal Capacity	1000 UBT years
Total value of production	\$40,000
12.5% increased production efficiency due to reduced stress	\$ 5,000

Even the more expensive Deep well/ Concrete wells can be cost effective if, in fact, areas are identified in which forage utilization is limited by water availability. (These calculations are only rough estimates meant to stimulate refinement of the

information available on cost and benefits of water development to make possible the use of underutilized areas and reducing pressure on heavily used areas.)

- 1.7.5 Every effort should be made in the remainder of Phase I to more specifically determine the costs and benefits associated with water point development, while identifying potential intervention sites.

Summary of Animal Production Recommendations

- 1.8.1 Continue and expand herd composition study.
- 1.8.2 Determine costs and benefits of animal health practices.
- 1.8.3 Determine costs and benefits of hay making.
- 1.8.4 Initiate intensive herd production/herd management study.
- 1.8.5 Review CON Ranch data and Sahelian literature from Niger and elsewhere, for production and cost-benefit parameters to be compared with the herd studies.
- 1.8.6 Contract a consultant to consolidate and analyze the animal research results.
- 1.8.7 Provide limited operational budget support of animal health services, for the outfitting of the veterinary posts under construction with NRL funding.

- 1.8.8. Determine from water point survey the specific needs for water points, obtain technical specs on catchment tank and well construction and site testing (short-term agricultural engineer/hydrologist should be considered for on site soil probes, etc. of selected locations); obtain cost-benefit data and initiate pilot water point development.
- 1.8.9. Monitor effect of water points for animal numbers watered and effect on range ecology.
- 1.8.10. Plan seminar for presentation of final report to Nigeriens and technicians from other Sahelian countries.

2. Veterinary Interventions in the NRI. Project

This analysis is of two aspects of project intervention in the area of veterinary medicine. First, we comment on the reports (admittedly preliminary) presented so far by Dr. Albert Sollod, veterinary consultant to the Project. Second, we offer some remarks on an innovative activity of the Project, the training and supervision of veterinary auxiliaries, who are themselves nomadic pastoralists in the project zone.

- 2.1. Report by Dr. Albert E. Sollod
- 2.2. Mohamadoun's report on the Veterinary Secourists

2.1.1. It is presented as a travel itinerary relating different meetings, enquetes and vet interventions. He mentions also studies and analyses to be done or to be elaborated.

2.1.2. The reported data are generally known by the livestock service. Some of them have been used for a long time, such as:

- Retention of the animals by the herders where there are no vaccination corrals.
- Clinical epidemiological and necroptic information given by the herders.
- Estimation of the regional pastoral situation.
- Influence of different factors on their herd: quality of the grass, water, salt blocks, the influence of diseases, bad weather etc..
- Selection criteria for animals and their value.
- Birth control.

2.1.3. The diseases that are diagnosed and treated are known to the livestock agents.

- The frequent lack of vitamin A (hemeralopia) and under nourishment of the herd.
- Isolated cases of sheep-pox and camel pox.
- Hydatids in small ruminants.
- A case of camel trypanosomiasis.
- Lesions from foot rot in a herd of small ruminants.

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- An isolated case of nervousness (sheep) resembling the "staggers", listeriosis and toxoplasmosis, etc.
 - Numerous cases of abortions, may be due to brucellosis in different female species.
 - A high frequency of respiratory problems (bronchopneumonia) often combined with digestive problems (enteritis), especially in small ruminants.

The pneumonias could be related to the pasteurellosis, pleuropneumonia, or the pest, etc.; the enteritis to the pest, salmonellosis or other agents and factors.

The author emphasized an idea that is already generally accepted, that is that undernourishment favors these diseases

Besides vitamin A, diarrhea medication in powder and some parasitic medications, Dr. Sollod generally used a broad spectrum antibiotic, oxytetracycline.

It is to be noted that the livestock service preferred to use antipest vaccination on small ruminants, in certain areas (Agadez Department), because it diminishes the risks of small ruminants diseases and pest in registered animals during the year. In general the herders report very few cases of diseases in the vaccinated herds.

11. Conclusions of the report.

The severity of their affirmation ought to be nuanced:

(a) "At present the Livestock Service does not provide any of these services in the field".

But everybody knows that there are free animal vaccinations against rinderpest and bovine pleuropneumonia in the field, year after year, and that the Livestock Service agents stay in the bush for 3 or 4 months, going through all the pastoral zones of the country.

But one can say that the Livestock Service does almost nothing to protect the health of the other species, mainly small ruminants. The explanation would come from the lack of means for the vaccination of greater numbers and also the lack of means and ways for rapid intervention. Nevertheless, we vaccinate small ruminants in the department of Agadez.

(b) "Vetophar was not able to get its products to the herders".

To be efficient the action of Vetophar should be supported by that of the Vet Secourists.

Created only in 1980, Vetophar has not finished solving its problems, which are above all lack of means, while the activity of the veterinary auxiliaries is not yet

well enough organised to be of great help.

(c) "A new administrative structure is necessary in order to get the goods and services to the field".

The reorganization to be undertaken is presumably that of the Livestock Service. We are waiting Dr Sollod's suggestions.

Talking about providing goods and services, we think that the activity of the "pastoral (supply) relays", and very soon the pastoral centers, is the best indication as to how to amplify the efforts that the government is doing already, including those towards the nomads.

2.2. Mohamadoun's Report on the Veterinary Secourists

It represents a balance-sheet of securist training problems and their activities.

After our field trip and after reading we can raise the following issues:

- 2.1.1. Secourist training will be of great help to the country.
- 2.1.2. The conditions of sound work by the securists are not yet found, and they ought to be specified as rapidly as possible.

They include:

- Site of the work (camps, water points etc.)

- Training program and work plan
- Selection of the agents
- Control of their activities
- Medical supplies and resupplies
- Harmonization of their role in the projects and at the national level.

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Range Management

This analysis covers the range management research now being carried out in the NRL Project. There are two major research sites involved, areas within the government ranches at Ibeceten in Tahoua Department and North Dakoro Ranch in Maradi Department. There are outlying exclosures as well. The work of the range management team is supervised by the Senior Consultant, Dr. Robert Bement, and is being carried out on the ground by an energetic team which includes two TSA's, David Blaine and Bud Rice, and four Peace Corps Volunteers, Karen Husserl, Roy Simpson, Dana Glazer and Bruce Wyle, together with their counterparts and staff. This section is based on written reports by several members of this team, an intensive visit to Ibecetene Ranch, and discussions with all team members. The principal author of this section expresses his thanks to all those people, who explained their work so carefully and were so hospitable. This section is arranged as follows:

- B.1. Introduction
- B.2. Basic Requirements for Successful Range Management
- B.3. Discussion/Clarification of Terminology
 - B.3.1. Stocking Rate
 - B.3.2. Grazing Pressure
 - B.3.3. Mixed Grazing
 - B.3.4. Carrying Capacity
- B.4. NRL Project Range Management Objectives
- B.5. Appraisal of Range Management Studies

B.5.1. Animal/Vegetation Studies

5.1.1. Choice of Stocking Rate

5.1.2. Effects on Vegetation

5.1.3. The Whole System Question

5.1.4. Soil Moisture

5.1.5. General Conclusions

B.5.2. Other Studies

B.6. Evaluation of Results Achieved vs. Goals Set

7. Analysis of Results as a Basis for Rangeland Improvement

B.8. Recommendations/Comments

8.1. General

8.2. Project Implementation

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Introduction

This report analyses the range management component of the Niger Range and Wildlife (NRL) Project. It consists of the following broad areas:

- Brief analysis of basic requirements for successful range management.
- Discussion/clarification of terminology used.
- Analysis of what the Project set out to do.
- Appraisal of work carried out.
- Comparison of goals set and achievements secured.
- Analysis of results as a basis for rangeland improvement programmes.
- Assessment of adequacy of organisation, execution and orientation of NRL Project with respect to the rangeland management component.

Recommendations/Comments

Basic Requirements for Successful Range Management

The main objective for rangeland management is to develop integrated strategies of exploitation which can be sustained and which will contribute to the improved well-being of both the individual herder and Niger in general.

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to Niger as well as being concerned for his/her own personal needs.

In the NRL Project there are various studies ranging through many disciplines which are attempting to form the basis for an ultimately integrated sound and sustainable general rangeland management programme.

The main requirements for such a programme are:

- Understanding of present rangeland forage production including total and seasonal patterns within and between years and the matrix of component species contributions.

- Knowledge of the quality of forage produced in the context of supply of quantity and adequacy of balance of animal diet nutrients for ruminants is essential.

- The application of the correct grazing management programme in terms of number and optimum balance of animal species to ensure good utilisation of forage and acceptable individual animal performance.

- Ability to apply suitable grazing management practices which will ensure high output and rangeland preservation or improvement.

- Suitably designed accessibility routes, water management, animal disease control, etc., programmes are necessary.

- Finally, the individual herder must be informed and understand how these factors impact on the rangeland before he is in a position to exploit them.

Implicit in these requirements the control element looms large and this will be discussed later in this report. Suffice it to state here that it is

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difficult to change range management characteristics unless one has control (ability to move livestock or to restrain them or to cut rather than graze a given area, etc.) which might be secured through herder/family/group/association enlightened control of a given area or simply via incentives which render certain desired changes attractive.

Discussion/Clarification of Terminology

There are four terms which need clarification in discussions of the grazing ecosystem in order to avoid ambiguity.

B.3.1. Stocking rate: This refers to the number of ha per Unites Bovin Tropical (UBT) with each UBT representing 250 kg of live animal weight and is used here. However it is useful to point out that what one is really referring to is the ratio of forage production to animal food requirements. Where there are a number of animals of different liveweight, UBT number is derived from the combined kg of liveweight divided by 250.

B.3.2. Grazing pressure: This refers to the number of UBT grazing on a given area at a given time.

B.3.3. Mixed grazing: This term is used to describe situations where two or more animals species grnze together on the same area of range.

B.3.4. Garrying capacity: Refers to the number of UBT which can be supported on a given area of range for a stated period of time. Generally refers to an all year or longer term period.

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NRL Project Range Management Objectives:

These objectives were set out in the Project Document (pages 13,14) and are not intended to repeat them here but rather to examine them in terms of their adequacy, balance and likelihood of success.

The main objective was to determine the carrying capacity and associated suitable grazing programmes as a basis for recommendations. Clearly this was the correct approach to take, particularly where there was a paucity of existing information. In such circumstances the first aim must be to study and understand the patterns of relationships between the main vegetation communities and livestock. This approach is also the quickest and most efficient to gain some initial insight into the grazing ecosystem to be studied.

In this approach the main requirement is that the stocking rates to be compared should span the target area i.e. should include in this instance a range of stocking rates which are sufficiently far apart to include a too low and a too high treatment. Subsequently further refinement may be introduced. The important factors are that a broad general understanding of animal/vegetation relationships be secured and the base lines for further investigations would be soundly established.

I believe that a broad based range and livestock management survey of livestock systems presently practiced by the pastoralists should have been initiated simultaneously and should be considered as part of strategy for the future. Such a survey would have pinpointed some of the background against which the animal/vegetation studies were being conducted. The major

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Difficulty in designing this work was lack of information as to what the position was out on the pastoral zone. This survey, in a sub-sample of the zone would be aimed at obtaining information on range management (grazing practices, stocking rates, etc.) and livestock (size of herds, number or different species in herd, and physical production factors such as calving rates, mortality rates, etc.)

This survey would have two further important benefits. Firstly it would serve as a reference point against which future progress can be assessed and secondly it would serve as a comparison in eventual extension efforts to point out the characteristics which differ between the 'good' (i.e. hopefully the Project investigation) and the 'not so good' management. In Ireland we have found such an approach indispensable, particularly where a whole range of information was associated with the survey area to give a good picture of general farming practices. One must understand a situation first before setting a strategy for change, just as the understanding of the animal/pasture relationships is basic to exploitation decisions.

The other objectives of the range management studies particularly those concerned with water, the impact of fire and animal feeding practices such as tree cutting in the dry season, could have been included in the kind of survey mentioned. Results would help to decide a priority listing of problems to be addressed by improved management systems.

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Further, it goes without saying that for each study within a Project, basic information requirements should be clearly recorded including objective, procedure, measurements, etc. Only in this way can the numerous areas of study be examined. It is not clear that these basic parameters have been set down for the NRL studies.

B.5. Appraisal of Range Management Studies:

For convenience these studies have been divided into animal/vegetation studies and other studies.

B.5.1. Animal/vegetation studies: Two studies were initiated to provide animal/vegetation responses on two important vegetation communities.

At the Ibecetene Ranch site the annual grass Aristida mutabilis was dominant and at the North Dakoro Ranch site the annual grass Cenchrus bifloris was dominant.

The essential aim of the two studies was to establish from animal and pasture response curves obtained at different use intensities the carrying capacity for desired individual animal production levels. Also the management decisions associated would be documented. Generally the pattern of these animal/vegetation responses show that as stocking ration is increased individual animal production remains unchanged up to a point where further increases begin to reduce individual animal production. Production per unit area generally continues to increase with increased stocking rate beyond the point where individual animal production

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is reduced but continued increases in stocking rate ultimately reduces output per unit area since the extra animal gain is not sufficient to compensate for the reduced production of all animals.

Clearly the response of the vegetation to the different animal treatments will determine where the depressions in animal and per unit area productions occur. The vegetation responses of main consequence are reflected through changes in production, botanical composition and quality which are inter and intra related and are associated with the main animal effects of biting, treading and excrement return.

All of these relationships can be described as the grazing ecosystem which is dynamic and especially so for the first two to three years when a relatively stable equilibrium is reached.

The main objective therefore is to determine the stocking rate/vegetation responses described above which give the desired levels of individual animal and per unit area productions for the particular (or for each) production system one wishes to study.

The real test of these studies is whether such conclusions can be secured based on the treatments chosen and methodology used so that the results can be applied generally throughout the range.

This includes a management package for animals, and the range

In order to draw such soundly based deductions from animal/vegetation responses for use in extension/development programmes three stocking rate points are necessary. They should extend below and above that generally obtained in the target area. The less the existing information about the general and hence the more exploratory the study is the wider apart the stocking rates should be. This is particularly true where there is doubt regarding range degradation and therefore ability to sustain production.

In summary, one is attempting to decide the correct feed supply/demand formula for target production levels which can be sustained. This area is now discussed in relation to the studies.

B.5.1.1. Choice of stocking rate: Existing information (mostly unavailable at the time of setting up the studies) from Sahelian Livestock Industry Status and Development Strategy (Sahel Development Programme, USAID, May 1981) which quotes Niger Livestock Statistics, 1979, Service d'Elevage statistics and from the July 1981 Aerial Survey show reasonably good concurrence that in the Project Zone of 8,192,300 ha the annual stocking rate is of the order of 20 to 26 ha/UBT. Also there is an apparent increased stocking rate southwards to about 4.7 ha/UBT in the Agricultural Zone.

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As the study areas are in the southern part of the Project Zone, an annual stocking rate of 6 to 8 ha/UBT appears to be an acceptable extrapolation. Variation between grazing pressure during wet and dry seasons obviously occurs.

The Aerial Survey showed that during the dry season cattle were concentrated mainly in the South with sheep, goats, camels and donkeys more widely dispersed. (The close agreement between estimates of 2.6 people/km² by the 1981 Aerial Survey enhances confidence in the figures quoted.)

Based on these estimates the annual stocking rates in ha/UBT for the three treatments and the surrounding zone area are as follows:

- 6 to 9 in the immediate zone area around the study sites.
- 5 to 6 in the Light Use treatments in the study sites.
- 3 to 7 in the Medium Use treatments in the study sites.
- 1 to 9 in the Heavy Use treatments in the study sites.

The Light Use treatments therefore appear to be close to the annual local stocking rates. Yet it must be pointed out that comparison of the Ibacetene (26 ha/UBT) and North Dokoro (13 ha/UBT) Ranches showed a marked falling off in animal performance on the latter which it is suggested

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could not be fully explained by vegetation differences.

On the other hand it can be argued that firstly, production potentials at the stocking rates included will be known and recommendations for target productions given for stocking rates which apparently vary from about 20 to 60% higher than those pertaining on the range in the south of the Project Zone. This is very concrete information relevant to extension/development, particularly when viewed against the background of lack of information heretofore and the exploratory nature of the studies.

5.1.2. Effects on vegetation: The inclusion of two important vegetation communities adds to the value of the conclusions which can be reached.

The responses in the vegetation mentioned earlier in this report are of major importance. Long-term experiments (4 to 6 years) demonstrate that the real effects on vegetation begin to be established in the third year.

This experimental work therefore, should continue for 4 to 5 more years, particularly so that animal responses in turn reflect changes in the vegetation.

I am very happy with the vegetation characteristics chosen for study and the methodology used. A cross-check of this based on animals consuming about 3% of body weight in terms of pasture dry matter supports this.

conclusion. There is considerable research evidence to show that pasture production and quality is markedly modified by the animal presence under both temporal and semi-arid conditions. Studies ranging from 4 to 7 years in Ireland, U.K., and New Zealand have shown that pasture production was increased by 33% through the application compared with similar stocking rates where the excrement was prevented from being returned.

Also individual animal gain was found to increase by 68% over a 5-year period when high stocking rate was applied to an initially low producing pasture.

In observing the herbage at Ibecetene there would also appear to be an increased pasture density on the high use pastures. These changes are of very significant consequence and are generally in agreement with research results in the 1950's by Mitchell who demonstrated that High Use by allowing sunlight into the base of the sward increased tillering, density and consequently yield. Further comment is not possible pending the availability of the actual botanical counts.

Once more we are reminded of the grazing ecosystem and the relevance of the food chain linkages of Darwin in the last century to the balanced establishment which develops through interacting biological mechanisms which develop

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between plant and animal.

It must be concluded that pastoral changes are taking place in response to the animal treatments and it is suggested that this work be continued for at least another 4 years. Also it is recommended that during the coming year at least 3 areas per treatment be protected from grazing (each about 2m²) and cut to ground level once per month to obtain 'clearer' estimates of differences (if any) in pasture production which have already taken place. This approach is crucial to the question of whether High Use leads to pasture and range degradation. The answer to divided opinion on this topic is to carry out properly designed experiments rather than continue to argue the pros and cons in sometimes emotive terms. Objective factual data is the real basis for planning. The opportunity to have this answer is just around the corner if the work can go on for at least 4 more years. Modifications are suggested later.

5.1.3 The whole system question: In the layout and methodology of the NRL range studies dry and wet seasons were essentially treated separately with a new set of animals introduced at the beginning of each. This was a sensible decision as the main determinant (apart from year to year climatic variation or drought) of annual carrying capacity

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is the number of animals which can be carried during the dry season.

The approach shows clearly that while the overall annual Light Use stocking rates were apparently close to that on the range, generally, all animals were maintained on half of each area during the wet season with the other half being rested for dry season use. This practice is not found on the range and neither is it possible as long as control is absent. If someone practices it someone else will put their animals in to eat what is being saved for dry season use.

The wet and dry season stocking rates are shown in Table 1.

TABLE 1: Wet and dry season stocking rates (ha/UBT)

USE	WET SEASON	DRY SEASON
High	0.74	1.27
Medium	1.47	2.54
Light	2.21	3.54

The results give the animal responses for the wet season which are useful but for the dry season they are a bit patchy due to removal of some animals and introduction of supplementary feed into some treatments in some years. These results are valid in that a liveweight gain depression was produced with increased stocking rate within the

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context of improved information being obtained if all stocking rates had been somewhat lower as referred to earlier i.e. if the stocking rates had actually spanned those practiced on the open range.

The real question is how the managements in both seasons are to be fused to give a suitably integrated all year management. This is basically a question of how the animal food produced can be apportioned to best advantage and the greatest constraint is that if sufficient animals are carried during the wet season to ensure good utilisation it is not now possible to carry them through the dry season. The results show that it is unlikely that more than 50% of wet season carrying capacity could be carried through dry season, according to the animal/vegetation studies.

There are three main possibilities in the short term to overcome this problem:

- Draft a proportion of the animals for sale at the end of the grazing season. This option is certainly not sustainable, for obvious reasons.
- Introduce supplementary feeding including protein during the dry season.
- Reduce the wet season (and therefore the annual) stocking rate and conserve some of the herbage as hay or silage.

to buffer the dry season deficiency. (Investigation should be set up to determine if termites will affect silage where the pH is down to 5 or lower.)

The traditional pattern amongst herders is to come South and use scrubble and in-between crop herbage during the dry season as their buffer against the food shortage.

Option 3 offers the greatest potential, since Option 2 implies that supplementary feed (option 2) would have to be imported on a massive scale for the foreseeable future - even allowing for the fact that there is debate as to whether say 50 kg per head would be adequate or for an increase in home based grain production.

In the zone the herders move North as soon as there is suitable feed available and adequate water. The areas vacated has a considerable amount of vegetation left ungrazed, which the herders are hoping will be available to support their animals on the return journey. They also point out that on this return journey movements were based on availability of pasture which had not been trampled upon.

If the herbage which they left behind when going North was conserved as silage or hay, I estimate that each ha so managed yielding one and a half ton of dry matter per ha would provide about 150 UBT feed days.

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The logistics of this could be worked out nationally where an area band somewhere central might be closed to grazing for a given period and machinery, etc. centralised in this area to conserve silage, which could be stored for dry season use.

It is in this context that the studies are useful since in a comparison of, for example, the High, Medium and Light Use wet season treatments the High Use indicates what would happen on the Medium and Light Use treatments if animals were restricted so as to conserve forage for the dry season.

The studies are thus assisting in providing the basis for long term planning for possible alternatives to present range management practices.

5/1/4 Soil moisture. In the studies it was found that heavy grazing during the wet season preserves soil moisture through a reduction in the amount of plant cover/canopy and therefore transpiration rate. When the animals were removed at the end of the wet season there was good herbage growth recovery associated with the upward capillary water movement.

The importance of this finding is that both annual and perennial plants grew earlier in the following season.

which was reflected in an increase of 15 kg more milk in the first month. This result could also be interpreted to help shorten the dry season food shortage and equally important to provide some green herbage (protein and vitamin A) at least for the early part of the dry season or to be grazed intermittently with less valuable forage over a longer period.

This aspect is directly relevant to the comments in the previous section and the consideration of cutting and preserving left over wet season vegetation in a more nutritive form for the dry season as it would also have similar soil moisture effects associated with the removal of herbage and reduction of transpiration of water by plants.

5.1.5. General conclusions for Section 5. have attempted to discuss the animal/vegetation studies in an integrated manner and to refer to scientific adequacy, relevance of results and to draw some conclusions appropriate to extension/development aspects.

It was indicated that these studies are certainly providing information on animal/vegetation relationships and that they are contributing useful information as a basis for planning.

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One of the problems of this exercise was that the studies are not yet sufficiently mature. Although the Project was signed in 1977, the trials got off to a sluggish initiation, due to unforeseen problems of acquiring fencing materials, weighing scales for animals, etc. Since it takes at least three years for experimental response patterns to emerge, they should be allowed to run for 4 to 5 years longer if possible. Some modifications are suggested later.

An important result emerging to date is that Heavy Use has not led to range degradation. Useful management standards such as times to move animals based on the amount of herbage present are emerging.

29 Other Studies: Quite a number of ancillary studies were carried out.

Burning of vegetation at the end of the wet season resulted in a two-fold increase in the quantity of herbage in the following February and some botanical changes, notably a reduction in the annual Aristida mutabilis. This result on pasture production supports the earlier mentioned improved soil moisture associated with Heavy Use. The less vegetation on the ground at the end of the grazing season the greater the amount of herbage (green) available in February. Both methods of moisture manipulation are useful in attempts to balance the food supply/demand situation through management practices.

Recolonisation study after burn was also included.

Standing herbage and botanical composition of ten different enclosures throughout the Project Zone measured the effects of grazing removal compared with the grazed range.

An informal herders school was set up for non-literates. Two pupils are now capable of recording weather data, pasture measurements, etc.

A demonstration garden was established where 600 trees were planted.

The effects of cotton seed supplement on sheep meat and milk production was initiated as a small scale study.

Soil moisture studies began in June 1981.

At the beginning of the wet season 1981 a useful germination study commenced in each of the grazing treatments to measure differences emerging.

Phenology studies were also initiated with Ariscida mutabilis and Brachiara distachnophylla species.

A study to measure the response to feeding Chrosophora brocciana to two heifers during the dry season at 40 g/head twice weekly was initiated to measure the response associated with its protein content

(circa 14%)

The setting up of a small meteorological station was a very useful and continuing effort. The rainfall and max/min temperatures can be correlated with pasture growth and milk yields.

Another useful exercise which is continuing is the establishment of a Herbarium, with 15 grass spp. and about 6 Forbe spp. should be fully assembled. This is referred to further in the recommendations section.

Camel feed preference for different vegetation was examined.

The history of these studies is rather patchy and I have indicated above the useful ones. After taking into account the human element of having a 'pet' study I am convinced that the orientation design and methodology should be properly planned to yield some interesting information. Otherwise considerable amounts of time and energy can be wasted.

Evaluation of Results Achieved vs. Goals Set

The Range Management goals set are described on pages 13 and 14 of the Project Grant Agreement. For the most part the main goals have been met insofar as was possible. The principal reason for any delay was associated with a rather sluggish and delayed take off-- especially with the animal/vegetation response studies. These studies were the main effort in the range management component. The (with fencing materials) could not have been foreseen and

therefore outside of control. However, repetition should be avoided if possible.

It is evident from Section 5 that much progress has been made and it is of primary importance that these two studies continue for 4 to 5 more years.

I believe that, given further time and with some modification, the preparation of a broadbased range management programme, not yet possible, can be based on these studies. This programme would include the very important elements of whether it is possible to increase livestock production and yet preserve or improve the range. Also it will be possible to quantify the changes.

Of singular importance is that the studies, if allowed to continue, will facilitate judgements to be made on objective fact rather than emotive or other guesses.

It was anticipated that vegetation maps could be set up from the Landsat satellite to record the vegetation changes over time and in collaboration with the Aerial Survey would prove successful within the whole context of mapping the area. This first effort attempt was unsuccessful but the launch of a new satellite may be of help in the future.

The seeding of denuded areas to speed up the present very slow plant colonisation was in my view a very worthwhile and important goal. In view of the particularly simple and low cost effort required to seed about nine miles throughout the zone, I am surprised that it was not carried out.

This effort must commence with controlled experiments and could usefully include some different seeding methods and seed mixtures, and should be

Also the range management training programme should have been accelerated from the beginning so that students could have the opportunity to come face to face with reality (in the animal/vegetation studies) before it terminated. In this regard also the minimal involvement of Nigeriens in these studies is especially disappointing given the obvious need to be involved in continued informed development in the years ahead.

Studies on water supply by Knight (referred to elsewhere in the report) are impressive, and can now form the basis for water supply and management generally.

The goals set with regard to fire control would involve some engineering studies and may have been over ambitious. However, the approach taken to measure the effects of burning on vegetation changes and subsequent production will form the basis of whether burning should be introduced or present practice improved as a management aid. In conclusion I believe that the main goals were almost achieved and had there been no delays at the beginning could have been better in terms of more mature results being now available.

Implications of Results as a Basis for Rangeland Improvement

This report was approached with the viewpoint that rangeland con-

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ditions in Niger can be vastly increased for the betterment of herders and Niger in general. Improved rangeland management is a vital component of such improvements.

The basis for programming the improvement strategy is adequate factual information on how to correct present deficiencies.

There is tremendous variation amongst people, patterns of range management, water supply etc. and barriers such as communication, education and credibility will arise just as in all other countries and these will impact on efforts to improve range management.

The Project, however, has given a good insight into many of these problems and in this way has contributed much. Clearly range management improvement per se must be interpreted within the wider scope of other things happening at the same time. However, in this section I address myself mainly to the rangeland management only.

The greatest constraints in attempting to improve the pastoral zone productivity are forage production and quality and in particular their seasonal pattern associated with climate. If these could be improved the overall productivity would certainly increase.

Irrespective of most other considerations, the herders generally appear to be interested in carrying more livestock and the theory has been advanced with some foundation that low offtake is associated at least partially with pride of having a larger herd. The wodaabe we

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visited, cited more animals and more millet as their special urgent needs.

Even if the herders did not exhibit this attitude quite large increases in animal numbers and outputs of animal products would occur due to improved nutrition and consequent improvements associated with earlier and more frequent reproduction, higher growth rates and reduced mortality.

The limiting factor in attempts to carry more animals or to improve the output from existing numbers is lack of food during the dry season. Transhumance behaviour is closely linked to the pattern of present animal food availability and the Aerial Survey shows that in particular the cattle are concentrated in the south east and south west during the dry season. When food is scarce the herder is in this way apparently allocating the better food source to the most needed animal type. Also there is the further consideration that as long as other crops such as millet are grown in the southern agricultural zone under present land structural conditions (lack of fencing, etc.) there will be crop by products and some pastoral areas available during the dry season. Either the present situation will prevail or farmers in the South must get involved in more livestock production if this food resource is to be utilised.

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It is evidently there is not sufficient food in the South during the dry season since sheep, goats, camels and donkeys remain relatively dispersed. Therefore any extra expansion of herd numbers would have to be accommodated in the pastoral zone. The area under crops in the agricultural zone is not diminishing (rather there is a considerable consensus of opinion that the agricultural zone is extending to the North).

It must be concluded that programmes aimed at increasing herder well-being and national livestock production will have to be planned as self-supporting within the pastoral zone. It has been suggested that prior to the 1972/73 drought livestock numbers had increased to near breaking point relative to food supply (Sahelian Livestock Industry Status and Development Strategy, Sahel Development Program, USAID, May 1981). The July 1981 ILCA Aerial Survey indicates that present livestock numbers are rapidly approaching those obtained before the drought.

It can be estimated from the mean herd size, and assuming almost all the cattle move South during the dry season that given the mean annual stocking rate in the pastoral zone is 20-26 ha/UBT, 60% of herd UBT move south leaving a stocking rate of about 50 ha/UBT on the pastoral zone during the dry season.

The suggestion that under these conditions of food supply variation

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between wet and dry seasons and movement of animals the pastoral zone is stocked to near breaking point does not mean that further increases are not possible with improved forage production and rangeland management.

Extreme caution must be placed on attempts to interpret the results of the studies carried out due to their immaturity and as yet lack of longer term all-year data. In this situation, with only one year's records, it would be foolhardy to make predictions--it is not possible.

It does appear that heavy stocking will not lead to degradation of the rangeland, and given time it may improve it. The vegetation data showing that livestock should be removed from the wet season grazing of the range when the residual herbage is about 180 kg/ha is a useful management aid and can be used in the context of deciding the best time to move South.

More especially it is of interest to the concept of forming Herder Associations where it appears that the area used for eventual range management, be divided into wet and dry season use with a possible layout as follows:

DIAGRAM 1 - SCHEMATIC LAYOUT OF ASSOCIATION AREA

1	2	3
50%	25%	25%

The area allocated to the Association might be conceptually divided into three use divisions in a given year, half for dry season grazing

one quarter for wet season grazing and one quarter for conservation. The management would be as follows: At the beginning of the wet season all animals would be placed on areas 2 and 3 for about the first two weeks. They would then be confined by the herders to area 3 and area 2 would be cut and the herbage stored as good quality feed for the dry season about 6 weeks later. Area 2 would thereafter be joined with area 3 to give an increased grazing area for the later part of the wet season. When areas 2 and 3 have been grazed to the extent that there is about 150 kg/ha residual which is the dry season pasture. As the dry season pasture reduces in quality the good quality forage conserved from area 2 during the wet season would be used to supplement.

Without having examined the studies in the Project one could not begin to assemble such management programmes. I believe that such a management programme would succeed in the Association context which would be self-supporting.

This approach indicates that a minimum of two water points per association group would be necessary. If the association area is very large perhaps water points at 10 km apart would be required to minimize animal self transport energy costs.

Once the area has been identified it should be carefully surveyed and at that stage a full management programme could be set which I believe would succeed.

Implicit in this programme is the control function. I believe there can be little change in rangeland production until some form of controlled grazing is introduced. Under present circumstances the only control over the diet presented to livestock is to move them to a fresh area as soon as it becomes available with all the energy costs of moving. Control does not necessarily involve removal of herder freedom to move livestock.

It is likely that during the wet season when pasture growth is good that the herders will continue to move on as rapidly as possible, resulting in poor herbage utilisation generally and by the time time it is regrazed it is of very poor quality.

Finally, it is evident that this process of measuring animal vegetation responses is a necessary prerequisite for development. It will give the answers if given time to mature and with some modifications.

B.8. Recommendations

B.8.1. General: Some form of controlled rangeland management is necessary if development is to take place. For this event goal the Herder Association concept is good. Some pilot associations should be started now, which would envelop all the needs of those participating. The focal point would add tremendously in bringing people together and in bringing

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about closer contact between the GON and the people. It must be clearly understood that the whole goal for forming an Association is eventually to introduce improved range management and livestock husbandry practices. Otherwise the effort cannot show an economic return. In my own extension work in Ireland, only grazing and conservation managements are changed. It is also to demonstrate how better animal production can be achieved without incurring the immediate cost of extra animals. Once the herdsmen understand that they can improve in this way, confidence in advisors in general can grow very rapidly.

Education programmes in rangeland management and improved livestock husbandry methods must extend throughout the zone via such associations, to give an understanding of why certain changes are necessary.

It is vital that in the early stages any interventions such as the formation of Pastoral Associations should minimise the risk factor. To do so more than one pilot Association should be initiated since a single failure could wipe out credibility with herdsmen which would take a long time to regain.

At least minimum programme recording should be carried out after a comprehensive inventory of the initial position. Recording is essential to pinpoint weaknesses as the programme

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progresses as well as to understand the cause of failure should it arise.

It is suggested that the leader of this extension element should have a broad knowledge of pastoralism, including soil, plants and animals and including the disciplines of Veterinary Medicine, Economics and Sociology.

Project implementation: In the evaluation of the range management component of the NRL Project, I referred to the sluggish nature of take off. This was due to unavoidable delays in securing fencing material and animal weighing scales. The real problem now is that the Project termination date will arrive before the results are sufficiently mature to be properly evaluated and recommendations made. In future projects these potential difficulties should be examined at the design stage. At some point shortly after the Project is agreed upon and personnel identified, the design team should be asked to meet the implementation team to discuss the work programmes prepared to implement the Project and examine methodology, etc. It would be a function of recruited leaders in different areas to prepare and submit at least outline procedures, target termination dates, reporting dates, etc. This procedure would preclude delays and indicate changes of direction required as the Project develops.

Another aspect requiring attention is that there appears to have

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seen a marked proliferation of subordinate studies as the project developed without a clear understanding of where they would fit into the general objective. Considerable time and effort can be expended in this manner with little reward unless more discipline is applied. One must first have at least a general conceptual position in mind and it must be fully understood by each person involved so that there is a clear picture of where each individual element fits into the mosaic. This kind of orchestration is an essential function of the leader. While the many subsidiary studies in NRL have been balanced by an essentially pragmatism, it is less clear how they are all contributing to the achievement of the project purpose.

I believe that periodic meetings of all staff on a Project to update progress in the different areas of work would be useful and would show up clearly where each member's work fitted in. A more cohesive approach would result.

Finally, I suggest that a listing of all studies within the project be prepared together with reports, memos, etc. received and updated copies of this list circulated to all staff. Staff will then update themselves although it is clear that some documents may not be suitable for general consumption. There is no need for premature conclusions to be reported, but sharing of work in progress can itself have a monitoring function.

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There appeared to be mixed viewpoints regarding the hiring of consultants who only visit periodically as opposed to the fulltime ^{slut} option. My opinion is that the part time choice is preferable but shorter-term and more frequent visits would be better than longer term infrequent ones.

The present NRL Project: Since this phase of the NRL Project will run until December, 1982, it is recommended that some changes be made which would considerably improve the final position.

8.3. Exclude animal grazing from 3 small areas in each of the High and Light Use treatment plots at the end of the 1981 wet season and take pasture dry matter estimates and repeat these estimates at the beginning of the 1982 wet season, mid-way through it and finally at the end of it. Cut herbage to ground level on the same area each time. Also try to locate the open range transects measured during 1979 and do similar clipping and botanical counts on them. This information would be very valuable to assess grazing treatment effects on pasture production and botanical composition, particularly in view of the widely held belief that Heavy Use leads to rangeland deterioration. I suggest that the grazing trials not be changed regarding other aspects until December, 1982.

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From the beginning of the dry season 1981 three sites (North, Mid, and South) in each of land units 1, 2, and 4 (shown in Fig. 28 of the Aerial Survey) should be selected and small plots fenced off and measured in a manner similar to that suggested for the plots in the previous recommendation. By comparison with the measurements taken in the High and Low Use treatments it would in this way be possible to predict to what extent the results of the studies apply across the Project Zone. It would be useful also to count the number of trees and shrubs by type on a 1/2 ha area selected adjacent to each cutting site. Also, at the North and South sites in each of the Land Units 1, 2 and 4 select 2 water points 10 km distant and estimate standing herbage at points 1 km apart along the line joining the 2 water points at the beginning of the dry season 1981 and at the beginning and end of the wet season 1982. This will give some guidelines for water planning in relation to pasture use which are urgently required.

I strongly recommend that at the beginning of dry season 1981 a one year study be commenced where at least one (as typical as possible) camp be selected and their movements and decisions in relation to rangeland and livestock management be recorded. This will give some idea on how and

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why certain decisions are made and levels of animal performance obtained. This requires careful planning to select out what components can be usefully recorded.

Other sections of this evaluation report make additional suggestions for this unified Range/Livestock Study.

8.3.4 The Herbarium collection should be completed and mounted.

There was also the suggestion that the plant collection could be presented to Niamey Museum.

8.3.5 A programme and time schedule should be drawn up im-

mediately to assimilate all data and other results for the NRL Project. Target dates of complete data assembly (November 1982), a final seminar with full presentation by participants of work area results and achievements including write up (mid-December 1982) followed by complete report should be set now. To do this a coordinator should be appointed now who would be in a position to 'call up' data and get reports in on time. It appears that a good experienced statistician should be engaged who would meet with each individual and set up data assembly formats suitable for card punching and computer treatment and generally organise data processing. If there is not already one available

I suggest Dr. John Connolly, Statistics Department
Agricultural Institute, 19 Sandymount Ave., Dublin 4;
who is very experienced and who might be available on
short notice for this assignment.

8.3.6. The animal vegetation studies (if work beyond December
1982 is planned) should be re-oriented to include mixed
animal species grazing. The July 1981 Aerial Survey
showed that mean herd size in the Project Zone is 33
cattle, 46 sheep/goats, 5 camels and 7 donkeys and this
breakdown could guide treatment choice. With this approach
the Project would identify more with what herders actually
do. Herder Associations might then visit and discuss
management practices, etc. from time to time. Mixed
species grazing produces about 20% advantage in individual
animal production compared with single species grazing
due mainly to complementary grazing. Pasture utilisation
efficiency is increased.

8.3.7. It appeared to me that there is considerable vegetation
and seed loss occurring due to the actions of ants, termites,
rodents, etc., and the effects of insecticides should be
measured in a scientifically orientated manner.

8.3.8. An integrated soil/vegetation survey should be initiated

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beginning with the Project Zone. The new satellite may be of help here. The suggestions put forward by Swift indicating the necessity for ground truthing are very good.

The possibility of a significant improvement in animal food production from seeding denuded areas should be studied as soon as possible using sites in each of the 5 soil types identified by the Aerial Survey.

8.3.9. The effects of burning and heavy grazing in the wet season in the context of moisture manipulation should be studied in well-designed and controlled experiments

8.3.10. It is vitally important that communications with the herders be augmented. They should be invited in to see, discuss, and understand the animal/vegetation studies management so that they will appreciate why it is carried out in a particular way.

8.3.11. Finally, the feasibility of conserving herbage as hay and silage should be investigated more fully including aspects such as termite damage during storage. This, in my view, would be a priority next to mixed species grazing for the rangeland management programme.

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Methods of storage difficulties could be overcome and it is likely that a beginning could be made in the South where it could be rented to the herders in the dry season. Unless steps are taken to investigate methods of apportioning total feed between wet and dry seasons in an all year context the overall aim of the Project will not have been achieved. Methods for conserving wet season food in good condition for dry season use are thus critical.

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C. Socio-Economic Studies

C.1. Research Objectives

The present section is an assessment of the sociological research methods and products of the NRL Project, with comments on the utility of that work to NRL Project and livestock sector goals. It includes an assessment of the articulation of the research relative to sector information requirements, identification of research gaps and elaboration of the methods by which those gaps might be filled and the sociological research product of the Project improved. Specific recommendations are made for the application of these research results to a program of development interventions in the project zone.

This review is based on materials gathered between August 6, 1981 and August 20, 1981. Three kinds of information were employed:

(a) NRL Project documentary materials made available by project management for review. These included reports by Thomson, Milligan, Swift, Loutan, White, Maliki, Knight, and Fitzgerald.

Conversations and discussions with Swift, Loutan, White, Knight, Mohamedoun, Fitzgerald, and Curry, and with project managerial staff.

(b) Field observations in the company of Loutan, White, Knight, Curry, Mohamedoun, and Fitzgerald.

These various materials were assessed against a background of the sociology of rural Niger and of the ecology of pastoral production systems

In semi-arid regions of the Sahel, the Sudan, and East Africa.

*This analysis is organized as follows:

- C.1.1. Socio-Economic Studies: Research Objectives
 - 1.1.1. Field Staff
- C.1.2. Communication and Coordination
 - 1.2.1. Communication
 - 1.2.2. Coordination
 - 1.2.3. Involvement in the Project of Nigerian Students
- C.1.3. Assessment of Socio-Economic Research Activities
 - 1.3.1. Household Level Studies
 - 1.3.2. Mapping and Aerial Surveys
 - 1.3.3. Herders Associations
 - 1.3.4. "Practical" Determinations and Actions of the Socio-Economic Unit
 - 1.3.5. The Impact of the Grain Trade and the Northward Migration of Agriculture
- C.1.4. NRI - II, Monitoring and Evaluation

C.1. Research Objectives: A clear statement of the goals of sociological research on the NRL Project appears in the Second Revised Work Plan of November 1980:

The objective of the socio-economic work of the project is to provide tested, socially feasible, economically sound and replicable methods of development, based on the wishes, values and needs of the pastoral inhabitants of the project zone. The major project goal of pastoral development is operationally defined as increased, more equitably-distributed incomes for the pastoral inhabitants of the zone, earned in an ecologically conservative manner. A sustained or increased supply of meat or milk for urban and rural consumption and for export is an additional project goal to the extent that it does not conflict with this primary objective.

The original logic for the emphasis on inquiry before action was soundly based and remains valid. It starts with the general recognition that interventions in the pastoral livestock sector have rarely proved effective. With the exception of certain veterinary actions, livestock development projects in semi-arid areas of Africa and the Near East exhibit dismal performance. An analysis of these failures has shown almost invariably there is a great discrepancy between the perception of pastoral practice on the part of development planners and its reality. That is, interventions are seldom based on the social and ecological realities. A whole mythology about pastoralism has developed which serves to justify

actions which fall: "the tragedy of the commons"; "animals are maintained for prestige rather economic reasons"; "herders do not respond to the market"; etc.

The research phase of NRI Project was designed in order to predicate such interventions as might constitute a second phase squarely on an understanding of the socio-economic and ecological realities of the production systems in the project zone. Both the RN and USAID are to be congratulated for the wisdom of this approach; the delay in mounting interventions in the zone should be more than compensated by their efficacy. The socio-economic components of Phase I of NRI may be characterized by the high quality of the conception, the personnel, and the products. There are nonetheless a number of problems which must be considered below, which may be divided into two interrelated issues:

- 1.1. Field staff It is important to note at the outset that the quality of work produced to date by the socio-economic unit (both full-time staff and consultants) has been in general high, and in several instances first rate. This is due to the unusual, indeed rare, qualifications of the research team, and to their enthusiasm for field work under difficult conditions. While the formal training of members of the field team is variable (from B.A. to Ph.D. candidacy to post-doctoral persons), they are uniformly talented, productive, and indefatigable. They show high competence in French and in the specific local language required (Tamasheq, Fulfulde, and Hausa). The TSAs

who were observed working with Twareg and Wodaabe pastoralists are models of excellence. They see living under the difficult conditions in the field as a privilege, not a penance, and are eager to spend as much time as necessary to do useful work. They have established deep rapport with the local people. NRI project management should be complimented for the selection of these persons. The involvement of former Peace Corps Volunteers, even without the usual formal qualifications (such as doctoral candidacy), has proved to be very effective.

1.2. Communication and Coordination

1.2.1. Communication The socio-economic unit has produced a substantial body of ethnological, sociological, and economic materials dealing with the several ethnic groups within the project zone. To a non-specialist, some of this material may seem only remotely relevant to project objectives, and may therefore engender both a misunderstanding as to its significance and an impatience to get on with "the real business" of development. Some of the responsibility for the lack of understanding and appreciation of the findings to date rests with the team itself, especially with senior personnel, who have not effectively communicated its importance to non-social scientists. In both the [redacted] and USAID. This failure to communicate effectively to [redacted] specialists in other fields and to program and planning officers is hardly

unique to this project. Many social scientists seem surprised to learn that the significance of their findings is not necessarily self-evident or immediately apparent to others. Rather than dismissing the skepticism as know-nothingism, the project must make a greater effort than it has so far to bridge the gap in understanding. Both GON and USAID personnel should be shown the direct linkages between the findings and alternative courses of action.

This does not mean that the time has come for a full-blown delineation of NRI Phase II. Sociological studies require a rather extended gestation period before final results can be obtained, and we sympathize with the team's reluctance to release only partial information which may, in its incompleteness, mislead rather than inform. Considerable time and effort has been invested by the field staff not only in obtaining adequate competence in the local languages, but also in proving themselves worthy of the confidence of the local people. Herders have good reason to be cautious of confiding in strangers. The fact that the NRI socio-economic field staff are willing to devote years under conditions that most AID officers would find physically unacceptable, and the fact that they have achieved excellent working relationships with the herders, constitute great strengths for the Project and necessary conditions for the generation of

of non-trivial analyses of the pastoral production systems. Much time was needed to identify and train local assistants and to adapt research schedules to local languages and conceptual systems. (The involvement of persons from the local groups rather than introducing secondary school students from elsewhere has been an inspired innovation in the research, and should be emulated in other places. Semi-educated persons often find themselves alienated from the rural scene, and their use in research may introduce as many problems as benefits.) Now that the teams are well-established we anticipate a marked increase in production which, if properly presented, will serve to mitigate much of the current misconception as to the salience of the research, and will provide a solid grounding for Phase II action.

In short, the Project is better than its press. But the sometimes unfortunate image which it has among some RN and some USAID officials needs to be corrected by thoughtful presentations and sharings of project findings. We therefore recommend the preparation of a summary document which outlines the findings to date and indicates the implications of these findings for alternative development scenarios. The document should be written for use by non-social scientists. The timing is critical because it must be available well before the commencement of the NRI-II design cycle. Clearly, such a report should be

prepared by the field team, with major responsibility assumed by the senior consultant. If the team's research schedule precludes spending the time required to coordinate with NRL-II calendar, then a contractor familiar with the country, specializing in the ecology of pastoral production systems, and knowledgeable about livestock development could be brought in to do the job in close collaboration with the field team. About 30 days in country should be sufficient. It would be most unfortunate if the planning for NRL-II got under way without the benefit of being guided by the findings of NRL-I. This summary statement would in no way substitute for the monographic reports expected at the termination of the field research, but it would go a long way to clearing the air, and to creating an atmosphere receptive to a continuing monitoring and evaluation capacity in NRL-II. At this point it is not at all certain that such a capacity would be received with enthusiasm.

- 1.2.2. Coordination A full ventilation of the issue of project management and coordination will be found in the complete evaluation team report. We shall mention here, therefore, only a few points which relate directly to the operation of the socio-economic research unit and to the description and analysis of the pastoral production systems in the project zone. A number of field staff persons spoke of the problems caused by flawed coordination between the research efforts on the range management and socio-economic teams. The position of

coordinator is identified in the NRL organigram, but has never been occupied. The division of labor between the two field teams has had the effect of the socio-economic group focusing primarily on actual systems (in vivo) and the range management group focusing on experimental, controlled systems. Both approaches are valid. Since the socio-economic group has elected to concentrate its attention largely (though not exclusively) on household level studies (see Section C 1.3.1.), they have little opportunity systematically to comprehend the ecology of the ongoing production systems. Through observations made in the field, they have some good insights into that system, but they are not in a position to undertake systems level analysis of the dynamic relationships among herders, animals, plants (including both terrestrial and arboreal pastures), water, etc. Systems ecology risks falling between the twin slats of the Project. It is critical that this omission be rectified immediately in order that a full year's transhumance be described and analyzed while there remains project time to do it. (It is unfortunately too late for such analysis to be available in the initial design of NRL-II, but the findings should prove useful for implementation.) Project management should move with all dispatch to get the necessary staff in the field. A reasonable model for this activity is found in the study carried

out under the Projet Production Primaire Sahel, in which
Malian, American, and Dutch scientists collaborated on the
analysis of herd and range management activities during the
transhumance from the Interior Delta of the Niger to Mauritania.
 Given the focus on actual empirical systems, it would seem appropriate to associate this effort with the socio-economic research unit; the important thing, however, is to get on with it.

The lack of close coordination among the component parts may also contribute to the sometimes confused image of the Project among RN and USAID personnel, who are unaccustomed to think of anthropology and veterinary medicine under a common umbrella. As noted above (Section C 1.2.1.), some of that responsibility rests with the socio-economic research unit for inadequately explaining the salience of their inquiries. But some of it is also due to imperfections in the overall management system. An examination of all the documentation made available for review reveals little effort to integrate the work of the two units, with the effect that the significance of the Project for development interventions is more elusive than it otherwise need be. Since the existing management officers appear fully occupied at present, it seems to follow that the lack of integration is a function of the absence of a individual who

is qualified and designated to carry it out. Is it likely that the findings of the two units (plus those of such other components as veterinary medicine, market economics, wild life biology) can persuasively be brought into harmony at the last moment, that is, during the writing of the final reports? The signal contribution anticipated from the Project at its conception was the integrated description of the existing pastoral production systems, with an identification of the constraints on increasing productivity, in order that appropriate interventions might be mounted to mitigate those constraints. Hence four coordinated units (range management, livestock production, sociological studies, training) were initially envisaged (see Annex 1 of Project Grant Agreement dated September 26, 1977). Somewhere along the line four coordinated units were transformed into two parallel but (as yet) relatively uncoordinated ones. Solving this problem would seem to merit very high priority in project thinking while there remains the possibility of doing something about it. If left unresolved the potential payoff from the Project will be severely attenuated.

Involvement in the Project of RN students identified for training in the United States deserves separate consideration.

1.2.3. Involvement in the Project of Nigerian Students An enduring benefit of Phase I of NRI Project is the group of Nigerian students currently in long term training in the United States. Several of these students are enrolled in Rural Sociology programs, and one of them, Garba Ibrahim, participated effectively in the 1979 AID Workshop on Pastoralism and African Livestock Development. It is hoped (and presumed) that these persons will become actively involved in the ongoing monitoring and evaluation work of any Phase II of the Project. It is disappointing, however, that their involvement in Phase I has been marginal at best and, for the Rural Sociology students, effectively non-existent. We have been unable to ascertain why this is the case, since it is reasonably self-evident that both the Project and the students would profit from their collaboration in the research. The nature of that collaboration requires a good deal of thinking, and several innovative possibilities present themselves. In addition to the usual summer visit to the Project zone (as several of the Range Management students have done), the formal schooling might be interrupted with a full year in the field, in order that the student has the opportunity to adapt classroom and laboratory instruction to the realities of the field situation. Senior research staff might be invited to participate in designing the study program, offering extramural commentary on research papers written, and otherwise

Involving the student in Project-related activities both in Niger and in the United States. A similar point was made by Bagoudou Maïdaji, who spent this past summer on a well survey and on Project ranches: "Nigeriens should be sent out in the bush to stay with these PCVs for two or three weeks at least... let's not forget that sooner or later these Volunteers will (re)join their families and it will be worthless if they have to come back with all (they have learned) without anybody to benefit from them."

C.1.3. Assessment of Socio-Economic Research Activities. From our discussions with the members of the socio-economic unit and an examination of their work to date, we are confident that the final products in the form of the monographs outlined in Annex 1 of Dr. Swift's report of April 12, 1981 will be of high quality, relevant to the concerns of those responsible for development interventions in the Project zone, and substantial contributions to the literature on pastoral production in Niger in particular. As has been noted at several points in this report, the problem lies not with the methodology or the products of the research but with the perception of that research on the part of persons external to the Project. We have proposed above an approach to solving that problem.

Such points as might be raised about the research refer not to its quality-- which is uniformly admirable --but more to its emphases and to what appears to be a general absence of an overall framework, a theory from which non-random hypotheses to be tested in the field

are derived. This theoretical absence is curious since the senior unit to the socio-economic unit is fully knowledgeable about various ecological and socio-political theories currently invoked to account for various characteristics of pastoral production systems. Perhaps the framework is implicit in the several studies being undertaken, but if so it is not clearly apparent to those TSAs questioned. There is, of course, a respectable empiricist tradition in field anthropology which induces its explanations from an examination of data. Yet given the sophisticated elaboration of theoretical discussions about pastoralism today one continues to wonder why such discussion is so understated in this Project.

It is recommended that the socio-economic unit (with the participation of interested members of the range management unit and of Project administration), during their next group meeting, consider carefully the theoretical implications of the work, and determine how the various sub-studies (household level studies, mapping, etc.) form a coherent whole. Such a consideration should be productive of new hypotheses for testing which need not radically reorient the direction of inquiry, but might make the products of the studies more useful. Without in any way prejudging the outcome of this consideration, it is recommended that the socio-economic research unit examine the pertinence of regional analysis, as elaborated by Dr. Carol Smith and her associates. Such an approach has not previously been explored in a pastoral area.

yet it appears to have considerable potential value. Regional analysis provides a bridge between the kind of micro-level studies represented in the household level inquiries (see C 1.3.1.) and the larger political economy within the pastoral production system operates.

1.3.1. Household level Studies In the absence of an elaborated framework against which to relate the specific studies being made it is difficult to be sure that the efforts involved are invariably commensurate with the products. For example, a great deal of effort is going into the household level studies. They are consuming the bulk of attention of three TSAs plus a large number of field assistants. These involve highly detailed recordings twice weekly of budgets, transactions, time, labor and capital allocations. The methodology to elicit the information is sound, and there has been an interesting and novel approach to measuring of time among the Tuareg. In tandem with a similar household level survey in Mali, this is the first time that such systematic examination has been undertaken among pastoral herders. The data will be much appreciated. Given that it is enormously consumptive of research time, is the emphasis justified? Ought more attention be paid to a larger arena of action than that of the household? After careful reflection on this question during the evaluation mission, we are tending increasingly to feel that it is indeed worth the effort. Nonetheless, we continue to regret the paucity of similarly systematic observation of the production system

In action.

The information to be derived from these household level surveys is an essential component of an understanding of how pastoral associations might best be organized, for they provide enhanced understandings of the nature of credit and debt. The studies should reveal how debt is organized, how it is retired, what kinds of guarantees are made. Through the depiction of social differentiation -- assuming the samples are large enough to pick it up -- we should have a better sense of how to direct credit programs to the needy rather than see them coopted by the already affluent. By providing detailed information on the connections among income levels, control over animals, labor mobilization, etc., these studies should give us answers to a wide range of important questions.

- 1.3.2. Mapping and Aerial Surveys The socio-economic unit is producing a useful series of maps identifying the movements of Tuareg and Wodaabe across a year's transhumance, locating watering points and identifying their ownership, and defining the major environmental features which relate to these movements. One of the obvious payoffs from this activity is the demonstration of the survival value (the "adaptive strategy") of mobility with a minimum of formal constraints. In the first place, any particular range will, over the course of a year, be used by a number of groups. (While this multiple use of land has long

been demonstrated in the northern edge of the cultivated zone, where herders pasture on cropped stubble after the harvest, enriching the soil with high quality manure, this study is the first to detail that usage among diverse groups (ethnic, lineal, camp - of herders). In the second place, each group must have access to a wide range of lands of different kinds. Since rainfall is variable in quantity, location, and distribution, and therefore one cannot predict with certainty the useful condition of pasture, it necessarily follows that range use must be highly flexible: there should be no attempt either to restrict the movements of a group or to lock them into a rigidly delimited area, such as might constitute a 'pastoral unit'.

The mapping exercise is limited by several factors. First, a single year's movements, or even a few contiguous years' movements, will not adequately represent the full thrust of mobility as an adaptive strategy. Since one cannot project readily into the future, it is important that the work of Maliki in defining past movements be closely linked to the maps, to indicate the kinds of changes which obtain over time, and in association with droughts, epidemic disease, etc. Second, in the interest of clarity, the lines of movement are presented as parallel among groups (to avoid a hodge-podge of intersecting curves on the map). But this is capable of giving the

The herder emerges from such a study as a careful manager of range and animals, whose constraints on production cannot be attributed to "tradition", which calls for the imposition of changes from without, but from the inadequate control over resources associated with poverty and with political vulnerability. The field team is well aware of these factors, and we do not belittle the problems in the attempt to deal with them.

- 1.3.3. Herders' Associations Among the most interesting and important findings of the socio-economic research unit deal with the question of the establishment of pastoral or herders associations. Such associations, often in conjunction with the notions of "pastoral units, and pastoral centers", have enjoyed a certain vogue among development planners in the last five years, and projects involving such organizations have been appraised in Niger, Chad, Senegal, and elsewhere. None of those which we have examined bases itself on what the herders define as their own prime requirements. That is, pastoral associations have been seen as instruments for increasing productivity to meet domestic and export demands for meat, and as instruments for the imposition of range use controls (through limits on stocking, rotational grazing). In return for accepting increased offtake and range use controls, the herders are supposed to receive a package of services, including water point improvements, veterinary services, and perhaps, credit.

The work of the socio-economic unit in the NRL, on the other hand, starts from the point of view of herders themselves, and their perception of their own needs. What emerges over and over again from the reports is the intense poverty of large numbers of pastoral people in the zone. Many of those who lost their herds during the drought have not been able to re-establish themselves. Having few or no animals, has meant having no milk for domestic consumption and no money with which to purchase other necessities, especially millet. An index of the extent of this poverty is the large number of persons who work as herders and shepherds for urban-based traders and functionaries and for more affluent Hausa farmers who invest in animals. These herders have access only to the milk and not to any offspring as may be produced. Thus such labor does not serve as an interim means of herd reconstitution and is simply a survival stopgap.

From the point of view of these impoverished persons, the Herders Associations must respond to the condition of insufficiency of animals and inadequate supplies and availability of grain. Such credit mechanisms as are introduced must assure that funds are directed towards those in need, and not coopted by the already affluent. A reasonable time for repayment must also be established, since quite a few years are needed for a cattle or camel herd to reach the point of sustainable offtake without compromising demographic stability.

Among the other interventions which might be associated with Herders Associations, the local people mention human and veterinary health interventions, and reasonably priced consumer goods such as tea, sugar and cloth. The very useful report produced for the NRE by Dr. James Thomson, Nigerien Herder Associations: Institutional Analysis and Design, discusses and called many further aspects of planning these associations into consideration.

What do the herders think about "range management"? It is clear that they think about it a good deal. They recognize the relationship between quality/quantity of graze and the number of animals which ought to be sustained on it. They distinguish subtle differences in nutritional quality of different grasses and trees. They resent the added pressures on the range from the northward migration of cultivation and from the transhumant movement of herds from the south into the Project zone. They wish that could be restricted. But-- and this is a critical "but"-- they also know that open access to range is their primary survival mechanism, and without it they would be trapped by the first bad year. Therefore, they are suspicious of any proposal which, in the interests of improved forage, would have the effect of limiting movement or arbitrarily limiting the number of animals which might be grazed. In this

light, it must be made clear from the outset that any attempts to form Herder Associations must have "range management" as an eventual possibility to be considered by the members if they identify new needs for such techniques, and not as immediate demands or even as the hidden agenda of association-building.

Finally, it must be pointed out that the socio-economic team has been ready for many months to create the first of these associations. For reasons that remained obscure to the evaluation team, the expressed will to begin this vital part of the agreed project actions has been blocked. It is now time to begin, with a new TSA to be hired for a full-time assignment on this task. This activity is seen to have the highest priority among all recommendations by the entire evaluation team.

See Chapter below for further discussion.

1.3.4. "Practical" Determinations and Actions of the Socio-Economic Unit

We have indicated above some of the development implications of the research undertaken by the socio-economic unit. There remain a number of items which should also be mentioned, although without extensive commentary. These have emerged in the process of the field work, and constitute important areas for practical actions aimed at benefiting the local population.

- 1.3.4.1. The identification of Vitamin A deficiency causing night blindness in ruminants in relation to changes in range composition, especially in the arboreal pasture. The herders felt it pointless to discuss this disease with livestock service personnel since they knew that the cause lay in the nature of the browse and that the livestock service was not in a position to do anything about it. Fortunately, the deficiency can be rapidly corrected with injectible or oral doses of Vitamin A (as in cod liver oil). The identification of this browse-related ailment further expands our knowledge of the decisions made in the selection of pasture.
- 1.3.4.2. The successful training and supervision of paraveterinary workers.
- 1.3.4.3. The emerging comprehension of why herders are often reluctant to have their animals vaccinated against rinderpest. The reluctance is due not to any irrational thinking, but to a reasoned assessment of the costs and benefits, that is of the potential losses from vaccination (including illness, abortion, depressed quantities of milk, and even death). They also recognize that certain animals are exceptionally difficult to manage, and these "wild" animals can wreak havoc if

brought into a crowded vaccination center.

1.3.4.4. The discovery that "ownership" of watering points does not necessarily accord exclusivity of access to either the water or to the surrounding range.

1.3.4.5. The importance of leaving certain areas without watering points to preserve the range as a natural seed multiplication center.

1.3.5. The Impact of the Grain Trade and the Northward Migration of Agriculture. At first glance, the socio-economic research unit's concern for agriculture may appear tangential to a study of pastoralism. It is in fact an essential component. As per capita millet yields decline and as small farmers become increasingly indebted to grain merchants and larger farmers to the point where the harvest is mortgaged to payoff accumulation credit, the pressure to expand production through intensification and through the extension of cultivation is very great. The northward movement of farming has ecological ramifications both in the cultivated fields -- whose soils are too thin to withstand the assault -- and on the pastoral range which necessarily contracts. Thus, "overgrazing" may be caused not by the will of the herders but by the loss of range to farming. Ultimately, the fault lies ^{not} with the small producers, but with the

huge export of grain from its area of production to the towns and across frontiers. This in turn caused a marked rise in the cost of millet in the countryside to both farmers and herders. For the latter, the additional costs of transport means that many simply cannot afford to eat grain or must further reduce already depleted herds to earn the necessary funds. Both small farmers and small herders are victims of the system. The agro-pastoral study should provide the necessary analysis of this system and perhaps identify those points at which remedial action might be taken.

C.1.4. NRI-II, Monitoring and Evaluation. An important body of material about production systems in the NRI-I Project zone has been collected by the socio-economic research unit. Its analysis should provide major guidance to any subsequent NRI-II. It would be a great mistake, however, to designate the two phases as "research" and "action" respectively. The momentum of study generated by the socio-economic unit will be a source of continuing strength to the Project if it is effectively incorporated into a Phase II monitoring and evaluation unit. In addition to continuing the Phase I studies, the monitoring evaluation unit would provide the RN and USAID with close examination of the impacts of various interventions, constituting an early warning system in situ, and providing the assurance that the intended beneficiaries are indeed profiting from the proposed actions. In order to maximize the contribution that such a unit might make, we further

recommend that the current members of the socio-economic unit be invited to continue their work as members of the monitoring and evaluation unit. Similarly, those Nigerians in long term training in the United States might similarly be offered positions on that unit (or elsewhere in the Project), before assuming their permanent positions in the Ministry of Rural Development.

C.2. Socio-Economic Studies: Research Methodology

This section of the evaluation report, like the last, is based on a review of the reports presented by the socio-economic research team, supplemented by intensive discussions on problems of data collection and analysis with nearly every member of the team. Because the principal author of this section resides in Niamey, he has offered to continue his advising in matters of data processing if members of the research team desire to do so. This section is arranged as follows:

C.2. Socio-economic Studies: Research Methodology

C.2.1. Assessment of Research Design

2.1.1. Household Surveys

C.2.2. Review of Data Collection

C.2.3. Validity of Phase-1 Hypothesis

C.2.4. Data Processing Options and Requirements

2.1. Assessment of Research Design

The mandate of the socio-economic research component is to develop a broad strategy for the pastoral zone.

The project has conducted research at the herder household level. The purpose of this section is to evaluate the appropriateness of the research methodology. The project could have chosen alternative methods of data collection and analysis (i.e. use of secondary data from previous studies, reported RN figures, or resort to strictly qualitative assessments of constraints to productivity and herder well-being). The present studies will yield current quantitative and qualitative primary pastoral data from which real constraints to efficient and equitable development can be identified and explained. The resultant identification and correlation of incentives and obstacles to development will lead to the recommendation of specific interventions and general fulfillment of the NRL Phase I, mandate.

The socio-economic research component of the project was largely designed by the NRL Senior Consultant in Socio-Economics. A survey questionnaire was adopted from earlier studies and methods of tabulation are standard. Field staff contributed to some modifications which are described in sections C.1.1.1. and C.1.3.1., and which should improve the validity of data collected. The questionnaire is fairly concise, including the identification and quantification of the variables most relevant to household budgeting and animal husbandry.

The work plans for field staff were prepared by the Rural Sociologist and Project Management to require specific activities that would generate the required quantitative and qualitative data. Three of the

DATA have completed their course work for the Ph.D. In anthropology, all of them are able correctly to interpret the research methodology and, without prejudicing the design, can constructively modify it when field conditions, either physical or cultural, call for changes. We suspect that there was a thorough literature review that led to the final research design and approaches to primary data gathering.

Some of the work builds on earlier NRL-funded studies in the project zone,¹⁻ as well as on several Ph.D. theses done in Niger independently of the NRL. The project has adopted some of their methodology for field research. This somewhat improves the reliability of the data and perhaps more importantly will permit a comparison of findings between time periods.

2.1.1. Household Surveys The purpose of the household budget studies is to describe a range of pastoral and agropastoral systems and the constraints under which they operate in various locales. The socio-economic team will analyze the contribution of livestock raising to these systems. The team has chosen linear programming, modeling and simulation as the analytical tool for

1- Sutter, John W. Pastoral Herding in the Arrondissement of Tanout. African-American Scholars Council, Zinder, Niger, August, 1978.

Maliki, Angelo B., Etude Socio-Demographique sur la Population Wodaabe et Fulbe de la Region du Projet NRL, USAID Niamey, 1980.

comparing the capacity of these systems to provide pastoral producers with basic necessities.

The total number of families under investigation is 222: pastoral zone - 115; agro-pastoral zone - 44 and; sedentary zone - 63. The project will analyze productive factor utilization for different agropastoral systems, and herder-farmer relationships.

The research was designed to sample randomly five different production systems in the three ecological zones. The principal variables quantified in the samples are: labor utilization practices, enterprise choice, use of inputs, and productive outcomes. The sample frame was constructed from recent census information.

From the data collected on a weekly or bi-weekly basis, estimates will be made of the proportion of family time and money allocated to various activities, and cash requirements and flows for sample households.

C.2.2. Review of Data Collection

Socio-economic data is recorded by Project-trained enumerators.

These Nigerians were selected from among the ethnic groups to be sampled, and they are therefore fluent in the predominant language of the sample. They are salaried and supported logistically by the Project. Interviews conducted at two of the three sample areas for the evaluation team

exhibited generally good execution in terms of questions asked and responses recorded. The recording of information in a local script, Tifinar, by both Tuareg and Wodaabe unschooled enumerators, represents a real innovation in Nigerian research.

The information collected in the household economic surveys is recorded on data sheets that will facilitate collation and coding. At this stage data is still in the raw form. The surveys are presently at slightly different stages, due to different starting dates. All will have covered one wet season by December, 1981 and some will have also covered a complete dry season.

The socio-economic component work plan calls for a team meeting and intensive analytical exercise to begin in February or March, 1982. The Project should begin a partial analysis of the data immediately.

C.2.3. Validity of Phase I Hypotheses

The socio-economic study team has formulated several key hypotheses that, when tested, will reveal relationships linking factors of production and income levels to resource and policy constraints in the pastoral and the sedentary zones. These relationships have been described by the sampled herders to the TSA's and their enumerators in qualitative and quantitative terms on a twice weekly basis over the past six months for the Wodaabe sample and eleven months in the Tuareg case. Socio-economic team members have lived among the herders and carefully observed herder practices. Based on these observations

and consultations with the socio-economic team leader, the TSA's were able to pre-test their questionnaire at the beginning of the survey and make the necessary adjustments in questionnaire format and interview techniques.

Observations and discussions in the herders' language have enabled the team to hypothesize about resource utilization and income constraints. A sample of the more important questions that the team will analyze are the following:

- A. Interzonal and intrazonal variations in agro-pastoral strategies affecting labor utilization, enterprise choice, use of traditional and modern inputs and productive outcomes,
- B. Factors potentially affecting size of the farming or herding enterprise.
- C. Functional relationships between farm production and climatic conditions which constrain all other factors.
- D. Estimations of market supply and demand for cereals, livestock, milk products and consumer goods, recognizing the herder and farmer as both seller and buyer. Varying assumptions about market control will be tested.
- E. Herder-farmer conflicts and dispute resolution to determine frequency of disputes, mechanisms for their settlement and compensations awarded.
- F. Interzonal trade to explain factors influencing quantities of products and relative price ratios for animals and goods exchanged between the pastoral and sedentary zones.

G. Wealth distribution, labor supply, herd management and necessary social structures for cooperative development.

On the basis of these findings the project can work with appropriate RN institutions, both within and outside the Ministry of Rural Development, to define appropriate units for cooperative action.

H. The contribution of women's sales and exchanges of milk products to the domestic economy.

One of the most important strengths of the socio-economic research methodology is the completeness and total quantity of data being collected. The surveys are both serial and cross-sectional in nature. The amount of data that has already been collected should insure sufficient sample size for statistical analysis and testing of simple correlations as well as more sophisticated hypothesis testing. It is anticipated that the largest of the household survey and marketing studies data will be subjected to treatment by a linear programming or simulation model.

Statistical analysis of the data is essential. The relevant variables are too numerous and the recognized relationships too complex to estimate results in an informal or guesstimate manner.

The evaluation team has reviewed the quantitative data collected by both the socio-economic team and the range management research team. We have assessed the significance and utility of that data and concluded that a thorough and statistically rigorous analysis is essential to

obtaining anticipated program results. The expected results will be necessary for the achievement of project goals and objectives.

C.2.4. Data Processing Options and Project Requirements

Electronic data processing (EDP) in relatively less developed countries is generally a difficult task. The most common problems are consistent supply of electricity, ambient temperature control, software matchup to hardware and programming needs and limited supply of qualified technicians and programmers.

This project has had its share of problems with the EDP hardware. The new micro-computers are a mixed blessing. At worst, they are easily transported back to the factory when they don't work. The computer that the socio-economic team borrowed has already been shuttled between Africa and England several times.

The project has wisely decided to divide the data for analysis according to principal components of the project. Each component data set is analyzed on different computers in Niamey and elsewhere. This reacting with alternative computer facilities should initially diminish the risk of long delays in starting the required analysis.

The head of the project socio-economic team has been working with a micro-computer at the International Livestock Center for Africa in Bamako. The malfunctions that have prevented preliminary processing should be corrected by October, 1981.

The CRED marketing and recurrent cost studies will presumably rely on

data processing facilities on their campus in Michigan. The project should discuss with CRED the possibility of using their facility in the event that the other processing centers tried prove to be unwork-

The facilities for possible contracting have been identified in Niamey: at AGRHYMET and the National Transport Corporation. Both have working equipment and programming capability. They may also be in great demand.

The NRL Project has generated a very large amount of socio-economic quantitative data. Project requirements for processing this data are no small matter. Time for coding, keypunching, and programming activities will be measured in months to meet the demands of this project. A summary of the estimated data inputs from the socio-economic studies as of December, 1981, is presented in Figure 1.

FIGURE 1. Socio-Economic Data Outputs

Description	Survey Period	Sample Size	Number of Questionnaire Sheets	Number of EPD Cases
1. Wodaabe Study	10 mos.	15	1,600	1,600
2. Twareg Study	12 mos.	100	7,600	42,000
3. Agro-Pastoral Study	7 mos.	107	10,100	60,000
4. Animal Production Study	2 mos.	100	100	100
5. Human Health Study	13 mos.	50	250	1,900

It is now urgent to complete the planning for these analyses. As appears in the chapter on recommendations, a consultancy in data processing is an urgent need of the project. The evaluation team expressed fear that without this planning, the NRL risks going to an end with vast amounts of unanalyzed data, or a best case scenario of the TSA's retire to their next pursuits with crucial NRL materials in hand for analysis in the more frequent and relaxed academic style.

C.3. Social Interventions of the NRL: Some Observations

This section comments on the social interventions that have been taking place under the NRL. It makes the crucial point that any long-term development in the pastoral zone requires "an essentially social solution", and that therefore "social interventions should be the pillar, the starting point, around which the other interventions should be articulated..." The evaluation team was disappointed that the Project has brought the social and the production interventions onto line only very slowly. We realize that they were to begin only after sufficient research and testing, but many are now "overdue" in terms of the original time lines, even when one counts from the de facto starting date of September, 1979.

Here we comment on the human and veterinary health auxiliary training, on the communications program of the project, on the nutritional research, and on the proposals in the Grant Agreement for a network of "community aides" and herder associations.

This section is arranged as follows:

C.3. Social Interventions of the NRL: Some Observations

3.1. Generalities

3.2. Objectives

3.2.1. Initial Objectives

3.2.2. Summary of Objectives

3.3. Zone of Intervention

3.3.1. Geographical Characterization

3.3.2. Human Characteristics

3.4. Types of Interventions

3.4.1. Nomadic Zone

3.4.1.1. Infrastructure

3.4.1.2. Production Techniques

3.4.1.3. Herders Organization and the Family Structure

3.4.1.4. Communication/Extension

3.4.1.5. Animal Protection and Health

3.4.1.6. Human Health

3.4.2. Sedentary Zone

C.3. Social Interventions of the NRL: Some Observations

3.1. Generalities

By creating a process of alarming pauperization, the droughts of 1968/69 and 1972/73 have brought about a tangible transformation to livestock herding in the country: the notion of economics is taking over the traditional aspect, the consciousness of the fragility of the sector is being felt more strongly. In fact, it appears that livestock raising as a way of living, even though founded on tradition and an experience which originated in ancient time, is no longer sure.

Actions became necessary above all in the pastoral zone, cradle of livestock raising in the country, where the catastrophe was felt the most. Three livestock projects were planned (NRL, World Bank and Sud Tamesna Projects) to improve herding techniques, increase animal productivity and improve the way of life of the herders, projects which relied on a bigger contribution from the public services, including the building of infrastructures and social services for the pastoralists (UNCC, human health, animal health, literacy, education, etc.

However, no improvement can be brought about in the zone without a "point of junction" between the public services and the herders, in which an organizational process of democratic participation in development programs of the zone could be elaborated and integrated to the global plan of national development.

3.2. Objectives

As noted, the droughts have hit the pastoral zone very hard. In its search for short and long-term solutions, Niger signed a convention in 1977 with USAID for the development and implementation of the NRI project. Its main objectives are:

- study of the present conditions of livestock raising
- setting up of pilot methods
- identification of technically and socially feasible interventions
- search for a well-adapted range management system, in other words, to prepare a program that would improve productivity and preserve the pastures of the zone, not forgetting as well the necessity of finding adapted institutional structures.

Concerning the social interventions in particular, whose aim is to bring new techniques, the ways and means and the appropriate knowledge to the herders, which are the basis of any management of a system of human activities.

In the particular case of animal production, the social interventions should bring about an improvement in the productivity of the livestock, the **only** guarantee of a beneficial control, which implies the implementation in the society of a conservationist model of the existing resources. In fact, without a balance between the needs/availability of forage, it would not be possible in the long run to increase the revenue of the herders without breaking the presently precarious ecological equilibrium.

Best Available Document

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3.2.1. Initial Objectives The Project Document envisioned four main social intervention types:

2.1.1. The search for a mechanism for "herders animation", implying the choice of herders for an in-depth study.

2.1.2. "Communication for participation", ending in a network of "herder community aides", in health, social actions, and extension.

2.1.3. Animation for the improvement of the standard of living, which requires the setting up of the following:

- Veterinary posts
- appropriate animal production techniques

2.1.4. Herders Associations.

The evaluation team found that some of these four points have not been taken up and others have been dealt with only superficially.

3.2.2. Summary of objectives:

2.2.1. Selection of herders for elaborated studies.

2.2.2. Communication for participation

2.2.3. Animation to improve the standard of living.

3.3. Zone of Intervention

The interventions are conducted in the central part of the Nigerien pastoral zone, initially forming a triangle of Tahoua-Agadez-Tanout.

but currently increased in the West and reduced in the East (to avoid overlapping with the World Bank project).

- 3.3.1. Geographical characteristics The zone which touches four arrondissements, Tchii Tabaraden, Agadez, Tanout and Dakoro, has an area of 4,000,000 ha and is located between the isohyets 200 mm and 400 mm (northern limit of the croplands--law 61-5 dated 5/26/61). Characterized by a meager plant cover, its main problem for livestock raising is the weaker grazing capacity, which implies above all the evaluation of the potential of the natural resources available before it could be possible to envision the rational management of the pastoral species. (The most abundant grass species is *Cenchrus bifloris* and the most common shrub: *The Callotropis procera*).
- 3.3.2. Human characteristics Two ethnic groups live in the sector, Filani and Twareg: at the outset of the project, a total of 50,000 people were said to own 150,000 UHT. The per capita revenue was believed to vary between 12,500 and 15,000 CFA per year. Social infrastructure is almost nonexistent and good roads are rare. The very mobile population poses for government the problem of regulation and of the justification of social action (infrastructures in particular). If we look at the social problem as a whole in terms of productivity/benefit, the question to be asked is: How can we realize with the consent

of all the herders, an articulated organization in pastoral units, within which there is a balance between the animals and the available forage, and where the social infrastructure would be rationally utilized?

3.4. Types of Interventions

This brief view of the conditions of the project shows the necessity of searching for the effective and free participation of the population of the zone, for they are heirs of their own habits and social practices, and for them the social factors remain dominant. Any outside intervention in extension work and animation should be based on the good understanding of these factors among the two main ethnic groups living in the zone. It is recognized in one of the Project documents that "those populations are de facto managers of the pastoral zone and it is the duty of whoever plans the future of pastoral life in Niger, to understand the pressures and the constraints under which they operate". However, the chore is not simple, however clear it appears to be: the Three Year Plan 1979/83, page 185 underlines the general path to follow: "the fixed objective will only be attained by bringing about some profound changes in the exploitation and the management of the livestock capital". The case of the pastoral zone is seen by all outside it as a social problem, but of course the pursuit of an essentially social solution must not set aside those technical aspects which block or intensify the negative aspects of the herders' situation.

In the overall plan we remain convinced that for the zone, the social interventions should be the pillar, the starting point, the central point around which the other interventions should be articulated and take support from. The current interventions are oriented in different directions, according to the project zone itself (nomadic zone) or the zone located south of the project zone (sedentary zone).

3.4.1. Nomadic Zone

4.1.1. Infrastructure It appears clear to us that to succeed in moving the services of the Project as close to the herders as possible, to be articulated perfectly with the classical service of the livestock service (which is not the case at the present time), the building of veterinary posts is indispensable. The four veterinary posts (only two of which are so far completed) will not be enough, and the possibility of their rational utilization is uncertain for no equipment is being provided for them. This handicap should be remedied, within the bounds of the present phase of the project (the list of the equipment to be done in advance). In addition, to avoid a disastrous concentration of population around these points, the veterinary posts should be multiplied.

An aspect also not to be neglected is the "research maturation" aspect from the viewpoint of the herders who prefer to see concrete actions, even token ones, rather than

simply discussions and continued interviews, the goals of which are only faintly clear to them, or in some cases not clear at all. Even if the goal of the Project is to observe the facts, to analyse them, to locate areas and identify actions to be undertaken afterwards, the Project should now review its preoccupations in this sense.

4.1.2. Production techniques This section of the project planning is, in our opinion, vital. But nothing has been done in this domain at the level of the producers themselves. In our opinion, something should be done before phase two, in terms of studying the validity of the extension auxiliaries, "the herder aides", and the level of a camp or a tribe. We are conscious of the difficulty of getting good auxiliaries due to language problems. But we estimate that in any case it is necessary to go in that direction to tighten the relations between the public services, the project and the herders.

4.1.3. Herders organization and the family structure. There cannot be any durable, concrete actions without organization and a good knowledge of the production units. So far, the idea of organizing the herders into associations is not well understood, or at best grasped in only a very restrictive sense.

Objectively, one can never attain rational management of the

resources of the zone without some restructuring of the social milieu. The way of living of the people themselves would make any action at the level of the individual non-productive and illusory. If the "pilot associations" have not been undertaken, it is certainly due to the misknowledge of the methodology to be adopted and the selection of the operations to be implemented and structured: the question then is to know: what kin units ought to be organized?

It would seem that the herders contacted were disposed to lend themselves to the experiment. Was it perhaps the conditions that were imposed that were insoluble, in terms of their own health, that of their animals, and the supply of basic commodities (see project activity report, 1980)? Besides, the study of family structures is the only way to appreciate the productive forces available or the components of these forces. In addition to a purely philosophical approach, one should get the effective participation of all sexes and age classes in the production system, not only socially, but mainly economically and technically. The insertion of the project zone into Niger's Development Society will come by letting the people themselves manage a means of "self-cooperativization", as limited as it may be.

The research at the level of social/producers' organizations must support the effort of the national service, such as UNCC and Animation, whose task is to find the most favorable level

for the constitution of pre-cooperatives (groups? tribes? camps? families?). This is the time when the project should contribute to the support of the essential mechanisms which could at this time underpin the idea of herders associations: supplies, loans for herd reconstitution, solutions to the problems of the late dry season, etc.

- 4.1.4. Communication/extension The importance of this component does not escape anyone. However, the intervention seems very limited in time and space, to us. Using the radio-clubs is judicious, but due to the fact that it is operational only during the Cure Salee, its range in terms of time is slight. Besides, the monitors, trained and equipped with low range radio transmitters (15 km only around In-Gall) have not shown any concrete, varified results. The subjects that are broadcast seem acceptable, but it has to be noted that, unfortunately, no Fulani monitor has yet been trained. This gap should be corrected rapidly, even if it has to be through use of Tamashek, if it should turn out that most Fulani can speak that language.

The project must reinforce its support in this area, mainly by providing equipment, because we think the operation should be oriented towards radio-cassettes and movie projectors: this is urgent, for the animators do not receive the broadcasts from In-Gall, and one would therefore wonder if the herders that are concerned yet know what the NRL project is! There must be a system of control and evaluation of this operation

which should be better organized. With the livestock service as the technical controller, the TSA/communication should work to amplify his activity in this field.

- 4.1.5. Animal protection and health Even if certain deadly epizootic diseases seem controlled (Rinderpest - bovine pleuro-pneumonia), we should not forget that many diseases form an obstacle to the fuller development of the herd (i.e. foot and mouth disease, brucellosis, telluric diseases, small ruminant pest). If one accepts that in the zone, better than anywhere else, "man depends on the animal", one accepts also the idea that animal health is a prerequisite to human health. The animal health component thus implies necessarily, a health aspect and a nutrition aspect. The system of animal health securists must be continued and improved. In our opinion, the lack of transportation and incentives (5% compared to 10% in the World Bank Project, of the drugs that are sold, after reimbursement of deteriorated articles) are blocking the development of the system. The motivation is now vanishing. Without getting into wage-earning, we remain convinced that there must be modifications possible that would maintain that motivation. Well-trained securists could also participate validly (though this could be studied) in the vaccination campaigns. This takes us to the veterinarian posts to be equipped (freezers mainly), because to be efficient, the securists should not suffer from a lack of medicine. For all these purposes, the

location and vocation of the posts should be determined in the future only after a study and an adaptation have been conducted in regards to the local needs. (On this point, we would remark that in Abalak the Project built a post, an abattoir and a drying area, the latter despite the fact that there exists an old drying area that has never been used since all skins are treated and used locally for clothing, water bags, bags, dippers, saddles, etc. In addition, the abattoir is located close to a pond from which the people get drinking water, without any protective measures!) One final note on the study now being undertaken on jackal and hyena controls to protect local livestock: the project ought to continue such an action, but in conjunction with the Forestry Service and with the Livestock Service as well.

4.1.6. Human health There is no data available in the country on the health and the nutritional status of the nomads in the zone. No development or productivity action can be undertaken with a population that is sick and undernourished, so human health has primordial importance. It appears to us that the project originally minimized the global aspect of this question, compared to animal health. The limited human health auxiliary training which was recently begun, is limited to two arrondissements only of the four in which it operates, then progressively to the rest with the help of the Health Service. The

results of the efforts so far is encouraging, but here, more than with the veterinary securists, the financial motivation is nil (no percentage), the drugs being given free. We realize that this is a problem with the whole securism system in the country. In all cases, for human and animal health, motivation and transportation tend to be the blocking factor. One fears that in the short-term there could be a situation in which the only persons that benefit from the securists would be their close relatives.

The case of the nomad securists must be considered independently of those of the sedentary zone, not in technical conception, but in the means of practical accomplishment in the field. In our opinion, due to the long distances and the mobility of the population, three main measures must be envisioned:

- (a) Increase the number of securists (there are 29 at present: 20 for animal health and 9 for human health).
- (b) Buy a camel for each securist or give them money to rent a means of transportation.
- (c) Give him money to take care of the camel.

Another aspect of the "securist problem" is the training, monitoring and the followup of these volunteers. The contribution of the veterinary services and human health services must be effective. The project should support them, by

reinforcing their means of action, which will imply sending agents into the zone who speak the language and who know the local traditions well. At the moment there is no assured followup. The system adopted by the Health Service at Tchintabaradene (the securists are coming to the local market to meet with the health service chief to debate problems and to get supplies), cannot be considered as much of a control, and even less as a followup program, since it does not permit verifying what the securist is really doing in the field. Besides, the securist action could be positively reinforced by technically and logistically well-equipped mobile teams. Neither of these two methods of interventions should be considered by any means to exclude the other.

It appeared to us that the Animation Service has not so far participated in the securist operation in the zone. This ought to be corrected, for even though we have seen that the securists can valuably fulfill their role even though they are not literate, the role of the literacy service ought not to be neglected. Something remains to be done, for the problem of communication is real.

In another order of ideas, the studies undertaken by Dr. Louis Loutan in the diseases, birthing, nutrition (human), must be continued, but with a more rigorous scientific approach (for example, a study of the chemical characteristics of the plants that are used by the herders; ways and means to modify,

improve or eliminate certain practices that are simply listed by Loutan; the real medical efficacy of the products used, at least in the interesting cases, etc.)

More particularly, in the question of birthing, the question of training matrones (traditional birth assistants) remains unanswered, blocked by the fact that traditionally, there were no such specialists in the camps of the two ethnic groups. Nevertheless, contact must be made through experienced women, perhaps by organizing talks and by audio-visual methods. This could be an additional activity of the TSA/Communications.

The nutritional question shows some situations that need to be varified. Dr. Loutan's studies indicate that the nomads lose 10 to 15% of their weight from March to June: any intervention that is to be undertaken ought obviously to be in that period. This implies two main dispositions :

- (a) The putting into place of pastoral "relays" or supply centers, to be considered as a priority among the social interventions (for human nutrition)
- (b) Distribution of cotton seed (for animal nutrition).

3.4.2. Sedentary Zone

The activities of the project have gone out of the project zone (northern most limit of the croplands) and socio-economic studies are conducted in the southern, sedentary zone:

- structure of agro-pastoral unit
- budget/consumptions of the production units
- prices of the agro-pastoral products

We noted some confusion between the notion of the production unit and that of the household (the latter is the one which is adopted), and also in the method of determining the fields and the systems of production.

We have asked that the formulation of the definitions and the questionnaires ought to be reviewed with the collaboration of the Agricultural Statistical Service and the Project Monitoring and Evaluation Unit in the Ministry (MDR).

It also appears very important, indeed essential, to us to start a study on the process of occupation of the areas outside the croplands: Is it the nomads themselves or is it the sedentaries that are moving north? Is it a permanent or a temporary occupation? What is the rate of cereal production in those fields? What is the influence of the rainfall? These studies could be done if necessary by diminishing the market studies.

This is a rapid presentation of some thoughts about social interventions planned and undertaken by the NRI project with the idea that they will contribute to the harmonization and the adaptation of future actions.

CHAPTER IV

THE ACHIEVEMENT OF PROJECT GOALS:EVALUATION AND RECOMMENDATIONS

This chapter has two sections, perhaps the critical ones of this evaluation report. First is an evaluation of the achievements to date. A review is made of the project outputs called for in the Project Grant Agreement.

A check-list of those that have been completed and those now in progress is presented. A commentary is made on the general reasons that some project activities not yet undertaken are nonetheless vital. A statement of the evaluation team's confidence that the NRL can achieve its purpose, and a confirmation of the validity of the purpose, conclude this section.

The second section contains the formal recommendations of the evaluation team for action to be taken from this point onward. It lists priorities of the level of individual implementation team members, of project management, and of AID/Niamey. Suggestions as to specific actions to be taken to follow through on these recommendations are also made.

This chapter is arranged as follows:

- A. The Achievement of Project Output and Purpose
 - 1. Summary of Project Goals and Purpose
 - 2. Analysis of Project Outputs
 - 3. Summary Statement on Output-to-Purpose Accomplishment
- B. The Remainder of the Project Program: Recommendations of the Evaluation Team

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1. Technical Recommendations
2. Program Recommendations
 - 2.1. Top priorities
 - 2.2. Second-tier priorities
 - 2.3. Other program recommendations
3. Project Recommendations
 - 3.1. Intensify Collaboration
 - 3.2. Begin the Consolidation of Project Findings
 - 3.3. Increase the Communication Flow

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A. The Achievement of Project Outputs and Purpose

1. Summary of Project Goals and Purpose

The goal of this project was to contribute to the development of a system of Range Management in the pastoral zone of Niger. This system would preserve and improve the range as a national resource and increase the income and well-being of traditional herders in the zone.

The project assumed that the RN would implement policies to optimize the productivity of the range. Project findings would show that the current pattern of use of rangelands conflicted with RN goals of increased livestock production. The potential increases in production identified and tested by the project would be sufficient to warrant an organization to provide increased services to herders and control use of the range. Herder cooperation with RN policies and service intervention would be insured by the potential increases in their income and financial security. Finally, the RN would be able to secure funding sufficient to implement the required program.

Comment: Chapter III above reveals a general consensus that the Project is generating a considerable amount of hard evidence on the conditions of Niger's range and the productive relationships that allow herders to exploit the natural resources

of the zone. After a year of investigation, the project concedes that the annual nature of the range vegetation and the rational movements of the herders rule out the likelihood of permanent deterioration to the range as a result of "overgrazing".

We can agree on four questions facing the herder:

1. Where should he graze his herd to insure the survival of his family and herd?
2. How many animals should he graze to feed his family, satisfy his cash needs, replace losses, increase his herd, and stay within the carrying capacity of the available forage and his available labor supply?
3. When should he move off a given pasture to maintain the optimum herd gain and milk production?
4. What combination of vegetative types and water sources should he look for, given the composition of his herd and the season of the year?

There is some disagreement within the project as to whether the herders should continue to make these decisions as they always have, or if an RN Range Management system should be imposed and thereby control these decisions. We feel that the Project will (must) test the validity of the assumption that

current range use patterns conflict with the RN goals of increased livestock production.

Since the time when the PP was written, it has become evident that the present RN strategy has been focussing away from range management and toward ensuring the survival of the herds and gradual re-constitution to pre-drought levels.

The purpose of the project is to test and demonstrate range management animal productivity interventions, to prepare a comprehensive range management plan and livestock extension program and to develop national institutional capacity to carry out recommended interventions. Attainment of project purpose is to be judged (1) on the validity of data on the costs and benefits of various interventions on productivity and (2) on the applicability of a range management plan, specifying kinds and levels of range use, based on the physical and biological characteristics of the land. Such a plan would also recommend the implementation of specific controls on resource use in the pastoral zone.

The project assumes that the area selected is sufficiently representative of the pastoral zone for project findings and results to be replicated. The area is in the central cattle raising portion of the country.

Comment: As the project got underway the original area of study was extended south into the sedentary zone and further west. This was done in recognition of the very important interactions between herders in the pastoral zone and their neighbors in the sedentary zone.

Project identified and tested management and livestock practices will be remunerative and consistent with the social and cultural systems of herders. It is assumed that once such a package of practices is demonstrated and made available to the herders, then they will adopt the package on a permanent basis.

Comment: The evidence necessary for an assessment of the value and applicability of the improved package work to improvement of the project purpose is incomplete. The socio-economic findings as tentatively reported by the TSA's and discussed during this evaluation suggest that herders are willing to accept and fully adopt productivity increasing inputs. There are a few examples in this project and the World Bank project where herders have demanded the "new" service or product and demonstrated a willingness and ability to pay the full cost. The final review of project research of factors influencing herder decision making will not be available until December, 1982. A preliminary analysis of the data in February, 1982 should consider the validity of this assumption.

For this analysis to be complete there will have to be a reconciling of the absences of and at best piece-meal approach to the testing of the package of range management and livestock production practices. The evaluation team is recommending a systematic testing of improved practices and inputs during the remaining life of the project.

A permanent Office for the Modernization of the Pastoral Zone (OMPZ) has been established and initially staffed in the Ministry of Rural Development. Candidates for long and short term training were identified and will all have completed training by October, 1982.

Comment: Both the project personnel and the Director of the Office for the Modernization of the Pastoral Zone have some questions about the authority the GOM will grant this Office to manage the range or control animal population in the zone. The issue of the future of this Office should be aired in the final report and recommendations of Phase I.

There has been a perceptible change in the project goal and purpose. Range management, as a system for regulation of the pastoral zone, has been given a lower priority by the RN than originally set in the PP.

The evidence gathered during Phase I strongly indicates that the range is not under imminent threat of damage. The data

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challenge the argument that herders in increasing numbers are degrading the range. The project has conducted a number of stocking rate trials where the number of animal units per hectare of range was much higher than the actual levels found in the pastoral zone. The results of these trials suggest that precipitation is the key constraint to emergence of annual forage types that predominate in the pastoral zone.

The OMPZ has emphasised the need to implement interventions in all of the pastoral zone that will improve the herders' well-being. Their survival depends on adequate production of milk and sufficient cash from livestock sales to purchase grain.

The shift in RN strategy to a livestock development strategy addresses this need. The main direction of research and action is toward the supply side of the herder production system. The herder's health and the survival of his livestock are directly linked.

The evaluation team agrees that this shift in focus is justified. The purpose of this project will therefore be met if it can identify the real constraints to the creation of larger and healthier individual herds and recommend tested interventions and organization structures that could overcome these constraints.

2. Analysis of Project Outputs

The activities specified in the project were divided into the following four categories: range management, livestock

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production, sociological studies and interventions, and training. The Evaluation Protocol, agreed upon by USAID and the RN, instructs the evaluation team to test the validity of the assumption that: successful execution of the studies and actions undertaken within each output category should result in achievement of the Project Purpose.

In this section we have listed planned project outputs, magnitude of outputs, completion date, and evaluators comments.

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NRL Project Outputs Evaluation

<u>Outputs</u>	<u>Magnitude of Outputs</u>	<u>Completion Date</u>	<u>Evaluators Comments</u>
1. Range resource studies/activities			
a. carrying capacity/ grazing patterns	ongoing	Dec. '82	
-existing water points	various maps	Dec. '82	Initial maps completed by Aug. '81
b. systematic aerial recon. survey	2	May/Oct. '81	
c. reseeding experiments	none		Given low priority/dropped
d. in-country training	45	Aug. '81	Semi-prof. and field staff
e. surface water development	6 wells	Dec. '82	Given low priority/suggested for Phase II

<u>Outputs</u>	<u>Magnitude of Outputs</u>	<u>Completion Date</u>	<u>Evaluators Comments</u>
f. fire control program trials	20 plots	Aug. '81	Project unable to obtain RN clearance for burns. Monitoring took place on uncontrolled burns.
2. Livestock production			
a. test of improved inputs package	?	?	?
b. recurring cost study	1	Dec. '81	CRED will conduct study
c.&d. support RD Livestock Service	2 3	Aug. '81 Dec. '82	Vet. posts constructed and fully equipped
e. sign livestock extension program	ongoing	Dec. '82	Just starting to come together, Aug. '81
f. livestock markets study	2	Dec. '81	By TSA Curry and CRED
3. Sociological Studies in Interventions			
a. demographic sample of herders	ongoing	Dec. '82	Preliminary finding Aug. '81 with update Feb. '82
b. formation "herder aides"	?	?	Related to herder associations - see (d) below
c. extension/ communic. materials	10 programs	Dec. '82	Just starting Aug. '81
d. creation pilot herder associations	?	?	?
e. pilot range management experiment	?	?	?

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<u>Outputs</u>	<u>Magnitude of Outputs</u>	<u>Completion Date</u>	<u>Evaluators Comments</u>
f. herder sociology capability	ongoing	Dec. '82	Requires further discussion
g. subsidiary studies			
1. sample census	1	Oct. '81	ILCA/Others
2. land tenure	1	June '81	J.T. Thomson
3. sociological report 1	1	Dec. '78	J.W. Sutter
4. Training			
a. 1 term training	10	Oct. '82	All are on track
b.&c. short-term U.S./ Third	13	Aug. '81	
d. short-term in-country	45	Aug. '81	Includes 34 enumerators
e. extension agents			see 3.b. Support to livestock school postponed

The program to which all of the activities in Figure are to lead is supposed to be prepared by the project staff in coordination with the Livestock Service and other related Services for review by the Ministry of Rural Development by December, 1982 (original date September 30, 1981).

Comment: The individual range, livestock and socio-economic studies are well underway. Most of the mapping and subsidiary studies have been completed. We feel that the performance of project staff in carrying out the required studies has been good, although full participation by Nigerian counterparts has been spotty. It is essential that a summary report of findings

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to date be prepared by the principal advisors by February or March of 1982. The summary or preliminary report must draw upon the data that has so meticulously been collected. Hard evidence should substantiate conclusions and recommendations related to pastoral and agro-pastoral production systems.

In-country as well as long term U.S. training has been on schedule. Some of the participants will start returning in Full 1981. If the project can integrate them fully into the project, they will be crucial resources for implementing the necessary interventions that remain in the life of project.

We have identified four major gaps in project outputs: testing of improved inputs packages (Fig. 2a) formation of "herder aides" (Fig. 3b); creation of pilot herder association (Fig. 3d) and pilot range management experiments (Fig. 3e). These are identified in the Project Grant Agreement and Project Paper as major outputs. We find that the implementation of at least some of these plans by the end of project is still a necessary condition for attainment of the project purpose. Each is discussed in turn below. We also believe that there is probably enough time remaining in the Project to implement the required activities. Most of the other project inputs are on track and available to do the work that has to be done. A start

has been made with pilot interventions through the veterinary and health auxiliaires, so that some experiences have been gained at the herder level.

1. A package of inputs to increase livestock production was to have been tested in conjunction with range management trials with a group of herders. The results were to be compared to traditional production systems to determine the cost and benefits of a comprehensive government program to increase animal productivity in the pastoral zone. The Project Grant Agreement States: "Although it is generally recognized that productivity can be increased, it is not yet clear that the required interventions are in fact cost effective under existing conditions of inadequate feed supply, multiple objective livestock raising practices and high cost inputs." (P. 12,a).

We feel that it may be fortunate that the project has delayed implementation of these activities until the socio-economic surveys were underway. The TSA's who have been conducting the surveys among the herders have all cited the long gestation period necessary to gain herder's confidence and to begin to understand this pastoral society. The design of a pilot intervention to analyze the impact of increased inputs and improved practices should fully take into account the studies being done on traditional livestock production systems in the pastoral zone.

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The inputs proposed for the project pilot interventions include: (1) complete vaccination coverage, (2) internal and external parasite treatment, (3) mineral supplements and (4) feed supplements for calves during the stress period at the end of the dry season. The project is to measure livestock output indicators, such as mortality rates, weight gains, fertility, disease incidence, and milk production. An economic analysis is also required of the actual costs and benefits of the pilot program from the standpoint of the RN and the herder. (PRO-AG. PP. 12-13)

To help with the analysis to be done, the project may wish to call upon the USAID/Niger Agricultural Economist for assistance.

2. It should be possible to form a pilot network of "herder community aides" chosen by the sample herding communities themselves. Their task would be to monitor and report veterinary and other health needs, pasture conditions and marketing problems. They could also play an important role in any extension efforts in a larger Phase II Project. (PRO-AG P. 14, 3b).
3. One of the most important project outputs is the creation of pilot herder's associations. These are to be based on criteria of indigenous social organization, micro-ecological zone, and existing administrative units. The eventual long-term role of these associations would be to receive and discuss

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information on the physical, animal, and human resources in the project zone and to work toward developing a sound resource management plan for their own areas. (PRO-AG. P. 14). Our review of TSA field reports and proposals covering herder social structures and attitudes indicates a genuine interest by herders to form pilot herder associations. The details on organizational steps to be taken and specific levels of authority within herder units and vis-a-vis. RN institution have yet to be defined. There is also good reason to proceed cautiously, so as to make every attempt at establishing long term, responsible relationships, without raising unrealistic expectations. The RN has strongly insistence that this project provide relief to herders in the form of basic consumption good. This is discussed in greater detail in Chapter V.

The project has a first priority to implement and attain designed outputs. The testing of pilot interventions and herder associations should not be left until Phase II, when the pressure for concrete actions will be greater.

4. The final major gap in Phase I outputs is the lack of a design and implementation of a pilot range management effort with one or two pilot herder associations. At best, given the range management advisor's work/theories for development of a range management strategy and the RN's reluctance to control the range, it would appear that this output may be

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dropped. The range study component is of a longer term nature , and isn't ready at this time for extension into an applied research stage.

Some of the delay in project implementation may be due to an optimistic time table of activities. The original schedule in the Project Paper called for personnel contracting and commodity procurement at a rather ambitious rate. The starting date of the whole schedule in fact was delayed from September, 1977 to September, 1979. The reasons for the delays are discussed elsewhere in this report.

It is important that the project get on with the implementation of the planned interventions and tests. Activities that are completed before the Phase II Design Team arrives will strengthen Phase I research findings and contribute to a more feasible "action" program for Phase II.

We believe that there may not be sufficient results available for the Project Paper team for planning all detailed interventions of Phase II, but there will be results as the second phase opens.

In conclusions it appears that the delivery of some project inputs has suffered from the usual delays and some were purposely postponed. The activities that are underway will have to accelerate to meet the need for a preliminary

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synthesis of findings in February, 1982 and final wrap-up at the end of calendar year 1982.

3. Summary Statement of Output-to-Purpose Accomplishment

The Evaluation Team is confident that if the project proceeds to implement the "missing pieces" with the same energy and resourcefulness that it has demonstrated to this point, the Phase I Project Purpose will be achieved.

B. The Remainder of the Project Program: Recommendations of the Evaluation Team

This section presents the major recommendations that emerged from the NRL evaluation mission. Our recommendations are of three general orders:

(1) Technical recommendations made implicitly and explicitly in Chapter III above. These suggestions are made to research teams or individual researchers, and can be incorporated into their work programs with no substantial modifications of their assignments or the resources at their disposition. We do not repeat those recommendations here.

(2) Program recommendations, which are the subject of the first sub-section below. These recommendations are deemed by us to be important to achieving the project purpose. They require close consideration by the senior consultants and/or project management, because

they will need (i) new commitments of financial resources, (ii) a complex course of action involving consultation with government and/or outside experts before they can begin, (iii) a firm decision by management known to be outside the present plans for senior project staff, or (iv) a combination of these factors. Because time is short and some important changes in project management are imminent, the evaluation team as a whole has collectively prioritized the six most important of these recommendations. The degree to which these recommendations are pursued will itself be a measure of the will of all the members of the project to achieve the project purpose.

- (3) Project recommendations, which are directed at establishing, among USAID, the Government of Niger, and the Project, a higher level of confidence that the NRL program will move through its final year to firm conclusions, collectively shared, that will serve as a critical foundation for Phase Two planning. After presenting these recommendations for the remainder of the life of the Phase One project, we return in the next chapter to a preliminary discussion of a possible Phase Two.

1. Technical Recommendations

See the detailed analyses by the technical members of the evaluation team in Chapter III.

2 Program Recommendations

2.1. Top Priorities

The following recommendations are listed in descending order of priority:

2.1.1. Organize the first herders associations. Comments:

Memos from Senior Consultant J. Swift of June 19, 1980, November 18, 1980 and March 1981 detail the initiatives already taken. MDR Ministerial Arrêté No. 18 of 3 April 1981 provides the juridical base. By Project Implementation Letter No. 13 of January 26, 1981, USAID/Niger and Project Direction have earmarked \$100,000 to implement herder cooperative activities. The major elements thus appear to be in place. This activity must begin if the project purpose is to be achieved.

Action Initiative: Swift/Project Direction. Major Action: Recruit new TSA to be charged with task. This is a full-time task for remainder of project. Finalize discussions with all cooperating RN agencies

2.1.2. Organize and conduct the collaborative field study of livestock production. Comments: The monitoring and analysis of actual production and husbandry systems in the field, over the course of a full

year, form one vital baseline for locating constraints in the system and therefore for identifying research and development issues.

Action initiative: Project Director Ali/Bement/Swift. Major Action: Joint elaboration of the research plan. Use PPS study from Mali as a major guideline (two TSA's, one Nigerian official, and Swift have extensive knowledge of the study). Recruit research team, to be under joint supervision (candidates already exist). Co-ordinate with TSA's White, Fitzgerald, and Curry to avoid unnecessary duplication of effort. No current TSA's have time, in addition to their defined programs, to help supervise such a study. The Project Manager's idea to integrate Nigerian students now in the U.S. into this study is a good one, if it does not inordinately disrupt their progress. Dr. Ali is identified personally here since animal production is his own disciplinary speciality.

2.1.3. Organize data processing routines. Comments:

Masses of data already exist in project file drawers that could now be undergoing processing. More is being collected every day. TSA's recognize the need for a collective approach to programming, data coding and processing. Unless the entire range of needs

is set forth together, researchers will compete for scarce resources available locally. Action Initiative: Rement/Swift, USAID/Niger Agricultural Economist will aid if desired. Major Action: Recruit short-term consultant in data processing (such a person may be available at AGRHYMET) to specify all project needs. Consultant should be fully conversant with current capacity in Niger and elsewhere in the Sahel for full processing of data. CRED team now due in Niger may be of help.

- 2.1.4. Carry out agrostological/vegetation mapping of entire project zone. Comments: Map at 1:200,000 will extend, and should be harmonized with, existing maps of Niger's (southern) agricultural zone. Broad ecological/geomorphological units could be mapped using aerial survey now under way. Ground truthing would be needed. Or, new aerial photography could be done. Or, the ILCA aircraft could be used in October to hand-annotate existing 1:200,000 IGN maps. Action Initiative: Project Direction/ILCA/Genie Rural (?). Major Action: Must be done between October and May. This could be the single most expensive new action to be taken. Identify

specific needs (Bement/Swift/MDR), locate appropriate services. Short consultancy may come first.

2.1.5. Organize project cartographic requirements.

Comments: Data for detailed mapping of water points, herd and population movements, range types, markets, government services, and other resources are being generated. Skilled cartographic services will be necessary to present these data in suitable map formats. State-of-the-art services should be consulted and retained for the final project outputs: Action Initiative: Project Direction. ILCA/Nairobi, UNEP/Nairobi, University of Niamey Department of Geography (Sidikou) may be of help. Major Action: Short-term consultancy immediately with senior consultants in field, to verify needs and plan completion of data-gathering. Contract for services later.

2.1.6. Implement "pastoral relays." Comments: Project

Centre-Est and Projet Sud-Tamesna have implemented supply "relays" for the less expensive provisioning of pastoralists with primary consumption staples. Revolving funds are used, and products sold cover the cost of transport. This intervention is seen to be a major response to herders' immediate needs.

Action Initiative: Project Direction/MDR (USAID/Niger for determination of acceptability). Major Action: TSA Knight and/or I. Tourawa, who know the zone most extensively, might be asked to visit Centre-Est's "relais pastoreaux" to determine conditions of their implementation, then determine possible sites in NRL Zone. Implementation must be very careful to anticipate the level of competition with (and opposition by) local merchants. Resupplies would probably have to be by chartered truck.

2.2. Second-tier Priorities

The following recommendations either reinforce the need for achieving outputs already specified in the Project Agreement or suggest major new dimensions of activity that can be achieved without major new resources:

2.2.1. Complete the epidemiological study of herds in the zone. Comments: Dr. Albert Sollod, Veterinary Consultant to the NRL, already has this in his contractual terms of reference (especially clauses 2, 4, and 6). His report on the incidence of diseases, levels of morbidity and mortality, and the economic value (cost-effect) of treatment strategies will be an important part of this work. This recommendation is set down simply to underline the importance of the

broad epidemiological data being collected.

Action Initiative: Project Direction/Sollod. Major

Action: No new action. Will form a critical part of Sollod's project contribution.

2.2.2. Extend, onto the actual rangelands, aspects of the range research program. Comments: The range management technical analysis (Chapter 2.B., Section B.8.3.2.) suggests a method for analyzing pasture production in transects at one kilometer apart between adjacent water points at nine different sites in the project zone. This is deemed the most efficient way to gain baseline data on pastures actually in use. Action Initiative: Project Direction/Bement. Major Action: Change of work program for one TSA (Rice) or other staff member. Identification of sites (near original enclosures?)

2.2.3. Reconsider decision to drop implementation of water-point construction. Comments: Range and livestock projects in Senegal may be demonstrating value of water catchments for extended use of otherwise unusable pastures: See Animal Production Technical Analysis above (Chapter 2.A., Section A.1.7.). Action Initiative: Project Direction. USAID/ADO willing to assist. Major Action: Detail TSA Knight

and/or Counterpart Tourawa to identify potential sites, if any. Then plan short-term engineering/costing consultancy. See analysis as above.

2.2.4. Reconsider decision to drop reseeding experiment.

Comments: Aerial survey can help identify locations. Technical help should be secured to decide this question on technical, economic, and environmental grounds. Action Initiative: Project Direction/Bement. Can REDSO/WA help? Major Action: Short-term consultancy, probably best when IICA air-survey expert Milligan is in country. Set reseeding experiment as determined thereafter.

2.2.5. Do the study of the recurrent costs of government livestock interventions.

Comments: This item occurs as (b) on page 15 of the Project Grant Agreement, but should be modified to include existing, not just "improved", livestock services. Action Initiative: Project Direction/USAID/Niger Economist. Major Action: Short-term consultancy, second quarter of 1982.

2.3. Other program recommendations: The following recommendations are grouped by general technical area, not by priority.

2.3.1. Finish the Herbarium. Comment: This is an excellent initiative. It will need an eventual

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permanent and accessible home. Action Initiative:
Bement/Hussel/Blaine/Simpson. Major Action: Plan
appropriate ending-point for collection. Consult
in Niamey for eventual home. Plan official presentation.

2.3.2. Think through haying/silage experiments. Comments:

If the only socially and economically viable future
for hay or silage production is as emergency feedstocks
in central locations, then experiments should be
planned accordingly. See Chapter 3B, Section B.8.3.11.
above. Action Initiative: Project Direction/
Bement/Rice. Major Action: Consult Livestock Service
on whatever expectations for or experience with such
experiments they have. Proceed accordingly.

2.3.3. Cancel any range experiments that are not well-
designed to produce scientifically acceptable results.

Comments: Enthusiasm for certain types of work is
no substitute for sound methodology. Action
Initiative: Bement

2.3.4. Continue the study of herd structure. Comments:

The study being conducted under the leadership
of Ibrahim Tourawa is valuable and should be continued.
Representativeness of herds being sampled should be
assured, perhaps in conjunction with a survey.

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If others join study, care must be taken to assure that same methods of estimation are being used throughout. Action Initiative: Tourawa/Project Direction.

2.3.5. Initiate an experiment with an animal health Shelter.

Comment: This is a specific suggestion for a small study requested by Dr. Pierre Inné of the Livestock Service. Action Initiative: Dr. Ali/Tourawa/Inné. Major Action: Small shelter construction for protection of ill bovines: experiment in appropriate technology. See P. Inné.

2.3.6. Continue the search for appropriate strategies for systems of human and veterinary health auxiliaries.

Comments: The NRL has had better success than elsewhere in recruiting, training, supplying, controlling, and rewarding the work of securists. These efforts need to be amplified, with plans drawn up for new training cycles and for retraining. As well, a means of training female health workers also needs to be devised. Above all, an efficient system of actual supervision in the field needs to be elaborated, and then the entire system requires a formula for handing off to the relevant government

services. Acting Initiative: Project Direction/
Mohamedoun/Loutan. Major Action: Reinforce
Loutan's position in the project by devising new
role to come into effect as current contract
requirements are met. Further discussion with
relevant services. (It is recognized by the evaluation
team that Mohamedoun and Loutan are thinking along
these same lines).

- 2.3.7. Deepen the studies of human nutrition. Comment:
This activity of the project is highly original
and creative. Liaison with other nutritionists
in Niger needs to be made, and the studies done in a
more rigorous manner. Action Initiative: Loutan.
- 2.3.8. Enlarge the work of the communications component of
the project. Comment: There is an ample project
for much more extensive work in communications.
Cassette recorders could be supplied to radio-club
animators. A more active search for Fulfulde-speaking
animators and narrators should be undertaken. Many
more cassettes should be produced. For suggestions
as to subjects (such as human health), one evaluation
team member has supplied copies of the syllabus of
the Nomadic Education Centers in Somalia.

Action Initiative: Project Direction/TSA Knight.

Major Action: Closer and more intensive work with Nigerian media. To sort out program needs, a TDY from Steven Grant, REDSO/WA, who has extensive media experience throughout West Africa, would be worthwhile.

3. Project Recommendations

These are general recommendations at the level of the project director, the project manager, and the USAID mission. They emerge from observation of the project as a whole, not of particular elements of its work. The evaluation mission had only a brief period in which it could perceive these issues, but the fact that each evaluation team member ran up against them in his own speciality reinforces our belief that our perceptions are valid. We are convinced that if efforts do not begin immediately to improve project performance, the project may well end as a series of disparate efforts that no one much knows or cares about.

3.1. Intensify Collaboration. Comment: Collaboration must deepen at two levels:

- (a) The Senior Consultants need to come together to plan jointly and in detail for the herding systems study (B.2.1.2. above), for coordinating their findings on rangeland decision-making, for determining the best

methods and joint needs for the vegetation mapping (B.2.1.4. above) and data processing (B.2.1.3. above), and for the crucial work of planning the final product. Working from J. Swift's report outline called "A Pastoral Development Strategy for Central Niger," which the evaluation team was informed has been agreed by all parties as the preliminary outline, the senior consultants must now fill in and enlarge that outline with substantive ideas and directions in which the data are likely to lead. Action Initiative: Project and Mission Direction must insist on this collaboration. Major Action: As early as possible, a full project implementation team meeting must be held.

- (b) The Project Manager and the Project Director must develop a fully collaborative style. Comment: This implies full and intense sharing of all information about the project, especially concerning budget and forward planning for the remainder of the Phase One work plan. Acting Initiative: Intensive meetings should be held, and other USAID/RN project management teams consulted if their experience is relevant. At the same time, Project Direction should work to clarify its own interests in achieving project objectives. The goal of these new departures should be that Nigeriens both control crucial decision-making and see

project activities more firmly as their own.

3.2. Begin the consolidation of project findings. Comment:

Collaboration on further studies and interventions is not enough. The evaluation team shares the worry expressed by USAID and the RN that the NRI output will consist of a long shelf of studies with little synthesis. Already some of the early studies done for the project appear little used or remembered. The synthesis of findings, difficult though it may be, is the crucial output expected from the Phase One project. Action Initiative: USAID/ADO and Project Direction/Bement/Swift. Major Actions: (a) Engage a short-term consultant to write a prospectus of Project findings-to-date. This document, to be presented to USAID and the MDR by January 1, 1982, would synthesize completed studies, all written reports of studies in progress, and interviews with all implementation team personnel into a single document that shows where the substantive work of the project now stands. Seen as an outgrowth of this evaluation report, it would bring all parties into more direct contact with the project work, would identify remediable gaps, and would set the stage for Phase Two planning. It would serve as a token of the intentions of all parties to move to the full project synthesis by the end of the project. (b) Commit all project members to intensive analytical efforts in the first quarter of 1982, so that a draft synthesis document emerges

from the implementation team by March 31. In view of the initiatives he has shown in formulating plans for this synthesis, Senior Consultant Swift should be designated chief editor of the writing project. If his work plans forbid his taking on this role, USAID/Niger should consider hiring a short-term consultant instead, for the period February/March 1982. (c) Engage the full implementation team in a set of discussions about Phase Two actions. A free-ranging debate will help to clarify areas of convergence and divergence about concrete strategies that are emerging from project work and work in comparable areas elsewhere.

- 3.3 Increase the communication flow between the NRL and its two sponsors, USAID and the RN. Comment: Trip briefings and debriefings are not enough. The enthusiasm demonstrated before or after a field trip is not a reliable indicator of substance. Neither the AID Mission nor the RN has a full appreciation of the range of activities and accomplishments of the NRL Project. Both, for example, have an image of the Project as being "all studies," and both have been surprised to learn that there are also interventions going on, in veterinary and human health *sé*courism, in communications in veterinary post construction, in addition of course to the important training elements in the project. In terms

of the studies themselves, neither the RN nor USAID have a firm sense of what problems of the herders or policies of the government are going to be directly affected by any particular research results. In consequence, both sides now await the termination of the "studies" and the beginning of an interventionist Phase Two, as if the two phases were hardly connected! The dangers of such perceptions are obvious: first, to terminate all research with Phase One would handicap the installation of a necessarily permanent pastoralism research capacity in Niger (two range research institutes with members on the evaluation tour each have over twenty-five years' worth of research experience on the pastures of Ireland and the U.S.A; second, to give up consideration of actions which proceed from the research in favor of only those which extend the infrastructure of the Livestock Service would vitiate the accord that the U.S. and Niger reached in 1977, namely that informed action held the best hope of achieving Project and RN goals in the zone (also see Chapter VA, below). The problem now is to intensify communication about the Project so that its potential policy contributions become much more obvious, and so that its work is not simply cast aside as planning for Phase Two gets underway. Action Initiative: Project Direction/USAID/Niger, and Bement/Swift. Major Action: Schedule workshops, one topic at a time, in Niamey and at the Department level on

concrete policy-related aspects of the research. (One such occasion might be the annual "Journées de Reflexion" held by the Livestock Service, usually in November, as a Service-wide meeting.) Topics might include pastoralist nutrition, Tuareg/Fulani concepts of animal disease (ethno-veterinary knowledge), strategies of herd reconstitution as seen by the herders, why herders hold back animals from vaccination, the economics of subsistence production, why and when herders sell animals, or others. Such seminars might also be held at the Livestock School, as occasional additions to the regular program. Most important is the involvement of managerial staff from AID/Niger/ADO and from the MDR. A schedule for such presentations/discussions should be agreed soon, so that the Phase Two design teams will come into a situation in which all the relevant actors know what Phase One of the NRI has to offer to the formulation of policy for the pastoral zone.

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CHAPTER V.

NRI. PROJECT IMPLICATIONS

As the NRL Project moves toward the last year of its first phase, a great deal of thought is beginning on the main lines of a possible second phase. The likelihood of a second phase was built into the original project conceptualization, as noted above in Chapter II.

The questions being asked are not vastly different from the questions of five years ago. Do we have a technology, a "package," to offer to the herders which is superior to their own in exploiting and conserving the rangelands? Do we have a strategy for effectively working with herders to improve their access to have goods and services? Have those aspects of a logical package that we can offer, like veterinary health, been cost effective? Do we know everything we need to in order to begin intervening with a moderate hope for success? Finally, does extensive pastoralism have enough of a future such whatever interventions we can find will stop the flow of youth out of the pastoral economy?

This chapter answers none of those questions. It is meant as a reminder that they are still before us. It starts with a brief perception of how other livestock projects in West Africa are faring, concentrating on the relation between the level of information that was achieved before action and the success of that action.

The second section notes some of the arguments being made for and against livestock projects in Africa. It concludes that the NRL project was

appropriately cautious, given the track record of livestock projects, but that its success so far gives reasons for optimism that this is not a project like many others. Since the project purpose is likely to be attained, we recommend the continuation of the NRL into a second phase.

The third section of this chapter thus gives our very tentative suggestions on the planning of Phase Two. Though not properly the domain of a project evaluation, the team was asked by the AID mission to provide these ideas.

This chapter is arranged as follows:

A. Livestock Projects in West Africa

- 1. Background
- 2. Some Comparisons with Other Sahelian Projects
- 3. Other AID Projects in the Sahel

B. Pastoralists in Africa

- 1. Livestock Projects and Pastoralists
- 2. The Twilight of Pastoralism
- 3. Some Reasons for Optimism
- 4. Implications for Projects in Pastoralism
- 5. Phase One-Phase Two

C. Implications for the Design of an NRL Phase Two

- 1. Issues for Phase Two Planning
 - 1.1. Support of RN livestock activities
 - 1.2. Pastoral Research
 - 1.3. Service Delivery

2.1. Phase One-Phase Two Coordination

3. Composition of a Planning Team

A. Livestock Projects in West Africa

1. Background

Livestock projects tend to be defined as being either action oriented or research oriented. The same project will often be classified differently by different people depending on their background and interest. In reality most projects in West Africa are a combination of both action and research, even if the research component is composed primarily of monitoring, with insufficient provision for evaluation of the data collected.

Host government personnel and often AID Mission administrators usually favor a totally action-oriented project. On the other hand the technical specialist and sociologist, who have observed mistakes made by previous projects, tend to be more inclined toward research. Most everyone will now agree that our early confidence in the direct transfer of "advanced technology" was misplaced, and that we must be very selective about the technical interventions to be introduced. It has become more evident that we must closely monitor these selected actions - in an almost research-like intensity - to assure that either the desired results are forthcoming or that adjustment recommendations are made. Research is also necessary for estimating the relative cost-effectiveness of various actions, in order to prioritize the use of limited development funds and resources.

The NRL Project Phase I was designed with a very strong research emphasis, with limited actions included for testing appropriateness and cost efficiency. For various reasons and reservations, many of the actions have been delayed in favor of pure research efforts. As observed in most other projects, this tendency of project management toward a research emphasis has resulted in negative reaction from the RN and pressure from AID/Niger to strengthen the action orientation.

It is recommended, however, by the evaluation team that both the RN and AID/Niger support the continuations of the strong research effort through the Phase I extension to December 1982. And, it is recommended that project management initiate those actions of the original PP that have been emphasized by this evaluation team as soon as possible. While Phase Two should be action oriented a strong monitoring and evaluation component should be included.

2. Some Comparisons with Other Sahelian Projects

Comparisons, differences and complementarities can be noted between NRL and other Sahelian livestock projects, though of course no two projects or ecological/sociological zones are the same. The similarities mean that information being developed in the NRL research projects will be useful to other projects throughout the Sahel, as well as for other Nigerien projects. For example, findings regarding the NRL herder associations can

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be useful to the Dilly Range Management Project (USAID) in Mali, which is trying to develop ways of rejuvenating the herder associations which were started as a direct action. Unfortunately those associations have become inactive, due to lack of follow-through planning which would have been dependent on the kind of full knowledge of the conditions and people which could have been developed in a earlier study phase. The Dilly Project, which is located in a zone somewhat similar to the southern part of the NRL Zone, is also planning direct actions in surface water development, with a strong monitoring component to evaluate their technical and economic effectiveness. The research on catchment tanks planned for the two projects should be beneficial to both. The Dilly Project has had experience with well drilling which was conducted as a direct action with less than optimal results. Due to the lack of previous study, and to limited use of water distribution and forage utilization data, the wells were poorly located and therefore probably not cost effective. Such negative experiences with direct interventions in this and other projects strengthen the argument for research-supported interventions.

The Bakel Range and Livestock Development Project (USAID) in Senegal has evolved from an action-oriented project with moderate monitoring to a strong monitoring or research effort to evaluate effects of previous actions. Of the four main actions, extension, herder associations, range fire control and surface water development, the

surface water has been identified as having the best potential for further development. The information developed in Phase I has allowed project management to identify the most probable effective interventions and has emphasized the importance of research in setting priorities.

While the Integrated Rural Development Project (USAID) in Seliababy, Mauritania is a different type of project, its range work is similar to that being conducted in NRL. Effects of different stocking rates on animal performance and on the evolution of the range ecology are being studied to determine if better recommendations can be developed for range and livestock management. The NRL results should be helpful to this Mauritania project.

The Village Livestock Project of Upper Volta (USAID) was conducted in a completely different geographical environment, but it was based on a strong research base, like the NRL. The project successfully supported veterinary nurse activities through herder associations. While project management received the typical pressure for more action orientation, it did manage to develop considerable information. However, due to lack of coordination of the activities, delays, personnel, etc. the final report was not as useful as one would have hoped.

Most projects include interventions in animal health, but none has monitored these activities sufficiently to document the cost effectiveness of the actions. We generally accept the importance of health controls and assume that much of the mortality and morbidity would be eliminated with good veterinary medicine coverage. Nevertheless, there remains a major gap in information the economics of animal health, a gap which should be filled to more specifically attribute losses to diseases, parasites, nutrition or other causes. Research must also be supported to evaluate the effect of specific health treatments on the level of production. A combination of these data with cost of health care delivery should be used to determine more accurately the cost-effectiveness of animal health care.

As well as the information being developed in AID projects through research and monitoring of actions, additional data is being produced by some other projects which have found it necessary to develop strong monitoring systems as well.

For example, a recent research and action project of FED in Mauritania developed substantial animal, range, water and human data for southeastern Mauritania, data which will facilitate planning of the Phase II FED Project along with other donor projects considered for the area.

The Dutch-led Sahelian Pastoral Production Study in Mali was totally a research project, and it has gained quick respect as the most outstanding recent forage and environmental study of the Sahel. One very useful finding of the study was that rangefires are more useful than harmful, and should be left to the herder's discretion. This supports observations in other projects such as Bakel that herder interest in fire control was not enthusiastic even though they were in favor of firebreaks, possibly for communication rather than fire control. Data from Bakel also indicated that firebreaks were not cost effective, even if fire control was beneficial. The theory of desertification was also judged by the Dutch-Mali research team to be much less of a threat than previously believed.

Findings are mentioned here to emphasize the value of research, or strong monitoring along with all action projects. Too many decisions have been made on poor information which has been and still is accepted by many respected consultants and project management personnel. Project research and monitoring of actions will help us all better manage the available resources.

3. Other AID Projects in the Sahel

a. Chad Range and Livestock Herder Training Project was an extension training project, but is now inactive.

b. Mali Livestock Sector Project includes Embouche Paysanne, an Industrial Feedlot, Animal Health and Vaccine Production Support,

and Research in Intensified animal production and health, as well as the previously mentioned Dilly project. Most of the activities are in the Sudanian zone, with the exception of Dilly and the broader animal health support. This has always been an action-oriented project with limited research and monitoring. The redesign of the next phase has recognized that focus as a problem, and has therefore incorporated a strong monitoring and research branch into the project.

- c. SODESP Livestock Production Project in northwestern Senegal is an action project to promote stratification. The team has a sociologist and an economist who should have access to two or three years of the early FED/SODESP Project records to do a preliminary socio-economic evaluation of the potential impact and cost effectiveness of the interventions. It is not known whether or not such an evaluation is planned, but its importance to the implementation of their project, and the importance of SODESP in general to the regional question of a "Stratification Strategy," is clear.
- d. Integrated Livestock Sector Development Project in the Gambia is a combination research and action project in the Sudanian zone. Much of the action depends on research to establish grazing areas and stocking rates and to find economical means of intensifying forage use from the farmland. There remains much

to be learned in the higher rainfall areas to allow expansion of economical intensive livestock production.

B. pastoralists in Africa

1. Livestock Projects and Pastoralists

In a policy review of livestock projects in Africa, USAID's Policy, Planning and Coordination Bureau Studies Section Chief Alan Hoben points out that USAID had by 1979 financed or was considering financing projects worth \$126 million in livestock projects in Africa, and another \$114 million in projects with livestock components. Despite this investment, there was not a lot of evidence that the livestock sector had been significantly upgraded, or that herders were significantly better off because of those efforts. As the last section also suggests, the effectiveness of livestock efforts in the Sahel has also been patchy and indefinite. Meanwhile, the pastoralists themselves have of course continued to respond in their own ways to all the uncertainties in their own environments, including passing rains, passing encounters with government services, and passing projects.

2. The Twilight of Pastoralism?

Some years ago a book on East African pastoralism suggested that extensive pastoralism seemed doomed to disappear. More recently a book on Niger, *The Last Caravan*, was also pessimistic about the future. Researchers of pastoralism have suggested: (a) that the terms of trade for pastoral products have declined so that

pastoralists may have to increase their herds just to provide enough offtake to continue to buy the same goods as before;

(b) that extensive pastoralists may have higher production costs per unit of output (dairy products, meat, hides, etc.) than more intensive producers, and may therefore lose their markets (one example being competition with Argentina for West African coastal markets); and (c) that pastoralists like other rural producers are losing their youth to the economic and social attractions of urban labor markets. If any or all of these (or other) generalizations are true, then there may be reason to feel that livestock projects in pastoral areas are not much more than holding efforts against a strong tide.

3. Some Reasons for Optimism

Some of the pessimism noted above applies just as fully to small farmers as to small herders. In response, there are also some positive arguments for continuing and intensifying the development efforts in pastoral areas. There is the welfare argument, of course, that millions of people are still engaged in pastoral production, and governments have the obligation to render services to them and to attempt to improve their standards of living. Second, there is hope and expectation that the technology of rural production will improve to the point at which a great many people will stay at home and lead better lives. Third, there is an economic argument that depressed living standards in rural areas are to a considerable extent the products of inefficient

or incorrect government food pricing policies that are increasingly under scrutiny by governments and international agencies. If domestic incentives grow, new life may be breathed into stagnating rural production. Fourth, an argument has been made that uses are now emerging for coarse grains (and for crop residues in West Africa) that have higher value than as feedstuffs for meat and milk production, and that rangeland production will therefore be able in the long run to compete successfully with presently more "intensive" methods. These and other arguments demonstrate that the future of pastoralism, if not as rosy as one would like to believe, is not as cloudy as some people would contend.

4. Implications for Projects in Pastoralism

On the one hand, then, there is not much to go on. Our knowledge of pastoral systems in Africa, and our capability of improving them beyond anything the pastoralists already know about and do, is highly limited. On the other hand there are clear imperatives, both of equity and of hard economic optimism, to continue working in the livestock sector. The sum of all these factors points to the need to act with caution. It is obviously easy, given the record, to waste money on livestock projects. It is a difficult slow process to build up a realistic package of improvements and to gain enough of the herders' confidence to be able to extend them. The process, on the record itself, is obviously long and hazardous.

5. The Approach of Niger Range and Livestock

It is precisely out of this cautiousness that the Niger Range and Livestock Project was conceptualized to be a long-term, two- or even three-phase program, with a strong first phase of information-gathering and pilot intervention testing. Despite the impatience for action, the evaluation team is in total agreement with the designers of the project and with the accord of the two governments that this first phase was appropriately structured and paced. If there was too much fear that aid to the traditional functions of the Livestock Service might be misplaced, we are now in a position to admit that fault.

6. Phase One - Phase Two

The conclusion of this evaluation is that the NRI was a well-designed project, that its implementation has been well carried out, and that, with the corrections and the launching of some new actions that are late or were thought worth dropping, the Project will attain its purpose. It is therefore strongly worth proceeding with plans for a second phase. The suggestions of the evaluation team for a possible Phase Two follow in the next action.

G. Implications for the Design of an NRI Phase Two

The terms of reference for this evaluation mission provided that the evaluation team make recommendations about the best operational approaches to a Phase Two program. The evaluation team was reluctant

to do this, since it felt strongly that much of the crucial work of Phase One was still to come, and that the work of the next six months especially would probably determine what both the RN and USAID would be prepared to discuss as elements of Phase Two activities. The team was, however, prepared to make some observations on issues that are likely to arise in Phase Two planning, and to offer some suggestions for the timing and personnel needs for Phase Two design.

1. Issues for Phase Two Planning

1.1. Support of RN Livestock Activities

There is now less fear than there was five years ago that support of traditional Livestock Service activities will exacerbate rather than relieve problems in the rangelands. As is discussed elsewhere in this report, the focus of thought has shifted away from the vision of imminent disaster to a longer-haul perspective on increasing productivity. The other livestock projects in the Pastoral Zone are supporting existing services, and the NRI should probably examine what it might do in this field as well.

Recommendations:

- (a) Examine the work of the other two major projects to determine the cost-effectiveness of support provided to the existing Livestock Service.

- (b) Be prepared to discuss the further development of the activities of Vetophar, especially as a key link in the chain of securist services.
- (c) Prepare for the planning exercise by discussing in advance the MDR plans for staffing and paying operational costs for the "Pastoral Centrals" being built in the other two major projects.
- (d) The planning team should include a livestock technician experienced with mixed-species African herds.

1.2. Pastoral Research

The Livestock Service realizes that research is a permanent need. The questions for Phase Two planning will be the balance of research and intervention, the Nigerienization of research staff, and the institutionalization of the research function. Socio-economic, rangeland, and animal production research must all continue.

Recommendations:

- (a) Discuss with the MDR, INRAN, and other interested parties the perceived long-term needs for research in this major Nigerien system of rural production.
- (b) Consider the possibility of using one of the ranches (Ibecetene may be preferable to North Dakoro) as a long-term research station, but examine the work

at Toukounous as well.

- (c) Begin planning the specific roles that NRI-funded trainees will play in research and/or operations of the Livestock Service upon their return.
- (d) On both socio-economic and the range/livestock sides, consult the international centers, especially ILCA, ICARDA, and ICRISAT for available models of nascent research programs in similar circumstances to those in Niger. Dr. Bement will provide a brief statement on critical staffing needs for a nascent research institution, based on the history of his own research station. The Pastoral Development Unit of the British ODM, and the Commission on Nomadic Peoples of the International Union of Anthropology (Commission Secretariat is at McGill University, Montreal, Canada) can also help with ideas for this component.

1.3. Service delivery

There is a frank and substantial difference of opinion within the present project implementation team as to the mechanisms by which development services can and should be delivered to pastoralists. These two positions being taken have been usefully characterized as "supply-oriented" and "demand-oriented" positions. They are not totally irreconcilable, but instead focus on elements in the mix. (a) The

"supply-siders" on the project look to the building of a better system of delivering health and animal production information and technology from the Ministry to the herder. Their position is that the individual herder must be responsible for his herds, and have access to the goods and services necessary to building up his enterprise. Looking "upstream" from the herder, it is necessary, say these people, to look to the national institutional infrastructure through which these services must run. Their advice is to: (i) consider modifications to the curriculum of the Livestock School, with possible Technical Assistance to improve the practical knowledge of herding gained by the students; (ii) integrate Vetophar more firmly into the delivery system and extend its delivery network; (iii) at the field level, build a two-or three-tiered organization of circuit-riding field supervisors and agents who deal directly with the herders (such a system not necessarily to include securitists). (b) The "demand-siders" on the project also look to the herders, but argue that structures must be created among the livestock producers to receive and utilize what will be, for the foreseeable future, all-too-scarce services. They argue that simply offering services to whomever lines up for them risks losing sight of equity questions that are important to the RN and to USAID. Without

structuring a routine process of outreach to herding communities, only those herders who have the best access to services will get them, and those may be cattle traders, chiefs, and the better-off herders. To combat this likely outcome, and to structure the pressure groups for credit repayments and the audiences for social services like adult education, they argue the necessity of reaching below the chiefs (without forgetting them) to create associations of herders with their own officers as key links to the government agents. They also stress that their views are in direct accord with the RN's view of the Development Society in Niger. Their advice is to: (i) continue the formation of herders' associations; (ii) carefully select veterinary and human health securitists to achieve broad and responsible coverage throughout the zone; (iii) sensitize and collaborate with the services to find recruitment and supervision formulas that work, given limited means; (iv) ensure that equity considerations are met; and (v) use the communities of demand - the herding communities themselves - as organizational vessels for collective decisions about range, water, marketing, and other matters where group decisions are necessary or economical.

Recommendations:

- (a) The planning team should recognize the differences of opinion within the Project team, and explore the

intellectual merits of each view, especially identifying points of irreconcilability.

- (b) The team should include someone with experience of herder's cooperatives, preferably in Africa.
- (c) The planning team should include someone with experience in the structures, logistics, and costs of delivering extension and animal health services, and should consult with the AID-funded Niger Rural Health Project for the direct comparisons available with the system of low-cost rural health delivery (and supervision) now being implemented.
- (d) As in C.1.1.c. above, explore the setting-up of Pastoral Centers in the IBRD- and FAC-aided projects to determine the effectiveness of these mechanisms, which appear to be seen as models for the future.

2. Timing of Phase Two Planning

1. Phase One - Phase Two Coordination

This evaluation report, and the consultant's report recommended above in Chapter IV, Section B.3.2.a., should serve as markers of an increased flow of information about Phase One. Then the Project team itself sees the period from January to March 1982, as the period of intense analysis of results so far. Phase Two planning should be coordinated with this remaining Phase One schedule.

- 2.1.1. If the consultant's "prospectus" report is submitted to the Ministry in French by January 1, the PID design could follow soon thereafter.
- 2.1.2. If the Project Team keeps to schedule, their analysis should be advanced enough by March 15, 1982, to be able to schedule a full PP team in soon afterward.
- 2.1.3. As a preparatory exercise, it would be wise to ask the Ministry for a dossier on its own hopes for the elements of a Phase Two. The idea would be get as many issues as possible out in the open and partially discussed before a PID team starts its work.
- 2.1.4. The evaluation team had no competence to make recommendations as to how vehicles could be ordered and other advance operations accomplished to enable a smooth transition between the two phases.

3. Composition of a Planning Team

to recapitulate recommendations made above, it is suggested that design team should have on it:

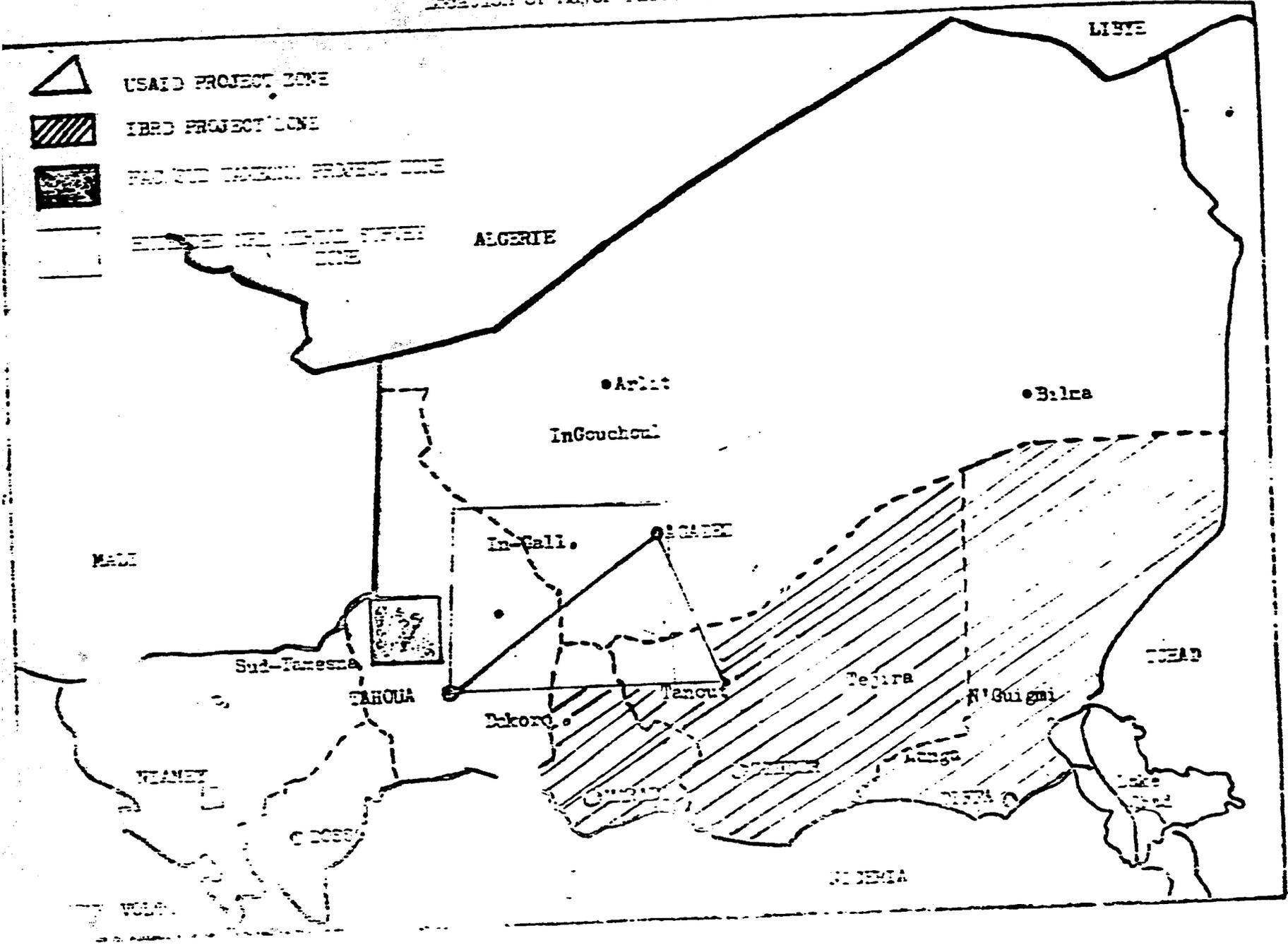
- (a) A livestock specialist with African mixed-herd experience.
- (b) A herders' cooperatives specialist, preferably with African experience.

- (c) A veterinary health delivery systems expert, who could look at the system from the top down.
- (d) A pastoral research expert (or one on rangelands and one on sociology) with experience of research institution-building.
- (e) Other expertise in design, finance, livestock economics and development anthropology as is customary on such teams.

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REPUBLIC OF NIGER
 Location of Major Pastoral Zone Projects

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ANNEX B

Extract of Evaluation Protocol

The protocol for the 1981 evaluation of the Niger Range and Livestock Project was agreed to by a letter from USAID/Niamey to the Minister of Rural Development of the Government of Niger.

Key portions of this protocol were as follows:

Section 5.3 of the Niger Range and Livestock (NRL) Project Grant Agreement between the Republic of Niger and the United States of America states that:

"The Parties agree to establish an evaluation program as an integral part of the project. Except as the Parties otherwise agree in writing, the program will include, during the implementation of the Project and at one or more points thereafter: (a) evaluation of progress toward attainment of the objectives of the Project; (b) identification and evaluation of problem areas or constraints which may inhibit such attainment; (c) assessment of how such information may be used to help overcome such problems, in this or other projects; and (d) evaluation, to the degree feasible, of the overall development impact of the Project."...

EVALUATION TEAM

USAID/Niamey believes that the following type of expertise should be represented on the evaluation team to provide assessments of indicated areas of project activity:

Best Available Document

1. Agricultural Economist	Economic Assessment
2. Sociologist/ Anthropologist	Sociological Studies and Interventions
3. Range Management Specialist	Range Management
4. Animal Scientist	Livestock Production
5. Evaluation Specialist	Overall Coordination of the Evaluation

The AID Mission views the evaluation as a collaborative U.S.-Nigerien effort and hopes that the Republic of Niger will assign counterparts to work with each of the U.S. specialists chosen to review work in the areas described above. The Mission believes that this approach will increase comprehension of current constraints by both U.S. and Nigerien participants. It should also enhance the possibilities for making the evaluation a practical, coordinated problem identification and program modification exercise...

EVALUATION METHODOLOGY

A. Data and Information Gathering

The Evaluation Team will:

1. Review available data and become familiar with the recent background and history of range and livestock development efforts in Niger and other Sahelian countries.
2. Visit the NRB Project Zone and all officials involved with the principal livestock programs in Niger and develop an understanding of major points of recent progress, and current emphases, within each of the principal livestock sector areas (range management, herder associations, veterinary services, breeding, disease identification and control, etc.)
3. Review NRB research and pilot study hypotheses, testing methods and implementational modes to technical and scientific validity.
4. Review current Niger livestock strategies and their relationships to the objectives of this project.

B. Outline of the Evaluation Report

Based on the reviews and discussions above, and in keeping with the evaluation program as described in the Project Grant Agreement, the Evaluation report will provide:

1. An evaluation of progress toward attainment of the objectives of the Project. This will include a review of the results of work under each of the major project components and its sub-elements and an assessment of the value and applicability of this work to achievement of the project purpose.
2. An identification and evaluation of problem areas or constraints which may inhibit attainment of the project purpose. The Report will review and assess project accomplishments against projected outputs. The Report will also identify factors, such as invalid assumptions, which may render cause and effect, i.e. output to purpose, relationships invalid.
3. An explanation of how experience gained to date and information derived from the evaluation may be used to help overcome identified problems in this and other projects. In this context, the report will provide a description and analysis of the factors which have affected the pace and quality of input delivery in Phase I and, based on this analysis, will provide specific recommendations about the best operational approaches to the Phase II program.
4. An evaluation, to the degree feasible, of the overall development impact of the Project. Based on reviews, discussions and assessments above, the Report will evaluate project contributions toward achievement of sector goals. The Report will also identify principal gaps in understanding of the dynamics of the livestock sector and describe methods for, and constraints to, filling those gaps through continued or expanded research. Evaluation will also recommend specific methods for application of research results now being received.

Best Available Document

ANNEX C

Members of the Evaluation Mission

1. Dr. Dan ABONCON, Team Leader, Chairman, Department of Anthropology, McGill University, Montreal, Canada.
2. Dr. James DECKEY, Animal Scientist, Rural Development Program Team, Bamako, Mali.
3. Dr. Michael HOROWITZ, Pastoral Ecologist, President, Institute for Development Anthropology, Binghamton, New York.
4. Dr. Pierre INDE, Veterinarian, Chief, Pastoral Development Section, Livestock Service, Ministry of Rural Development, Government of Niger.
5. Dr. Ilio KATCHE, Statistician, Chief, Evaluation Unit, Ministry of Rural Development, Government of Niger.
6. Dr. Thomas NOLAN, Cattle Scientist, Principal Research Officer, Agricultural Institute, Mullinrobe, County Mayo, Ireland.
7. Dr. SIDIKOU A. Hamidou, Social Geographer, Department of Geography, University of Niamey, Niger.
8. Dr. Raymond WATROU, Agricultural Economist, CATD/Niger.

ANNEX D

EVALUATION ITINERARY

August 6 - September 8, 1981

Date	Activity	Personnel Met:	Night At:
August 6	Arrival, Niamey of External members of Evaluation Team		
August 7-10	Briefings, Document review, team discussions, mission scheduling	Mr. Peter Chaveas, Chargé d'Affaires, U.S. Embassy Mr. John Lovaas, Acting Director, USAID/Niamey USAID/Niamey Staff Mr. Paul Daly, Project Manager, NRI, and Staff Dr. Robert Bement, Senior Consultant, Range Management Team, NRI, and Team Members Dr. Jeremy Swift, Senior Consultant, Socio-Economic Team, NRI and Team Members The Minister of Rural Development, Government of Niger, . ARI Toubou Ibrahim . Oumarou ALOU, Deputy Director, Livestock Service, Ministry of Rural Development, and Senior Staff.	N I V M M V

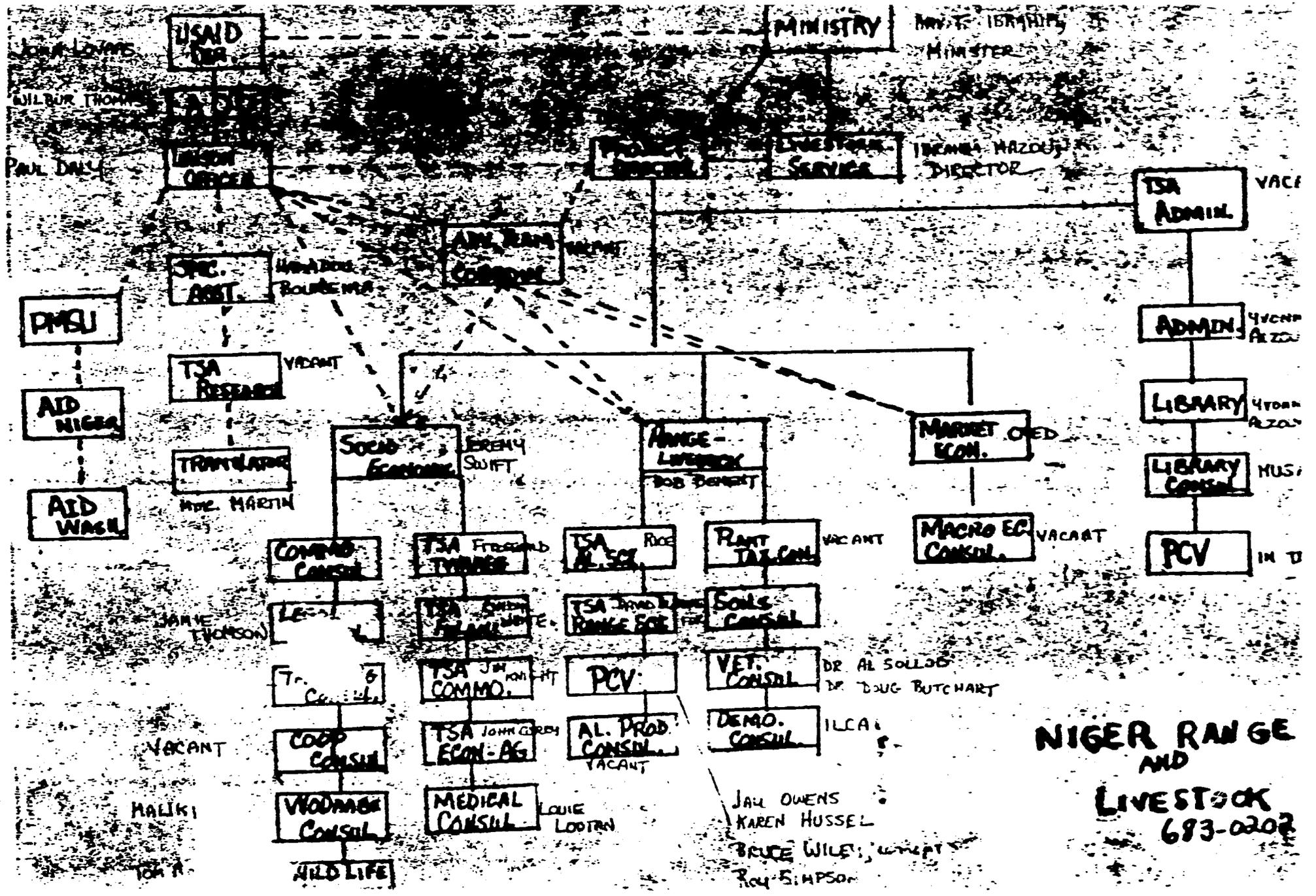
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Date	Activity	Personnel Met:	Night At:
August 11	Flight to Agadez with low-level overflight of Project Zone Team discussion of Agenda	The Prefect, Agadez Department	Agadez
August 12	Visit to In-Gall Discussions	Chief of the Administrative Post, In-Gall Chief, Agadez Department Veterinary Service Chief, Veterinary Post, In-Gall Director, In-Gall Basic Club Service and Staff attached to NRE	Agadez
August 13	By road to Abalak Visit & Discussions, Abalak	Chief of Administrative Post, Abalak NRE Veterinary Auxiliaries NRE Counterpart in charge of Veterinary auxiliary training Peace Corps Volunteers, Predation Study	Abalak
August 14	By road to Echir-Tabaradene Discussions	Sub-Prefect, Arrondissement of Echir-Tabaradene Assistant Chief of Arrondissement Veterinary Service William Fitzgerald, ISA, Socio-Economics, and Inareg sample enumerators	Inareg (north of Abalak)

Date	Activity	Personnel Met:	Night At:
August 15	Discussions	Chief, Medical Center, Tchintabaradene Cynthia White, TSA, Socio-Economics, and WodaaEe sample enumerators, veterinary and human health auxiliaries Dr. Louis Loutan, Consultant NRL, Health	WodaaEe Camp, South of Akaranan
August 16	By road to Ibeceten Ranch	David Blaine, TSA, Range Management, and Peace Corps Volunteers assigned to NRL Director, Ibeceten Ranch	NRL Research site, Ibeceten Ranch
August 17	Ibeceten	Ed Rice, TSA, Range Management and rest of team as August 16	NRL Research site, Ibeceten
August 18	By road to Tahoua Discussions	Deputy Prefect, Department of Tahoua Project Director BADAMASSI Jarili, South Tamesna Project (RH/PAC)	Tahoua/ Malbaza
August 19	By road to Galmi Market, Nagaria, Haradi Discussions	John Curry, TSA (Socio-Economics) & enumerators Intermediaries, Livestock Market. Galmi	Haradi

Date	Activity	Personnel Met:	Night At:
August 20	By road to Zinder Discussions	Deputy Prefect, Department of Zinder Project Director, Dr. AKILOU Habor, Centre-Est Livestock Project (RN/IERD), & Senior Staff	Zinder
August 21	Discussions By road to Maradi	Chief, Zinder Departmental Veterinary Service	Maradi
August 22- August 28	Discussions Report writing	Deputy Prefect, Department of Maradi Peace Corps Volunteers assigned to NRL from North Bakoro Ranch Dr. Albert Solloc, Veterinary Consultant, NRL Staff, NRL Project Headquarters	Maradi
August 29- September 8	Discussions Report writing, editing Briefings Departure	USAID & Embassy Staff Dr. Ibrahima Ibrahima, Director, Service Ministry of Rural Development, Government of Niger, & Senior Staff Dr. ARI Toubou Ibrahima, Minister of Rural Development, Government of Niger	Niger

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NIGER RANGE AND LIVESTOCK
693-0202

ANNEX F

NRL STUDIES UNDER WAY OR COMPLETED

This annex contains incomplete lists of the studies and study-related activities of the field research teams of the NRL. In some cases, integrated studies of "socio-economics" have been broken down here to show each different focus of the work. In other cases, short studies have been omitted. Major studies by a number of short-term consultants (Sutter, Thomson, Schneider, Sollod, and others) have also been omitted.

- F(1) List of Studies and Activities Undertaken by Range Management Section
- F(2) NRL Socio-Economic Team: Twarog Studies
- F(3) NRL Socio-Economic Team: Wodanbe Studies
- F(4) NRL Socio-Economic Team: Studies in the Agro-Pastoral Zone
- F(5) NRL Communication Section Activities
- F(6) NRL Human Health and Nutrition Studies

ANNEX F (1)
 STUDIES AND ACTIVITIES
 LIST OF ~~PROJECTS~~ / PROJECTS UNDERTAKEN BY RANGE MANAGEMENT SECTION, NRL
 TSA: DAVID BLAINE

<u>SUPERVISOR</u>	<u>TITLE OF STUDY</u>	<u>PURPOSE</u>	<u>DURATION</u>
Range Management Team, Ibacetene	1. Burn/Nonburn Germination	Evaluate Germination Rates of Grasses by Species for Burned & Non-Burned Pastures	2 yrs
Ibacetene/North Dakota	2. Burn/Nonburn Pasture Composition & Production	Evaluate Pasture Composition & Productivity Changes Due to Burning for Grazed & Ungrazed Pastures.	2 yrs
" "	3. Plant Phenology	Study Phenologic Stages of Plant Growth for Major Grass Species	2 yrs -
" "	4. Pasture Decomposition	Evaluate Effects & Rate of Decomposition of Pastures Due to Natural Factors Other than Livestock (Wind, Rain, Insects)	2 yrs -
Ibacetene	5. Litter Study	Evaluate Rate of Litter Buildup, When Livestock Use Litter as Feed & Changes in Forage Quality When Eating Litter	2 yrs -
Ibacetene/North Dakota	6. Germination	Evaluate How Grazing Pressure & Litter Affect Seed Germination	2 yrs -
Ibacetene/North Dakota	7. Milk Production	Measure Milk Production Under Different Grazing Pressures, Duration of Lactation, & Total Quantity Produced	2 yrs -
" "	8. Girth/Weight Measurements	Correlate Weight to Girth so That Girth Measurements Can Be Taken in Bush to Estimate Livestock Weights	2 yrs -
" "	9. Cow Selectivity	Determine Cattle Preference for Forage at Different Times of Year	2 yrs -

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<u>SUPERVISOR</u>	<u>TITLE OF STUDY</u>	<u>PURPOSE</u>	<u>DURATIC</u>
Ibecetene	10. <u>Chrozophora</u> Supplement	Determine Effects of Using <u>Chrozophora Brocchiana</u> as Dry Season Supplement	1 yr
Ibecetene	11. Weighed Bulls	Girth & Weight Measurements taken on Multiplication Center Bulls	1 yr
Ibecetene	12. Water Infiltration vs Germination	Monitor Rain Infiltration as Affects Seed Germination, Die-Off, and Come Back of Young Plants	2 yrs
Ibecetene/North Dakoro	13. Green Perennials	Monitor Numbers of Green Perennials in Dry Season Under Different Wet Season Grazing Intensities	2 yrs
Ibecetene/North Dakoro	14. Herbarium	Project Herbarium of Plants Occurring in Zone. Smaller Herbariums to be Presented to Multiplication Centers	2 yrs
Ibecetene	15. Sheep Study	Monitoring of Family Sheep Herd History & Cotton Seed Supplementary Feeding as Affects Milk Production	2 yrs
"	16. Vegetable Garden	Planting & Garden Maintenance Taught to Project Herders	2 yrs
"	17. Tree Nursery & Plantation	Tree Nursery Set-Up & Maintenance, Out Planting for Shade & Windbreak	2 yrs
"	18. <u>Cicer</u> <u>Mi</u> <u>ch</u>	Planting, Maintenance, Seed Replication, & Exploitation of <u>Cicer</u> as high Protein Supplementary Feed	2 yrs

<u>SUPERVISOR</u>	<u>TITLE OF STUDY</u>	<u>PURPOSE</u>	<u>DURATION</u>
Ibecetana/North Dakoro	19. Hay	Explore Possibilities of Hay Cutting, Storage & Feeding for Dry Season Supplement	2 yrs +
" "	20. Weather Data	Monitoring of Rainfall & Temperature at Grazing Trials	2 yrs +
North Dakoro	21. Clipping Studies	Monitor Effects of Different Amounts of Clipping on Composition, Total Vegetative Production & Plant Morphology	1 yr
North Dakoro	22. Camel Selectivity	Monitor Camel Selectivity for Different Types of Forage at Different Times of Year	1 yr
North Dakoro	23. Millet Succession	Monitor Re-Establishment of Grasses into Abandoned Millet Fields	2 yrs +
"	24. Gadabedji/Aderbissinat Enclosures	Monitor Effects of Non-Grazing on Pasture Composition & Vegetative Production	2 yrs +
"	25. Wet Season Cattle Selectivity	Cattle Preferences During Growing Season	1 yr
"	26. Rodent Study	Monitor Rodent Populations	1 yr
"	2. Heifer Monitoring	Reweighing of Grazing Trial Heifers After Exterior Grazing Under Multiplication Center Herding	2 yrs +

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SUPERVISOR

North Dakoro

TITLE OF STUDY

28. Cotton Seed on Cow
Milk Production

29. Azouak-Bororo
Comparisons

PURPOSE

Monitor Effects of Cotton Seed
Supplement on Cow Milk Production
During Dry Season

Comparisons Between Azouak & Bororo
Cattle Gains, Girth & Milk Production

DURATIC

2 yrs

2 yrs

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ANNEX F(2)

NPL SOCIOECONOMIC TEAM - TWAREG STUDIES

TSA: William Fitzgerald

<u>NAME</u>	<u>TITLE OF STUDY</u>	<u>PURPOSE</u>	<u>DURATION</u>
1. Fitzgerald/ Mohammadun/ Twareg Team	Household Budget Studies	To Collect Basic Information on Labor Allocation Practices & Capital Constraints of Twareg herding systems.	Sept '80 to end of Phase
2. Twareg Team 3 Enumerators	Animal Production Study	To Gain a Better Understanding of the Evolution of a Twareg Under Traditional Management Tchin Tabaraden & Dakoro Arrondissements	June '81 to end of phase
3. Twareg Team	Milk Production Study	This project measures the seasonal variation in Milk produc- tion among animals in different stages of lactation	June '81 to
4. Fitzgerald/ Mohammadun	Ideal Seasonal Variation of Pasture Study	Using Informant Recall, This Study Identifies herders' perception of ideal pasture conditions under differing seasonal conditions	1 week per trimester
5. Fitzgerald/ Mohammadun	Traditional Veter- inary Practices Among the Twareg	An Effort to Investigate Tradition- al Medecine, Their Utility, and the Extent to Which They Are Still Used Among the Twareg	14 mos. May-Dec. '81
6. Fitzgerald/ Mohammadun	Paraveterinary Training Assistance	Input into Training of Veterinary Secouristes in Tchin Tabaraden Arrondissement	1 month Apr '81
7. Fitzgerald/ Mohammadun	Follow-up of Para- Vet Training	An assessment of positive & nega- tive elements of the present Para- Vet system	1 mo.

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ANNEX F(3)

NRL SOCIO-ECONOMIC TEAM - WODAABE STUDIES

TSA: CYNTHIA WHITE

<u>SUPERVISOR</u>	<u>TITLE OF STUDY</u>	<u>PURPOSE</u>	<u>DURATION</u>
White	Household Budget Study	Household budgets for 15 families: importance of salaried labor, exchange or sale of milk products, seasonal variation, decision-making	2 years
White	WodaaBe Social Organization	WodaaBe social organization, present political/administrative structures, the kinship basis of camp composition, social organization of pasture use	2 years
White	Labor Use Study	WodaaBe labor requirements and use: labor constraints on production, seasonal variations, labor sharing arrangements, unsalaried labor for outside groups (herding animals for the use of their milk)	2 years
White	Animal Ownership	Distribution of animals between households, inheritance system, animal loans and redistribution mechanisms	2 years
White	Basic Needs Inventory	Survey of the expressed aspirations of WodaaBe herders in the project zone including their evaluation of problems facing them and their ideas about possible solutions	2 years
Maliki	WodaaBe Groups: History and Locations	History and present distribution of WodaaBe in the project zone: major divisions and their populations, dry season areas and wet season migration	4 months

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ANNEX (7)
 SCIO-ECONOMIC TEAM STUDIES IN THE
 N.P.L. AGRO-PASTORAL ~~ZONE~~ ~~STUDIES~~

TSA JOHN CURRY

Magaria 27 hh
 Doullou 21 hh
 Chaduwanka 22 hh
 Egif/Tukubulu 22 hh

<u>Responsible</u>	<u>Project</u>	<u>Purpose</u>	<u>Duration</u>
1. Agropastoral Team	Demographic Sample Survey	To provide basic demographic information on units of production in sample frames	1-3 days at start of each sample frame selection
2. "	Agricultural Parcel Sample Survey	Obtain basic information on Parcel number, ownership, cropping practice and yield for all parcels used by sample units	1-3 days at start of sample frame selection
3. Aboubakar Ibrahim	Field Measurement	Estimation of size and shape of parcels used by units of production in sample frames	est 3 Mos July '81 until all parcels measured
4. Agropastoral Team	Time/Budget Interviews	Twice weekly interviews with economically active members of sample productive units to obtain numbers of hours spent in productive tasks, amounts of purchases and sales. This will aid in identification of labor and capital constraints for sample frame units, and forms basic data for simulation and budgetary analysis for Phase II	May '81 until end of Phase
5. "	Household Production Study	Weekly interviews of production units to determine levels of production.	Aug '81 until end of phase

ANNEX F(3) (Continued)

<u>SUPERVISOR</u>	<u>TITLE OF STUDY</u>	<u>PURPOSE</u>	<u>DURATION</u>
Maliki	WodaaBe Range Use Concepts	WodaaBe use and perception of environment, rainfall, risk, seasonal variation, including their classification of plants, judgments of nutritive values for each animal species according to season, etc.	5 months
Maliki	Animal Marketing	WodaaBe perceptions of markets and strategies for marketing	5 months
Maliki	WodaaBe Animal Husbandry	Animal management techniques of the WodaaBe, including their detailed identification of animal diseases, causes, treatment	5 months

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<u>Responsible</u>	<u>Project</u>	<u>Purpose</u>	<u>Duration</u>
6. Moussa Ado Issoufou Nari Oumarou Sadao Manzo Maman	Mkt price study	Weekly visits to principal markets for sample frames to obtain information on prices of animals and basic commodities. This enables the study to monitor changes in market condition that constrain household economic strategies	May '81 until the end of phase
7. Agropastoral Team	Observation of Activities	Sample Time/motion studies will provide basic information on actual time spent engaged in labor activities, and enable the study to evaluate time/labor responses from twice-weekly interviews.	Sept '81 until end of phase
8. "	Seeding Activities survey	Obtained information on amounts of labor inputs to clearing and seeding sample parcels. Augments information obtained in twice-weekly interviews	3 Mos. June '81 through '81 agricultural campaign
9. Agropastoral Team	Field history survey	One-time questionnaire administered to obtain history of land ownership and utilization of parcels in sample frames	Oct '81 1 mo.
10. "	Animal Production study	To obtain information on the process of animal production to determine returns of labor and capital in selected agropastoral situations	Fall '81 until end of Phase
11. TSA Agro-pastoral team	Ethnographic Interviewing	Directed and open-ended interviews in all sample frame locales to acquire qualitative information on: 1. history 2. social & political	Jan '81 to end of phase

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Agro Pastoral Enquête, cont'd.

<u>Responsible</u>	<u>Project</u>	<u>Purpose</u>	<u>Duration</u>
11. continued		organization; 3. Ethnographic concepts and practices; 4. migration; 5. gardening activities; 6. role of Samaria coops and other govt. encouraged institutions in local production	
12. TSA Agro-pastoral team	Herder Conflict Case Studies	Collection of case histories of conflicts between herders and farmers to determine the levels of conflict for sample frame areas and to elucidate the processes of resolution of such conflicts	Feb '81 to end of phase
13. Issouf Bayard/TSA Agro-pastoral	Transhumance	Survey of Transhumance groups who utilize both project zone and agropastoral zone to determine the nature and extent of Transhumance for our zone.	Oct '81 - Dec '81
14. TSA	Agropastoral Survey	Questionnaire survey of agricultural areas identified by aerial survey. Will determine who farms in the zone and why, history of ag settlements and essential features of these agropastoral systems.	Aug '81 to end of phase
15. Agropastoral Team	Rain. Monito. Study	Record amount and distribution of rainfall for sample frame locales	June '81 until end of phase
16. E. Bui/TSA	Soils inventory	Identification of major soils types for production areas in Magaria vicinity	3 days May 81

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Agro Pastoral Enquête, cont'd.

<u>Responsible</u>	<u>Project</u>	<u>Purpose</u>	<u>Duration</u>
17. CRED	Mkt study	Determine essential features of animal marketing system in project and agropastoral zone; flow of animals through markets; mkt constraints on livestock production.	Fall '81

ANNEX F(5)

NRL COMMUNICATION SECTION ACTIVITIES

TSA: James Knight

<u>RESPONSIBLE</u>	<u>TITLE OF ACTIVITY</u>	<u>PURPOSE</u>	<u>DURATION</u>
J. Knight, I. Zeyngui, O. Alpha	Water Point Survey	To inventory water resources in NRL Zone, determine their adequacy, and define socio-economic parameters of water allocation. Concurrent effort to achieve baseline communications data, socio-economic characteristics of the zone as a whole, and degree of herder interaction with government services.	15 months
J. Knight, Boubacar Dan-Rani	Radio Clubs Cooperation	To test feasibility of a joint Radio Clubs-NRL program as an aspect of an NRL extension program and to announce project activities.	4 months
Tom McShane, John Grettenberger	Animal Predation Study	To quantify animal predation in NRL zone and recommend appropriate project action.	2 months
Oumarou Alpha	OPVN Survey	To determine present OPVN grain-distribution facilities in the NRL zone, planned extensions of the system, and present sales policies.	1 week
Issoufou Zeyngui	Puisatier (Well Digging) Survey	To define present characteristics of well digging in NRL zone by Hausa puisatiers.	1 week
Ibrahim Tourawa	Herd Composition Survey	Study of age, sex, species mix of representative herds throughout Project Zone.	Ongoing

ANNEX F(6)

NRL SOCIO-ECONOMIC TEAM

HUMAN HEALTH AND NUTRITION STUDIES

Consultant: Dr. Louis Loutan

<u>RESPONSIBLE</u>	<u>TITLE OF ACTIVITY</u>	<u>PURPOSE</u>	<u>DURATION</u>
Loutan	Nutrition and Sanitation Survey	54 WodaaBe families: information on water drawing and use, food consumption (cereals, milk, meat), nutritional condition, disease incidence	1 year
Loutan	Traditional Medical Practices	Study of traditional medical practices, nutrition and health, traditional medicines of WodaaBe and Twareg communities (with participation of Mr. Mohamedoun Abdourabahi)	18 months
Loutan	Human Health Auxiliaries	Evaluate and followup training of herder secourists. Search for replicable formulas for training and supervision	1 year (if new contract drawn)
Loutan	Access to Dispensaries	Study of access to and frequencies of use of dispensaries in the Arrondissement of Tchir-Tabaraden by Herders (with the cooperation of nurses in place)	1 year, at 3-month intervals
Loutan	Age/Participation Survey	Labor use study of 54 WodaaBe families: observation of levels of effort by different age-groups, focus on children and aged family members	1 month
Loutan	Milk Production	Measurement of milk production in WodaaBe camps	Every 15 days for 1 year

ANNEX G

NRL-SPONSORED TRAINING AND OBSERVATION ACTIVITIES

NAME	TRAINING	INSTITUTE	BEGIN DATE	(ANTICIPATED) DATE OF COM- PLETION	(ANTICIPATED) POSITION UPON RETURN TO <u>NRL</u>
<u>Long-Term</u>					
N'Grade Goumèye	BSC Range Management	Texas Tech.	3/3/79	7/81	N R L
Ali Maman	BSC An. Husbandry	U. of Ariz.	9/17/78	5/82	N R L
Abdoulaye Alio	BSC An. Husbandry	"	12/9/78	5/82	N R L
Maï'agi Bagoudou	BSC Range Management	"	12/9/78	5/82	N R L
Ibrahim Garba	B.A. Rural Sociology	U. of Miss.	4/26/79	5/82	N R L
Abdoulaye Garba	BSC Ag. Econ.	New M. St.	9/4/79	5/82	N R L
Denda Issa	BSC Range Management	Utah St.	1/25/80	9/82	N R L
Nouao Abdoulaye	B.A. Rural Sociology	U. Missouri	3/15/80	1/84	N R L
Seydou Yacouba	BSC Ag. Economy	West Texas State	4/4/80	7/82	N R L

ANNEX G (continued)

NRL-SPONSORED TRAINING AND OBSERVATION ACTIVITIES

NAME	TRAINING	INSTITUTE	BEGIN DATE	(ANTICIPATED) DATE OF COM- PLETION	(ANTICIPATED) POSITION UPON RETURN TO NIGER
<u>Short-Term</u>					
Rabou Akilou	Observation Tour/ U.S. Southwest		7/25/78	8/30/78	Livestock Service as before
Rabo Aiao	"		"	"	"
Bachir Boukary	"		"	"	"
Moussa Hadi	"		"	"	"
Yahaya Tourava	"		"	"	"
Sani Alakarbo	"		"	"	"
Bachir Boukary	Bement Ranch/Training		mid-1979		"
Yahaya Tourava	"		"		"
3 Peace Corps Volunteers	"		mid-1979 (two weeks)		N R L
David Elaine, TSA	"		"		"
Ali Dankintafo	Range Society An. Meeting		2/9/80	4/1/80	N R L
Pierre Inné	"		"	"	Livestock Service
3 Nigerian Students (already in U.S.)	Bement Ranch/Training		mid-1980 1 month		Return to university

ANNEX G (Continued)

NAME	TRAINING	INSTITUTE	BEGIN DATE	(ANTICIPATED) DATE OF COM- PLETION	(ANTICIPATED) POSITION UPON RETURN TO SERVICE
Adamou Laoualy	Range Society Meeting/ Ewment Ranch observation		2/6/81	2/20/81	Livestock Service
	"		"	"	N E I
Hammadou Bourahim	"		1981		Livestock Service
Pierre Innoc	Seminar on results of PPS/ Dutch Work-Banako, Mali		"		N E I
TSA Knight	"		"		N E I
TSA Blaine	"		"		N E I
3 Nigerien students (already in U.S.)	U.S. Southwest/Extension- Indian-Forest Service observation		mid-1981 8 weeks		Return to service
Oumar Nomao	Practical Observation Training	Colorado	8/3/81	9/11/81	N E I
Issoufou Zangni	"	"	"	"	"