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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
INTERNATIONAL DEVELOPMENT ASSOCIATION

THE ECONOMIC DEVELOPMENT

OF

UPPER VOLTA

(in four volumes)

VOLUME III

LIVESTOCK

November 27, 1970

Western Africa Department

CURRENCY EQUIVALENTS

Currency Unit: CFA Franc (CFAF)

Before August 11, 1969:

US\$ 1.00 = CFAF 246.85

CFAF 1,000 = US\$ 4.05

After August 11, 1969:

US\$ 1.00 = CFAF 277.71

CFAF 1,000 = US\$ 3.60

WEIGHTS AND MEASURES

1 Metric Ton (t) = 2,205 lbs.

1 Kilogram (kg) = 2.2 lbs.

1 Kilometer (km) = 0.62 mile

1 Meter (m) = 3.28 feet

COMPOSITION OF MISSION

This report is based on the findings of a Mission which visited Upper Volta in November-December 1969 and which consisted of:

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The report consists of the following volumes:

- I Main Report
- II Agriculture
- III Livestock
- IV Education

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SUMMARY AND CONCLUSIONS

i. Livestock is of considerable importance to Upper Volta's economy contributing between 11 and 12 percent of GDP and over half of total exports. Apart from exporting its own livestock, Upper Volta provides transit facilities for large numbers of animals moving from Mali and Niger to markets in the Ivory Coast and Ghana. In the four-year period 1966-1969 cattle in transit accounted for 46 percent of total live cattle exported, while sheep and goats in transit represented 27 percent of total exports of such animals. These figures, however, somewhat underestimate the "foreign" contribution to exports. Thus of the number of Voltaic cattle exported in this period (both live and as meat), 30 percent probably represented imported animals absorbed into Voltaic herds. For sheep and goats the corresponding percentage was 34.

ii. The productivity of Upper Volta's livestock industry is generally low. The annual offtake from the country's herd of about 2,500,000 cattle is only about 10 percent and the meat yield (in terms of carcass weight) per animal maintained is only 11.2 kg as compared with an estimate of 14 and 15 kg for Niger and Mali respectively. Inadequate feeding is one of the principal reasons for this low output. Over much of the country there is intensive competition between man and beast for available land. Large parts of the Sahelian North suffer from overgrazing. Under these conditions, periodic droughts cause severe losses. In addition, livestock diseases take a considerable toll. The Livestock Service, starved of adequate operating funds, has been unable to combat disease effectively. There is danger of a renewed outbreak of rinderpest owing to the sharp reduction in vaccinations of young animals. The incidence of pleuropneumonia, trypanosomiasis, and other diseases has also considerably increased.

iii. There is reason to believe that a properly integrated disease control campaign costing perhaps CFAF 1.7 billion over the next ten years would increase the offtake of cattle by 1 or 2 percent and increase the weight of animals marketed, giving rise to total benefits far outstripping the possible cost. It should be a multi-purpose campaign providing immunization against bovine pleuropneumonia and treatment of animals against external and internal parasites, and consolidating and protecting the gains from the preceding campaign against rinderpest. At the same time the opportunity provided by the presentation of cattle for treatment could be utilized as a means to persuade herders to castrate their animals, to enable them to buy supplementary feed and salt licks and to give them advice on the improvement of animal husbandry. However, the effectiveness of a disease control program in Upper Volta would depend on requisite cooperation from Mali and Niger to ensure in particular that animals entering from these two countries are properly vaccinated against diseases.

iv. In the northern Sahelian region, which accounts for about 15 percent of Upper Volta's cattle and 29 percent of the sheep and goats, it is important to establish a separate ORD (Regional Development Office) for livestock. A pre-feasibility study looking toward the establishment of such an ORD was started early in 1970 with financing by FAC. This ORD should focus on better disease control with the help of personnel delegated from the national Livestock Service, the development of water supply and more rational use of available range land through rotational grazing, and the provision of advice for the improvement of animal husbandry. The necessary agrostological study of this region has already been carried out.

v. In the South, where generally more pasture is available, efforts should focus on (1) the development of trypano-resistant breeds, such as the Baoule and Mere, which are potentially more productive than Zebu cattle, with the help of a special livestock research station devoted to such breeds, (2) an agrostological study designed to determine the pastoral vocation and carrying capacity of land south of the 13° parallel, (3) the possibilities of developing a feed-lot operation for the intensive fattening of cattle, and (4) efforts to integrate, slowly but progressively, agriculture and animal husbandry.

vi. Conditions in the South, where trypanosomiasis is a serious threat, are generally more favorable for the development of trypano-resistant breeds which account for about 35 percent of Upper Volta's cattle and which, though smaller than the Zebu, are more prolific and likely to yield more meat. A German team has investigated the possibility of establishing a ranch for the fattening of Zebu cattle southwest of Banfora in the south. It is doubtful, however that the expense of treating Zebras against trypanosomiasis as well as the danger of bush encroachment in this area, will make such a ranch uneconomic. It may prove more worthwhile to establish a mixed ranch for the breeding and fattening of Baoule and Mere cattle.

vii. The possibility of a feed-lot operation is suggested by experiments with the intensive feeding of cattle that have been carried out by IEMVT (Institut d'Elevage et de Medicine Veterinaire des Pays Tropicaux) in Senegal, Ivory Coast and Madagascar. Eventually it might be possible to establish such an operation either near Bobo-Dioulasso or near Banfora in conjunction with a proposed scheme for the irrigated cultivation of cane sugar. However, a number of preliminary studies have to be undertaken. One of these is a study on the availability, potential cost and nutritive value of by-products which are or might be available for animal feeding, including bran from rice mills and from a flour mill in process of construction at Banfora, oilseeds and oilcake, cane tips and molasses, blood and bonemeal from the Bobo-Dioulasso abattoir and brewery dregs from the Bobo-Dioulasso brewery. A study of this kind has been undertaken at the request of FAC by IEMVT. Another requirement will be to conduct intensive feeding trials either on the Banankeledaga livestock research station or IRAT's Farako Ba research station. Finally, it will also be necessary to experiment with the

growing of fodder crops (i.e. the graminaceous Bracharia raziziensis or the leguminous Stylosanthes gracilis) which can be used to supplement the feeding with the by-products mentioned previously. If the cane sugar scheme is launched, provision might be made for the cultivation of 500 hectares of fodder crops under irrigation.

viii. Hitherto the raising of livestock and farming have been completely separate occupations. Even cattle belonging to farmers have been entrusted to pastoralists for grazing. Where animals are being used to draw implements or carts, they are usually left to forage for their own feed. Supplemental feeding is rarely practised. The use of draft animals has so far made little progress: in 1969 only about 5,560 oxen and 8,100 donkeys were used as draft animals. Yet in the South it is necessary to move slowly toward a more effective integration of farming and animal husbandry. The efforts made in this direction in the Yatenga ORD show the potentialities of such an approach even though its success in this ORD was severely restricted by unfavorable conditions. The objective should be to gradually increase the number of farms capable of supporting three oxen, two as work animals for four or five seasons and one for fattening after it has finished its service as a draft animal. To achieve this objective it will be necessary to some extent to reorganize land holdings so as to provide separate consolidated areas for cultivation and fallow grazing, to provide for village herding of cattle, to institute essential animal health care and to develop means for supplemental feeding with fodder by-products. Progress will necessarily be very slow and will have to be based on experience with various pilot schemes that should be initiated on a village basis.

ix. To facilitate marketing it is essential to develop and equip livestock markets, to organize and delimit the routes along which livestock moves and to provide proper holding grounds for cattle awaiting slaughter or shipment to foreign markets. FAC has developed plans for, and will finance, two livestock routes in the eastern part of the country, converging on Ouagadougou and Puytenga. These should provide the requisite experience on which similar livestock routes could be developed for the central and western part of the country. These livestock routes should be delimited so as to avoid cultivated areas and provide in-transit grazing, should be equipped with facilities for the watering and sanitary inspection of animals and should have at their terminus appropriate holding grounds. FED is financing the construction of a new and larger abattoir at Ouagadougou, and plans exist also for the replacement or expansion of the Bobo-Dioulasso abattoir. Upper Volta hopes to expand its exports of meat at the expense of those of livestock, but the realization of this goal will largely depend on the eventual success of the efforts to develop a common market for livestock and meat among the Entente countries, Mali and Ghana.

x. If Upper Volta is to make full use of its livestock it will also have to make a serious effort to correct the existing serious deficiencies in the collection and treatment of hides and skins. For this purpose it will be necessary to develop and properly staff a special section in the Livestock Service.

xi. Proper coordination of all the activities in the livestock sector is urgently needed. It might well be desirable to create a Supreme Livestock Council to coordinate, in particular, the work of the Directorate for Rural Development, the Livestock Service and the Ministry of Planning. One of its functions would be to allocate responsibility for the various aspects of a livestock development program. In this connection it might be appropriate to confine the Livestock Service to disease control, collection of statistics and improvement in the treatment of hides and skins. While a special ORD for the Sahelian North is envisaged, development activities elsewhere, including the operation of livestock routes, might be entrusted to a company for the Development and Management of Livestock Resources, the establishment of which is expected to be studied with the help of FAC.

xii. Up to the present little foreign aid has been directed to the livestock sector, largely owing to the absence of concrete development plans. Primarily owing to the efforts of FAC, a number of basic studies have now been completed, are under way or are about to be undertaken. These should provide the basis for a much more intensive and comprehensive campaign to develop Upper Volta's livestock resources -- a campaign which the Mission believes may entail outlays of around CFAF 17 billion (about \$61 million) in the seventies. Without such a major effort there is serious danger that Upper Volta, a country with a poor natural endowment, will experience a serious deterioration of its livestock resources.

I. LIVESTOCK PRODUCTION AND ITS CONTEXT

A. General Features of Production

Ecology and Constraints

1. Upper Volta, which lies between 10° and 14° North and 5° and 2° West, is a country without direct access to the sea. Most of its territory has a Soudanian type of climate, with between 500 and 1,000 mm annual rainfall. In the North, a narrow strip falls in the Soudano-Sahelian transition zone rather than in the Sahelian zone as the Niger. In the South, there is a similar gradual transition to a Soudano-Guinean climate.

2. Soils are generally poor, eroded and severely leached. The dry season is long and totally without precipitation. The rainy season is brief and marked by heavy rainfall. What is more, rainfall averages cover a wide range of variation, and years of drought are invariably calamitous, as their effect is aggravated by the scarcity of good pasture. Although Upper Volta fortunately did not suffer to the same extent from the droughts that struck Niger in 1967/68 and 1968/69 and which caused losses estimated at CFAF 2-2.5 billion, overall losses to domestic animals are nonetheless estimated to have been CFAF 500 million. Table 1 shows the estimated losses due to drought in the Sahel (Dori) in 1968/69.

Table 1: LOSSES DUE TO DROUGHT (1968/69)

"Cercles"	Cattle	Sheep	Goats	Horses	Donkeys	Camels
Dori	24,000	6,000	9,000	200	700	10
Sebba	2,000	3,000	2,000	50	200	-
Oudalan	6,500	3,500	8,500	20	350	40
Livestock lost	32,500	12,500	19,500	270	1,250	50
Losses in %	8%	3,7%	5.2%	1%	3.6%	1.6%

3. Animal mortality is highest when the rains start, as the intestinal flora changes abruptly. Young animals and cows that have recently calved suffer most severely. To the immediate numerical losses must be added those due in the longer run to the reduction in breeding and replacement stock. Finally, there are the particular consequences of drought: compensatory growth is upset, the number of unproductive animals increases, and feeding deficiencies spread, leaving a legacy of fractures, abortions and diseases on deteriorated grazing areas. While the qualitative effect of drought on both watering and feeding is fully known, its economic consequences have unfortunately never been measured, even approximately. An obvious gap remains to be filled here.

4. Drought is not the only limiting ecological factor. The shortage of drinking water, which is drawn mainly from wells and boreholes, everywhere promotes the spread of parasitic and infectious diseases. Disease-bearing vectors close off vast areas to man and livestock. The competition we can therefore surmise between the various factors of production is also evidenced by an analysis of the geographic distribution of livestock.

Geographic Distribution of Livestock

5. The structure of livestock rearing in Upper Volta cannot be compared geographically with that in the major Sahelian countries. It is surprising (and disconcerting) to find 5 million inhabitants living within a space of 274,000 km² and in effect competing with 2,500,000 cattle and 4,000,000 small ruminants, to quote only the probable figures for the most important species. A comparison with 1969 densities in Niger, for example, is extremely instructive in this respect.

<u>Country</u>	<u>People</u>	<u>Cattle</u>	<u>Small ruminants</u>
Upper Volta	18 - 20	9 - 10	15 - 16
Niger	3 - 3.5	3.5- 4	4 - 5

6. The regional breakdown in Tables 2A and 2B also reveals a number of interesting facts:

- (i) In the Dori and Djibo sectors the number of cattle including "foreign" animals (commercial transit and transhumance), exceeds 16 per km², indicating an availability of 6 hectares per head. Overgrazing thus largely characterizes this pastoral area, on the average not to carry more than one head of cattle for 8-10 hectares. The density of small ruminants (30 per km²) is also abnormally high. For this region, a better ecological balance must be sought before consideration can be given to stepping up livestock production.
- (ii) On the Mossi and Yatenga plateaus, overgrazing is severe in view of competition on poor soil. Human population density exceeds 50 inhabitants/km² in certain regions and the average population density is 25 inhabitants/km² (1965). There are about 10 cattle/km². The region is not suitable for traditional stock-raising or for intensive fattening operations. Because of the absence of suitable pasture it has reached the limit of its livestock carrying capacity.

- (iii) In the West and Southwest the problem is less acute. In view of the rainfall and quality of the soils, it would seem that there is room there for a true integration, rather than juxtaposition, of agriculture and animal husbandry, particularly in the direction of intensive operations, with ranching and feed-lot operations. The number of livestock should not increase except in the North (Barani and Tougan). Human population density is between 12 and 13 inhabitants/km² (1965). There are 7 cattle/km², i.e. one head to every 14 ha. Better distribution could increase carrying capacity by one-third.
- (iv) In the Southeast and East there are large areas with little or no livestock or people in view of the very unfavorable health conditions (trypanosomiasis, onchocerciasis, filariasis, and a variety of parasitic infections). Average population density is between 8 and 9 inhabitants/km² (1965); and the number of cattle per km² is only 5, or one head of livestock per 20 ha. The present carrying capacity could easily be doubled. Once the health problem is resolved, this region would be favorable for the development of modern agriculture with the help of appropriate guidance and adequate resources. The two forms of animal husbandry, sedentary and nomadic, can exist here side by side from the start.

7. All the figures for human population should be revised upward by approximately 10% and those for the cattle population by 5-6% to reflect the 1970 position. In the case of small ruminants, the figures are in any case estimates of rather doubtful accuracy (Table 2A and 2B).

Table 2 A: DISTRIBUTION OF LIVESTOCK IN 1966/67 (CATTLE)
AND 1969/70 (SHEEP AND GOATS)

Regions	District	Area in km ²	Cattle		Small Ruminants ^{c/}	
			Number	Density/km ²	Number	Density/km ²
North Sahel	Dori - Ouadalan	23,519	357,475	15.2		
	Djibo ^{a/}	<u>13,350</u>	<u>195,960</u>	<u>14.7</u>		
		36,869	553,435	15.0	1,000,000	29.0
Mossi and Yatenga plateaux	Ouagadougou	47,218	334,609	7.1		
	Kaya	24,109	315,000	13.0		
	Ouahigouya ^{b/}	<u>19,595</u>	<u>242,198</u>	<u>12.4</u>		
		90,922	891,807	9.7	1,000,000	16.5
West and Southwest	Bobo-Dioulasso	60,620	360,967	5.9		
	Dédougou	<u>33,106</u>	<u>296,882</u>	<u>8.9</u>		
		93,726	657,849	6.9	1,000,000	11.0
East and Southeast	Fada-N'Gourma	52,483	254,500	4.8	500,000	9.6
	<u>Total</u>	274,483	2,357,591	8.6	4,000,000	14.5

^{a/} To be set up with the Djibo cercle (subdivisions of Arabinda and Djibo).

^{b/} "Cercles" of Ouahigouya, Gourcy, Yako, Kongoussi, Titao, Séguénégué only.

^{c/} Generally speaking, the density of sheep and goats is twice that of cattle. These densities, together with the numbers of small ruminants, are approximations.

Source: Livestock Service - Anti-rinderpest campaign.

Table 2B: REGIONAL POPULATION DISTRIBUTION (1965) ^{a/}

Regions	Districts	Population	Area	Density
North Sahel	Dori - Oudalan	143,718	23,519	6.1
	Djibo	88,745	13,350	6.6
		<u>232,463</u>	<u>36,869</u>	<u>6.3</u>
Mossi and Yatenga Plateaux	Ouagadougou	1,203,080	47,218	25.5
	Kaya	433,517	24,109	17.9
	Ouahigouya	687,221	19,595	35.1
	<u>2,323,818</u>	<u>90,922</u>	<u>25.5</u>	
West and Southwest	Bobo-Dioulasso	705,373	60,620	11.6
	Dedougou	445,926	33,106	13.5
		<u>1,151,299</u>	<u>93,726</u>	<u>12.3</u>
East and Southeast	Fada-N'Gourma	433,592	52,483	8.3
TOTAL		4,141,172	274,000	15.2

a/ Density : Inhabitants per km²
 Area : in km²
 Inhabitants : absolute numbers

Source : Ministry of the Interior

Prospects for Livestock Production

8. It is clearly apparent from the above that the physical environment for livestock rearing in Upper Volta is extremely unfavorable. We shall see below that the technical and administrative framework does not in any way mitigate these ecological limitations. Special efforts, taking account of all these factors, are therefore called for in both planning and implementation.

9. As a first step, it will be necessary to eliminate the current confusion between movements of local livestock and animals in transit, in order to identify more clearly the various flows and attribute to each of them a fair share of development costs and benefits. Within the Entente group, account must be taken of the need to harmonize health and customs legislation and to establish livestock routes with facilities for sanitary inspection of animals.

10. A second feature of livestock production is its complementary nature -- both on the domestic and international plane. Hopes of a balanced economic development depend on an adequate recognition of this feature rather than on the profits of random exploitation, the prospects for which are uncertain. Recognition of this complementarity should encourage the State to decide on a development policy that will ensure full utilization of its animal protein production potential.

11. On the domestic plane, for example, the Sahelian belt in the North should be retained, and used more intensively, as a breeding area. It will act as the reservoir of female animals, whose progeny will be used for various purposes (meat, milk, breeding, traction). This calls for the establishment of a special livestock ORD and the development of a livestock water supply system utilized in such a way as to preserve a proper balance for the relationship of livestock, soils and grazing. The long-term objective should be to make the Sahelian North the center for breeding cattle and to transfer as many animals as possible over two years old to the South for fattening. This can be done most economically by taking advantage of the local availability of fodder and industrial by-products for various fattening operations (savannah ranching, farm fattening and industrial fattening in feed lots). Supply and evacuation routes and processing plants with their own holding grounds will need to be developed concurrently with this program.

12. On the international plane, it must be recognized that production must be developed to meet both domestic consumption and exports, both expanding outlets. In developing this production, means and objectives should be realistically adapted to the existing constraints and the necessary modifications made in the use of the resources. However, the appropriate policies cannot be properly worked out until 1970/71, when the Government will have available the results of the general livestock survey being carried out by Messrs. Fredet and Arnaud of SCET/ Cooperation. On the basis of this survey the Government will have to make its decisions. The present report is therefore presented in general terms and anticipates the decisions that may be taken by the Government in the light of the recommendations that the World Bank group may submit to it in the near future.

B. Livestock in Upper Volta - Basic Data

Introduction

13. Having been struck since 1966 by the paucity of statistical information on the regional and national level and the lack of recent annual reports and survey documents, FAC (Fonds d'Aide et de Cooperation) has commissioned a study ^{1/}, with the approval of the Government, which should, at the end of 1970, make possible the updating of basic data relating to animal production for the period 1960-1969. This study will also serve as a basis for a development plan in line with the real possibilities of the livestock industry.

1/ Carried out by SCET/Cooperation.

14. It must, however, be stressed that there will continue to be obvious uncertainties regarding certain parameters, such as the total number, rate of increase and composition of flocks of small ruminants, pigs and poultry, as well as the number of animals in transit and imported. With respect to animals in transit and imported, it is likely that the conclusions of the survey will not long remain valid, since the movement of animals across the frontiers varies widely and the relationship of animals in transit to real imports also fluctuates markedly.

15. The updating of essential information must therefore be a part of a continuing program of development. It is the task of the Livestock Service to keep this information permanently up-to-date. If this is not done, the elaboration and evaluation of major projects will always run into difficulties that can be overcome only by lengthy and costly surveys which external aid agencies will be reluctant to undertake in a continuing basis.

Livestock Numbers - Overall Availabilities

16. Pending publication (end 1970) of the results of the SCET/Cooperation study of the basic features of animal production, the IBRD Mission has prepared a series of tables showing the approximate numbers of domestic animals and offtake rates. It should be noted that the supply or "availability" of animals includes both the net annual increase and the offtake through slaughtering or export.

17. An estimate of the growth of the cattle population is given below:

<u>Year</u>	<u>Estimated Numbers (rounded off)</u>	<u>Rate of increase (%)</u>
1963	2,000,000	
1964	2,080,000	4
1965	2,300,000	11
1966	2,340,000	2.5
1967	2,400,000	2.5
1968	2,425,000	1
1969	2,450,000	1
<u>1970</u>	<u>2,500,000</u>	1
<u>1971</u>	<u>2,550,000</u>	2
1972	2,600,000	2
1973	2,650,000	2
1974	2,700,000	2
1975	2,785,000	3

It should be noted that from 1964 to 1965 the increase of 11 percent was almost entirely due to a revision of previous figures which were considered underestimated and which needed to be corrected before the start of the joint rinderpest eradication campaign financed by the European Development Fund (FED).

18. The highest number of cattle immunized under this campaign was 2,340,000 (July 1966), but, according to the director of the campaign, this figure probably included 100,000 foreign cattle, largely from Mali. Considering the impact of the drought during the past two years, the spread of bovine pleuropneumonia and a general deterioration on animal health it seems prudent to assume a modest rate of increase of 1 percent up to 1969. Subsequent figures will largely reflect the success of efforts to improve animal health.

19. The total of trypano-resistant breeds and crosses (taurins) in 1970 is estimated at 875,000, or 35 percent of the total; the remainder are Zebu cattle.

Sheep and Goats

20. Estimates on the number of sheep and goats in 1966 and the probable rate of increase (in rounded figures) are given below. No tax is levied on small ruminants, nor are they systematically counted in any way. The SCET/Cooperation survey will perhaps provide more information.

<u>Species and Numbers</u>	<u>1966</u>	<u>1970</u>	<u>1975</u>	<u>Annual increase</u>
Sheep	1,400,000	1,500,000	1,650,000	2.0%
Goats	<u>2,100,000</u>	<u>2,500,000</u>	<u>3,050,000</u>	<u>4.0%</u>
Total	3,500,000	4,000,000	4,700,000	3.5

Other Domestic Animals

21. With an unknown margin of error, the following estimates for 1970 may be cited:

<u>Species</u>	<u>Numbers</u>	<u>Annual increase</u>
Pigs	150,000	10%
Donkeys	250,000	?
Horses	100,000	?
Camels	5,000	?
Poultry	10,000,000	100% <u>a/</u>

a/ Equivalent to the offtake rate for poultry.

Herd Offtake: Exports and Domestic Consumption

22. Tables 3 and 4 show estimates of the annual offtake from the country's herd and of domestic consumption. The general condition of the population and of its livestock, and above all the low purchasing power of the local inhabitants, make it important not to overestimate animal protein consumption, which seems to be one of the lowest in Black Africa.

Table 3: OFFTAKE OF DOMESTIC ANIMALS

Species	Numbers	% Offtake	Destination		
			Exported alive (numbers)	slaughtered (numbers) <u>a/</u>	total (numbers)
Cattle	2,500,000	10	75,000	175,000	250,000
Sheep	1,500,000	25	125,000	250,000	375,000
Goats	2,500,000	30	150,000	600,000	750,000
Pigs	150,000	50	-	75,000	75,000
Donkeys	250,000)	?	tons	tons	tons
Horses	100,000)	?		500	500
Camels	5,000)	?			
Poultry	10,000,000	100	2,000	5,000	7,000 <u>b/</u>

a/ Including foreign meat and offal exports, viz. 8,000 cattle and 15,000 ruminants.

b/ Based on a carcass weight of 700 g per animal slaughtered.

Table 4: DOMESTIC MEAT CONSUMPTION

Cattle (local)	175,000 x 105 <u>a/</u>	(tons) 18,400
Sheep	250,000 x 16	4,000
Goats	600,000 x 11	6,600
Pigs	75,000 x 40	3,000
Other		500
Poultry (based on 1 kg/yr/person)		<u>5,000</u>
TOTAL		37,500
Less: Meat exports (average for the three years 1967-69)		- 1,500
Plus: Live imports in carcass equivalent (average for the three years 1967-1969)		<u>+ 4,000</u>
Estimated domestic consumption		40,000

a/ cf. Annex 1 for data on weighings by certain abattoirs.

b/ Rounded total.

23. For a population estimated at 5,100,000 people 1/, the average per capita consumption can thus be taken to be 7.80 kg, 3.6 kg of this (46%) from cattle. To this figure must be added various other products, which cannot, however, be added mathematically in view of their different protein value as compared with meat:

Offal	- 20% of carcass weight	1.60 kg
Game, insects, etc.		1-2.00 kg
Dried or smoked fish		2-3.00 kg

Per capita consumption in rural areas is lower. The urban population living in towns, communes and centers of more than 5,000 inhabitants can be estimated at 400,000 2/. Assuming urban consumption to be 25 kg per annum per person, or 10,000 tons in all, the amount of meat available to the rural population may be estimated at 30,000 tons or about 6.5 kg person per annum (30,000,000 kg ÷ 4,700,000).

24. These figures certainly mask large internal variations. They are still open to question in view of the uncertain or arbitrary nature of certain assumptions particularly regarding average carcass weight, number of consumers, net imports and actual exports, offtake rate, etc. Assuming a margin of error of + 20%, these figures reflect reasonably well the situation of the rural population as regards animal protein intake. One fact is not disputed: under the influence of several factors (population pressures, urbanization, stationary standard of living), meat consumption generally does not show any tendency to rise.

25. The shortage in the number of animals available is also resulting in the slaughtering of even younger animals, which weigh less and give a lower yield. Older animals are reserved for export, either on the hoof or in the form of meat.

26. Some 40 percent of the cattle and 30 percent of the small ruminants were slaughtered in 1968 in town abattoirs and at markets visited by the Livestock Service officials on their sanitary inspections. Total slaughterings -- controlled and uncontrolled -- are estimated on the basis of the number of animals assumed to be available from national livestock output and imports. They make no distinction between slaughter for domestic consumption and that for exports.

1/ The true figure for the present population should exceed 5 million in 1970, since migration to other countries has slowed down and the population has been growing at a rate higher than that indicated in the last population survey (INSEE 1960: 1.9%).

2/ Based on a 7% urbanization rate related to the figure for 1966 (300,000).

**Table 5: TOTAL ESTIMATED AND SUPERVISED SLAUGHTERINGS BY SPECIES
IN 1968 AND 1969**
(Unit: head of livestock)

Slaughterings	Cattle	Sheep	Goats	Pigs	Horses	Donkeys	Camels
National production	175,000	250,000	600,000	60,000	1,500	3,000	250
+ imports	25,000	50,000	50,000	-	-	-	-
Controlled slaughter (1968)	82,895	33,671	124,303	9,868	1,047	1,208	64
Percentage of total	41.5	11.2	19.1	16.4	70	40	26
Controlled slaughter (1969)	65,137	22,218	75,443	8,560	628	963	130
Percentage of total	32.5	8.9	11.6	11.2	42	32	52

27. The drop in controlled slaughter in 1969 was in fact compensated by a rise in clandestine and home slaughter. This rise, the result of the unfortunate introduction of a national levy on controlled slaughter, illustrates the difficulties of direct official intervention and the limited power of the state to control traditional methods of processing and trade.

Exports of Carcass Meat

28. Precise figures for these exports should be available. However, even in a field as straightforward as reporting the tonnage of meat exported in refrigerated cars, variations of between 1 and 4% are currently found between the figures provided by the Livestock Service and the Customs (see Table 6).

Table 6: EXPORTS OF REFRIGERATED MEAT (including Offal)
(Unit: kilograms)

Country of destination	1966 Exports			1968 Exports		
	Customs	Livestock Service	Difference	Customs	Livestock Service	Difference
Ivory Coast	1,384,574	1,433,116	-48,542	1,583,883	1,620,624	-36,742
Ghana	-	-	-	94,764	73,999	+20,765
Niger	1,290	-	+ 1,920	1,795	-	+ 1,795
France	-	-	-	15	-	+ 15
TOTAL	1,386,494	1,433,116	-46,422	1,680,456	1,694,623	-14,167

The Mission has accepted as more trustworthy the figures of the Livestock Service, but even these contain a number of discrepancies. In any event, the overall volume of exports appears to be rising and for the past 8 years has been consistently above 1,000 tons. Two diagrams, together with Tables 7A and 7B below, sum up the situation for the past 5 years by abattoir and by product exported. Additional data are given in Annex 2.

Table 7A: EXPORTS OF REFRIGERATED MEAT - BROKEN DOWN BY ABATTOIR
(tons)

Year	Ouagadougou	Bobo-Dioulasso	Total
1965	255	791	1,046
1966	175	828	1,003
1967	670	763	1,433
1968	1,114	580	1,694
1969	1,041	290	1,331

Table 7B: EXPORTS OF REFRIGERATED MEAT - BROKEN DOWN BY PRODUCT
(tons)

Year	Cattle	Sheep and Goats	Other animals and Offal	Total
1965	602	249	195	1,046
1966	257	291	207	1,003
1967	943	270	220	1,433
1968	1,310	220	164	1,694
1969	1,013	121	197	1,331

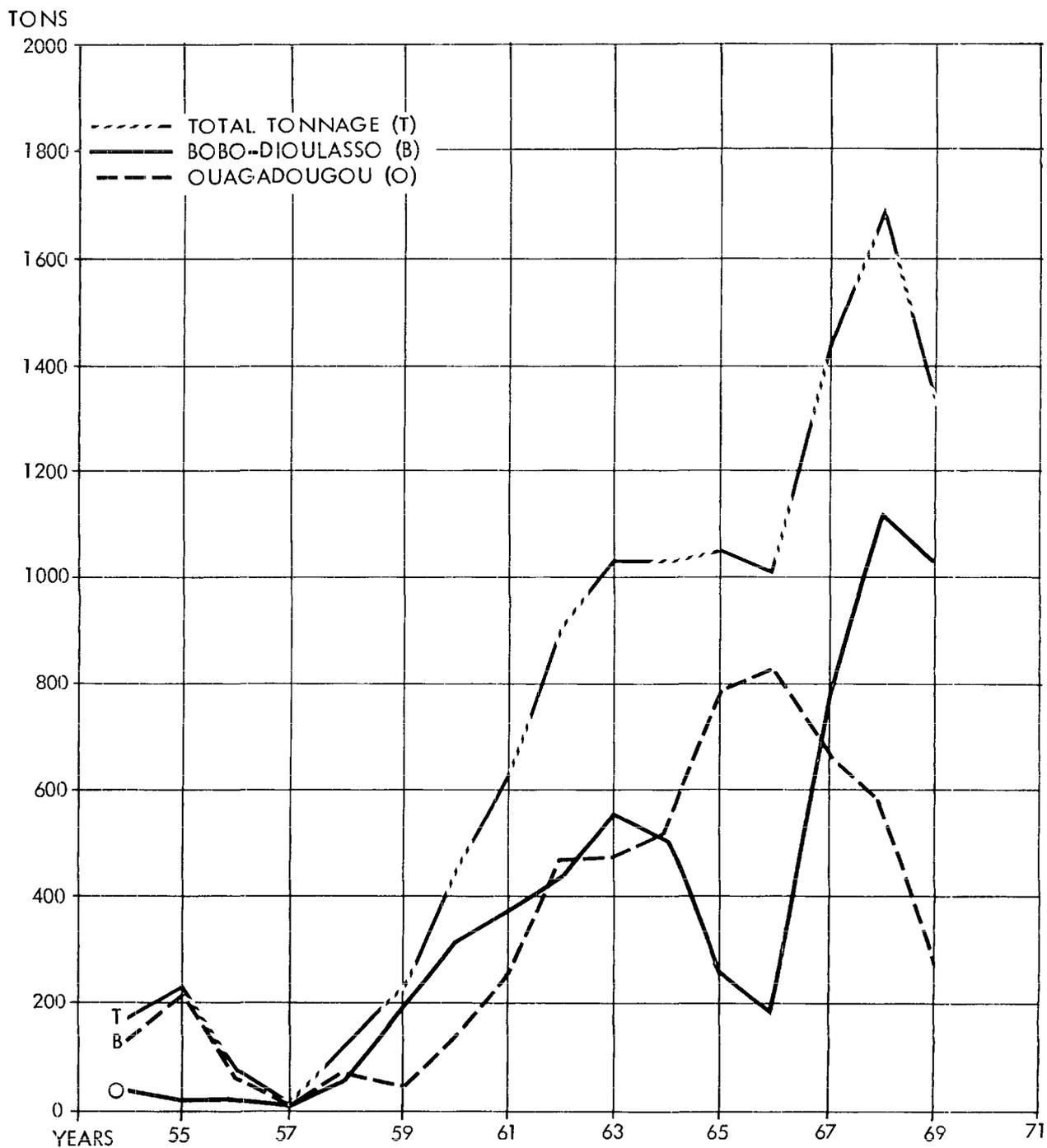
Source: Livestock Service

29. Beef exports have, depending on the year, amounted to between 50 and 80% of total shipments. During the period 1967-1969, exports averaged 1,486 tons, or around 1,500 tons.

30. In 1969 only a single African butcher had meat slaughtered for export in the Bobo-Dioulasso abattoir. Ever since an European butcher stopped operating owing to the (temporary) imposition of a national tax on

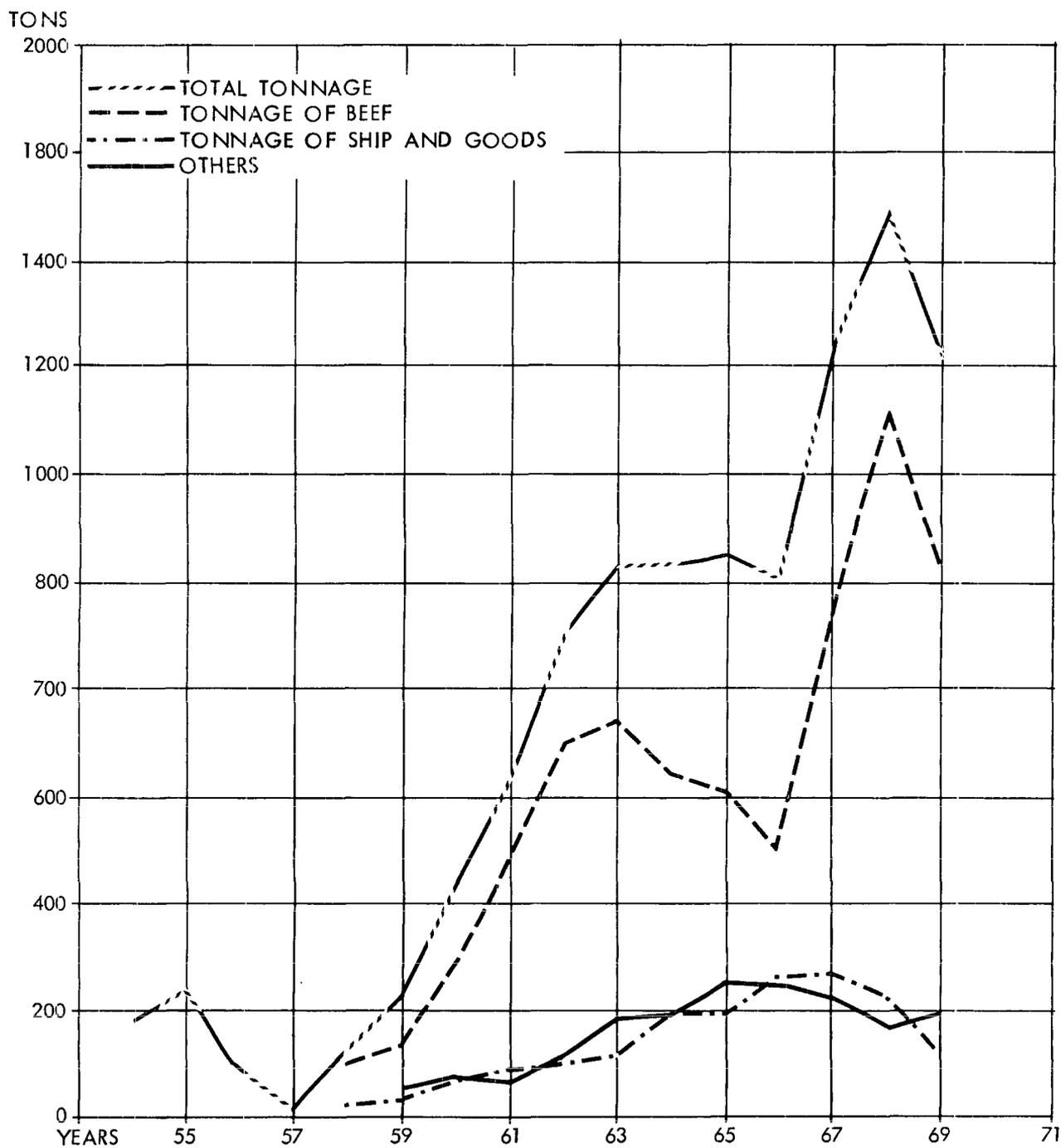
UPPER VOLTA: EXPORT OF MEAT

DISTRIBUTION BY ABATTOIR



UPPER VOLTA: EXPORT OF MEAT

DISTRIBUTION BY TYPE



slaughtering, the Bobo-Dioulasso abattoir has accounted for only 22 percent of total meat export. In 1966, Bobo-Dioulasso was the most important source of such exports, accounting for 828 tons.

Bobo-Dioulasso	828 tons	83%
Ouagadougou	<u>175 tons</u>	<u>17%</u>
Total	1,003 tons	100%

31. These developments show clearly the uncertainties of the market. Not only does the supply of livestock vary considerably in terms of both quantity and quality, but the proportion slaughtered in Upper Volta can be seriously affected by the imposition of a tax on slaughtering and by difficulties encountered in foreign markets such as the regulation of retail price of meat as in Abidjan, or restriction on transfer of payments as in Ghana. The latter is, however, the best placed traditional client for livestock, and this makes it urgent to negotiate on an intergovernmental level more realistic trade agreements than those signed privately by certain Voltaic companies. The first meat exports to Ghana started in 1968 but ceased in the second half of 1969 because of non-payment in convertible exchange.

Exports of Animals on the Hoof

32. Estimated exports of Voltaic livestock plus animals from Mali and Niger are given in Tables 8 and 9.

Table 8: EXPORTS OF VOLTAIC LIVESTOCK (AVERAGE 1966-69)

Destination	Cattle (number)	Sheep and Goats (number)	Poultry (tons - carcass)
Ivory Coast	35,000	125,000	2,000
Ghana	30,000) 150,000	-
Togo & Dahomey	10,000)	-
Total	75,000	275,000	2,000

The figures shown are lower than those reported by the official agencies which include both Voltaic livestock and animals from neighboring countries treated as local livestock by the customs authorities.

Table 9: EXPORTS OF LIVESTOCK ORIGINATING FROM MALI AND NIGER
(Average 1966-1969) - Products in actual transit

Origin	Destination	Cattle (number)	Sheep and Goats <u>a/</u> (number)
Mali	Ivory Coast	60,000	30,000
	Ghana	30,000	25,000
	Togo & Dahomey	<u>5,000</u>	<u>5,000</u>
	Sub-total	95,000	60,000
Niger	Ivory Coast	-	20,000
	Ghana	-	15,000
	Togo & Dahomey	<u>5,000</u>	<u>5,000</u>
	Sub-total	5,000	40,000
TOTAL		100,000	100,000

a/ Mostly sheep.

Exports of Poultry

33. Upper Volta exports poultry to Ivory Coast. The quantities exported have risen steadily from 420 tons in 1960 to 2,610 tons in 1968 and more than 3,000 tons in 1969 (see Table 10).

Table 10: CONTROLLED EXPORTS OF LIVE POULTRY
(Unit: tons - net weight without packaging)

Year	tons (net weight)
1960	421.8
1961	291.3
1962	815.6
1963	963.1
1964	1,307.6
1965	2,235.7
1966	2,473.4
1967	1,895.4
1968	2,610.9
1969	3,100.9 (provi- sional estimate)

Source: Livestock Service

In 1969, official exports of dressed poultry amounted to 6 tons. These exports take place mainly for the year-end holiday season. Losses are frequently very high, whatever mode of transport is used and are largely due to the poor condition of the animals. The major points from which poultry are shipped by rail are Bobo-Dioulasso, Hiangoloko, Ouagadougou and Koudougou. Assuming an average carcass weight of 700 g, exports are equivalent to about 2,000 tons of meat (average 1968/69).

Imports

Live Animals

34. Imported animals are intended either for breeding (heifers) or are of little commercial value and destined for slaughter. Since it is impossible to distinguish between these two categories and some breeding stock is in turn exported to Ghana, it will be assumed that all the animals imported are intended for slaughter and are added to national production in the form of meat.

Table 11: IMPORTS OF ANIMALS ON THE HOOF (AVERAGE 1966-1969)

Origin	Cattle	Sheep and Goats
Mali	20,000	70,000
Niger	5,000	30,000
Total head of livestock	25,000	100,000
Carcass weight in kg	100	15
Equivalent in tons of carcass meat	2,500	1,500

35. These figures tally with estimates and breakdowns made by experts in Upper Volta and neighboring countries. Experience has, however, revealed major internal discrepancies in official data which cannot be explained away solely by errors in counting or in attribution. The SCET/Cooperation study should produce more reliable information on all internal movements in Upper Volta. The organization of the Common Market for Livestock and Meat, which was initiated in Niamey in March 1970 and which is to have its headquarters at Ouagadougou, will also help to update and make available statistical series whose importance, particularly in the field of medium-term and longer-term planning is evident.

Balance of Import-Export

36. Comparing the figures for "national" exports resulting directly from local production, and those for imported animals slaughtered locally, it can be seen that in 1970 Upper Volta is still a net exporter. However, all the experts are in agreement that this position is being steadily eroded. Production is no longer increasing while a combination of factors is bringing about an increase in local demand in terms of absolute value. The State cannot, without serious consequences, bring about a reduction in existing meat consumption. Higher taxation would prove ineffectual in the face of clandestine professional slaughtering or an increase in home slaughtering. Taxation could even reduce supplies for export. Recognition of this fact made it necessary to lift the national levy on meat less than a year after it had been introduced. The annual offtake from the country's herd will inevitably fall if the State fails to take the appropriate financial or fiscal measures to support the livestock industry or to obtain the external aid essential for its development. Otherwise it is certain that the current surplus will have turned into a deficit before 1985.

Table 12: IMPORT-EXPORT BALANCE (live and dead)
(number of head)

Movement	Cattle	Sheep and Goats
Export	83,000 <u>a/</u>	290,000 <u>b/</u>
Import	25,000	100,000
Balance	+ 58,000	+ 190,000

a/ Cattle: 75,000 (alive) + 8,000 (dead)

b/ Sheep and Goats: 275,000 (alive) + 15,000 (dead)

37. Expressed in terms of carcass weight, the export supplies amount to only 12,500 tons, or 2.5 kg per inhabitant per annum. It is thus evident that, for a population of 5 million inhabitants, the safety margin is very small.

38. Assuming a 2% rate of increase, the population will reach 6.5 million by 1983. The surplus will by then have entirely disappeared, provided all other factors remain unchanged and the level of consumption, in particular, is frozen at 8 kg/annum. Once this period has passed, consumption can only decline.

Place of Livestock Exports in Total Exports

39. The proportion of livestock exports to total exports has declined sharply since 1961 as is indicated in Table 13.

Table 13: LIVESTOCK EXPORTS

Products	1961	1962	1963	1964	1965	1966	1967	1968
Percentage of total exports:								
Live animals	85.8	64.6	61.3	55.5	58.2	55.4	51.3	47.7
Meat and skins	<u>0.9</u>	<u>4.9</u>	<u>6.1</u>	<u>9.4</u>	<u>4.7</u>	<u>9.7</u>	<u>7.7</u>	<u>6.8</u>
Total	86.7	71.5	62.4	64.9	62.9	65.1	59.0	54.5
Value f.o.b. (CFAF million):								
Live animals						2,271	2,525	
Meat						259	280	
Skins <u>a/</u>						<u>85</u>	<u>75</u>	
Total						2,615	2,882	

a/ Including crocodile skins.

Source: Comptes Economiques

Role of Livestock Production in GDP

40. According to national accounts, the contribution made by livestock production to Upper Volta's GDP varies between 11 and 12%.

Table 14: NATIONAL ACCOUNTS

Heading	1964	1965	1966
Gross Domestic Product (GDP) in CFAF billion	50.4	56.4	58.2
Trading in %	51.0	-	-
Non-trading in %	49.0	-	-
GDP per capita in CFAF	10,800	-	11,000
Livestock Production	6.0	6.3	6.5
Percentage of GDP	12.0	11.2	11.2

It must be emphasized that these are only estimates. Volume II (Agriculture) of this report estimates that in 1966 livestock production did not contribute more than CFAF 5.7 billion to GDP. This represents an income from all animal products of CFAF 250 per hectare used for extensive grazing. Assuming the national average carrying capacity to be 6 hectares/head, this gives an overall gross product of the order of CFAF 1,500 per head. This figure should be related to the 11.3 kg of meat produced per head of cattle maintained. On the basis of a price to the producer of CFAF 80 per kg, this gives a figure close to CFAF 900. The difference, CFAF 600 or 40%, presumably represents income from other types of animals.

41. The gross domestic product per herder is nonetheless believed to be greater than that per farmer. There are 600,000 herders as against 4,000,000 farmers, who together have an overall product of CFAF 30 billion. GDP per capita would thus be close to CFAF 8,000 for the farmers and CFAF 9,500 for the herders. It should, however, be noted that many of the herders do not own the animals which are entrusted to them by the settled farmers. Moreover, no significant conclusion can be drawn from these figures which are subject to considerable error. In fact, the incomes of farmers and livestock herders are unlikely to be very different.

42. For 1969, on the basis of information made available by SCET/Cooperation, we estimate that the livestock population contributed not less than CFAF 6 billion to GDP. It was made up as follows (value in billions of CFA francs).

<u>Species</u>	<u>Value of product</u>	<u>%</u>	<u>Value of Capital</u>	<u>%</u>
Cattle	3.6	60.0	22.5	75.0
Small ruminants	1.8	30.0	6.0	20.0
Poultry	0.5	8.3	0.5	1.6
Others	0.1	1.7	1.0	3.4
Total	6.0	100.0	30.0	100.0

On this basis, the gross rate of return on livestock capital (ratio between capital and product) can be estimated at 20% on average for livestock as a whole. The gross "rates of return" for the various types of animal are given in Table 15.

Table 15: GROSS RETURN ON LIVESTOCK CAPITAL

		<u>Value of Capital</u>	<u>Value of Product</u>	<u>Rate of Return</u>
Cattle	2,500,000 x 9,000 =	22.5	3.6	16%
Small ruminants	4,000,000 x 1,500 =	6.0	1.8	30%
Poultry		0.5	0.5	100%
Other species		1.0	0.1	10%

Meat Yield of Voltaic Livestock

43. Per capita livestock productivity can be expressed in terms of the total carcass weight of the take-off divided by the total number of livestock maintained in the country.

Domestic consumption: (175,000 - 8,000)	167,000 x 95 =	15,875,000 kg
Exports (live and dead): (75,000 + 8,000)	83,000 x 150 =	12,450,000 kg
Total offtake:	250,000	28,315,000 kg
Per capita:	$\frac{28,315,000}{2,500,000}$	= 11.3 kg

Although one-third of Upper Volta's total cattle population consists of taurins and cross-breeds, which give a higher meat yield than Zebus, animal productivity in Upper Volta is considerably lower than comparable estimates for Mali and Niger.

Niger	: 14 kg	: Zebus	(1965) (Robinet)
Mali	: 15 kg	: Zebus and <u>Taurins</u>	(1964) (Lacrouts et al.)
Entente	: 13 kg	: Regional average	(1966) (Tyc et al.)
Belgium	: 93 kg	:	(1964) (OECD)

These figures on meat productivity per animal maintained are useful, not for its absolute value, which is at best approximate, but as an indication of the way Upper Volta compares with neighboring countries. On this basis the figures for Upper Volta is extremely low.

Incidence of the Cattle Tax

44. All cattle aged 2 years and above (small ruminants are excluded) are in principle subject to an annual tax of CFAF 200 per head (CFAF 150 in the Lobi country). In actual fact, however, the amounts collected are always well below the amounts assessed, as the following estimates show:

Amounts assessed:	CFAF 112 million
Amounts collected:	CFAF 80 million (400,000 head at CFAF 200)
Incidence for 2,500,000 head of cattle:	CFAF 32/head
Effective rate:	CFAF 200/head
Except in the Lobi country:	CFAF 150/head (Gaoua-Diebouyou)

45. Less than one animal out of five is actually taxed, so that the average tax is only CFAF 32 per head. If meat production is estimated at 12 kg per animal maintained and the producer receives CFAF 80 per kg, gross income per head of cattle amounts to CFAF 960. The incidence of the tax is therefore 3.34 percent on this gross income. Herders would be much less unwilling to pay a considerably higher levy (say, CFAF 70 per head) if it were related to specific services which they felt to be of direct benefit to themselves.

46. National or local taxes should in theory be levied on the value of products marketed not on the animal itself, the means of production. However this idea, although attractive and apparently simple, has always been difficult to apply in practice.

Conclusions

47. The value of Upper Volta's livestock potential in relation to local and foreign demand is being gradually eroded. No one need have any illusions on this score. Lack of animal care and the unsuitability of traditional methods of livestock rearing do not entirely account for this situation. The situation will become more serious as the result of the growing competition between man and beast, in which both are likely to be the ultimate loser. The longer remedial action is delayed, the greater will be the expense of rehabilitation, including both investment and recurrent charges. It is hardly likely that the pastoralists themselves, who appear already resigned to losing their place ^{1/} in a society indifferent to their problems, will be able to conceive of and carry out a dramatic solution to this problem.

C. Production and Marketing of Hides and Skins ^{2/}

Present Situation

48. By the end of 1967 the Ouagadougou Tanning Center, opened in April 1964, had accumulated a deficit of over CFAF 40 million. The balance sheet was burdened by a stock of 70,000 virtually unsalable goatskins, unused dyes and vegetable tanning materials (gonakie). In addition, the staff, 50 workmen and supervisors including fifteen regular apprentices (shoemakers, morocco-leather dressers, saddlemakers), had virtually acquired the status of civil servants and presented an obvious social problem. After three expert missions (Robinet, Flavigny, Chambard), a plan designed to put

^{1/} Barral (H) - Les populations d'éleveurs et les problèmes pastoraux dans le Nord-Est de la Haute Volta (Cercle de Dori - Subdivision de l'Oudalan). 1963-1964 - Cahiers ORSTOM série Sciences humaines, volume IV, no. 1/1967, particularly page 28, paragraph 2 and conclusion.

^{2/} See Annex 3 and Chapter II - Item I.

the Center on its feet was adopted by the Government. The craftsmen were organized in an independent cooperative and separated from the tannery proper and the personnel was reduced to 25 workmen. The two French technical assistants, the director and the production chief, were replaced.

49. Finally, collection, which (together with preparation) was the weak point in the local marketing setup, was confided to a new mixed corporation, the Voltaic Hides and Skins Corporation (Societe Voltaique des Cuirs et Peaux -- SVCP), in which private enterprise took a 51% interest, the State 47%, and the Tanning Center and the Development Bank 1% apiece. The new corporation commenced operation on September 1, 1968.

50. The tasks of SVCP as laid down in Article 3 of its Articles of Association, are:

- (i) collection from producers, purchasing, distribution, sale and export of hides and skins in all stages of processing, either for its own account or for that of third parties, on a commission basis or otherwise;
- (ii) establishment and operation of depots and sales outlets and of installations of all types relating to the treating of hides and skins;
- (iii) operations relating to preparation, transportation and brokerage in whatever form, necessary for its commercial activity;
- (iv) participation in all public or private contracts, by award or otherwise;
- (v) participations in corporations or associations formed for one or the other of the purposes listed above and, in general, in all commercial, financial and real estate operations directly or indirectly connected therewith.

In 1969 SVCP's profit after tax and depreciation worked out at 10% of sales volume, or nearly CFAF 80 million.

51. The Tanning Center (CTMC) is still having an uphill struggle but is no longer running a deficit. Its profit for the year worked out at CFAF 1 million at the end of 1969, with a sales volume of CFAF 15 million, excluding depreciation. The State has taken over and settled foreign debts totaling CFAF 16 million and has waived repayment of a CFAF 14 million loan. Part of the stock of goatskins and all the leather has been disposed of after processing into objets d'art, rugs, coverings, and miscellaneous suede or velvet-type articles decorated with local-style pokerwork. Custom processing of goatskins collected by SVCP has now become its principal activity. Under normal circumstances the latter has to provide the Center with 8,000 skins a month, which are returned to it "wet blue".

Flanks of cattle hides have also been tanned. The craft-product section must be maintained for even the supply of 90,000 skins a year ^{1/} is still insufficient to make the Center a going concern. The supply of these skins also deprives SVCP of certain markets offering greater returns for raw than for tanned skins.

52. Increasing the number of skins collected and better preparation are therefore the two key means in coming years of assuring the viability of the two enterprises. For instance, if CTMC is to meet full depreciation charges and achieve financial equilibrium, it must not treat fewer than 150,000 small skins a year as long as the salaries of the two technical supervisors are paid in full by the French Government. This figure will have to be increased to 200,000 when Upper Volta assumes full responsibility for the payment of these two staff members. If SVCP is also to export 300,000 of undressed hides by 1975, the total annual collection of hides and skins would have to be 500,000. Since there are no supervisory staff under training, Voltaic personnel will not be available to take over the senior positions at the Center before 1973-74 at the very earliest.

Production in 1969

Resources 2 /

53. Tables 16 and 17 provide data on the number of hides and skins available (equal in theory to the estimated number of animals slaughtered) and the number collected and processed. Processing refers to the preparation given to the skins immediately upon slaughtering in order to ensure their preservation.

Table 16: ESTIMATED AND OFFICIAL FIGURES FOR ANIMALS SLAUGHTERED IN 1968
(Number of hides and skins available - figures rounded off)

	Cattle	Sheep	Goats
Estimated	200,000	300,000	650,000
of which controlled slaughter:			
number	85,000	35,000	130,000
percentage	42.5	11.5	13.0

1/ The actual figures were only 57,791 in 1969 and 4,300 in 1968.

2/ See also Annexes 1 and 3.

Table 17: HIDES AND SKINS PROCESSED AND COLLECTED BY SVCP AND HAUSA MERCHANTS IN 1968

	Cattle hides	Sheepskins	Goatskins
<u>Processed:</u>			
number	75,000	30,000	100,000
percentage of total available	35	10	15.5
<u>Collected:</u>			
number	130,000	100,000	350,000
percentage of total available	65	33	53
of which <u>SVCP</u>			
number	69,510	53,636	201,996
percentage	54	53	57

The collection and processing of skins presents the most serious problem. The percentage collected and processed is only between 10 and 15, depending on the type, while their market value is proportionally higher than that of hides leathers for which demand is well below supply on the world market. Good preparation or processing can increase the selling price by 50 to 100%, depending on the intrinsic quality of the skin.

54. A summary of the volume and value of gross production in 1969 is given below. The prices are for goods delivered to depots in Bobo-Dioulasso or Ougadougou.

a) Cattle hides

Number of hides available	200,000
Average unit weight in kg	4.8
Price per kg, dry (CFAF)	80
Weight in metric tons	960
Total value in millions of CFAF (rounded off)	77
Useful area in square feet	25 to 28
Classification by grade	30/30/20/10/10

b) Sheepskins

Number of skins available	300,000
Average unit weight in kg	0.6
Price per kg, dry (CFAF)	170
Weight in metric tons	180
Total value in millions of CFAF (rounded off)	31
Useful area in square feet	5 to 7
Classification by grade	20/30/30/20

c) Goatskins

Number of skins available	650,000
Average unit weight in kg	0.430
Price per kg, dry (CFAF)	240/235
Weight in metric tons	280
Total value in millions of CFAF (rounded off)	66
Useful area in square feet	4 to 5
Classification by grade	20/30/30/20

d) Summary

Total weight available in metric tons	1,420
Value to producer in millions of CFAF	174

Utilization and End Value of Production ^{1/}

55. The destination of hides and skins falls into three categories:

- (i) Domestic consumption by local craftsmen, use within the family and some direct sales to the Tanning Center.
- (ii) Exports of undressed hides and skins - to Europe for the account of SVCP, and to Niger and Ghana, through border trade (often clandestine) engaged in by some Hausa merchants.
- (iii) Exports of tanned and worked hides and skins. Such exports are handled by SVCP as far as wet blue skins are concerned (goatskins) and by CTMC as regards African craft work sold to tourists and some tanned leathers exported to Togo for the Bata company.

Mention should also be made of the various losses that are caused by predators, deficiencies in processing and simple scrapping; in certain regions skins are even eaten. With the exception of (iii) and a proportion of (ii) it is difficult to assign satisfactory figures to these various end-uses which in any event vary widely depending on the product concerned. Large numbers of sheepskins, particularly those obtained from ritual slaughterings (baptisms, marriages, Tabaski) are used by the families involved.

56. The normal trade in these articles is distorted by transfers and speculation in various forms, especially by fluctuations in stock due to the world market situation for leather and leather goods. Currently trade is still strongly influenced by the fact that skins are in fashion while hides are suffering from a depression owing to the reduced demand for heavy walking shoes, leather soles and harness, and military equipment made of leather, coupled with a larger supply of hides resulting from beef consumption.

^{1/} Cf. Annex 3.

57. Table 18 provides rough estimates of the supply and utilization of hides and skins in 1969.

Table 18: ESTIMATED UTILIZATION OF THE OUTPUT OF HIDES AND SKINS - 1969

1) In numbers

	<u>Cattle hides</u>	<u>Sheepskins</u>	<u>Goatskins</u>
a) Domestic consumption	50,000	175,000	250,000
b) Exported raw	125,000	100,000	250,000
c) Exported tanned	5,000	-	100,000
d) Losses or other uses	20,000	25,000	50,000
e) Total	200,000	300,000	650,000

2) Approximate end value in millions of CFAF

	<u>Cattle hides</u>	<u>Sheepskins</u>	<u>Goatskins</u>
Value of a)	15	20	30
Value of b) + c)	<u>70 + 5</u>	<u>15</u>	<u>40 + 20</u>
Total	90	35	90
Total a + b + c	CFAF 215 million <u>a/</u>		

a/ of which CFAF 80 million represents SVCP's 1969 sales volume.

No figures for crocodile skin are available for 1969.

The Future of SVCP and CTMC

58. SVCP, which treated 450 tons in 1969, or 32% of the production and 53% of the hides and skins collected, stocks included, considers it will reach the following figures in 1970, representing a 20% increase over the previous year:

Number of cattle hides	: 85,000 - 405 tons)	
Number of sheepskins	: 65,000 - 40 tons)	Total : 540 tons
Number of goatskins	: 225,000 - 95 tons)	

The Government must continue its efforts with respect to collection, which is carried out in broad daylight and without any possibility of fraud.

59. SVCP's Articles of Association also permit it to play a role in the treatment of hides at the time of slaughter. However, this entails a partial and temporary delegation of the State's responsibilities, since the State still retains final authority in this field. It ought then to reimburse SVCP for the expenses (personnel, transport, materials), which later would contract for this purpose. In any event any such action is likely to be replaced soon by direct State action unaffected by any commercial considerations.

60. As regards the Tanning Center, its limited means prevent it from undertaking any activities other than those at present assigned to it, namely custom-processing of leather and production of craft articles in that material. An annual output of 200,000 tanned skins -- a level that has not yet been reached -- is not sufficient for the export trade owing to the variety of origins, weights, qualities and sizes involved. It will therefore be essential for this production to be incorporated into a larger enterprise better able to make up and market batches that are big enough for the world market. Care must be taken to avoid a return to the small-scale trading approach, the fatal consequences of which were noted at the beginning of this section.

The Prospects for the Sector - Measures to be Taken

61. The preceding analysis indicates that the results achieved so far are sufficiently encouraging to warrant the continuation of efforts to encourage production and enhance its value. Efforts should focus essentially on:

- (i) The establishment of a hides and skin preparation section, for the proper operation of which the State must assume responsibility. This preparation will be done at the time the animals are slaughtered in the public abattoirs and in the official markets.
- (ii) The improvement of the collection arrangements. This has been facilitated by the establishment of SVCP. On the other hand, the preparation of hides and skins for which the Livestock Service is responsible must be completely reorganized. While the Director of SVCP does his best to encourage butchers to treat skins in the bush, using whatever is at hand (frames, wires, straw shelters), he can hardly carry out the tasks for which extension workers (moniteurs) should be responsible, namely those of ensuring that each skin is properly prepared in a well-maintained dryer, and of supervising the work of butchers and extension workers. However well formulated a set of rules for the treatment of hides and skins may be, it remains ineffective if the basic organization for implementing them is missing, as in Upper Volta.

62. Before considering an investment program, it is a matter of urgency that a preparation section with a separate and appropriate budget be set up; this budget should be financed from a preparation levy charged on products exported. The section should provide for:

- (i) a score of qualified technicians to carry out the supervision of 35 to 40 markets initially;
- (ii) the distribution of equipment and supplies required for treatment (knives, rope, measures, dyes, stamps, arsenate); and

- (iii) means of transport for the personnel (mounts, bicycles, mopeds), and a van for taking supplies out to the main centers and for staff inspections.

This section should be placed under the Animal Industries Service.

63. The appointment of the moniteurs must be accompanied by the drawing up of detailed inventory of the amount and condition of existing equipment. There are in fact twenty bush abattoirs-dryers which were set up with FAC and FIDES credits some ten or more years ago and have now more or less been abandoned (Annex 3).

64. Determination of the new or renovated equipment required in the light of the importance of traditional equipment will provide the basis for drafting an investment program spread over a two-year period. In the beginning the personnel responsible for supervising and teaching proper methods of preparation under the authority of sector chiefs should work with the simplest of equipment (dryers under straw shelter, arsenic curing in barrels). The fitting out of fifteen centers with abattoirs, dryers, wells and storage facilities for skins collected is under study.

65. Within the framework of these recommendations, one would stress:^{1/}

- (i) the importance of providing an economic justification for each location through proper analysis of the turnover and volume of slaughter in the local market; and
- (ii) the need for effective and conscientious supervision by qualified personnel with adequate means at their disposal.

^{1/} See also page 119.

D. The Health Situation

66. Upper Volta's geographical location provides no protection against diseases. The volume of transit trade in livestock, climatological factors and even the intervention of man have created conditions under which the country's livestock suffers from a varied range of microbial, parasitic or other infections which frequently assume epizootic proportions. It will be noted that the financial resources and equipment available to the Livestock Service are inadequate to enable it to eradicate these diseases, or even to take preventive measures sufficient to prevent them from spreading. Tables summarizing the health position over the past five years are given in Annex 4. In the following section some of the main diseases which seriously limit the economic potential of the livestock sector will be considered.

Rinderpest

67. Officially rinderpest has disappeared since 1966, after a joint international campaign lasting three consecutive years in which 80-85 percent of the livestock was vaccinated. However, the threat still persists, and in a highly serious form; in the last three years 50-60 percent of the young stock has ceased to be immune to the disease because the necessary follow-up measures after the mass vaccination campaign are not being applied in full owing to lack of funds. Two suspected outbreaks occurred in 1968 and 1969 on the Mali frontier, along the Beli. These point up a situation which warrants much more concern on the part of the Government for the future of the country's livestock than it displays at present, despite the warnings of its specialist staff.

68. The first reported center of infection (1968) was indisputably a case of rinderpest. The second cannot be considered as scientifically proven, since the laboratory was unable to arrive at a definite conclusion owing to the poor quality of the sample received. The animals in the reported area of infection, whether Malian or Voltaic, were destroyed (if contaminated) or vaccinated over a radius of about 10 km from the two foci of infection in Voltaic territory. Two Voltaic teams and another from Mali combined their efforts. The number of animals that died before the outbreak was confirmed is not known. Twenty-three animals were slaughtered in 1968 and one in 1969. The two outbreaks were reported in February, with one year between them.

69. The animals infected had never been treated previously, which indirectly demonstrates the effectiveness of vaccination. The number of vaccinations, which totaled 376,891 between November 1967 and April 1968, had fallen off to only 41,500 between May 1968 and April 1969. Five thousand vaccinations were carried out in 1968 in the centers of infection referred to above, and 1,000, including animals in transit, in 1969.

70. The danger is therefore considerable if systematic annual immunization of young stock aged between six months and three years is neglected. It is estimated that such young stock represents 33 per cent of the total number (2,500,000 head), or 800,000 head in 1970. The annual cost of immunizing them is estimated at CFAF 40 million on the basis of CFAF 50 per dose, but the longer immunization is delayed the lower will become the percentage of animals protected as the number remaining of those vaccinated between 1964 and 1967 dwindles. If it is left until 1977/78 the entire herd will have to be revaccinated at a much higher cost -- something like CFAF 200 million, inclusive of operating and equipment costs.

71. The cost of the measures required to maintain immunization will not become any less, however, unless definite confirmation is received during the intervening period that rinderpest has been permanently eradicated from the African continent, which is hardly likely. 1/

Bovine Pleuropneumonia

72. The position as regards this disease is shown in Table 19.

Table 19: FOCI OF INFECTION CONFIRMED SINCE 1963

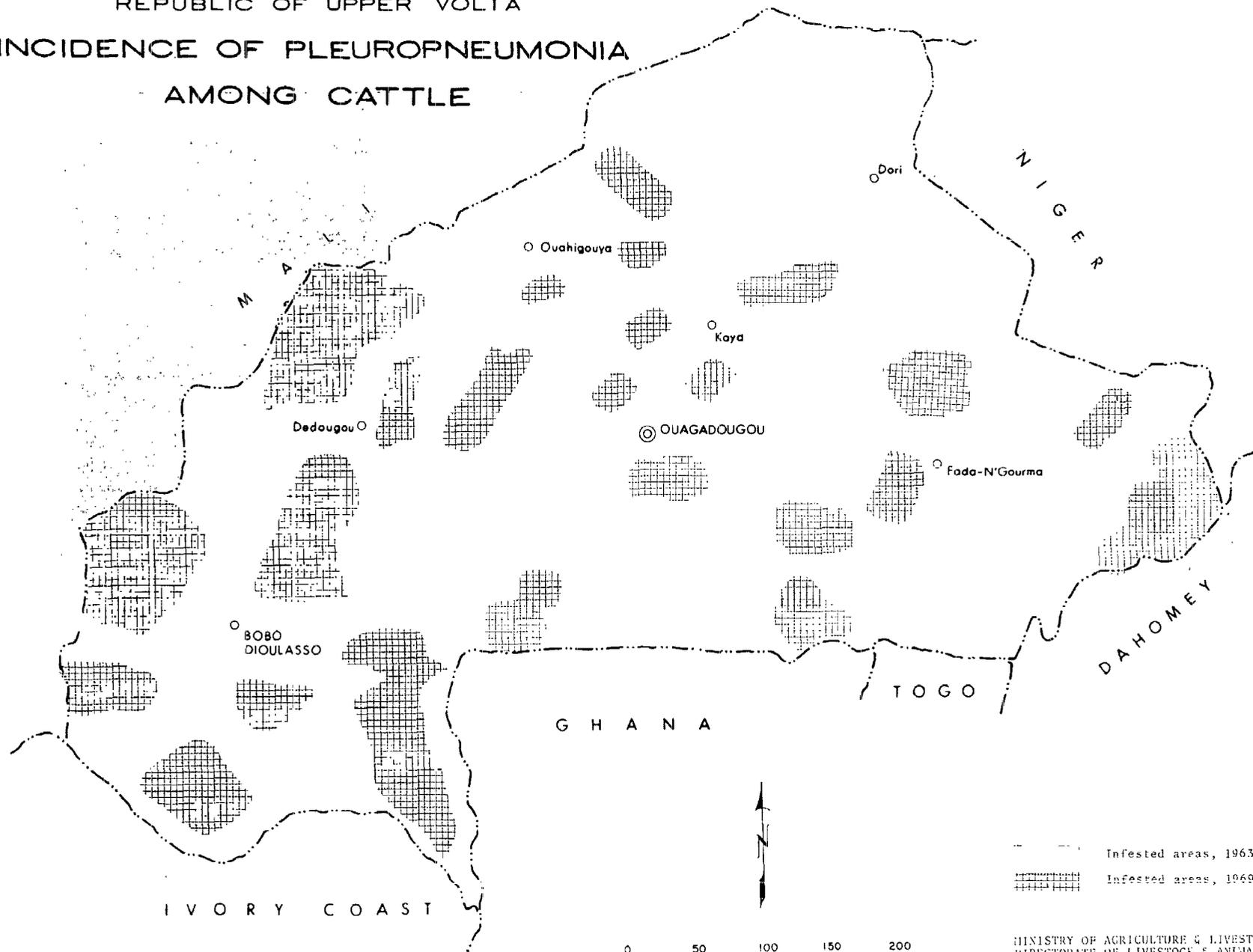
Year	Number of foci	Animals sick	Animals dead
1963	54	1,482	559
1964	64	3,148	1,462
1965	35	1,246	890
1966	54	2,314	1,471
1967	45	630	240
1968	94	1,972	803
1969	73	1,122	565

In 1963 only three areas, located in the West and Northwest, bordering Mali, were affected. In 1969 no part of the country was spared. At the beginning of 1970 no single area of Upper Volta could be considered unaffected (see maps enclosed); in fact, taking the country as a whole, there are now something like a hundred permanent fluctuating foci. This rapid spread is due to:

- (i) the lack of equipment and funds for a rational campaign which would necessarily have to entail the systematic slaughtering of all affected animals and the application of rigorous quarantine measures to detect and isolate disease on obligatory livestock route;

1/ The serious rabies outbreak on the Franco-German border should be borne in mind. The disease has never been permanently banished from European continent.

REPUBLIC OF UPPER VOLTA
 INCIDENCE OF PLEUROPNEUMONIA
 AMONG CATTLE



..... Infested areas, 1963
 [Cross-hatched] Infested areas, 1969

MINISTRY OF AGRICULTURE & LIVESTOCK
 DIRECTORATE OF LIVESTOCK & ANIMAL
 INDUSTRY SERVICES

REPUBLIC OF UPPER VOLTA LIVESTOCK ROUTES (AS OF 1966) CATTLE(C) AND SHEEP AND GOATS(SG)

- ① Point of entry
- PUYTENGA Principal livestock markets
- 1 Points of exit

C	50.000
SG	100.000

C	15.000
SG	20.000

C	5.000
SG	30.000

MALI	
C	60.000
SG	100.000

C	120.000
SG	100.000

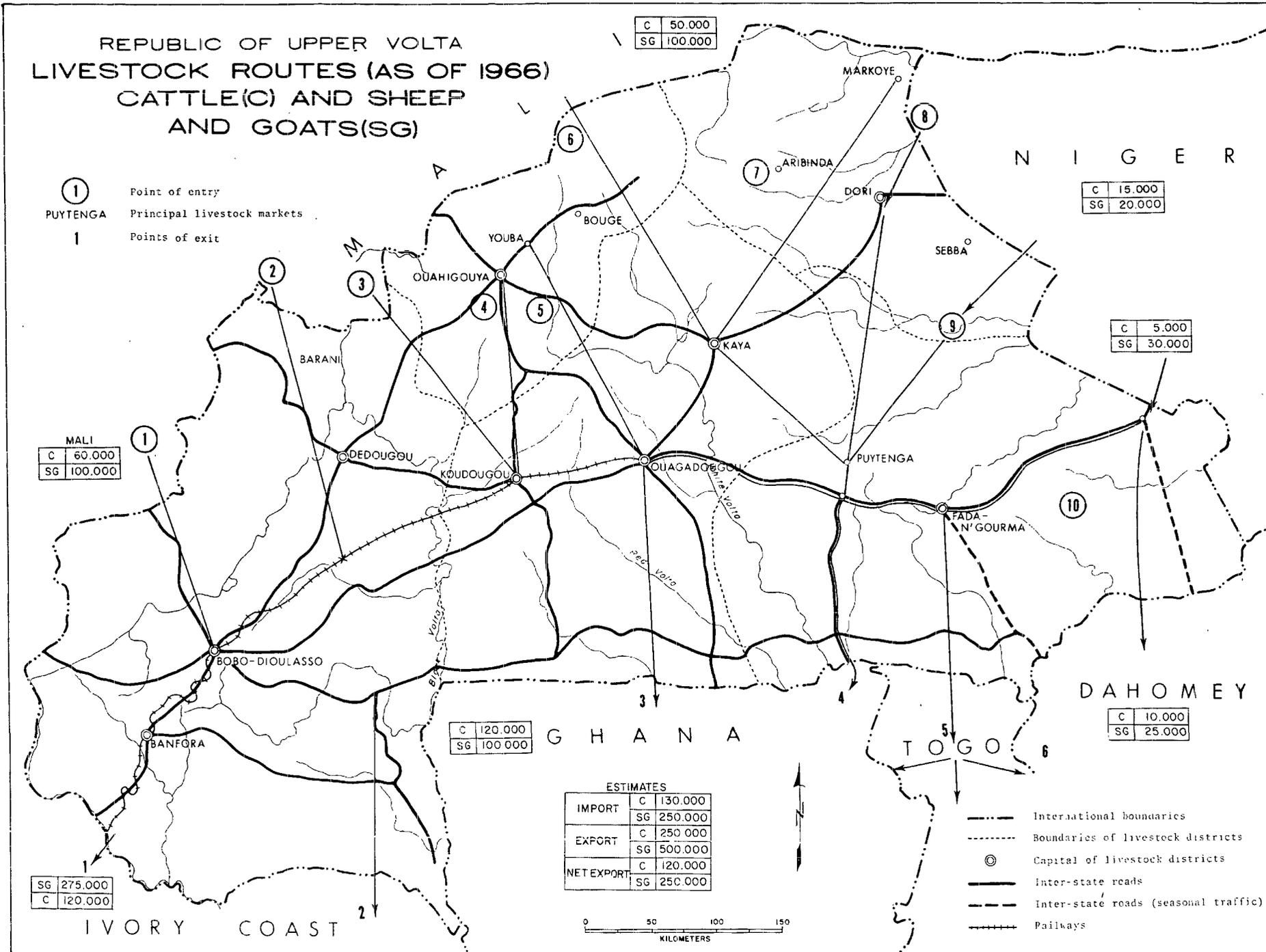
C	10.000
SG	25.000

SG	275.000
C	120.000

ESTIMATES	
IMPORT	C 130.000
	SG 250.000
EXPORT	C 250.000
	SG 500.000
NET EXPORT	C 120.000
	SG 250.000



- International boundaries
- - - Boundaries of livestock districts
- ⊙ Capital of livestock districts
- Inter-state roads
- - - Inter-state roads (seasonal traffic)
- ++++ Railways



- (ii) the growing number of carriers passing through Upper Volta on their way to the coastal countries. Proof of this is provided by the fact that all the major North-South routes used across the country by cattle dealers are badly infected. Animals exported by Mali and Niger to Ivory Coast or Ghana trek through between 500 and 1,000 km of Voltaic territory;
- (iii) ineffective vaccination of healthy carriers or undetected sick animals and the use of chemotherapy unaccompanied by an effective quarantine and systematic slaughtering (stamping out).

Vaccinations Carried Out

73. Owing to the external origin of the infection and the particularly slow and insidious nature of the contagion, systematic vaccination is not done. The Livestock Service does not step in until a center of infection has been declared to exist. Vaccination is only carried out in a very limited area. The following table provides an idea of the ratio between the increase in the number of cattle and the vaccinations effected between January 1963 and the end of 1969. On an average only 0.6 percent of the cattle is therefore vaccinated, an absurdly low percentage with no practical effect since the disease has been becoming increasingly widespread for six years.

<u>Year</u>	<u>Assumed number of cattle</u>	<u>Vaccinations</u>	<u>%</u>
1963	2,000,000	147,436	0.73
1964	2,080,000	120,896	0.58
1965	2,300,000	124,092	0.58
1966	2,340,000	75,426	0.33
1967	2,400,000	156,705	0.65
1968	2,425,000	127,079	0.54
1969	2,450,000	179,840	0.73

Vaccines Used

74. Before February 1969 the Service obtained two types of vaccine cultures in liquid form from the Dakar Laboratory. One was from the DK1 strain (Perized), reserved for Zebu cattle, and the other from the T3 strain, less strong than the former, reserved for taurins (Peritor). These two strains do not keep well, and only for a short time in any case. While the immunity provided is satisfactory it lasts for only about six months, hence not very long, which is an obstacle to a mass vaccination campaign. From March 1969 onwards these two vaccines have been replaced by a freeze-dried type prepared from the T1 strain which retains a high immunizing value for one year provided it is kept under permanent refrigeration. The protection afforded definitely exceeds eight months, although it has yet to be proved that it lasts for as long as a year.

75. Tests which reproduce conditions of natural transmission through the cohabitation of vaccinated cattle with controls and infected animals have made it possible to reach a meaningful judgement regarding the value of this strain. It appears to have no harmful effects, although more virulent than the Kii 3J strain which has limited immunizing potential. The Australian V5 strain is considered too strong for African cattle and is therefore unsuitable for large-scale utilization.

76. Huddart (FAO), after noting the effectiveness of T1 vaccine in East Africa, considers that if all the cattle in an infected area were to be vaccinated twice in the first year and once yearly in the two subsequent years, the disease ought to be stamped out. At Dakar, the results of the tests carried out by Doutre and Chambon will soon be known and will make it possible to evaluate the length of the immunity provided by the T1 strain in West Africa.

77. Finally, at Fort-Lamy, combined rinderpest and pleuropneumonia vaccination appears in principle to be giving good results, although the use of the Kii 3J strain makes it considerably less attractive from the economic angle owing to the low level of immunity provided by this strain (duration and virulence) (Perreau).

78. The conclusions which may be drawn from the foregoing brief summary are the following:

- (i) In the case of a localized infection center, mass vaccination using a Kii 3J freeze-dried strain can be applied without worrying about either reaction or hostility on the part of cattle owners. Since the immunity afforded does not last long, vaccination should be repeated every six months and accompanied by strict separation of infected animals from healthy ones, together with total commercial and sanitary isolation of the area. These measures very much limit the preventive value of a mass campaign but are of a definite indirect economic value in that they protect the healthy animals from infection.
- (ii) When infection is general and widespread, as is the case at present in West and Central Africa, results will only be obtained by the combination of four series of measures. These are, in order of importance:
 - (a) the supervision of commercial or any other movements of cattle on compulsory routes;
 - (b) the detection and isolation of infected animals and of carriers;
 - (c) the slaughtering of all animals found to be infected under (b);
 - (d) the vaccination of healthy stock.

79. While (ii) (a), (b) and (c) could be put into practice immediately throughout the entire country, as preliminary but indispensable measures, (ii) (d) is still subject to certain scientific and financial reservations which have so far postponed its application throughout the African continent.

80. By the end of 1970 the results of experiments with the T1 vaccine should be known, including the duration and value of the immunity conferred and the extent of possible harmful effects particularly in the case of taurins. The results obtained will then have to be confirmed in the field by a three-year pilot campaign involving animals susceptible to the disease. FAC intends to start such a campaign in 1971 among 160,000 head of cattle in the northern savannah region of Togo. Upper Volta might benefit from a similar program, should Togo refuse to meet the scientific requirements for these experiments.

81. Thus, from the economic and scientific angles no large-scale anti-pleuropneumonia campaign can be advised anywhere before 1974, particularly if the establishment of obligatory livestock routes and adequate supervision and the detection of foci of infection are not permanently assured. These measures must therefore be taken everywhere as soon as possible. The technical, financial and economic conditions for a campaign are considered in the second part of this report.

82. The foregoing in no way lessens the necessity of localized campaigns wherever the disease has gained a footing. As regards the preparatory measures listed under (ii) (a), (b) and (c), these should become a permanent part of an up-to-date system for the prevention of contagious diseases.

Other Microbial Infections

83. A limited campaign should be carried out in the centers of anthrax infection which periodically reappear around pools and swampy patches, particularly after years of pronounced drought (1967/68). Pasteurellosis also requires constant attention -- 500 deaths were reported in 1968. This situation is common to all African countries and the Livestock Service is quite capable of holding these diseases in check if provided with the means to do so. Tuberculosis and brucellosis, both human and animal, are endemic but form special cases, the detailed consideration of which would be beyond the scope of this report. Streptothricosis and rickettsioses come under the program to eradicate their vectors and are included under external parasite elimination campaigns.

Trypanosomiasis

84. The number of foci of infection confirmed each year is quite small, just 15 to 20. This figure does not provide a true picture of the spread of the disease, which is found throughout the entire country

including the Dori region and in all susceptible species. Only the cattle of the Sahelian North are unaffected, because they move into Mali for part of the year. Elsewhere the disease is brought in by the movement of herds to the North-East along the Sirba to Niger or southward to the Bobo-Ouagadougou-Fada-N'Gourma border route.

85. The trypanosomiasis problem is a socio-economic one. The Livestock Service is to be congratulated on halting the uncontrolled application of trypanocides in order to prevent the development of trypano-resistant strains. However, the stockfarmers insist on having the anthrycides, or "powder," which they are now obtaining from Ghana, Togo and Mali. They then ask for injections (against payment) from vaccinators formerly employed by the antirinderpest campaign who have kept (or, more precisely, stolen) their equipment, which now provides them with a source of easy money.

86. Although no trypanocides of any type was officially supplied between June 1968 and March 1969, there has not been any recrudescence of centers of infection. There can be no doubt that the solution lies in control of the vector, rather than in large-scale but often ineffective campaigns against the agent of infestation. However, the fact that the vector exists in bordering countries would be bound to lead to re-infestation if a campaign against the tsetse fly were not carried out at the same time in those countries. It must be added that, just as for onchocercosis, the technical difficulties involved in such operations are considerable. It is far from easy to calculate their cost in advance, and their economic effects are even more difficult to determine even though it is quite certain that they will have a beneficial effect both in principle and in practice. They would have to be financed by means of foreign subsidies and not by loans, in order to insure that the State would not become involved in an operation which would not show a sufficient return in the medium-term to permit repayment of borrowed funds.

Ticks and External Parasites

87. There are no tick-control dips in Upper Volta even though a real need for them appears to exist in the region where rainfall exceeds 1,000 mm. However, the operation of such dips raises operational and maintenance problems. The choice of the site is important insofar as it governs the frequency with which the dip will be used and hence the usefulness and value of the equipment. An epidemiological study of the region ought to make it possible to determine the areas most affected and those where the livestock density is highest. Some trial dips should be installed in order to test the herders' reactions and to determine the operating costs before moving on to a more large-scale program.

Internal Parasites

88. Internal parasites are giving increasing concern to veterinarians and agronomists in the context of collective campaign at ORD level. The effects of such parasites, particularly on the mortality among young stock, are well known. Unfortunately, eradication of parasites is costly and can really be effective only if coupled with action to prevent the use of reservoirs for drinking. The most effective and economic means of combating parasites is to prevent stock from drinking the polluted water of perennial ponds, reservoirs and any other perennial bodies of water where the parasite and its vectors can live and breed. Wells and boreholes must be provided not simply to provide cattle with drinking water (which is not so acute a problem in Upper Volta as in northern Mali and in Niger) but as an essential part of a campaign against parasitism and the transmission of certain contagious diseases.

E. Applied Livestock Research

Research Establishments

89. This section is based primarily on the report of J. Mordant, an IEMVT (Institut d'Elevage et de Medecine Veterinaire des Pays Tropicaux) expert assigned to analyze the stockbreeding potential of Upper Volta in 1967. ^{1/} Before considering the problem of research, the characteristics of the different animal species in Upper Volta will first be considered.

Zebu cattle

90. As regards Zebu cattle, it is hard to compete with Mali and Niger which are better placed for extensive natural production and ranching. There is, however, scope for fattening or finishing imported Zebus. At present, Mali Zebus are always in better condition than those of Upper Volta.

Trypano-Resistant Cattle (taurins)

91. These belong to the West African short-horn breed and are known as Mere in Upper Volta and Baoule in Ivory Coast. Little information is available on this breed; it will have to be studied, since taurins are very good meat animals. Upper Volta would be a very good place to do the necessary research, in view of the importance and concentration of this breed in the country.

Draft Animals

92. There is much less of a future for these than for animals raised for meat. It is not recommended that efforts should be made to develop a draft breed; rather, draft work should simply be a stage in the utilization of the animal, commencing when the animal is four years old and lasting for two to three years, after which the animal would be finished and fattened for slaughter.

^{1/} Mordant, J.: Le Potentiel Zootechnique de la Haute-Volta -- Cooperation -- 1969.

Small Ruminants

93. These are highly important from the economic, food and social standpoints. The raising of these animals should be developed and expanded at the same time as crop farming. Greater use could be made of improved breeds such as the Maradi goat which has a high productivity and whose skin fetches a good price on the world market.

Pigs and Poultry

94. These are typically associated with small family-type holdings. Their large-scale production has to be considered essentially in economic terms; any expansion depends on the urban market (purchasing power and taste of customers) and the rural market (increased money income from expansion of agriculture).

95. The present research stations include:

- (i) Banankeledaga: This is hardly suitable for anything but small-scale stockraising and possibly the study of the fattening of cattle or sheep by smallholders in cooperation with producers of market-gardening crops and agricultural by-products.
- (ii) Samandeni: This station was established to study the behavior of cattle in a hostile environment. It was never provided with adequate means to do so and its herd has been dispersed. Taking the present state of the country's finances into account, there is no great point in recommencing research that is of a fundamental nature and not therefore intended to produce concrete projects in the short term. It would be preferable to close the station down altogether.
- (iii) IRAT (Institut de Recherches Agronomiques Tropicales et de Cultures Vivrieres): Saria and Farako Ba are doing very good work on fodder production and animal traction; there is no point in duplicating their efforts. However, the Livestock Service could be associated more closely with their work and the results of the experimental work carried out should be very widely publicized among the agricultural services, the Livestock Service and the ORDs.
- (iv) Markoye: This station is working in the Sahelian region, i.e. on Zebu cattle. 1/

96. Like Mordant, we recommend that only one new research station be set up: i.e. for the study of the potential of the trypano-resistant short-horn Mere and Baoule cattle, with experimental work on intensive fattening techniques as a subsidiary activity. However, the latter work,

1/ See also paragraph 99.

should not be just a sideline, but rather one of the more important research subjects in the Soudanian region. It will determine the most economic rations on the basis of the by-products available in the Bobo-Dioulasso-Banfara region and high-yield fodder crops. Experiments with fattening techniques should focus on Zebus because of their superior final weight, and should be complemented by special research on measures to protect the health of Zebus, particularly those dealing with the control of parasites and trypanosomiasis.

97. Mordant also notes the importance of the environment and the health problem in all attempts to improve stockbreeding. Stockraising of the extensive type cannot be expanded owing to the shortage of available sanitary watering points and grazing areas. Increasing productivity through the improvement of grass cover on range land is a long-term operation in view of the obvious economic constraints. Thus the improvement of stock, itself also a long-term operation, is essentially dependent on improvement of the environment.

98. To find a way out of this dilemma, applied research must give priority to determining the most judicious distribution of the country's existing herd. Based on the agrostological and the pasture-use maps of the land on both sides of the 13th parallel, it should determine the most profitable ways of utilizing the animal-breeding and fodder potential. This concept of research, applied to immediate development objectives, has rarely if ever been suggested to researchers and economists. We believe that this approach warrants consideration. It would interest financing agencies in projects with definite objectives and would fit in well with the development of Upper Volta as a meat exporter, a role which is amply justified by the country's geographical position.

The Oudalan Livestock and Training Center (Markoye)

99. This Center was set up with assistance from the USAID program and has entailed expenditures in excess of CFAF 200 million, including investments totaling CFAF 180 million, between 1964 and June 1970. The small amount of land provided (800 to 825 ha, enclosed, to which it is intended to add 1,000 to 1,010 ha of more or less bad land in the course of 1970) hardly warrants terming the station a "ranch." It is essentially a demonstration (or promotion) and training center, set up to:

- (i) distribute, against payment, concentrated feeds and saltlicks, which it has already started to do;
- (ii) receive young stockmen, which has yet to be done;
- (iii) supervise the placing of breeding stock (bulls and goats) and provide advice to the stockraisers, which it has started to do;
- (iv) provide guidance and training in order to raise the level of traditional stockraising, as is also being done for goat and cattle raising.

100. Viewed from this angle, the role of the Markoye Center is more easy to justify and warrants the support of the authorities and outside assistance. The real problem is to determine the actual scope of this costly project, and the orientation of its work particularly in the difficult field of providing extension services to herdsmen. If the Center is left altogether without resources, it might as well be admitted a failure as of now. If, on the other hand, it were to be integrated with a larger-scale development unit such as an ORD (Regional Development Office), the Center would have an essential role to play. However, owing to lack of maintenance it is to be feared that much of its equipment will have to be renewed. The loss could therefore prove quite considerable if decisions were delayed too long.

101. At the end of 1969 the livestock numbered 120 Zebu cattle, of very mixed strains, obtained from a 62-head herd imported from the Toukounous station (Niger) and 110 red goats (Maradis) also imported from Niger, and obtained from an initial nucleus of 56 breeding stock. Health surveillance is excellent. The general condition of the animals is good and there are no deaths at the end of the dry season, which is as it should be at a station where water and fodder are available daily.

102. These figures are too small to permit any effective applied scientific research. For comparison, it should be noted that the Toukounous Azawack Station, in Niger, is somewhat cramped with 4,475 ha, which was just enough to carry 550 head in 1969 and to complete all the progeny-testing programs. The Maradi Goat-raising Station in Niger exceeds 3,000 ha, carries 500 head and distributes between 600 and 1,000 among the villages. It is planned for a permanent flock of 1,500 head and distribution of 2,000 goats each year.

103. The Center could, on the other hand (and as Mordant suggests), become a reference station for the study of Sahelian pastures, their development and their improvement. The introduction of plants such as Sorghum almum and Phaseolus lathyroides has already given good results. It could serve as a center for livestock extension work and the distribution of concentrated feeds and saltlicks. It would undoubtedly be a long time before the results of a promotion campaign became apparent.

104. The Center has already made modest quantities of concentrated feeds composed of rice bran, oilcake, cottonseed, bone meal, ground millet and mineral supplements available to stockfarmers. The ingredients are mixed and the feed prepared at the station. The charge of CFAF 15/kilogram is 15 percent below actual cost, which is CFAF 17.50 -- 18, including CFAF 9 for transport. A gross 20 percent should be added to this figure, representing labor, depreciation and a minimum return, which would raise the price to CFAF 21.50-22.00. This price would make it possible to establish a working capital fund and maintain production at something like 100 tons per year, which would, in our opinion, be acceptable.

105. Saltlicks are given to the animals at the station and sold. The American ones are excellent and sell at US\$2 (US\$1 cost plus US\$1 transport), or CFAF 500 for a 10-lb (4.5-kg) saltlick (before devaluation); this works out at CFAF 110/kg. The French saltlicks are less in demand and cost rather more (CFAF 240 for one weighing 2 kg). The selling price has made it possible to build up a small working capital fund for restocking.

106. The personnel were initially all American, but these have since been replaced by Voltaics. At the end of 1969 only one American extension worker remained, Mr. Deffendol, and he was to leave in June 1970. A Voltaic agricultural engineer specialized in agrostology, who had been at the station since 1965, asked to be released a year ago and has not been replaced. Dr. Balima, a qualified veterinarian, officially took over the running of the Center at the end of 1968. There are also two veterinary assistants, three drivers, ten or so laborers, three shepherds, a clerk-storekeeper, a book-keeper and a secretary-typist. The consequences of any premature withdrawal of American technical assistance would be unfortunate.

107. Expenditures during the past six years included a Voltaic contribution of CFAF 41-42 million on the basis of CFAF 7 million per year. After completion of the American aid program, this sum will have to serve as the basis for the operating budget, on which the mission received no data. The Government appears to want to limit itself to a ceiling of CFAF 4 million, which is most certainly inadequate for any worthwhile work. Operation of the station will be jeopardized unless provision is made for adequate depreciation and replacement of its equipment, particularly the jeeps, the maintenance and operation of which are always a problem in a Sahelian region. Their replacement by a pickup and one or two Landrovers will soon be essential.

Conclusion

108. Utilization of the Center as a means for carrying on extension work within the framework of ORD would appear to be the best means of insuring its continued existence. The distribution of concentrated feeds and saltlicks is certainly the best way to attract stockraisers and to keep them at the Center for training and other extension courses. Rather than its current program, the Center could undertake practical activities that are better adapted to its means. Research should be dropped, because of lack of space, except for pasture improvement. In the short term, goat raising alone would warrant full attention and priority. It should, however, be carried out on a much larger scale, with a 500-head herd. Cattle can be cut back to a few dozen needed for training purposes and the sale of bulls, since space is not available for anything more ambitious. The operating credit of CFAF 4 million/year envisaged by the Voltaic authorities will not cover either current maintenance or depreciation. Means of finding the additional funds needed will have to be worked out as a matter of urgency.

F. The Livestock Service

Administrative Structure

109. The Service is made up of an administrative headquarters (direction), 7 districts (circonscriptions) and 47 posts (postes). The Djibo and Koudougou districts and the Gorom-Gorom sector (secteur) will be set up shortly, while the Tenkodogo and Gaoua districts are to be formed at a later stage but before 1975. These changes are justified by the distribution of livestock and the need to bring administrative and technical boundaries into line with each other. It is also intended to make the borders of districts identical with those of the 11 ORDs which will be in existence by 1975. This trend will facilitate the provision of combined advisory services for herdsmen and settled farmers by extension service personnel responsible to the same technical and administrative authorities and in a position to exercise closer control of development activities and respond more rapidly to development needs. The reorganization leading to the formation of new prefectures should be correlated with the rest of the administrative structure with a view to cohesion and efficiency.

110. For reasons of economy, however, the trend appears to be towards forming 7 or 8 regions. The following table is based on a comparison between the organization of rural and administrative services and shows the situation at the national level in 1969:

Table 20: ADMINISTRATIVE STRUCTURE

Services	"Cercles"	Subdivisions	Posts
Administration	44	61	65
Livestock Service	Districts 7	Sectors 12	Posts 47
ORD (1970)	Existing = 8	Sectors	Sub-sectors
	To be set up = <u>3/a</u>	100 (?)	(?)

/a Bobo-Dioulasso, Gaoua and Sahel.

111. In the capital, the Administrative Headquarters will very shortly be installed in a new building, and this will make it possible for all departments, including the Production Department still at Bobo-Dioulasso, to be relocated. Besides the Director and Deputy Director there are 6 Departmental and 2 Bureau Chiefs, as follows:

- (i) Animal health and central dispensary.
- (ii) Diagnostic laboratory.
- (iii) Production, research, animal feed.
- (iv) Livestock industries - tanning center, abattoirs, dryers.
- (v) Rural and pastoral development, cattle routes.
- (vi) Teaching and training.
- (vii) Personnel (Bureau).
- (viii) Management and accounts, "Funds and Materials" (Bureau).

All these posts are held by Voltaic nationals except the post of Laboratory Chief, (vacant), the teaching posts (expatriate) and the rural development post (expatriate).

112. An economist/veterinarian is expected in the Planning Bureau. This post, which has been vacant since 1968, will probably be filled during the second half of 1970. Although an expatriate would hold this position initially, it would be advisable to assign to him a Voltaic counterpart who would relieve him after 4 or 5 years, after which the expatriate would remain for some time as an adviser for a further period. Practical development planning calls for general training, supplemented by a specialized training that cannot be usefully acquired until after some years of experience and maturity, initially in the field, and subsequently at headquarters in positions with technical and administrative responsibilities. A Voltaic should therefore be selected to receive training of this kind supplemented by a series of periods of attachment to the principal financing institutions so that he may familiarize himself with the criteria for project identification, and preparation and presentation of loan applications.

Financial Resources

National Budget

113. A comparison between estimated direct and indirect receipts from livestock production and the expenditure incurred by the Livestock Service is quite revealing (Table 21). In this connection it should be noted that the figures on expenditures provide for no investment or recurring charges associated with investment. Livestock production is regarded primarily as a source of tax revenue. The system provides no incentive, whether for the livestock producer or for the technical staff of the service, whose salaries account for 87 percent of the budget (Table 22). Development of the sector is left to foreign aid. Moreover, although revenues tend to lag behind estimates, they are actually two or three times above expenditures. The cattle tax represents only 25 percent of receipts and its importance continues to decline.

114. The principal revenues are obtained from transactions in animal products, particularly the export of "Voltaicized" cattle, i.e. cattle in transit through the country as a result of its special geographical position. The amount of revenue received on this account depends to a large extent on the assessment at any given moment by the exporters of the advantage that may be gained by declaring the true source of their earnings, or, on the contrary, by neglecting this formality either entirely (there is little outright fraud) or in part.

Table 21: SHARE OF LIVESTOCK PRODUCTION
IN THE VOLTAIC BUDGET (1968-1969)
 (in thousands of CFAF)

Category	Revenues ^{/a}	Expenditure	Category
Cattle tax (assessment)	140,000	118,500	Personnel
Transit)	14,000	11,000	Equipment
) Animal			
Imports)	23,500	500	Telephone
) Products			
Exports)	200,000 ^{/b}	5,000	Joint expenses
)			
Miscellaneous revenues	28,500	2,500	Missions
Trading permits (estimated)	<u>10,000</u>	<u>--</u>	--
Total	416,000	137,500	
Cattle tax	<u>50,000</u>		
Revised Total	356,000		

^{/a} Budget estimates.

^{/b} Varies between CFAF 150 and 250 million in actual receipts according to the year.

Unfortunately, there have been extensive delays in utilizing these funds. Since it is now expected to take almost four years to spend funds that could have been spent in two years, the action undertaken has been less sustained and less effective than it might have been.

Table 22: RATIO OF LIVESTOCK BUDGETS TO TOTAL PUBLIC EXPENDITURE - OPERATING EXPENSES a/
(in CFAF)

Years	State Budget b/	Budget of Livestock Service			% National Budget			Budget of Rural Local Government c/		
		Total	Equipment	Personnel	Total	Equip-ment	Per-sonnel	Share of Livestock		Total
							Amount	%		
1960	6,044,700,000	86,683,000	24,497,000	62,176,000	1.43	0.40	1.03	Non existant before 1961		
1961	7,664,500,000	116,774,000	36,351,000	80,423,000	1.52	0.47	1.05	7,000,000	3.0	235,000,000
1962	8,369,400,000	115,965,000	21,493,000	94,472,000	1.38	0.25	1.13	28,242,000	6.0	470,000,000
1963	8,947,500,000	111,724,000	9,768,000	101,955,000	1.25	0.12	1.13	25,200,000	4.0	630,000,000
1964	9,320,900,000	140,353,000	33,296,000	107,057,000	1.50	0.35	1.15	17,766,000	3.16	562,300,000
1965	8,923,995,000	127,785,000	24,772,000	103,013,000	d/ 1.43	0.27	1.16	13,625,000	2.50	545,000,000
1966	9,157,000,000	131,150,000	21,150,000	110,000,000	1.43	0.23	1.20	2,834,848e/	0.35	788,325,763
1967	8,374,773,000	125,115,000	17,975,000	107,140,000	1.49	0.21	1.28	7,448,089	0.90	820,377,840
1968	8,563,610,000	126,536,000	16,520,000	110,016,000	1.48	0.20	1.28	8,363,035	0.86	972,437,205
1969	9,030,587,000	137,356,000	18,800,000g/	118,526,000	1.52	0.21	1.31	8,010,548f/	0.80	999,004,378 f/
1970	9,756,861,000	134,148,000	18,800,000	115,348,000	1.37	0.19	1.18	n.a.	-	-

- a/ Some small additional sums have been contributed by the FAC to the budgets of certain ORDs, details of which will be found in Appendix V. Hardly any use was made of these before 1969 or 1970, and they do not relate solely to operating expenses.
- b/ Between 1961 and 1970 the National Budget increased by 27 percent while the Livestock Service Budget increased by 14 percent (difference = 13 percent).
- c/ The percentages and figures for the years 1961 to 1965 are approximate.
- d/ In 1966, actual expenditure on personnel was less than CFAF 110 million and not CFAF 124 million as shown in the budget statement. This has been taken into account.
- e/ Since 1966, 30 percent of the budget revenues of local rural government has been transferred to the National Budget. The overall drop in livestock appropriations was, however, substantial, since the provision for operating expenses in the National Budget have remained practically unchanged at between CFAF 16.5 and 18.6 million.
- f/ Budget estimates. Tax revenue is generally from 10 to 20 percent below estimates. The figures shown in these columns should therefore be reduced in the same proportion.
- g/ Appropriations were the same in 1969 and 1970 and were made up as follows: Equipment: CFAF 11 million; Missions: CFAF 2.5 million; Telephone: CFAF 0.5 million; Joint Expenses: CFAF 5.0 million.

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115. Between 1961 and 1970 the rate of increase in appropriations for the livestock sector was 13 percent below that for the budget as a whole although livestock production plays an important role, accounting for 50 to 60 percent of export. Table 22 shows, moreover, that the increase is solely due to a rise in expenditure on "personnel" that the State could hardly have avoided. Real requirements for "operations and equipment" have never been taken into account and, in the same period appropriations for this purpose fell from CFAF 36.5 to 18.8 million, i.e. by some 50 percent.

116. The absurdly small amount of assistance given to the Service -- of which the latter does not, incidentally, make the most effective use -- is insufficient to allow it either to undertake itself any significant action in the sphere of animal health or to participate in such action. In the field its agents have been idle for several months each year ever since the rinderpest-control operations have been suspended. At headquarters, administrative duties absorb the energies of the higher officials, who are out of touch with the real problem in the field and with methods of development.

Foreign Aid

117. Only FAC has taken part in small-scale livestock production activities within the framework of the ORDs. These are discussed in the chapter dealing with the integration of animal and crop husbandry.^{1/} Around CFAF 16 million have been made available for measures designed to assist farmers who own draft animals and for campaigns (removal of parasites; spraying) to assist herdsmen or groups of villages (1969-1970).

Local Rural Governments

118. Rural local governments devote very little to livestock production and even this small amount is steadily declining. Their assistance for the most part consists of a contribution to the maintenance and operation (fuel) of motor vehicles.

119. Insufficient budgetary funds is undoubtedly one but not the only reason for the inadequacy of the livestock. Excessive centralization has paralyzed action, and the slender and declining contribution to livestock work made by local governments has provided only a minor palliative.

120. It is evident that, unless there is a substantial progressive and permanent increase in the contribution made by the State to animal husbandry, the Livestock Service will be gradually reduced to a skeleton

^{1/} See also Annex 5.

of unproductive officials. Such an increase, however, would also have to be accompanied by a clear and realistic definition of the duties and requirements of all concerned.

121. If a way out is to be found, the authorities must in the first instance properly allocate sufficient resources for operating expenditures^{1/} and for the recurring charges of projects, at the local government level (or groups of producers) on the one hand, and at the national level on the other. The Government has certainly had a difficult task in restoring sound public finances which had been compromised by serious mismanagement in the past. However, restrictions on expenditures should not be allowed to become counter-productive and to brake the development that can be achieved with the help of foreign financing.

122. After a normal period of assistance, some prudent reapportionment of the tax burden will be required so that the State can recover part of the fruits of expansion and to keep the infrastructure at the level required for regular development of production. Special attention should be devoted to observing the rules of regular maintenance and depreciation of technical equipment, the burden of which should normally be borne by the direct beneficiaries.

123. It is therefore desirable that the opportunity presented by the formation of new agencies such as a Regional Development Office (ORD) for the Sahel, be used for the redistribution of a number of tasks. Such functions as disease prevention, animal health, border inspection, applied research, animal genetics, the provision of statistical data and staff training fall within the traditional administrative structure are, by their nature, permanent activities of the State itself. Development functions, especially the establishment and management of collective means of production as well as their maintenance and expansion need to be brought within a less rigid and more personal framework tailored to the requirements at the regional or sector level (ORD).

Personnel Resources

124. Tables 23 and 24 summarize the personnel situation as it was in 1964, 1966 and 1968 and give forecasts for 1970, 1975 and 1980. In recent years there has actually been a decline in staff at the higher levels. The Government ought to have at least 15 Voltaic veterinary surgeons by 1980.

^{1/} i.e. expenses incurred by the State in providing personnel and equipment for operation of the Livestock Service as a department in contradistinction to the financial charges attributable to the implementation of development projects.

A recruitment drive is therefore needed to avoid further calls for foreign assistance. Until 1975 there will be little increase in the numbers of veterinary assistants (infirmiers). Recruitment will merely offset resignations, assignments on detached duty, dismissals and retirements.

125. The vaccinators used in the rinderpest campaign were released in 1968, but will have to be re-engaged by 1972 or 1973, perhaps even earlier, for new large-scale campaigns, if bovine pleuropneumonia gets the upper hand.

126. The projections of staff required have been made with the three-fold object of setting up an ORD for the Sahel, with a livestock district at Djibo; forming a new district at Koudougou and possibly at Koupela ^{1/}; and bringing about a closer and more realistic association between crop and animal husbandry in the Black Volta ORD (including Bobo-Dioulasso and Oradara) and in the ORDs at Koudougou, Yatenga and Gaoua. These appear to be the best equipped to undertake integrated rural development operations, extending beyond the scope of experimental demonstration plots or mere examples of the combination of crop farming with stockraising.

127. It is suggested that a special section charged with livestock production and extension service among livestock producers be established and staffed with livestock assistants who have received specialized training, first at school and then in the field. Instructors in hide and skin preparation (also called market inspectors) are also essential to ensure that full use is made of existing and new processing installations.

1/ Or Tenkodogo.

Table 23: LIVESTOCK SERVICE -- PERSONNEL IN SERVICE IN 1964
 -- EXPATRIATE AND VOLTAIC PERSONNEL IN THE VOLTAIC CIVIL SERVICE

Categories of Staff	Number
Veterinary inspectors (Technical Assistance)	4
Voltaic senior veterinarians (<u>docteurs vétérinaires</u>)	2
Quota veterinarians	2
African veterinarians <u>/a</u>	9
African veterinarians under contract	2
T.E.I.A. <u>/b</u> engineer (Technical Assistance)	1
Hides and Skins expert	1
Livestock technicians	1
Livestock assistants <u>/c</u>	25
Student livestock assistants (three classes)	4
Veterinary assistants <u>/d</u>	137
Student veterinary assistants (two classes)	21
Administrative and decision-making officials	137
FAC agrostologist	1
Agricultural engineer on detached duty from D.S.A.	1
<hr/>	
Total number of personnel in service	348

/a One African veterinarian on detached duty Deputy
/b Travaux d'Élevage et des Industries Animales
/c One livestock assistant available RHV
/d Five veterinary assistants on detached duty 4 deputies
 1 cantonal chief

Source: Extract from 1964 Annual Report of Livestock Service.

128. Direct technical assistance will continue on a modest scale: there will be one veterinarian specializing in pastoral development attached to the Livestock Service, one economist attached to the Planning Department, one educationalist/principal at the Livestock Service School and one technical adviser to the Minister. Indirect assistance will be mainly provided:

- (i) by the experts responsible for setting up the Sahel ORD and for its management until its staff can become entirely Voltaic which should be the target for 1980;
- (ii) by the experts responsible for bringing the Ouagadougou abattoir into service;
- (iii) by the veterinarians who will take part in large-scale campaigns against bovine pleuropneumonia, parasitic infections, trypanosomiasis, etc.;
- (iv) by temporary consultants responsible for special studies, e.g. fattening of livestock.

129. Table 24 related only to Voltaic staff and technical assistance officials on active duty with a Livestock Service.

Table 24: LIVESTOCK SERVICE: MANPOWER PROJECTIONS a/

Personnel on active duty	1966	1968	1970	1975	1980
Voltaic senior veterinairans	7	6	8	10 <u>b/</u>	15 <u>a/</u>
Expatriate veterinarians	4	3	3 <u>c/</u>	4 <u>c/</u>	4
Voltaic veterinarians (supply becoming exhausted)	<u>9</u>	<u>7</u>	<u>5</u>	<u>4</u>	<u>1</u>
Total Group I	20	16	16	17	20
Voltaic engineers and assistant engineers	20	23	25	30	40
Expatriate civil engineers	<u>1</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>
Total Group II	21	24	26	30	40
Livestock assistants - Group III	150	165	175	185	200
Vaccinators - Group IV	54	0	0	150	150
Instructors/inspectors, idem	0	2	2	20	30
Animal husbandry extension workers <u>d/</u> : idem Group III	0	0	0	25	50
Total manpower	245	205	217	427	500

- a/ Prepared by the Livestock Service; projections for vaccinators, instructors/inspectors and animal husbandry instructors were made by the IBRD Mission.
- b/ This figure is, in our view, too low to cover the wide range of direct responsibilities in livestock production. In addition, there are too few Group II officials in relation to the numbers in Group I. The provision for personnel for the intermediate stages between planning and implementation is also too small.
- c/ One school principal, one official responsible for pastoral development and one planner (after July 1970 in the latter case). The forecast of four expatriates i.e. the three indicated above plus one technical adviser, is rather optimistic for 1975 and beyond.
- d/ To be trained by officials who have already graduated as livestock assistants.

Equipment

Vehicles

130. In 1969 the Livestock Service Vehicle Pool consisted of 60 cars and 70 motorized cycles in poor condition. To provide the service (including the ORDs) with adequate equipment in 1970-71, 90 percent of the present pool would have to be scrapped. Transportation requirements for 1971 are shown in Table 25 below.

Table 25: VEHICLE REQUIREMENTS

<u>Vehicles</u>	<u>Service</u>	<u>ORDs</u>	<u>Total</u>
Liaison	35	10	45
Field	25	15	40
Motorized cycles	-	100	100

Other Equipment

131. Six oil-driven freezers, 8 refrigerators and 6 ice-making machines were purchased for the rinderpest campaign. This equipment is still in working order but the ice-making machines have not been used since 1968. The camp equipment, canteens, tents, etc., are almost unserviceable after three years' use.

Dispensary/Vaccines

132. Stocks are extremely low, particularly those of vaccines.

Conclusions

133. Whereas the responsibilities of the Livestock Service have been increasing, at least in theory, its resources have been steadily declining over the past 10 years, with the exception of the resources temporarily made available for the rinderpest campaign sponsored by FED. Local governments have contributed little to relieve the pressure on the State budget. Livestock production has continued to be regarded by a number of Government services as a permanent source of tax revenues.

134. The country's geographical situation has done much to encourage the idea that livestock destined for export, whether or not of Voltaic origin, should be taxed either on entering or on leaving the country, and without reference to any services rendered. Under these conditions, smuggling, favored also by the economic situation of its trading neighbors (Mali and Ghana in particular), has reached a scale and significance that is difficult to assess.

135. The Livestock Service no longer has either the resources or the capacity to exercise the responsibilities which it has in theory for the promotion of livestock trade and livestock development. Organizational reforms are therefore needed that would leave to the service its technical responsibilities in such fields as health education, information and statistics, but would entrust to a Voltaic mixed corporation the studies, programs, execution and, if necessary, management of certain projects. Development will, of course, have to take place within a framework determined by the Government.

136. The establishment of an ORD for the Sahel that will cover at least 600,000 head of cattle and 1 million small livestock should provide the means for tackling the problems of the essentially pastoral region of the North. Elsewhere responsibilities will have to be shared between the agricultural ORDs and State agencies. Without such far-reaching reforms, weighed and accepted by all, the present service will progressively become more stagnant. It will be reduced to a skeleton of under-employed and unproductive officials which the State must continue to maintain, paying their salaries and representational expenses.

137. Indefinite continuation of the existing state of affairs could be disastrous, particularly at a time when attention is increasingly focused on regional aid and the coordination of objectives and resources with a view to the development of a common market for livestock and meat in West Africa (Niamey Conference - March 1970). As the bridge between Central and West Africa, Upper Volta should provide this key sector of its economy with the organizational structure and resources it now lacks.

II. THE DEVELOPMENT OF LIVESTOCK PRODUCTION

A. The Planning of Livestock Development

Projects Underway (1970)

138. Livestock production is still very far behind so far as the provision of an up-to-date technical infrastructure is concerned. FAC has helped to remedy this situation with a series of investments and studies undertaken between 1959 and 1969 at a cost (excluding direct technical assistance and expert missions) of CFAF 478 million. USAID set up the Oudalan Center at a cost of CFAF 163.5 million, plus local counterpart funds of CFAF 41.7 million. FED is financing the erection at Ouagadougou of a modern cold-storage plant and abattoir with a capacity of 6,000 tons, capable of expansion to 13,000 tons. As the result of protracted delays this project which has been under study since 1964 will not be operational until 1974. After a number of vicissitudes, its cost, including studies, execution and technical assistance, has risen to CFAF 520 million. Finally, German aid has financed a detailed study for a ranch project (CFAF 52 million).

139. The total cost of the projects executed or approved over the past decade amounts to CFAF 1,260 million. 1/ Half of these, including the following, have still to be carried out or completed:

Livestock Service School -- scheduled opening date April 1970 (FAC);

Administrative Headquarters -- scheduled opening date May 1970 (FAC);

Ouagadougou abattoir -- start-up scheduled from 1974 (FED);

the two skin-drying plants at Ouaga and Bobo-Dioulasso -- scheduled opening dates April and June 1970 (FAC);

the Bobo-Dioulasso by-product recovery station (1970/71) (FAC);

the Djibo livestock district scheduled to come into operation in 1971 (FAC).

1/ This total does not include such hydraulic engineering projects as dams, village wells, deepening of ponds, etc., incorrectly classified as animal husbandry.

140. These capital investments are evidence of the authorities' desire to fill obvious gaps. Although for the most part not directly productive, the need for them is inescapable and efforts should not be relaxed until they have been completed.

141. A number of studies have also been undertaken that will make it possible to embark on a second stage more clearly directed towards the growth in output that should become the guiding principle of the next 10 years.

142. The projects that should be undertaken in this decade are described below. Their total cost is of the order of CFAF 10 billion. They are being embodied in successive plans and the contribution of each to production -- the principal element in the justification of each to individual projects -- has still to be established by detailed studies.

143. The year 1970 promises to be a fruitful one. The following studies, financed with FAC credits, are either underway or about to be started:

- (i) a general and regional inventory of livestock production in terms of resources and employment including a series of tables for inclusion in the national accounts; this survey will also review the long-term prospects for animal husbandry;
- (ii) an agrostological survey of the region north of latitude 13° N;
- (iii) pumping tests on an underground aquifer found in the Beli valley;
- (iv) a feasibility study of two cattle routes;
- (v) a preliminary study for a livestock ORD in the Sahel;
- (vi) a study of the statutes and operating requirements of a National Livestock Corporation;
- (vii) a market survey of the by-products available for feeding livestock.

The cost of all these preparatory surveys will exceed CFAF 100 million. German aid should for its part complete by the end of 1970 a technical and economic survey of the prospects for establishing a combined fattening and breeding ranch southeast of Banfora. The studies that have been mentioned will make it possible to face the future with reliable data and a thorough understanding of the environment, its potential and its limitations.

144. It may seem strange that this should not have been done long before. In point of fact, none of the Upper Volta's neighbors, immediate or distant, with the exception of the Niger, appears to have adopted this systematic approach. After the surveys of the long-term prospects for animal husbandry and of livestock production resources, a further vital and urgent study will still need to be undertaken. This will be a survey of the suitability for livestock raising of the areas south of latitude 13° N, supplementing the agrostological study of the region north of this latitude. The application made to the planning authorities in 1966 by the Livestock Service does not appear to have been followed up. On the basis of the report made by the agrostologist Scaillet (FAO), the cost would appear to be of the order of CFAF 50 million broken down as follows:

24 expert-months	CFAF 30
Transportation	5
Cost of preparation of map	5
Publication of map and report	5
Contingencies	<u>5</u>
	CFAF 50 million

145. The agrostological map should show the unfarmed areas, their potential for animal husbandry and serve as a basic reference document for opening up new livestock ranges. This survey should be correlated with the studies on settlement of areas at present abandoned on account of onchocercosis and other forms of parasitism. It should be financed by UNDP or FAC as a matter of urgency.

146. Finally, a solution to the problem of the planned development of livestock production is largely dependent on three factors:

- (i) completion of the basic studies, which is now less of a problem and which appears assured by the end of 1971;
- (ii) the preparation of project studies which have been barely started and which have lagged. One ray of hope is the assignment of a veterinarian-economist to the Planning Office in 1970. Until then little progress will be made on the studies despite the ideas put forward and the goodwill shown by all, unless they can be prepared by teams of foreign experts and financed from external contributions to the local budget;
- (iii) ability to carry out the projects once financing has been secured.

It is in the two latter cases that the bottlenecks occur, especially in the livestock sector.

147. Progress in carrying out the 1967-70 plan has varied widely both by sector and within the sectors. After three years CFAF 13.5 billion of the CFAF 20.8 billion program has been spent: i.e. 66% of the target level has been achieved. The rate of spending on rural development has been the least satisfactory; and the fact that, within this sector, expenditures on livestock development have reached only 29 percent of the target testifies to the seriousness of this problem.

Table 26: EXECUTION OF THE PLAN

Sphere of development	Forecast (billions of CFAF)		Actual expenditure 1967-69	Percentage of target
	1967-70	1967-69	(billions of CFAF)	1967-69
	(1)	(2)	(3)	(3) ÷ (2)
Rural sector	7.8	6.0	3.0	50
Modern sector	5.3	4.5	3.0	67
Economic infrastructure	8.4	5.6	4.2	75
Social sector	5.1	3.6	2.1	58
Applied research	<u>0.9</u>	<u>0.7</u>	<u>1.2</u>	<u>171</u>
Total	27.5	20.4	13.5	66

148. Acting as a channel for funds, rather than as an executing agency, the Livestock Service delegates its responsibility to specialized departments such as Public Works, Rural Hydraulic Engineering and Development, over which it has no influence. Those responsible for livestock production should associate themselves more closely than in the past with the actual execution of work in the field so as to prevent delays when sites are selected, when work is provisionally accepted, etc.

Apportionment of External Aid for Livestock Production

149. Table 27 summarizes the external aid accorded to the livestock sector between 1959 and 1969. Prior to 1962 only FAC (previously FIDES) participated in the development of the sector. After 1962 other foreign aid, both bilateral and multilateral, reinforced the assistance being provided by France. IBRD has so far not financed any livestock projects in the Upper Volta. In the table, the US contribution to the Markoye ranch is included, though it is assigned entirely to the first of the two financial years in which it was actually made available; the Voltaic contribution is not included. The data on aid in 1969 include CFAF 520

million released by FED for the Ouagadougou abattoir. For 1970 the only firm commitment is that of FAC to finance development of two livestock routes in the East. The estimated cost is CFAF 80 million for the two routes extending over 700 km. In addition, three markets at Puytenga, Markoye and Kaya will be fully equipped, and a livestock sector created in Gorom-Gorom.

Table 27: FOREIGN AID TO THE LIVESTOCK SECTOR a/
(Sums authorized in thousands of CFAF)

Investments	1959	1960	1961	1962	1963	1964
Total FAC aid	1,010.90	1,157.70	944.30	903.40	907.40	836.90
Share of animal husbandry	50.50	87.00	8.50	69.00	15.70	0
As a rounded percentage	5.00	7.80	0.90	7.60	1.70	0
Total aid	1,017.00	1,613.40	4,679.10	4,014.10	1,803.80	4,679.10
Share of animal husbandry	50.50	87.00	8.50	69.00	60.60	80.00
As a rounded percentage	4.90	5.50	0.15	1.70	3.40	4.65
Investments		1965	1966	1967	1968	1969
Total FAC aid		1,333.10	781.10	1,474.60	1,315.00	467.90
Share of animal husbandry		8.60	81.10	0	106.10	58.65
As a rounded percentage		0.60	10.50	0	8.10	12.30
Total aid		2,450.00	2,859.80	4,978.90	3,749.10	2,555.30
Share of animal husbandry		19.95	117.20	22.00	147.30	603.65 ^{b/}
As a rounded percentage		0.81	4.50	0.45	3.91	23.63

a/ The total cost of the rinderpest campaign is not included but can be estimated as follows, as at the end of 1969: Upper Volta -- CFAF 100 million; FED -- CFAF 160 million. The cost of the temporary missions of experts (FED, FAC, FAO, UNDP) is unknown and has not been included. On the other hand the cost of the German study for the southern ranch has been included, i.e. CFAF 52 million spread over 3 years (1967: CFAF 1 million; 1968: CFAF 30 million; 1969: CFAF 21 million).

b/ This includes CFAF 520 million for the Ouagadougou abattoir (FED), which explains the exceptionally high figure for this year.

Long-term Development

General Objectives (1971-1980)

150. The general objectives of long-term development should be:
- (i) a general increase in productivity;
 - (ii) a more rapid transition from a subsistence to a market economy;
 - (iii) an increase in domestic consumption of meat; and
 - (iv) an improvement in the balance of trade.

Theoretically speaking, these objectives should not be accompanied by a numerical increase in livestock in face of the limited supply of food and land until fresh areas, at present unhealthy, have been opened up for permanent occupation by human beings and animals. However, these areas are unlikely to be available in the near future, since extensive prior studies and work are still required. Any rise in production must therefore come from increasing the take-off of the older stock and turning over more rapidly the capital in younger animals.

151. Greater mobility in certain age groups especially in the case of cattle should also form part of any long-term policy. For this purpose the long-term objective should be to develop the North as a breeding area, involving a more rapid throughput of adult males and sterile or culled females, and to promote at the same time intensive fattening schemes and farm fattening of cattle in the less overburdened and ecologically more suitable areas of the South.

152. At the various operational levels the following approaches can be considered:

- (i) Integration of Farming and Animal Husbandry. With the help of extension workers in intimate contact with a limited number of farmers, it should be possible to raise productivity per head of cattle maintained through:
 - (a) the supply of power (i.e., through animal traction) and of manure; and
 - (b) the sale of older animals after fattening on the farm for slaughter for domestic consumption.

These measures are described in the chapter on the integration of crop and animal husbandry. They are only feasible in the most advanced areas (Black Volta) where there is already a farming elite which has reached the stage of farming with animal traction and possesses enough land and labor for collective herding of cattle and the inclusion of a fodder crop such as Bracharia in the rotation. However, over the next ten years farmers are unlikely to reach the stage of being able to raise young livestock and produce milk for the market, if only because of the specialized skills required.

- (ii) Improvement of Animal Health. Large-scale campaigns against parasitism in young livestock, the trypanosomiasis, contagious diseases such as pleuropneumonia and rinderpest, streptothrichosis, tuberculosis, etc. must be undertaken or consolidated.
- (iii) Intensification of the principal activities in livestock production, i.e. breeding and fattening to raise meat production and unit weights. The conservation and expansion of fodder resources would be the principal aim and could be achieved, depending on further study, for both settled and nomadic raisers of livestock through (a) the establishment of a livestock ORD in the Sahel, (b) the development of industrial fattening in feed-lots (Bobo-Dioulasso/Banfora), and (c) the creation of mixed intensive breeding and fattening station in the South.
- (iv) Marketing. This entails a reorganization of marketing channels, with properly equipped livestock routes, designed to "nationalize" (i.e. to make truly Voltaic) the trade and transactions in livestock that take place on Voltaic territory. This should go hand in hand with the formulation of an appropriate flexible fiscal policy that would not unduly harass cattle owners and traders. Such a policy must be brought into line with the tax policies of the neighboring countries, especially those of the Entente, within the framework of a common market for cattle and meat.
- (v) Increased slaughter of livestock with a view to the export. Through Ouagadougou, Bobo-Dioulasso and perhaps Banfora of a larger volume of meat, including that from cattle of foreign origin.

- (vi) The establishment of light subsidiary industries (dairy products, canning, manufacture of cattle feed and organic fertilizers). These industries would be designed to provide facilities for all possible forms of processing animals and by-products on Voltaic soil, provided they offer a good return, in order to maximize the value added by animal husbandry to the gross domestic product. There are no real difficult technical problems, although market studies will be essential in each case.

- (vii) The resumption of an applied research program based on the short-term projects envisaged should normally accompany a course of action such as the one outlined above.

Projected Operations 1971-1980

153. On the basis of these long-term objectives, the Mission has prepared, as a guide, a list of the projected operations (see Table 28) and a provisional estimate of their cost (see Table 29).

Table 28: LIST AND POSSIBLE PHASING OF PROJECTED OPERATIONS

No.	Name	Dates
1.	Ouagadougou abattoir (1st plan)	1973/1974
2.	Ouagadougou cattle market	1971/1972
3.	Ouagadougou loading platforms	1971/1972
4.	Western trails (cattle movements + markets)	1971/1972
5.	Bobo-Dioulasso cattle market	1972/1973
6.	Bobo-Dioulasso loading platforms	1972/1973
7.	South Banfora fattening ranch (following RFA studies)	1973/1974
8.	Holding grounds at Bobo-Dioulasso terminus	1974/1975
9.	Holding grounds at Ouagadougou terminus (1st plan)	1971/1972
10.	Holding grounds at Koudougou terminus	1972/1973
11.	Central trails (cattle movements + markets)	1972/1973
12.	Koudougou loading platforms	1971/1972
13.	Sahel ORD	1972/1973
14.	Banfora and (or) Bobo-Dioulasso feed-lot (associated with sugarcane project for example).....	1974/1975
15.	Bobo-Dioulasso abattoir	1975/1976
16.	Eastern trails (cattle movements + markets)	1970/1971
17.	Establishment of Koudougou district	1971
18.	Establishment of livestock sectors (e.g. at Gorom)	1971
19.	Establishment of Koupela/Tenkodogo district	1971
20.	Equipment for abattoirs and drying plant in the bush	1971/1975
21.	Joint financing of livestock watering facilities	1971/1980
22.	Large-scale animal health campaigns (joint financing)	1971/1980
23.	Integration of crop and animal husbandry (joint financing)	1971/1980
24.	Study of suitability of soils for animal husbandry (South of 13th parallel)	1971/1972
25.	Supplementary agrostological studies (North of the 13th parallel)	1970/1971
26.	Experiments in intensive fattening	1970/1972
27.	Experimental on-farm fattening i.e. by the farmers themselves	1972/1974
28.	Cattle-feed factory	1973/1974
29.	Dairy products	1972
30.	Warehouse for hides and skins	1971/1973
31.	Improved methods of poultry keeping for farmers	1971/1980

Table 29: PROJECTED EXPENDITURE (1971-1980)
(In billions of CFAF)

1.	Ouagadougou and Bobo-Dioulasso cattle markets <u>a/</u>	0.30 - Equipment and loading platforms
2.	Ouagadougou and holding grounds <u>a/</u>	0.20 - To hold stock prior to slaughter -- 2 holding grounds
3.	Bobo-Dioulasso slaughterhouse <u>a/</u>	0.40 - Including stabling and cold-storage facilities
4.	Cattle trails <u>a/</u>	0.40 - Eastern, Central and Northern + Koudougou loading platform
5.	Banfora feed-lot (sugarcane project) <u>a/</u>	0.30 - With Bobo-Dioulasso as alternative
6.	Sahel ORD (10 years)	2.00 - plus 2 years preliminary studies
7.	Livestock watering facilities (Sahel ORD)	1.50 - 0.5 FED + 0.5 FAC + 0.5 IBRD
8.	Animal health campaigns (10 years)	1.70 - At national level
9.	Technical infrastructure	0.10 - Program of completion of equipment of (livestock) service
10.	Warehouses, wells and abattoirs/drying plants	0.20 - 2 annual instalments
11.	Integration of crop and animal husbandry (10 years)	0.50 - (Livestock production -- 10 ORDs)
12.	South Banfora mixed ranch <u>a/</u>	0.50 - (Following German studies - RFA)
13.	Studies-experiments-projects-maps	0.90 - Animal genetics -- fodder -- soils -- extension service activities
Total for the 10 year period 1971-1980		CFAF 9.00

a/ Excluding the cost of technical, economic and financial studies and preparation of projects.

Considering the possibility of price changes and the need to provide for contingencies over a period of 10 years, the program is likely to cost CFAF 10 billion.

154. The action required to carry out these projects during the 1971-1980 decade, including those not completed under the first Plan, may be grouped under the following headings:

(i) Study and Research

Studies and experiments at livestock stations on intensive fattening on an industrial scale (priority);

Preparation of a map for the region South of 13° North with a view to delimiting areas suitable for integrated crop and animal husbandry, on the one hand, and areas of non-agricultural land that can be reclaimed for more extensive stock-raising;

Continued studies on the development of livestock routes;

Development of on-farm fattening techniques and the extension methods appropriate for their promotion among the farming population.

(ii) Administrative, Technical and Commercial Organization to prepare for:

Establishment of the Sahel ORD by 1972/1973;

Initiation of large-scale animal health campaign from 1973 onwards;

Formation of a national corporation to manage investment projects as the executing agent for livestock production development programs. (This corporation might also assume responsibilities for marketing where private entrepreneurs are lacking or decline to cooperate);

Coordination of existing and new organizations in the light of the development of the projected Common Market for livestock and meat in West Africa.

(iii) Training

Development of the new school for Livestock Service personnel (former veterinary assistants) was to enable it to train several classes of 10 to 15 students each year, including veterinary assistants, extension workers, supervisors, etc;

Creation of a corp of market inspectors and livestock supervisors, with a total staff of 20 agents by 1975;

The training of "pastoral" extension workers to serve the modern livestock centers extending from the Sahel to the reclaimed areas of the South which may be established following the necessary technical and economic studies.

(iv) Legislation

Establishment of a "single import-export tax" on meat and cattle consistent with the fiscal policies of bordering States and the needs of producers and consumers;

Elimination of the direct cattle tax, now outdated;

Establishment of an animal health service tax.

(v) Infrastructure

The content of this program, which will be defined in detail at a later stage in the light of feasibility studies, can only be outlined at this time but might include:

livestock routes, buildings, wells and markets in the Sahel ORD (Djibo, Dori, Markoye, Aribinda);

routes for livestock in transit and loading platforms at Koudougou, Ouagadougou and Bobo-Dioulasso;

a market and holding grounds for these termini;

a feed-lot fattening station at Banfora and/or Bobo-Dioulasso, depending on prospective rate of return;

an intensive fattening ranch in the Southwest, if ecological factors are not too unfavorable;

finally, an intensified program of integration of crop and animal husbandry in areas (Black Volta, Bobo-Dioulasso, Koudougou and Ouahigouya) where a farming elite exists capable of participating in more advanced forms of settled livestock production, based on the cultivation of fodder crops and the use of concentrates for feed.

(vi) Expert Missions

At the request of the Voltaic government, FAC has made provision for special missions in 1970 to:

- (a) Study the supply and utilization of by-products available for cattle feeding, with projections to 1975 and 1980, and the possibility of establishing an animal feed plant.
- (b) Work out the objectives and statutes of a corporation for the development and management of livestock resources which, as previously indicated, would relieve the Livestock Service of all non-administrative, developmental functions. Under this plan the Livestock Service would retain responsibilities for livestock health, general and statistical information, research and vocational training.
- (c) Make a preliminary feasibility study on the Sahel ORD, which would specify the supplementary studies needed and provide an indication of the investment needed. Missions (b) and (c) may usefully be combined.

Conclusions

155. In the next decade, emphasis would accordingly be put on:

- (i) applied research, notably on cattle feed and fodder, on methods of fattening, on the raising of taurins for slaughter and on the integration of crop farming with animal husbandry;
- (ii) the infrastructure for production (Sahel ORD, feed-lots, water supply);
- (iii) the infrastructure for marketing and processing (livestock routes, markets, abattoirs, drying plants, etc.);
- (iv) the control and protection of animal health; and
- (v) in the longer term, on development of livestock in areas that can be reclaimed for production through disease eradication (e.g. regions infested by onchocerciasis).

Some of the more important of these projects, which may well be of interest to the Bank, will be described in the following chapters.

B. New Organizations for Development

General Considerations

156. It has already been noted that the competence of the Livestock and Animal Industries Service extends at present to the entire field of animal production even though it unfortunately does not command the technical and financial resources essential to the effective discharge of their task and its administrative organization is subject to constraints that make it difficult to take the initiatives and make the decisions necessary to development. The Mission is therefore impelled to recommend a re-allocation of resources and functions both of which will have to expand substantially in the course of the forthcoming years if the project programs are to be effectively carried out.

Establishment of a Supreme Livestock Council and an Advisory Committee on Rural Development

157. It is suggested that a Supreme Livestock Council be set up to prepare and coordinate the necessary livestock policies and programs. It would consist of representatives of the Livestock Service and the Department for Rural Development (DDR) ^{1/} of the Ministry of Agriculture and the Planning Bureau of the Ministry of Planning and Public Works. The Minister of Agriculture, Animal Husbandry and Water and Forests could be the ex-officio chairman of the Council. The Council would probably need to be represented also on the board of the National Livestock Corporation which will be charged with particular development responsibility in line with proposals made below. The Council might be complemented by a Rural Development Advisory Committee which could advise the Government on the whole spectrum of rural development problems and which might include representatives of the private sector.

The Livestock and Animal Industries Service

158. In the Mission's opinion this Service should not be deprived of its traditional functions, but should be relieved of certain operational tasks for which it simply does not possess any resources in terms of manpower, appropriations and equipment. Furthermore, fettered as it is by administrative rules and regulations, it lacks the flexibility required to exercise day-to-day supervision over the execution of programs or projects and to take the technical and financial decisions that will insure that these are rapidly and economically carried out.

^{1/} DDR - Department for Rural Development (Direction du Developpement Rural) responsible for drafting and coordinating at the national level the policies of the Regional Development Offices (ORDs).

159. In principle jurisdiction over all the key sectors should be maintained, including:

- (i) Range development and relations with ORDs and DDR.
- (ii) Production, research, livestock stations, and cattle feed.
- (iii) Health, laboratory and animal health inspection.
- (iv) Livestock industries, processing and livestock routes.
- (v) Education, training and agricultural extension service.
- (vi) Statistics, information programs and studies.

However, in all of these sectors the actual implementation of projects should be the responsibility of a parastatal agency operating under the permanent supervision of the Livestock Service as the responsible agency of the Government. Notwithstanding this, the Service should continue to be responsible for campaigns to combat disease on a national scale and for the administration of all controls that contribute to the preservation of animal health. These responsibilities should be delegated, as far as necessary, to the authorities in the livestock districts, of which there should be the same number as there are ORDs.

The Sahel Regional Development Office (ORD du Sahel)

160. This ORD will in principle be the same as other ORDs but will be primarily concerned with livestock and range management. It will possess the same management and inspection structure as the agricultural ORDs and will have the same general terms of reference. However, for the sake of economizing resources, particularly manpower, the Livestock Service should delegate to this ORD the discharge of the functions of the future Sahel livestock district, which will have the same boundaries as the ORD. Such delegation will also have to apply with respect to animal health measures which are an integral part of a larger project for the development of livestock production.

161. Establishment of the new ORD will no doubt give rise to some problems, not so much on the technical level as with respect to personnel. These should be settled by Ministerial decision after obtaining the views of the advisory rural development committee and the Supreme Livestock Council, both of which would be concerned. 1/

1/ On the assumption that these two bodies are in fact established.

162. Existing legislation on the ORDs, amended if necessary in the light of the experience of the agricultural ORDs, would be applicable. The problem of proper coordination between the new ORD on the one hand and the DDR and Livestock Service on the other hand will have to be broached as soon as a draft project has been prepared. Whether the new ORD will necessarily be responsible to the DDR is a moot question. Policies and methods of operation will presumably have to be settled by joint consultation of all agencies concerned. The same problem is posed, but with respect to the Livestock Service, for the activities of the essentially agricultural ORDs, all of which should be concerned about and have substantial livestock -- cattle, sheep, goats and poultry.

The National Livestock Development Corporation (SONADEL)

163. An expert examined, in accordance with instructions received from the Government, the formation of a mixed corporation to manage livestock production projects, except for those to be carried out within the Sahel ORD. This corporation is to have no responsibility for marketing unless private enterprise is unwilling or fails to enter this field. In the Mission's opinion, it should have four principal departments supported by the necessary technical divisions, i.e.:

- (i) Management Department. Supported by three divisions (Personnel, Administration, Finance).
- (ii) Department of Studies and Programs. It will identify and prepare projects in the light of the requirements of external financing agencies and will be responsible for the legal (legislative), fiscal and economic aspects of projects.
- (iii) Projects Department. It will be responsible for carrying out agreed projects on the basis of funds made available for this purpose.
- (iv) Department for Operational Management. It will be concerned primarily with:
 - pilot projects and applied research programs;
 - abattoirs, drying plants and abattoir/cold storage plants;
 - livestock routes;
 - transportation problems as a whole.

It will have authority to collect service fees which would provide the greater part of the corporation's own budget revenues.

C. Improvement of Animal Health

Introduction

164. Everywhere in Africa production is closely but not exclusively dependent on the health environment. For a number of reasons, this elementary axiom is more true of Upper Volta than of any other country.

165. Generally speaking, health may be regarded as a means of production. An investment is needed to obtain it and thereafter it must be protected. It takes the form not only of supplies and buildings but also and primarily of a recurrent and continuing charges.

166. Owing to the failure to maintain outlays for animal health some African states may sooner or later be threatened by such a deterioration that foreign aid agencies, and particularly banking agencies, will hesitate to finance projects for the development of modern livestock production. Such projects may not in fact be profitable if at the outset substantial expenditures on animal health have to be included merely to make them feasible.

167. Viewed as part of the production process, the protection of animal health is clearly a national economic necessity. Even the contraction of foreign loans, supplementing domestic resources available, should not a priori be rejected as unjustified.

Economic Impact of Animal Diseases

Bovine Pleuropneumonia

168. As a rule the number of animals affected by this disease is counted only on the occasion of the first outbreak. Experience indicates that a realistic appreciation of the impact of this disease can be obtained in such a case only by multiplying the number of outbreaks roughly by three, the number of dead by five, and the number of sick and infected animals by ten. On this basis, it is estimated that 4,000 animals died of pleuropneumonia in 1965 and that an additional 20,000 were infected. Most of the animals are slaughtered in extremis or sold for slaughtering; they are therefore not a complete loss. The loss in income (meat and by-products) may be put at CFAF 5,000 per head. This means a total loss for the year of approximately CFAF 100 to 125 million, which is by no means negligible. It is equivalent to about two percent of the portion of the gross domestic product attributed to animal production. By way of comparison the annual budget for the permanent staff of the Livestock Service fluctuates each year between CFAF 110 and 115 million.

169. While the importance of effective measures against this disease is not contested, this itself is not sufficient to enlist the unanimous support of all those interested in development when it is realized that

the situation does not require a limited operation but rather a prolonged and massive campaign.

170. The present situation has two main characteristics:

- (i) The disease has been prevalent throughout the African Continent for about 10 years, and there is nothing to indicate that it is likely to recede spontaneously or that, in the absence of a suitable vaccine, it will be brought under control in the very near future.
- (ii) The domestic resources available to the countries in which it is prevalent are insufficient to arrest its spread. Moreover, the countries still free of the disease are likely to be infected before long because of the increasing extent of unsupervised movements of live-stocks.

Other Diseases

171. While a campaign to combat pleuropneumonia is necessary to safeguard cattle against an eventual catastrophe, it should not be forgotten that there are many other causes for concern. WHO and the Muraz Center report that tuberculosis, far from disappearing, is still among the major endemic diseases. The distribution of the human infection coincides with that of bovine tuberculosis (Gidel). Trypanosomiasis is also widespread. In view of the cost and difficulties of controlling the vector, efforts are directed at treating the disease, an approach that is not very promising and risks the development of strains resistant to chemo-therapy.

172. Internal parasitic diseases of ruminants cause losses that vary according to the three physiological ages: nursing calves, weaned calves and adults. While infestation by strongylidae (in the broad sense) during the first two stages progressively diminishes, it is only to make room for invasion by coccidia, which is just as serious, and for liver fluke infection.

173. As in the case of pleuropneumonia, it is important to counter losses due not only to mortality, particularly among young animals, but also to failure to gain weight leading to low output of meat and milk, and probably adversely affecting reproduction also.

174. In the case of parasites, as in the case of pleuropneumonia, it is undoubtedly difficult, both in theory and in practice, to draw up an accurate balance sheet of costs and benefits for a campaign to deal with infection. Proof of net benefits can only be furnished by the campaign itself, ex post facto, by determining, if possible, the difference in production before and after treatment. To be effective, treatment must be given annually both to the host and to the reservoirs and vectors of the parasite.

Outline of a Campaign

175. Clearly the profitability of a mass campaign would be infinitely more attractive if it could be managed so that:

- (i) treatment would be annual, taking into account the movements of animals and the problems connected therewith;
- (ii) measures against pleuropneumonia would be coupled with efforts to preserve and consolidate the results of the rinderpest control campaign which are already being jeopardized;
- (iii) when the technical and manpower resources are mobilized for vaccination, young animals are treated at the same time against parasitic diseases, in particular gastro-strongylosis and enteritis or coecal and rectal coccidiosis;
- (iv) when animals are brought together and presented for vaccination, the opportunity be utilized also to carry out a variety of other activities (extension and educational work among stockherders, castrations, distribution of fodder, saltlicks, etc.) in cooperation with the staff of the ORDs and in support of their regular work.

176. With respect to bovine pleuropneumonia, it is useful to quote the observations of the IBRD Livestock Mission to West Africa (April 1969): "The Mission recognizes contagious bovine pleuropneumonia as a major disease problem of cattle in Western Africa and concludes that measures should be taken to bring it under control....It is primarily a disease of travelling cattle and major efforts should be concentrated in measures to prevent spread by travelling cattle. The following measures are recommended:

- a) Increased efforts to identify foci of heavy infection with CBPP and concentrated programs of vaccination in these areas....
- b) Closer supervision of travelling cattle for early detection of outbreaks ... Cattle owners will have to be induced to use recognized stock routes ...
- c) Enforcing vaccination of cattle before they are moved on the hoof over long distances ...
- d) Branding of cattle from endemic areas ...
- e) Cattle imported into the Ivory Coast should be moved by rail or motor truck, as is done in Ghana, rather than on the hoof."

Estimated Cost of a Campaign

177. The joint rinderpest campaign (JC15) provides excellent terms of reference for calculating the different factors involved in the cost of immunization against a single disease. More than 80 million rinderpest immunizations were administered between 1963 and the end of 1969. The campaign coordinator reports 79,767,990 head vaccinated by October 1969. The outlays covered by external assistance, all in the form of a grant, amounted to almost CFAF 2,000 million (1,968,087 excluding activities in progress at the end of October 1969 in Liberia and in Guinea. The cost per immunization financed by external assistance therefore amounted to 25 CFAF (corrected figure). Government counterpart contributions are said to have amounted to CFAF 1,526,600,000 bringing the apparent total to about CFAF 3,500,000,000 of which around 43 percent was borne by the beneficiary countries.

178. In this basis the cost per immunization may be summarized as follows:

External assistance	CFAF 25	10.5 US ¢
Local contribution	<u>CFAF 19</u>	<u>7.5 US ¢</u>
Total	CFAF 44	18.0 US ¢

There are grounds for believing, however, that actual counterpart contributions probably did not even reach CFAF 1.2 billion.

179. The Mission was unable to determine accurately the actual cost of the campaign in Upper Volta. Revised program authorizations on expenditures of CFAF 300 million (185 million by FED and 115 million by the Voltaic Government). Since 6,630,000 vaccinations were administered, each therefore costs 46 CFAF. However, actual disbursements do not seem to have exceeded CFAF 250 million.

180. By and large the Mission believes that the average real cost per vaccination under the international rinderpest campaign was probably CFAF 40, and Table 30 shows the breakdown of this to serve as a point of reference for determining the cost of a campaign against pleuropneumonia.

Table 30: ORIGIN AND USE OF FUNDS FOR JC15 IN UPPER VOLTA
(per head of livestock)

Contribution	CFAF	%	CFAF	%	Use of funds
Local <u>a/</u>	15	37.5	4	10.0	Coordination and miscellaneous
External, of which:	25	62.5	6	15.0	Vaccine, delivered cost per dose
72.5% FED	18.5	72.5	4	10.0	Investments
25.0% USAID	6.25	25.0	18	55.0	Operation, wages
2.5% other	0.63	2.5	8	20.0	Operation of equipment, including branding, vehicles, refrigerators, etc.
<u>100.0%</u>	<u>25.00</u>	<u>100.0</u>			
Unit Cost	40	100.0	40	100.0	

a/ of which part (amount not available) is French in origin (salaries of cooperating French veterinarians in particular).

181. Below a summary account of the main features of a ten-year health campaign is given. The economic returns on an annual health campaign increases in proportion to the extent that vaccination, deemed indispensable in a particular context, is coupled with other measures which may be defined as marginal in the sense that they would have little chance of being undertaken separately, either because of their cost (parasite control) or because of their minor economic impact in the short term (advice to stock breeders, minor operations on animals in specific age groups or on animals other than cattle). Taking this into consideration, such measures can be carried out as a by-product of a major vaccination campaign with the same personal and the same means, and at the marginal cost of the limited extra manpower and products required. Animal species other than cattle may then be covered in the course of the campaign.

182. On this basis, the elements of a more comprehensive, integrated health campaign can be costed as follows: 1/

Immunization against bovine pleuropneumonia CFAF 54
Calculation on the basis of the figures in Table 30, but using CFAF 10 per dose of vaccine delivered at Ouagadougou and adding CFAF 10 for serological diagnosis and periodical field checkups of immunity:

$$(40 - 6) + (10 + 10) = 54$$

1/ Individual treatments of draft animals in de ORDs would be carried out under different arrangements and budgets.

Consolidation of the results of FC15 (1 animal out of 2), CFAF 3
on the basis of one dose, estimated at CFAF 6, delivered at
Ouagadougou.

Control of other contagious diseases CFAF 3
For one-third of the livestock presented at a cost
of CFAF 9 per dose.

Annual anti-parasitic treatment CFAF 40
The cost of treatment per animal is assumed to be
CFAF 160 (40 for treatment against external and
120 for treatment against internal parasites) and,
pending determination of incidence, it is assumed
that one animal out of four will be treated.

Average cost per head of stock and per year CFAF 100

183. A campaign would have to last for ten years, divided into two equal periods. During the first five years, 80 percent of the estimated number of livestock would be treated once a year. The following five years would constitute a consolidation phase during which only 25 percent of the livestock population would be treated.

184. While such a campaign would need foreign financing for the first 10 years, it could thereafter become self-supporting on the basis of the increased income realized. The cost could then be borne by the national budget and considered part of the State's obligation to maintain its important livestock assets.

185. To allow for a possible increase in unit costs in the course of the decade, the figure of CFAF 100 has been increased by 5 percent, 10 percent, and 15 percent, beginning in the 4th, 6th and 9th year respectively. On this basis and assuming that the number of cattle will rise at a uniform annual rate of 2 percent, Table 31 gives an estimate of the total cost and its phasing.

Table 31: LIVESTOCK NUMBERS AND COST OF TREATMENTS

Year	Estimated Number of Livestock	Number treated	Unit cost	Total cost x 1,000	Cumulative cost x 1,000
1	2,500,000	2,000,000	100	200,000	-
2	2,550,000	2,040,000	100	204,000	404,000
3	2,601,000	2,080,000	100	208,080	612,080
4	2,653,000	2,122,400	105	222,850	834,930
5	2,706,000	2,164,800	105	227,300	1,062,230
6	2,760,100	690,000	110	75,900	1,138,130
7	2,815,300	703,000	110	77,330	1,215,460
8	2,871,600	718,000	110	78,980	1,294,440
9	2,929,100	732,000	115	84,180	1,378,620
10	2,987,600	747,000	115	85,905	1,464,525
Number of treatments		14,008,000	104.60	1,464,525	-

186. To this gross cost, three other items should be added:
- (i) An amount of 10% per year for the renewal of technical equipment and supplies in the course of the campaign. This will ensure the efficient conduct of the project and will leave the Service, the end of the campaign, with a few still usable items.
 - (ii) A compensation fund, specifically for pleuropneumonia control, estimated at CFAF 20 million per annum, through the third year. This is intended for payment of compensation for sick animals or healthy carriers detected by serological diagnosis and destroyed on the order of the authorities. This figure assumes that 4,000 animals will be destroyed each year and compensation will be paid at the rate of 5,000 CFAF each. After the third year, the net losses would be borne by the owners, who by that time should have been fully informed of the purposes and conditions of the campaigns, and aware of its beneficial effect in practice.
 - (iii) An interest charge, which will be determined at the same time as the conditions for repayment of the loan. Since this is a matter of negotiation between the State and the lender, it will not be dealt with here and the loan charges will be cited pro memoriam. Table 32 summarizes the total cost of the project.

Table 32: TOTAL COST OF THE PROJECT
(in million CFAF)

1.	Project only, including price increases over 10 years	1,464.5
2.	Renewal of equipment and supplies	<u>146.5</u> 1,611.0
3.	Pleuropneumonia Compensation Fund	60.0
4.	Possible loan charge	<u>pm</u>
5.	Total	1,671.0

The unit cost of the 14 million treatments involved would average CFAF 120 per head.

Methods of Financing

187. If a foreign loan or credit of CFAF 1,000 million can be obtained, the national contribution would amount to CFAF 671 million, excluding interest, or 40 percent of the cost of the project. Through such a contribution the State would underscore its determination to protect its livestock assets and to develop production. The national contribution could take the following forms:

- (i) Staff. Half of the staff of the Livestock Service could be regarded as assigned to this operation. The annual personnel outlays of this Service could probably be kept stable at CFAF 115 million per annum because the average age (and hence seniority) of the personnel is declining and recruitment will be limited to replacing staff members who retire. The personnel contribution for 10 years could therefore be evaluated at CFAF 575 million.
- (ii) Supplies and equipment, and compensation. Although the CFAF 18 million made available for supplies and equipment in the 1969 and 1970 budgets is already insufficient, it is suggested that CFAF 36 million be provided by the budget for the entire 10-year campaign. In addition, a total of CFAF 60 million might be made available over a three-year period for the compensation of the owners of the cattle that would be destroyed. Assuming that the total amount of CFAF 96 million were defrayed from additional budget appropriations, the Livestock Service would then retain the very small annual amount of CFAF 18 million (apart from personnel) for other activities (research, training, administration, statistics, controls), which would certainly be an irreducible minimum.

Table 33: FINANCING PLAN

Head	Expenditure	Receipts	Head
Loan	1,000	1,000	Service tax CFAF 72 per head of stock per annum
Interest	pm	pm	
Counterpart: Personnel) 575	575	To be allocated from normal livestock budget
Counterpart: Supplies & Equipment) 36	(To be defrayed by one State in the form of an additional allocation to the Livestock Service Budget.
Counterpart: Compensation) 60	(96	
Total	1,671	1,671	

188. The provisional financing plan presented in Table 33 suggests that CFAF 1 billion of the cost of the health campaign be financed by external borrowing. Repayment of such a loan could be assured by levying a service charge of CFAF 72 for each of the 14,008,000 treatments that would be given during the whole course of the campaign. Such a charge would be the equivalent of 2.2 times the tax actually levied per head of cattle now (CFAF 32) and 7.5 percent of the annual gross meat yield (CFAF 960) per head.

189. The loan and the contribution by cattle owners are the two new features of this scheme in comparison with earlier operations. The loan would cover 60 percent of the expenditure and the State would provide the remaining 40 percent. Collection of the contribution of livestock owners may pose problems that may make it necessary to modify the formula for repayment of the loan. A more acceptable alternative might be to levy a tax on distribution of meat, which would bring in about CFAF 1,000 million over a period of ten years. Thus a meat tax of 5 CFAF per kilogram on a total volume of 20,000 tons per year might not be too burdensome to consumers particularly if a supply of meat at fixed prices can be assured under conditions where demand is apt to exceed supply.

Costs and Benefits

190. In assessing the benefits of an annual expenditure of CFAF 167 million on the proposed campaign, account can be taken in the first instance of the annual losses due to pleuropneumonia which may be estimated at CFAF 125 million and may well continue to increase. Losses due to parasitic diseases and the malnutrition of young animals are at least of the same order. On this basis it would seem economically logical to launch a 10-year campaign costing CFAF 1.67 billion with the objective of preventing losses totaling CFAF 2.5 billion.

191. The actual benefits are, however, likely to be considerably greater than the amount of losses prevented. An attempt will be made below to draw up a plausible balance sheet of costs and benefits. Table 34 gives the projected annual outlays on the campaign. Tables 35 and 36 then present estimates on the additional income that may be generated by the project.

Table 34: YEARLY CHARGES

Year	Project ^{a/}	Renewal	Pleuro- pneumonia Fund	Total
1	200.00	14.65	20.00	234.65
2	204.00	14.65	20.00	238.65
3	208.10	14.65	20.00	242.75
4	222.80	14.65	-	237.45
5	227.30	14.65	-	241.95
6	75.90	14.65	-	90.55
7	77.30	14.65	-	91.95
8	79.00	14.65	-	93.65
9	84.20	14.65	-	98.85
10	85.90	14.65	-	100.55
Total	1,464.50	146.50	60.00	1,671.00

a/ Cf. table 31 - a few figures have been rounded off.

192. While it is really impossible to calculate accurately the losses due to parasitic diseases and to pleuropneumonia, the estimated annual loss of profit is CFAF 250 million overall. The additional income resulting from the campaign may perhaps be estimated with greater confidence. This additional income is likely to come from:

- (i) an increase in the total number of cattle available for slaughter;
- (ii) an increase in weight per animal maintained.

193. A detailed analysis of the extent of the increase in these two accounts requires, of course, an economic study which goes beyond the limits of this report and which could use as a starting point the SCET/Cooperation study of Upper Volta's livestock potential which is now being completed. Meanwhile, it may be estimated that the project would raise the offtake rate from 10 percent to 12 percent in two stages -- to 11 percent in the first five years and to 12 percent in the following five years. This offtake additional to that which would take place if the rate were to remain constant at 10 percent ^{1/} may be valued at CFAF 10,000 per unit at the level of the producer. ^{2/} The year by year and total projected increase in output is given in Table 35.

1/ i. e. if no animal health campaign is undertaken. The entire operation is pointless unless that it is certain not only that 3,000,000 head can be properly maintained around 1985 but also that the production can be disposed of at a remunerative price.

2/ If the value at the frontier is taken, the product would be higher.

Table 35: INCREASE IN LIVESTOCK NUMBERS AND IN OFFTAKE RATE

Year	National Herd		Offtake rate			Increase (numbers)	Increase x 1,000 CFAF
	increases 2 % per annum	10 %	11 %	12 %			
1	2,500,000	250,000	275,000	-	25,000	250,000	
2	2,550,000	255,000	280,500	-	25,500	255,000	
3	2,600,000	260,000	286,000	-	26,000	260,000	
4	2,653,000	265,300	291,800	-	26,500	265,000	
5	2,706,000	270,600	297,700	-	27,100	271,000	
6	2,760,000	276,010	-	331,212	55,202	552,020	
7	2,815,300	281,530	-	337,836	56,306	563,060	
8	2,871,600	287,160	-	344,592	57,432	574,320	
9	2,929,100	292,910	-	351,392	58,582	585,820	
10	2,987,600	298,760	-	358,512	59,752	597,520	
Total Additional Yields					417,374 Head	4,173,740 x 1,000 CFAF	

194. All the measures envisaged by the project, which would cover 80 percent of the national herd for a period of five years and 25 percent for the following years, should increase the average weight of cattle by improving their health and producing more rational livestock management. In the absence of reliable, meaningful data one must be prudent in assessing the magnitude of this increase. However, an increment of 5 kg of meat (carcass weight) per animal slaughtered after the fifth year would not appear to be a physiological impossibility. It is assumed that the total herd will increase as indicated in Table 35. The value per kilogram (carcass weight), including that of by-products can be put at CFAF 100. The resulting calculations are shown in Table 36.

Table 36: WEIGHT INCREASE

Year	Increments		
	In numbers	In kg of meat (carcass)	In value (CFAF 1,000)
1	275,000	-	-
2	280,500	-	-
3	286,000	-	-
4	291,800	-	-
5	297,700	-	-
6	331,200	1,656,000	165,600
7	337,836	1,689,180	168,918
8	344,592	1,722,960	172,296
9	351,392	1,757,460	175,746
10	358,512	1,792,560	179,256
Total additional yields		8,618,160	861,816

195. Table 37 recapitulates the total value of the additional production that might be attributed to a health campaign.

Table 37: SUMMARY TABLE OF ESTIMATED TOTAL INCREASE IN PRODUCTION
(In CFAF 1,000)

Year	Increment in Value		Total	
	Numbers	Meat	By Year	Cumulative
1	250,000	-	250,000	-
2	255,000	-	255,000	505,000
3	260,000	-	260,000	765,000
4	265,000	-	265,000	1,030,000
5	271,000	-	271,000	1,301,000
6	552,020	165,600	717,620	2,018,620
7	563,060	168,918	731,978	2,750,598
8	574,320	172,296	746,616	3,497,214
9	585,820	175,746	761,566	4,258,780
10	597,520	179,256	776,776	5,035,556
	4,173,740	861,816	5,035,556	-

It is well to note that the total estimated additional output would be just sufficient to keep pace with the population growth but not enough to permit any appreciable increase in per capita domestic consumption or in the export of beef. If rising domestic and export demand is to be satisfied other sources of meat (e.g. poultry, goats) would have to be expanded, or other measures would need to be taken in the hope of raising the increase in the offtake rate to 3 percent (e.g. fattening of cattle on farms or in feed-lots).

196. Table 38 shows the phasing of the anticipated benefits in relation to the annual cost of the campaign: while the calculation is necessarily summary and somewhat hypothetical in character it does support the presumption that the benefits would substantially exceed the costs involved.

Table 38: ESTIMATED PHASING OF COSTS AND BENEFITS OF A HEALTH CAMPAIGN
(In million of CFAF, excluding financing charges)

Year	Annual Cost of campaign	Value of total benefits	Net Benefits	
			By year	Cumulative
1	234.65	250.00	+ 15.35	-
2	238.65	255.00	+ 16.35	+ 31.70
3	242.75	260.00	+ 17.25	+ 48.95
4	237.45	265.00	+ 27.55	+ 76.50
5	241.95	271.00	+ 29.05	+105.55
6	90.55	717.60	+427.05	+532.60
7	91.95	732.00	+440.05	+972.65
8	93.65	746.60	+452.95	+1,425.60
9	98.85	761.55	+462.70	+1,888.30
10	100.55	776.80	+476.25	+2,364.55
Total	1,671.00	5,035.55	2,364.55	-

Conclusions - Recommendations

197. Probation of the health of "livestock capital" is a long-term operation, especially when it is a matter of rectifying a situation that has already been impaired. A more detailed study than this simple outline is undoubtedly necessary in order to obtain reliable information about the economic profitability of animal health protection in countries practising extensive stock breeding. An animal health campaign can either be incorporated in a project for developing modern livestock production or carried out in the framework of an improved traditional stockraising system. In any event it is illusory to suppose that any increase in production can be achieved without effective control of major endemic livestock diseases and parasitic infections.

198. The preceding analysis, which is based on reasoned hypotheses, indicates that a large-scale animal health campaign could usefully be carried out, provided it comprises an attack phase and a consolidation-cum-extension phase, which here have arbitrarily been taken as being of equal duration. It also provides presumptive evidence that the benefits would be such as to justify the contraction of a foreign loan for this purpose. However, the State should pay part of the cost, including a contribution to the compensation fund and higher allocations for "supplies and equipment" in the budget of the Livestock Service. It should be stressed also that effective collaboration both by Mali and by Niger is a prerequisite to the launching of such a comprehensive animal health project.

199. A pilot campaign envisaged for Toto in 1971 should produce valuable technical data. Unfortunately these will not be available for three years.

200. Meanwhile, local measures such as the control of frontiers on official stockroutes, quarantining of suspected herds, destruction of infected animals, and bi-annual vaccinations around center of infection represent the only action that can be taken to prevent the spread of pleuropneumonia. Given the limited financial and other resources available to the Livestock Service and the modest impact of such measures, it is likely that they can be undertaken only with the help of an external subvention.

201. An initial step in the direction of a more comprehensive program might be undertaken in the proposed Sahel ORD which has 600,000 head of cattle and through which pleuropneumonia penetrated widely into the country. External assistance for a development program in this ORD might be coupled with disease control. When the ORD comes into operation -- which, bearing in mind the time required for the necessary studies, is likely to be before 1972/73 -- its economic development is unlikely to be assured without a prior "cleansing" of the area. According to the experts of SCET/Cooperation, such an operation would cost about CFAF 50 million per annum and would entail the vaccination of 80 percent of the animals in the Sahelian ORD, along the Mali frontier, and within 20 km on either side along the principal stockroutes.

D. The Establishment of a Sahelian Pastoral ORD

Introduction

202. As early as 1965, the Government of Upper Volta decided to promote rural development through specialized regional agencies (Offices Regionaux de Developpement - ORD). In 1969 there were 8 ORDs. In theory these were to provide integrated development. In fact, they have almost entirely concentrated on agricultural production and in particular on one cash crop (cotton). None are devoted to stock-raising as a major component of farm income. Staff have been assigned to some of them to undertake small isolated health protection programs for draft animals (donkeys and oxen) and for the anti-parasitic treatment of cattle and small stock belonging to nearby stockherders.

203. In these ORDs everything still needs to be done to get farmers to feed, replace and fatten this draft oxen in such a way as to ensure them a larger and more secure income than is possible from crops alone. 1/

204. At present livestock, which in 1968 accounted for 55 percent of exports 2/, does not benefit from any serious health protection program owing to the shortage of funds available to the Livestock Service or from any integrated development activity within the ORDs, which are still predominantly concerned with agriculture.

205. The establishment of a "pastoral" ORD is therefore part of the national rural development program and should make it possible to re-establish some balance in development between the regions by promoting the livestock industry in the north.

Principles Underlying the Establishment of a Sahelian ORD

Purpose

206. The special promotion of animal production in the north, fully justified by the livestock density of this region and the socio-economic tradition of its population. In this area there are 15 head of cattle per km² as compared with a national average of around 10 (1970).

Geographic Scope

207. This ORD, which is bisected by the 14th parallel north, would cover the Dori, Gorom-Gorom and Djibo cercles at present divided between

1/ See Chapter II-F dealing with the integration of livestock and farming and preceding Chapter (II-C) on animal health protection.

2/ Eight percent in 1961 before the introduction of cotton into the export trade.

the Dori and Ouahigouya livestock districts (circonscriptions). It might be advisable to include in the new ORD also the Titao cercle, which, with 40,000 head of cattle and an area of 6,360 km², is predominantly pastoral in character and is now attached to the Yatenga ORD. In that case the new ORD would cover more than 650,000 head of cattle, or approximately one-fourth of the total national livestock population (1970).

208. The area in question measures 100 to 150 km from North to South and 150 km from East to West. Djibo lies 180 km to the west of Dori with which it is connected by a road, frequently impassable, via Aribinda. During the rainy season communications between these two towns is possible only over 400 km of tracks via Ouahigouya-Kongoussi-Kaya. The distance between these two principal towns might argue in favor of establishing two ORDs: one at Djibo and the other at Dori, the more so since the trade movements are almost always from North to South and not from East to West. However, technical and other reasons militate in favor of a single ORD, although in the last analysis the Government must make the decision after taking into account the advice of experts.

Operating Procedures

209. The expert or experts charged with drawing up a plan for the ORD will from the very beginning have to obtain the agreement of the various authorities regarding the relations which the ORD should have with the traditional Livestock Service on the one hand and with the Rural Development Department on the other. This point is of capital importance. There will have to be an appropriate apportionment of tasks and resources. The authorities are inclined to leave to the Livestock Service the responsibility for animal health functions. Since the new ORD would have 600 km of frontiers with Mali on the West and North and with Niger on the East, and would be the hub of constant livestock movements, the protection of animal health there is really of national importance and therefore should be a responsibility of the central administration. However, methods of delegating to the ORD the carrying out of health measures under a program determined by the national Livestock Service might be worked out. In any event actual development activities will have to be undertaken by the ORD, in whose administration livestock herders should be represented so that they can gain a better understanding of its purposes and value, request its assistance, and participate in it effectively and continuously.

Scope of Activities

210. The scope of the ORDs activities should be worked out by an expert before the final project is elaborated. In the ORD, the Livestock Service would presumably continue to be responsible for:

- (i) statistical information, its collection and dissemination;
- (ii) animal health and control of contagious diseases;

- (iii) livestock inspection at frontiers;
- (iv) sanitary inspection of slaughtering (though this is debatable).

In this field priority should be given to vaccination against rinderpest and pleuropneumonia and control of parasitic diseases. Annual vaccinations and associated treatments will have to cover not less than 80 percent of the livestock for a period of five years and be followed by a continuing consolidation phase. Increased health surveillance of stock routes will be facilitated by equipping the central and eastern routes. This surveillance is essential to the success of development.

211. The functions of the ORD itself should be:

- (i) The development of pastoral water resources in association with HER (Hydraulique et Equipement Rural) and with the general objective of establishing one perennial drinking water point every 25 km or within a radius of 12 km. In this connection it is necessary:
 - (a) to persuade herders to participate actively in the establishment of water points and to give up the practice of watering their cattle at ponds which, whether perennial or non-perennial, are invariably polluted and a danger to human and animal health;
 - (b) to define a program for the management of boreholes including rotation by periodic closure and protection of grazing land;
 - (c) to determine how the cost of supplying water and the maintenance of boreholes and wells might be met (e.g. maintenance through the organization of technical brigades).
- (ii) Effective range management. Meat and milk production depends on watering and nutrition, hence on the quality and rate of utilization of grazing lands. The ORD should accordingly organize the use of grazing land together with water control (boreholes with branch lines to be closed periodically, wells, ponds, and surface water). With the assistance of an agrostologist (range ecologist) and an expert in range management it should delimit areas reserved for (a) breeding cattle, and (b) animals awaiting fattening or marketing. The best range lands provided with watering points should be singled out so that they can be exploited as rationally as possible. Experience with their exploitation could provide valuable reference material for the management of the region's entire pastoral assets.

- (iii) Establishment of emergency fodder reserves. Supplementary feed consisting basically of fodder and concentrates made from agro-industrial by-products should be made available at cost in order to protect livestock, particularly young animals, during major droughts. The fact that herders will need money to purchase this feed might well encourage them to sell their animals more readily for despatch to fattening grounds and thus to some extent relieve the overgrazing of range land. These sales could be organized through auctions and the market rates published.
- (iv) Improvement of breeds. This would involve the distribution of breeds and sires (Azawak zebus and Maradi goats) through the existing "ranch" at Markoye, which would be integrated into the ORD, and by private and supervised stock farms in other parts of the ORD such as at Djibo, the headquarters of a livestock district. The distributing of improved livestock should be accompanied by appropriate measures to ensure that the health of the animals distributed is properly protected and that their progeny is properly fed and weaned. It should provide an opportunity for initiating extension activities among villagers.
- (v) Management of abattoirs, driers and centers for the collection and treatment of hides and skins. Arrangements should be made to prevent losses and facilitate evacuation. This activity must be coordinated by the national Livestock Service and the SVCP (Societe Voltaique des Cuirs et Peaux).
- (vi) Establishment and operation of a pastoral extension service. Various methods of extension will have to be tested before they are generally applied. It will also have to be determined whether such an extension service can make effective use of part-time animateurs who might be selected from among livestock herders and be induced to propagate by example more modern methods of animal husbandry. Organization of an effective extension service is certainly a matter of high priority.
- (vii) Organization of livestock herders into cooperative groups. The approach to this must be experimental. In theory such groups could be useful instruments for getting livestock owners to participate actively in range land management and in the organization of marketing, particularly in the form of direct sales or auction sales at markets equipped with weighing platforms, as well as the purchase and sale of consumer goods, animal feed, saltlicks, etc.

Collaboration with Other Services and with Stockherders

212. The pastoral ORD will have the same general responsibilities as

the agricultural ORDs have in the field of rural development. Its staff will need to obtain the collaboration of other services through the assignment or secondment of personnel from:

- (i) The Water Resources and Rural Equipment Service (HER) for research on and execution of pastoral water development.
- (ii) The Department of Rural Development and Agronomy for the constitution of emergency food and feed resources for human and livestock consumption and such measures as need to be taken with reference to cereal production. Despite an apparently unfavorable ecology, the production of cereals is of considerable interest since it largely suffices for the requirements of the local population and benefits from the supply of manure from the large number of grazing cattle. It should be noted, however, that some experts (e.g. Barral in ORSTOM, Cahiers IV.I.67) recommend "conservation measures to limit the extension of crops" which are often "speculative" in character and are of "no benefit to the economy of Upper Volta."
- (iii) The Waters and Forestry Service (Eaux et Forêts) for soil conservation, prevention of desert encroachment and for reforestation, including the demarcation, by planting of bushes and trees, of stock routes.

The collaboration of stockbreeders and of their representatives will have to be enlisted at all times, since any measures to meet their needs which are imposed from the outside are unlikely to have lasting results.

Means of Communication: Evacuation of Cattle

213. The activity of this ORD, unlike that of the agriculture ORDs, will be more important in the dry season, when herds are concentrated on a smaller area and there is an active trade in food products, than in the rainy season, when the condition of roads and tracks makes communication difficult. However, communications will have to be improved in order to serve vaccination camps, evacuation points, markets, hide stores, etc. and to enable dispensaries, educational institutions and the administration to operate effectively.

Other Centers of Regional Activities

214. With departing from its essential objectives, the ORD, in accordance with its statutes, will have to take an interest in all aspects of development and in particular in educational problems and the no less essential problems of human health. Its statutes should reflect these principles and make provision for the representation on its board of management of the relevant national administrative and technical services as well as of stockmen.

Relations with other ORDs

215. Such relations should be based on regional complementarity. The production activities of the Sahel should improve the profitability of the livestock industry by raising the birth rate and reducing the mortality rate among young animals (cattle, sheep, goats). The effectiveness of this would be enhanced by appropriate measures in the South designed to promote farm fattening of cattle, to develop fattening operations on ranches and feed-lots and to establish holding and grazing areas at the major markets and close to meat packing plants. The rapid evacuation of cattle also calls for proper interregional cooperation in the mapping of routes and in the maintenance of lines of communication and cattle routes, whether the animals involved are imported or in transit, or are intended for export before or after fattening.

216. Upper Volta must use to the full its resources in breeding stock and range land to make the North a breeding ground for cattle and to improve its position among the countries exporting meat and livestock on the hoof. Without such a long-term policy it will lose on both accounts and will remain one of the poorest of the African rural nations. Crop production alone cannot compensate for failure to develop this livestock potential. Nor is the exploitation of mineral resources likely to generate much money income.

Terms of Reference for Basic Studies 1/

217. In defining these studies, which should be undertaken by Upper Volta, a distinction must be made between those that have been or are about to be completed and those which are still to be initiated, perhaps pursuant to recommendations made in earlier studies.

218. In the field of water resources, it will be necessary, after the current prospecting work financed by FAC is finished, to complete studies on:

- (i) Hydrogeology and, in the absence of underground water, surface water studies, keeping in mind the need to avoid ponds and shallow wells, which are likely to become breeding grounds for parasites.
- (ii) A program for development of deep boreholes such as the "Christine (Beli)" borehole, which may provide the basis for an integrated range management program including communal ranching.

1/ See Annex 6 for the terms of reference of a project identification mission.

219. In the field of soil and agrostological studies, the agrostological map of the area north of the 13th parallel being prepared by IEMVT with FAC financing will shortly be completed. Agrostological observations will have to be continued with a view to their practical bearing on the economical use of range land.

220. A general livestock study undertaken by SCET/Cooperation with FAC financing will be available in October 1970. It will emphasize:

- (i) The importance of small stock (sheep and goats), of which about 25 percent of the total number in the country -- the same percentage as for cattle -- are to be found in ORD. Their economic potential is particularly promising. The Maradi goat is much demanded by stockbreeders, particularly for its superior meat yield.
- (ii) The importance of proper feeding. For instance, in the last three years the Markoye station has had a fertility rate of 77 percent (77 calves weaned per 100 cows per annum, as compared with 30-40 percent in traditional stockraising). Furthermore, the same station had no deaths during the severe dry season 1968/69, when the mortality rate for calves under one year of age, in the traditional stockraising areas, exceeded 50 percent.

221. Additional sociological studies should be undertaken by ORSTOM covering the territory outside the Oudalan region and the area north of Lake Oursi. While that agency has already made interesting studies of the pastoral environment (e.g. studies by Barral and Riesman), additional information on the regions of the ORD that have not yet been studied will be useful in providing more accurate data on all the ethnic groups of stockraisers. Such studies should focus on:

- (i) Factors motivating the movements of herds and possibilities of modifying them in certain desired directions.
- (ii) Factors motivating the sale of animals, which are apparently prompted more by immediate monetary needs than by economic considerations, such as the availability of livestock and grazing.
- (iii) The receptivity of stockraisers to the various methods of stockbreeding that might be proposed, according to their tribal origin.

222. It is through an appropriate synthesis of information on the four factors (water, pasture, man and livestock) that the authorities in charge of the ORD will be able to achieve the optimum ecological balance in preparing and carrying out a development program. In the 1960's the livestock population increased by about one-third without any corresponding action to improve the environment. One authority has warned that "It

would be disastrous to allow the situation to deteriorate there (Oudalan) as a result of the progressive destruction of what is the principal grazing potential of Upper Volta." ^{1/} Studies would be of no use unless they took account of the traditional methods of stockbreeding and the ability of graziers to respond to more modern and progressive methods.

Economics of the Project

223. The total cost of the project will have to be broken down in accordance with requirements for (1) new or additional investment, (2) technical equipment, (3) salaries and allowances for expatriate and local personnel, (4) additional funds for the Livestock Service, and loan service charges. A proper phasing of the expenditures will have to be worked out and an attempt made to determine the break-even point when self-financing might be achieved. It must be anticipated that a project of this nature, involving a traditional environment, will require subsidies over a ten-year period.

224. A rough indication of the expenditure likely to be entailed over the next decade is given below under major headings (in CFAF billion):

Water development	1.5
Other investments (buildings, housing)	0.2
Studies and applied research	0.1
General equipment	0.2
Operation-10 years	<u>1.5</u>
Grand Total	3.5

It must be considered that, at this stage, these estimates are rather arbitrary.

225. The financing plan will have to take into account the phasing of requirements and the possible sources of financing for:

- (i) Studies still to be made: complementary or new.
- (ii) Supplementing the existing infrastructure in terms of:
 - The Gorom-Gorom sector
 - The Djibo livestock district
 - Markets, tracks, boreholes, abattoirs, etc. (FAC projects)

^{1/} Barral, ORSTOM: Sciences Humaines, IV, 1-1967, "Problemes Pastoraux, Subdivision de l'Oudalan."

(iii) Establishment of new infrastructure:

- Headquarters of the ORD at Dori
- ORD Office at Djibo
- Equipment of markets (Markoye)
- New livestock posts or sectors
- Access roads and tracks
- New and old water points

(iv) Equipment, notably:

- Means of communication; vehicles and radio
- Audio-visual aids

(v) Special programs.

(vi) Operating costs: personnel and supplies.

226. The financing plan will undoubtedly have to envisage considerable external assistance but should at the same time envisage a gradual tapering off of such assistance, including that in the form of expatriate personnel. Thus a schedule for transferring management responsibilities to Voltaic staff and financing responsibilities to the State should be provided. In this connection it will be necessary to work out the progressive impact of the project on the expenditures and revenues of the ORD itself, the local rural governments of the area, and the central government.

227. The final project document will have to give information in particular about:

- (i) the additional output likely to be generated by the project;
- (ii) recurrent charges entailed for the national and local budgets;
- (iii) taxes and service fees that will be collected by the ORD;
- (iv) the employment generated in both the private and public sector by occupational groups;
- (v) the anticipated economic return on the basis of a phasing of cost and benefits and in accordance with methods specified by potential lenders.

228. SEDES and SCET/Cooperation have been entrusted with the preparation of a project identification study. The mission will be carried out in November 1970. It will serve as a basis for a feasibility study scheduled for 1971 for which FAC or the UNDP will provide financing. Negotiations for the implementation of the project may take place in 1972/73.

E. Modern Fattening Techniques

Ranching in the Sahel

229. The possibilities of using the grazing lands located south of the Beli valley, between the Mali frontier and Lake Oursi, for the establishment of a ranch for the fattening of cattle has been the subject of a series of studies.

230. The socio-economic study revealed, even before it was completed, that the existing herders who were permanently using 30,000 hectares in this area were unwilling to surrender any land for this ranch. It indicated that at most 25,000 hectares of little-used land could be appropriated by the State. However, it was clear that a Sahelian ranch would not be possible except on the basis of 8,000 to 10,000 head of stock, which, on the basis of a carrying capacity of one head per 8 hectares, would have required an area of 75,000 hectares.

231. The hydro-geological study, although also unpromising initially revealed, on the basis of a second reconnaissance, the existence of an aquifer. Pumping tests to measure the potential rate of discharge were initiated in March/April 1970.

232. The agrostological study, which was begun rather late and when the problems of establishing a ranch were already known, has focused basically on getting a better knowledge of the forage potential of the sub-Saharan area, which would be helpful in the preparation of a feasibility study of a Sahel ORD serving principally as an area for breeding and communal grazing of stock.

233. As a result of these studies, the commercial ranch project has been abandoned. The studies have shown that there are still 20,000 hectares in the area that are unexploited because of lack of water and that an additional 30,000 hectares is little used because of the long distances between water points. The development of these 50,000 can be undertaken within the framework of the projected pastoral ORD. They represent a welcome additional reserve of range land that can be used during the latter months of the dry season. If the pumping tests already mentioned confirm the possibility of exploiting the borehole in the Beli Valley (diameter 10"), three or four water pipelines radiating 10 km from this water point

will be laid. Each of these lines should be closed in turn so as to permit the conservation and regeneration of the range land at the periphery of the distribution point over an area of 10 km² (30,000 hectares). The initial zone of influence of this ranch could thus be doubled by these branch lines and cover 150,000 hectares.

234. Meanwhile, further studies of the yield and carrying capacity of range land will be continued in 1970 with a view to the preparation of an agrostological map. Thus, although the studies (costing CFAF 75 million) have not achieved their original objective or demonstrated the feasibility of commercial ranching, they will result in the opening up of new range lands, help to ensure their rational utilization, and thus reinforce the importance of the Sahel as a pre-eminent area for animal production.

Semi-intensive Fattening on Savanna Ranches

235. The Government of the Federal Republic of Germany has sent a team of experts (veterinarians, agronomists and economists) to explore the possibility of establishing a mixed stockbreeding/fattening ranch in the savanna area of the Sideradougou region, southwest of Banfora. Little is known about this project, which has been under preparation for the last two and a half years. The French version of its report will not be available until the end of 1970. The studies, including the salaries of experts, have already cost CFAF 55 million (end of 1969). The studies on agrostology and animal diseases are completed; those on the supply of cattle and the economic aspects of the property were still in progress early in 1970.

236. Protection of the health of zebu cattle imported from the North, in particular from Mali, will probably be a major element in production costs since the ranch is situated in a savanna area where trypanosomiasis is prevalent and rickettsial diseases probably exist (heart-water). Bush encroachment, which is characteristic of this ecological zone, may also be a problem as long as a balance between the livestock carrying capacity and the fodder potential is not achieved.

Outline of an Intensive Fattening (Feed-lot) Project

Objective

237. On the basis of reliable data obtained over a period of two or three years on an experimental station by varying different parameters (ration, animals, age, duration of fattening, etc.), the project proposes:

- (1) To put into effect, in the Bobo-Dioulasso region, or the Banfora region, on the basis of intensive fodder crops supplemented by agricultural and industrial by-products, a system of rapid fattening of cattle, consisting of three to four annual rotations of 4,000 head each.

- (ii) To provide the Bobo-Dioulasso abattoir with a more regular supply of good quality beef stock in all seasons.
- (iii) To increase the value added by livestock which at present are slaughtered when their weight, finishing, and quality are below par for export.

Justification

238. Under present conditions in Upper Volta, the average unit carcass weight is too low, the number of animals slaughtered before they are mature is abnormally high and the carcass weight varies with the seasons to an extent unacceptable for a regular export trade.

239. The SEDES report on meat supply in Central West Africa estimates the average carcass weight of Voltaic cattle at 100 kg. We have taken 105/110 kilos in 1969/1970 1/, a figure that is confirmed by the experience of the Bobo-Dioulasso abattoir which, however, is largely supplied by Zebu cattle from Mali. For that establishment--the only one up to 1969 that has been able to weigh carcasses regularly -- the average carcass weights recorded in 1968 are given in Table 39.

Table 39: AVERAGE WEIGHT OF CATTLE SLAUGHTERED IN THE BOBO-DIOULASSO ABATTOIR

Bobo-Dioulasso Abattoir	Number	Carcass Weight	Average Unit Weight (kg)
Bulls	3,486	320,135	91.83
Steers	11,980	1,474,097	123.04
Cows	3,797	386,652	101.83
Bull Calves	19	1,035	54.47
Calves	<u>110</u>	<u>6,008</u>	<u>54.61</u>
Total	19,392	2,187,937	113

Source: Livestock Service, 1968

Underweight carcasses entail a wastage of the animal husbandry potential and a loss of value added, downgrade the quality of the animal, and do not satisfy the normal requirements of importers.

240. The number of young animals slaughtered is appreciable. Out of 735 head of cattle slaughtered at Bobo-Dioulasso between November 14 and November 25, 1969, 105 were 2 to 3 years old and 92 were 4 years old.

1/ This is a national average for both export and domestic consumption.

Therefore 14% of the slaughterings were of cattle between the ages of 2 and 3 years, and 26% of cattle aged 2, 3 and 4 years. The carcass weights of these young animals range from 60 to 130 kg. They ought therefore all to have undergone intensive fattening before slaughter, the more so because such young animals, despite earlier privations, would respond better to intensive feeding than older animals.

241. The carcass weight varies according to the season. For male animals, which accounted for 67.3 percent of the total tonnage slaughtered, carcass weight in 1968 varied from a minimum average of 119 kg in June and July to a maximum of 132 kg in December. If the carcass weight of the 11,980 cattle slaughtered at Bobo-Dioulasso in 1968 had averaged 132 kg, the additional meat produced would have been 106,320 kg (net), which at CFAF 100 per kg would have valued at CFAF 10,632,000. Fattening would make it possible to even out seasonal variations and to present more good quality animals throughout the year (criterion of consistent quality).

Technical References to Fattening in Feed-lots

242. Trials with fattening carried out by IEMVT and IRAT 1/ have been promising:

- (i) Fattening experiments conducted by IEMVT in different countries - Senegal, Ivory Coast, Madagascar (two years out of the three for which provision was made) - show that adult Zebu cattle are able to make daily weight gains of 700-800 grams.
- (ii) Experiments with fodder crops have been conducted in Upper Volta at the Livestock Service (Banankeledaga) and IRAT (Saria-Farako Ba) stations, and in other countries by IEMVT (Cameroon, Madagascar, Senegal). The Upper Volta experiments, in which more than 100 imported fodder plants have been tested, have demonstrated, at least up to 1969, the superiority, in terms of adaptability and yield of two plants for use in farm fattening of cattle, namely: a graminaceous species (Bracharia ruziziensis), and a legume (Stylosanthes gracilis). Different varieties of Pennisetum and of fodder maize should be tested for intensive industrial fattening (feed-lot or zero/grazing).

Siting of the Project: By-products available

243. Two sites are to be studied -- one in the Bobo-Dioulasso region and the other in the Banfora region. Both of these regions have considerable fodder potential and can draw on a supply of agro-industrial by-products such as molasses and sugarcane tips from the sugar cane plantation

1/ IEMVT: Institut d'Élevage et de Médecine Vétérinaire des Pays Tropicaux

IRAT: Institut de Recherche d'Agronomie Tropicale

and mill projected for Banfora (if it is realized), bran from the Matourkou and Banfora rice mills, dregs from the brewery at Bobo-Dioulasso, blood and bonemeal from the Bobo-Dioulasso abattoir and cotton seed from the ginnery at Bobo-Dioulasso. The ginnery has a capacity of 15,000 tons which is to be expanded by 25,000 tons. The cotton seed is at present reserved for sowing and for export, primarily to Japan. The grain mills (Grands Moulins Voltaïques) which are being constructed near Banfora with the participation of SIAN 1/ should also supply a certain amount of by-products. The facilities will be able to treat about 1,000 quintals of wheat and millet per day or 750 quintals of flour and 250 of bran. Production is to reach 13,000 tons in 1972.

244. The CITEC 2/ and SHSHV 3/ oil factories (Bobo-Dioulasso) are sources of groundnut cakes. At the beginning, in 1972, a cottonseed oil factory is to be erected at Bobo-Dioulasso. The present and projected availability of cottonseed and cake under CFDT-CITEC programs is shown in Table 40.

Table 40: AVAILABILITY OF COTTON SEED AND COTTONSEED CAKES
FORECASTS THROUGH 1975
(in metric tons)

	Total Supply of Cottonseed	Seed required for sowing	Seed available to oil mill factory	Projected operations of CITEC mill	
				Seed processed	Cake produced
1966/67	16,272	4,800	5,700		
1967/68	23,700	7,000	8,300		
1968/69	30,000	9,000	10,500		
1969/70	36,000	11,000	13,000		
1970	40,000	12,000	14,000		
1971	46,000	13,800	16,100		
				<u>Opening in 1972</u>	
1972	50,000	15,000	17,500	15,000	5,326
1973	55,000	16,500	19,250		
1974	60,000	18,000	22,000		
1975	65,000	19,500	22,800		
1976				30,000 (plan)	11,000 ?

1/ SIAN: Societe Industrielle et Agricole du Niari, a subsidiary of Grands Moulins de Paris.

2/ CITEC: Comptoir pour l'Industrie Textile (Bobo-Dioulasso), Boussac Group, Paris.

3/ Societe des Huileries et Savonneries de Haute-Volta (Bobo-Dioulasso).

245. Out of the production of 807 tons of groundnut cake in 1968/69, 76 tons were sold in Upper Volta to the Livestock Service, IRAT (Farako Ba), the Matourkou Center and a few private individuals, and 731 tons were exported to Ivory Coast (Baoule-Bingerville). Production is likely to remain at a level of about 750 tons.

246. A detailed survey of the availability of by-products has been entrusted to IEMVT and has been in progress since March 1970. It seeks to determine for all by-products (a) the present supply situation; (b) the output by factory or source; (c) supply through 1980; (d) type and method of use; (e) the nutritional value of each product; and (f) actual and prospective prices. Laboratory analyses will determine the value of those that appear to be the most promising, taking into account tonnage and price. Experiments will then have to be undertaken to determine the most economic rations.

247. In the light of the results of this study, the feasibility of establishing a factory to produce cattle feed for animals in feed-lots and research stations and for the whole of the domestic market, can be explored. Surplus by-products could be exported depending on sales possibilities. The IEMVT survey should be available in May or June 1970. It should supply information very important for further consideration of the fattening problem irrespective of the fattening techniques that might ultimately be chosen.

248. Present (end of 1969) or anticipated prices are as follows:

- (i) Cotton seed: The CITEC factory will pay 2 CFAF per kg at the cotton ginning factory. The stabilization fund at present collects 3 CFAF per kg on exported cotton seed.
- (ii) Cottonseed cake: Anticipated price in 1972: 8 CFAF (according to the 1969 base prices).
- (iii) Cottonseed oil: Semi-refined: 54 francs (Refined: 65 CFAF)
- (iv) Groundnut cake: For Upper Volta: 12 CFAF per kg in bulk ex-factory. For Ivory Coast: 15 CFAF per kg in bulk ex-factory.
- (v) Rice bran: 6 CFAF.

249. A feed-lot operation might be located either near Banfora or near Bobo-Dioulasso. In both regions, the human population density, which is less than in the Mossi country, is such that 1,000 hectares can be found for the proposed operation without displacing or expropriating landholders.

250. In the Banfora region, the problem of water could be solved in association with SIAN's projected sugar cane plantation. SIAN would initially have 4,000 hectares, of which 3,500 could be devoted to sugar cane and 500 to irrigated fodder crops. In the case of both Bobo-Dioulasso, which is a large town, and of Banfora, if and when the sugar mill is established, many of the necessary facilities (repair workshops, water, power) would be available. Both centers are also served by the railway. However, from the standpoint of the supply of cattle, Bobo-Dioulasso is better placed because it would be the logical place to purchase a considerable number of animals in transit from Mali or northern Volta, or underfed animals transported from Yatenga, the Sahelian North or other upcountry origins. Moreover, Bobo-Dioulasso will be the terminal point for livestock routes in the West likely to be financed by FED. Bobo-Dioulasso infrastructure is also better, since the town has an abattoir and is the headquarters of a livestock district, and the Banankeledaga station is nearby. As far as the control of livestock disease is concerned, both locations would be almost equally satisfactory. However, it should be noted that the incidence of trypanosomiasis is low around Bobo-Dioulasso whereas preventive measures would have to be taken at Banfora, in particular against tick-borne and parasitic diseases.

251. The study of the economic and financial profitability of a fattening operation will have to determine the choice between the two sites. However, they would not necessarily be mutually exclusive if capital availability and market conditions permitted both to be used.

Responsible Agency

252. In the absence of private enterprise, the proposed National Livestock Development Company could be entrusted with the operation. The necessary personnel might be obtained from the Animal Production Service or recruited on contracted according to need.

Execution-Indicative cost

253. On the basis of an earlier study made in Madagascar, it may be assumed that the project could be operational in two years and would cost CFAF 300 million. A working capital fund of CFAF 50 million would be needed for each unit producing 15,000-16,000 head annually and marketing another 15,000 in transit through the Center. The Government will immediately have to take decisions with a view to enlisting the necessary financial assistance for carrying out the operation if the results of the experiments and the economic conditions are favorable. The cost of the technical studies and necessary trials should not exceed CFAF 25-30 million distributed over 2 years.

Recommendations

254. The Mission recommends that the Government take the necessary measures:

- (i) To carry out at the Banankeledaga station and/or at the ERAT's Farako Ba station controlled tests of intensive fattening using fodder with the best possible yields and by-products available on the local market. These tests would be entrusted to IEMVT, which is supported by FAC and has the necessary experience. They would utilize the results of the preceding study in the availability of, and market for, the various by-products that can be used to create an animal feed industry.
- (ii) To make a preliminary feasibility study of the technical, economic, and financial aspects of the project.
- (iii) To prepare the definitive project, including a decision on the sites to be chosen, when the above-mentioned data become available (two years).
- (iv) To make an economic analysis, involving a comparative study of the cost of meat produced in accordance with the methods envisaged by Upper Volta (traditional grazing, improved Sahelian grazing, intensive or semi-intensive ranching, feed-lot). The cost would in each case have to be related to the prices at which meat available in the indicated volume and quality can be sold abroad.

255. To justify any type of "industrial" investment in meat production, it would, of course, be necessary to make sure that the purchase price of meat would progressively conform to the actual cost of production. If this were impossible, the only possibility would be to improve traditional production and trade.

F. Integration of Farming and Livestock Raising

Introduction

256. The distribution of cattle shows that there are enough cattle in the agricultural areas to provide a basis for the joint development of crop and animal husbandry. The cattle in such areas comprise (a) village herds of milch cows and their progeny plus a few draft animals where animal traction is making some headway, and (b) herds belonging to people, principally peuls (Fulani) who make livestock raising their profession. There are on the one hand, farmers who are not engaged in livestock raising but who do own, largely as a form of investment for their savings, livestock which they entrust to the management of livestockherders, and, on the other hand, the professional livestock owners who get their income from exploiting their own livestock and managing the livestock of others under "sharing" arrangements which are often complex. Conflict between these two groups are inevitable, because the competition of man, livestock, and food or cash crops for the available land is such that the two cannot coexist without adversely affecting each other and operating to the detriment of the economy of the country.

257. A very gradual solution of this problem can be achieved only by integrating crop farming and animal husbandry, particularly through the development of mixed farming providing for eventual on-farm fattening of several thousand young animals.

The Present Situation

258. At present there is no definite policy for associating crop farming and animal husbandry in Upper Volta. While a single policy of this sort would be difficult to devise in view of the wide difference in conditions and means of production, it is a matter for serious concern that no joint programs, even these limited to animal health care, can at present be carried out within the agreed time limits.

259. Funds for individual animal health care and mass prophylaxis have been available since 1968. As a result of considerable delays, these funds are unlikely to be disbursed even by the end of 1970. The worst situation appears to be in the ORDs of Koudougou and Ouagadougou, where drafting of the necessary program was completed only in August 1969. Taking into account further delays in the arrival of equipment and supplies and in the assignment of the necessary personnel, the program will get underway only in 1970/71 instead of in 1968/69.

260. In the Dedougou (Volta Noire) ORD the situation is better, although disputes about the powers and duties of the directors concerned have also delayed the delivery of trypanocide products. Out of CFAF 8 million provided for 2 years, only CFAF 3 million had been used by the end of 1969. A program for using the unexpended balance is under consideration.

261. In the Yatenga ORD "livestock" part of the new program is excessively modest and envisages the establishment of control herds with a view to improving livestock management. This approach will only confirm the coexistence of two distinct methods of livestock management without really integrating them. In the past the activities of the ORD were better integrated although limited by a shortage of funds. It is a pity that these activities were not resumed in 1970. After the cessation of animal health protection measures in this ORD, the only remaining activity will be the distribution of salt, which is insufficient and discouraging, particularly because the milieu seems to be receptive.

262. For the other ORDs no reliable information is available on the types and scope of activities undertaken for the benefit of stockraising and draft animals. However, such activities are likely to be of little or no importance.

Estimate of the Number of Draft Animals

263. Studies have been undertaken to ascertain the approximate number of animals used for traction. The resulting data for 1968 are given below, subject to reservations.

- (1) Koudougou ORD. While donkeys have proved adequate to drawing carts, their limited tractive power has not made it possible to make rapid progress in the use of donkey-drawn cultivators. Approximately 2,000 donkeys are used, of which 1,600 for drawing cultivators. The number of other types of draft animals has remained very low (200 oxen, a dozen horses). The number of cultivators in the ORD decreased in 1969, when 280 implements, which had not been used and paid for, were repossessed. On the other hand, 55 donkey-drawn cultivators (up to the end of November) and 72 donkey-drawn carts were sold for cash between January 1, 1969 and November 27, 1969.

Table 41: KOUDOUGOU ORD - GROWTH OF EQUIPMENT
DISTRIBUTED

Year	Carts	Cultivators	Remarks applying to cultivators
1965	151	2,440	
1966	173	2,570	
1967	278	2,322	After repossession of implements
1968	338	2,379	57 cultivators sold - 1,566 in actual use
1969	410	2,434	55 cultivators sold - 1,611 in actual use

The figures in Table 41 point up the unsuitability of donkeys for the tilling of soil which calls for tractive power three times (50 kg) greater than that normally developed by this animal (15 kg). The use of donkeys should not, however, be completely abandoned, since they are useful for many jobs and are well suited to pulling cultivators on light and poor soil. In addition, their price (CFAF 3,000) is often more in keeping with the real income and debt-carrying capacity of farmers than that of a yoke of oxen (CFAF 30,000). The actual number of plows, as distance from cultivators, that have been acquired and are in use is not accurately known. However, there are about 50 ox-drawn plows and perhaps a dozen horse-drawn plows. This number has varied very little since 1967.

(ii) Ouagadougou ORD. Information is even less accurate because of the vicissitudes of animal traction in this ORD, where many of the donkeys have finished their career -- in the abattoir. At the end of 1969, the figures were roughly as follows:

- donkeys used for cultivators 3,700 to 3,800
- donkeys used for carts 200 to 300 (excluding
Ouagadougou)
- other draft animals a few, primarily horses.

In 1970, SATEC expects that 20 pairs of oxen will be put to work.

(iii) CIDR Zones (including Volta Noire, Bobo-Dioulasso and Gaoua).

Here again, it is to be noted that little progress has been made since 1965, and that in 1968/69 there was no increase in animal-drawn equipment, except for sales of carts. It seems likely that 500 oxen are in service in the sectors in which CIDR is providing extension services (Bobo-Dioulasso: 340; Hounde: 50; Gaoua: 150).

(iv) Yatenga ORD. In 1969, a total of 1,073 plows together with 300 donkey-drawn carts and 450 cultivators were in service. The number of ox-drawn carts was very small. There are an estimated 2,200 trained oxen and 500 trained donkeys. An inventory was being made in the second half of 1969.

(v) Volta Noire (excluding CIDR Zone). At the end of 1969, it appears that not more than 1,800 oxen were being used for plowing or traction and 600 donkeys for pulling carts (cf. Annex 5).

(vi) Kongoussi-Kaya ORD. As in Volta Noire, our information is inaccurate. There are believed to be 600 trained oxen and 500 donkeys.

(vii) Banfora ORD. The number of teams is very small, about 20 oxen.

264. For the other regions, no reliable information is available. At Fada-N'Gourma, a private farm school is beginning to send out a few settlers with teams of animals. An estimated 100 yokes of oxen are in service. In the CFDT sector of Bobo-Dioulasso, 20 pairs of oxen are in service.

265. Table 42 shows the total number of draft animals in Upper Volta.

Table 42: DRAFT ANIMALS (NUMBER OF HEAD) 1969

ORD or Zone	Oxen	Donkeys	Horses
Banfara (SOTESA)	20	-	-
Koudougou (SATEC)	100	2,000	10
Ouagadougou (SATEC)	100	4,000	10
Yatenga (BDPA)	2,200	500	-
Kaya (SATEC)	600	500	-
Bobo-Dioulasso (CIDR + CFDT)	340	-	-
Gaoua (CIDR)	150	-	-
Volta Noire (CFDT + CIDR)	1,850	600	-
Other <u>a/</u>	200	500	30
Number 1969	5,560	8,100	50
Number 1965	4,000	8,000	50
Rate of increase per annum	8.6%	0	0

a/ of which 100 oxen in Fada N'Gourma.

It will be noted that oxen are used in yokes. Therefore, there would be about 2,280 teams at the end of 1969. It appears that the annual increase since 1965 has not exceeded 8.6%, not a very impressive rate of progress. In point of fact the progression is uneven. In certain areas the poor quality of the agricultural implements produced by the local factory has limited the use of equipment and draft animals.

Prospects of Mixed Farming

Animal Husbandry Activities

266. Animal husbandry activities, in order of importance, concern:

- (i) choice of species;
- (ii) conditions for proper maintenance;
- (iii) improvement of performance.

267. Experience with donkeys in the Koudougou and Ouagadougou ORDs shows that an error of judgment can set back the extension training plan several years and seriously prejudice the anticipated results. There is no doubt that where animal traction is deemed necessary, the only suitable animal is the ox; it is too often forgotten that the ox is basically a dual-purpose animal, a work animal and a meat animal and, in addition, in Africa, a source of organic manure.

268. Proper maintenance of livestock is of capital importance. An animal that is being worked or fattened should always be given extra rations in addition to that required purely for maintenance. Animals cannot be left to find their own food, especially after working in the field or pulling carts. The cost of the "work" ration is in the order of CFAF 3,500 per year for an ox and CFAF 1,500 per year for a donkey. The cost of the fattening ration is not known, but it may be between CFAF 3,000 and 3,500 per year per animal, depending on the type of feed available and its price. Continuing health surveillance is also essential in order to detect signs of parasitic infections, contagious diseases, and trypanosomiasis in areas where these diseases are endemic. Health protection involves periodic inspections and appropriate preventive measures, the cost of which must be added to the operating costs either at the producer level or at that of the ORD, within the framework of a mass campaign. The cost of medical care in areas in which trypanosomiasis is endemic is estimated at CFAF 250 per year per ox, and CFAF 150 in other areas. For a donkey, a minimum of CFAF 100 must be allowed.

269. The Mission has attempted to estimate the various cost components, distinguishing between fattening costs, current maintenance costs and health costs. In its opinion, 2,750 farmers must be gradually induced to undertake farm fattening in the Volta Noire ORD. This would represent only 5% of the approximately 55,000 farmers in the area. Although very modest, this program should be carried out with great care owing to its value as a pilot project.

270. An estimate of the cost of health care per ox is given in Table 43. In principle, no allowance is made for deaths of animals between the ages of 3 and 9 years, which is perhaps a little optimistic.

Table 43: ANNUAL HEALTH COSTS PER OX
(in CFAF)

<u>(A) Cost of products</u>		
<u>Nature of activity</u>	<u>Cost</u>	<u>Frequency</u>
Pleuropneumonia vaccine	16	Annual <u>a/</u>
Rinderpest vaccine	4	Over a 3-year period: 2 doses at CFAF 6 a dose <u>b/</u>
Prevention of trypanosomiasis	120	Twice a year: at CFAF 50 a dose
External parasite control	40	Four times a year: at CFAF 5 a dose
Internal parasite control	75	Annual
Minor treatments, mineral supplements	<u>175</u>	Saltlicks, 500 g/year/animal
Sub total	210	
<u>(B) Cost of Livestock Service Activities</u>		
Personnel <u>c/</u>	30	It is assumed that an animal being fattened for 6 to 8 months does not need any health care other than the above.
Equipment, (including operating cost) <u>c/</u>	<u>10</u>	
Sub total	40	
Total	470	
For a pair of oxen	940	

a/ If a good annual vaccine is available in 1971/72.

b/ Revaccination at age 3 years and 6 years of an animal introduced onto the farm at age 3 and sold at age 7.

c/ The following costs have been distributed over 50,000 head of cattle including 5,000 draft animals:

1. Personnel		
2 dispensers.....	2 x 300,000 =	600,000
2 vaccinators.....	2 x 150,000 =	300,000
1 laborer.....	1 x 100,000 =	100,000
1 assistant.....	1 x 500,000 =	<u>500,000</u>
		1,500,000
2. Operation and amortization of vehicles and other equipment.....		
		<u>500,000</u>
Total		2,000,000

271. Table 44 gives an indicative estimate of the cost of feeding per animal per annum. For a draft ox, the ration would cover maintenance, work and travel. Grazing can contribute 2.7 FU (fodder units) per day and supplemental stall feeding 0.3 FU. The ration for fattening is intended to provide for a 60/65 kg increase in live weight in 6 months (350 g per day). All the FU costs include allowances for labor and losses. Fattening would be entirely based on stall feeding.

Table 44: THEORETIC FEEDING ALLOWANCES AND COSTS

Rations	Days	FU/D	Total	Cost FU	Total	Remarks
<u>Draft animals (300 kg) a/</u>						
Maintenance) Travel)	365	3.0 b/	1,095	1.0	1,100	Collective grazing for 85% of the time
Work	60	4.0	240	6.0	1,440	Supplements in the stall
TOTAL	--	-	1,335	1.98	2,540 5,080	for one ox for a pair
<u>Fat stock</u>						
Maintenance	180	2.7	486	4.0	1,945	with harvested fodder
Fattening	180	1.0	180	8.1	1,440	with concentrates, vitamins, salt
TOTAL	-	3.7	666	5.08	3,385	for an ox in stall

a/ Five to six year old animal.

b/ Collective grazing - 2.7 FU; supplemental stall feeding to cover travel - 0.3 FU.

c/ Increase in live weight of 50/60 kg in 6 months with 330 g/day, on the basis of 11 FU per kg of weight increase.

272. The annual cost of feeding three animals (in CFAF) may be summarized as follows:

Two work oxen -----	5,080	
One ox for fattening -----	<u>3,385</u>	8,465
Cattle tax ----- 200 x 3	600	
Health care ----- 470 x 2	<u>940</u>	<u>1,540</u>
Total -----		10,005
In round figures -----		<u>10,000</u>

It should be recognized that these estimates are rather hypothetical, particularly with respect to the number of fodder units required, the cost of various types of feed and the net gain in weight likely to be achieved under actual conditions. It is suggested therefore that the Government entrust to IRAT and IEMVT the responsibility for testing the underlying assumptions and the economics on the three regions likely to provide the most favorable conditions -- Bobo-Dioulasso, Banfora, and Gaoua, for example. This would make it possible to arrive at rations reflecting an optimum combination of technical and economic considerations in the light of the characteristics of cattle and soils and the cost and availability of by-products.

Improvement of Performance

273. It is not advisable to experiment, either on the farm or on applied research stations, with exotic breeds of heavier configuration capable in theory of maturing earlier and of gaining weight more rapidly. Such breeds would make demands in terms of health care and feeding that would certainly be beyond the capacity of the people raising livestock. To devote funds to long-term breeding operations would be useless if the improved breeds do not find a suitable environment for their development and maintenance. Moreover, the improved yield of such breeds will be compensated by the much larger demands they will make on livestock raisers as well as by the loss of resistance to trypanosomiasis which now characterizes the local taurins.

274. The most urgent problem is therefore to thoroughly explore and take advantage of the potentialities of the local livestock. We have already indicated the type of practical research on methods and costs that should be undertaken on the farm in order to reach conclusions valid for particular areas and conditions. The propagation of farm fattening of cattle will demand several years of effort, and during this period some of the cost will have to be borne by the ORD, at least until an appropriate and economic method of fattening has been perfected. It will undoubtedly be difficult not only to persuade farmers to look regularly after the health of their

animals, but, above all, to provide the fodder for stall feeding which is essential since the practice of letting animals forage entirely for their feed is incompatible with efficient livestock management. In Madagascar, where farm fattening of cattle is practised on the plateaux, all the farmers are of the opinion that the system of mixed farming is more lucrative than cropping or livestock raising undertaken separately.

Extension activities

275. With respect to extension activities, either a minimum program or a more comprehensive, integrated program can be envisaged. In Yatenga, a minimum program comprising the following has been tried out:

- (i) Feeding of draft cattle. A number of silos were established: 62 in 1965 and 32 in 1966. Subsequently, this activity was given up because of the limited supplies of fodder available and the reluctance of the farmers to do the considerable work involved in cutting and transporting it. The distribution of a mineral supplement in the form of salt had more success, as the following figures on salt distribution show.

Crop year	66/67	67/68	68/69
Tonnage	4.2	41.9	25.1
Value	85,000	849,000	417,000
<hr/>			
Cost per kg	20 CFAF	20 CFAF	19 CFAF
<hr/>			

The selling price of saltlicks (CFAF 400) has been deemed too high. Although their weight is not accurately known, it is probably about 2 kg. It will be recalled that the Markoye Center has succeeded in selling saltlicks to stockbreeders at a price of CFAF 100-110 per kg.

- (ii) Health Protection. In 1967, 4,375 cattle and 8,225 sheep belonging to stockbreeders were treated for external parasites; in 1968, 5,950 cattle and 8,250 goats were treated for internal parasites. These operations, deemed to be too expensive, were suspended after May 1968. Their cost is not known but stockbreeders were asked to pay part of it. This work has not been continued owing to a lack of pastoral extension workers to demonstrate its value.
- (iii) Improvement of marketing. Stockbreeders' associations were established for collective shipment of animals to the market. Although, for various reasons, these operations have not always been profitable, the associations have enjoyed a certain success. Unfortunately, from May 1968 onward, it has no longer been possible to continue this activity because of lack of funds.

276. The experience of Yatenga is hardly illustrative. Ecologically the region is certainly the least suited to carry out a complex program. It has an excessive number of livestock, the soil is poor, and population pressure is high. On the other hand, the Volta Noire ORD, where an increasing amount of income from the cultivation is available it would have been possible to undertake a more sophisticated program involving, at the outset, the maintenance of three animals, of which two, one younger and one older ox, would be used as draft animals, and one would be in the process of being fattened after having worked as a draft animal for four or five seasons.

277. The association of crop and animal husbandry which is essential to achieve a balanced management of soil/animal resources does not yet exist because the necessary specialized extension workers, funds, programs and policy guidelines are all lacking. Provision for these must be made and integrated into all new programs whatever their sources of financing. This task is the primary responsibility of the Upper Volta Government, but foreign agencies will need to provide financial and technical assistance.

278. Activities to promote animal production call, of course, for a radical change in the outlook both of farmers and of extension workers and in their motivations. However, the farmers appear to be receptive and the leaders well aware of the difficulties and the advantages of the association of crop and stock farming.

A Ten-Year Program

279. The slow pace of this evolution must, however, be emphasized to all the partners in development. Formulas must be found to help Upper Volta to transform the best of its farmers, now exclusively preoccupied with food and cash crops, into producers of beef, complementary traditional stock-raising, or to modern fattening techniques (feed-lot, ranches).

280. A program should be so devised that through successive steps the farmer can progressively integrate animal husbandry permanently with his other farming activities. Through the production of meat the farmer would thus be able to make better use of his land. He would buy animals born in other regions (the Sahel), use them for traction and fatten them with feed produced on his farm, supplemented with animal feed bought on the market. This would not only produce a more integrated farming, but would contribute to a more advantageous division of labor between the northern and southern parts of Upper Volta, relieving eventually the traditional grazing areas in the North which would ultimately be reserved for breeding and the raising while the richer areas of the South would be utilized for fattening. To exclude livestock from an agricultural development and extension program is a serious error and does not make economic sense in Upper Volta.

281. With the progressive integration of livestock into farming, there will undoubtedly be a need for additional credit, since farmers are unlikely to have the means to buy three or four animals for traction and for fattening. In order to avoid usurious rates of interest, such credit might be supplied by an organization which might itself buy the animals directly from breeders.

282. Below we have attempted to outline the progressive stages of a ten-year program for the integration of livestock into crop farming. The idea would be to maintain permanently on the farm three animals, preferably castrated males, of which a three-year old animal in training would be used to replace annually as a draft ox a six-year old animal fattened over a period of six months. This principle would link animal traction with fattening on the farm.

Suggested Evolution of a Mixed Farm

<u>Year</u>	<u>Hectares cultivated</u>	<u>Principal farm operation and extension activities 1/</u>
0	1.50/2 ha	Man as virtually the only factor of traditional crops (food and other)
1	from 2.50 ha	Purchase of 2 trained animals (1). Use of selected seed, disinfection of seed, proper storage of crops. Animal traction for sowing and weeding in rows (2). Construction of a stall-shelter (3). Animal care, feeding, watering, tending (4,5,6,7). Counseling. Introduction of carts (8).
2	to 3.00 ha	
3	from 3.00 ha	On the basis of by-products and bush introduction of the practice of ensilage, fodder reserves and supplementary feeding (9). Introduction of animal traction for land preparation (10). Refresher course on animal care (11). Construction of a stall-dunghill (12). Purchase of one animal age 3 years. Counseling (13).
4	to 3.50 ha	
5	from 3.50 ha	Training of the young animal (14). Introduction of fodder into the rotation (15). Use of mineral and organic fertilizers (16). One animal withdrawn from work and put out to fattening (17).
6	to 4.00 ha	

1/ The numbers on this column refer to the successive stages of development for which the extension service will provide assistance.

<u>Year</u>	<u>Hectares cultivated</u>	<u>Principal farm operation and extension activities</u>
7	from 4.00 ha	Sale for slaughtering of the fattened animal and training (18) of a new young animal; initiation of the purchase/fattening cycle.
8	to 5.00 ha	
9	from 6.00 ha	Introduction of a female among an elite group of farmers (19). Extension of fodder cultivation (20).
10	to 8.00 ha	

Conclusion

283. Under present conditions it can be anticipated that the use of donkeys and horses as draft animals will make no further progress and that the use of draft oxen, the only animals really suitable for work, will increase only slowly. The constraints are not the availability of animals, but the problems of feeding, sometimes of watering, of health protection, in short, of managing the working capital represented by the animal permanently maintained under the responsibility of the farmer.

284. To meet these problems, the farmer must be given extension training and the farm must be transformed to provide for two work oxen and a young animal in such a way that all stages of animal husbandry, ranging from the training of animals for draft and the eventual fattening and replacement of the draft animal "retired" from work are effectively incorporated into farming practice. To this end, regional pilot projects should be undertaken, beginning in 1970, under the supervision of a specialized research establishment. Such a formula is especially recommended for the Volta Noire ORD. It involves the establishment of centers for training draft animals, the equipment of farmers for farm fattening, the solution of problems of supplementary feeding, and the constitution of herding of cattle when they are not working. Animal traction implying the occasional use of a donkey or of an ox for eight to ten weeks a year, cannot be put on a par with the economic and technical association of crop and stock farming.

G. Means of Evacuating Cattle

General

285. It is estimated that 125,000 cattle and 200,000 small stock are brought into Upper Volta each year from Mali and Niger. The breakdown by origin, by species, and by destination is approximately as indicated in Table 45. All these animals are not necessarily used for the purpose for which they were originally intended. Some are imported for breeding (heifers). Still others (e.g. those too tired or sick to be included in an export convoy moving on the hoof) are exchanged for local animals in better condition.

Various factors -- seasonal, economic and fiscal -- may also determine whether animals retain their "foreign" character or become "Voltaic". For example, attempts in Mali to collect certain trading taxes and enforce foreign exchange regulations affected the volume and character of export movements to and through Upper Volta prior to 1969. It is therefore difficult to accurately define the true volume of cattle movements across frontiers. As far as livestock other than cattle is concerned, most of the imported goats and a few thousand sheep are consumed at the frontier markets and in the town of Bobo-Dioulasso and Ougadougou. Most of the sheep, on the other hand, are exported to the south by truck or by railroad.

Table 45: ANIMALS IMPORTED AND IN TRANSIT

Origin	Cattle		Small Stock	
	Transit	Imported	Transit	Imported
Mali	95,000	20,000	60,000	70,000
Niger	<u>5,000</u>	<u>5,000</u>	<u>40,000</u>	<u>30,000</u>
TOTAL	100,000	25,000	100,000	100,000

286. To the export of foreign cattle (or cattle that have become foreign through exchange) must be added the convoys consisting of Voltaic cattle or of cattle brought into the country surreptitiously and transformed into Voltaic cattle in that manner. These animals are, as a rule, provided with national laissez-passer. For 1969 the number of such animals may be estimated at about 75,000 cattle and 275,000 sheep and goats. The total number of animals which at one point or another enter or leave the evacuation routes may be put at 200,000 cattle and 475,000 sheep and goats (Import + Transit + Export).

287. It has been pointed out that most of the small stock transported over long distances consists of convoys of sheep moved by railroad or by truck. On entering the country, for example, the eastern routes are taken by 90,000 to 100,000 head of which half are transported in trucks before reaching Ouagadougou and Puytenga. The remarks that follow relate basically to the movement of cattle on foot. The data are not very precise and are open to question. More light on these movements should be shed by the general livestock study which is being completed by SCET/Cooperation and to which reference has already been made.

Mapping of routes

288. In 1969, FAC undertook a feasibility study of two stock routes to the south (Ghana, Togo, Dahomey). This study, carried out by SCET/Cooperation (Arnaud), was completed on April 30 and submitted to the authorities on May 8, 1970. The project will be carried out in 1970/71 with FAC credits. The expected outlay for equipping 700 kilometers of track and three markets, comprising the creation of the Gorom-Gorom sector, is on the order of CFAF 80 million.

289. These routes and the experience with their operation should be useful in planning other routes for conveying stock from the production areas in the "loop" of the Niger (Mali, northern part of Upper Volta) towards the deficit areas on the African coast. However, a study for the demarcation of the routes can be undertaken straightaway because their development is required to cope with urgent trade and animal problems which is increasingly necessary to resolve.

290. Schematically it is possible to distinguish, north of the railroad and the Ouagadougou-Niger road, seven arteries of concentration whose relative importance depends on economic or seasonal factors. 1/

- (i) In the East there are three main tracks running from the Mali and Niger frontiers, which carry about 70,000 cattle:
 - (a) The first via Kantchari takes animals that have come from Niger and which have moved along either bank of the river to Dahomey, Togo and Ghana. It carries 5,000 head of stock.
 - (b) The second takes animals sold on the many markets in the Gorom-Gorom and Dori cercles to the important market of Puytenga and, beyond that, to Ghana and to Togo. It carries about 20,000 head.
 - (c) The third leads to the abattoir and the railroad loading platform at Ouagadougou; there are three possible destinations for the 45,000 head it carries: Ghana, the Ouagadougou abattoir, and Ivory Coast.
- (ii) In the Center there is a general artery coming from Mali and used by 70,000 animals from Upper Volta and Mali. Its importance depends on the railway cars that are made available to exporters at the loading platforms at Ouagadougou and Koudougou. It represents the convergence of a network more or less well-defined tracks in the interior of the country.
- (iii) In the West there are three tracks converging on the abattoir and loading platform at Bobo-Dioulasso and used by some 50,000 head coming principally from Mali.
 - (a) One is used by animals sold on the markets of the Djibo and Ouahigouya cercles.
 - (b) The second is used by animals imported from Mali via the Soin and Djibasso tracks.
 - (c) The third moves stock from the Sikasso region, and follows the road to Bobo-Dioulasso via Faramana.

1/ See map, page 30.

- (iv) In the South from the railroad to the Ouagadougou-Fada N'Gourma-Niger road, there are six arteries that are regularly used, namely:
- (a) The Kantchari artery via Dahomey, Togo, and Ghana.
 - (b) Puytenga-Ghana via Bittou or Puytenga-Togo.
 - (c) The Ouaga-Ghana track via Po.
 - (d) The Ghana route or track to Ivory Coast.
 - (e) The railroad to Ivory Coast via Ouagadougou, Koudougou, Bobo-Dioulasso, etc.
 - (f) The all-weather track to Ivory Coast, which carries the taurins cattle of the Lobi and Dagana country and some of the Zebu cattle which are not loaded at Koudougou and sometimes at Ouagadougou. It can be assumed to carry about 10,000 head.

Equipment Projects

291. These routes have been established by tradition without any intervention of the public authorities other than a customs and health inspection, neither of which is very effective.

292. The choice and equipment of a demarcated route must be governed by the following considerations:

- (i) Watering possibilities. Daily watering is necessary in all seasons. However, artificial reservoirs must be avoided since they are sources for transmission of infectious and parasitic diseases both for man and for animals. It is advisable to dig shallow wells and to equip them with rudimentary facilities.
- (ii) Quality and area of grazing land available. The cultivation of land along the routes followed must be prohibited. Holding areas for herds must be provided near abattoirs or evacuation points by rail or cattle truck.
- (iii) Nature of the soil; land problems. As far as possible, care should be taken to avoid a route whose surface is too hard since this will cause lameness. Similarly, a route should not cross too many cultivated fields near villages. One of the purposes of the investment is to reduce conflicts between farmers and migratory herders.

Management and profitability

293. The total economic and social effects of the establishment of these routes will not be fully known until the results of using the two experimental routes financed by FAC are at hand. Because of the lack of data on cattle weights and weight losses, it is indeed difficult to estimate how profitable the development of such cattle routes would be. Cattle will certainly lose less weight during the dry season if they have water and grazing each day. This would be particularly true of Voltaic animals; the others are usually watered only once every two days and are already living on their reserves when they arrive in Upper Volta. It cannot be denied that establishment of "legal" stock routes for the evacuation of cattle would simplify the control of herds in many respects and that their equipment, at various stages, with watering points, grazing and resting grounds would be a "service" which, according to the preliminary findings of on-the-spot inquiries by SCET/Cooperation experts traders would be prepared to use and to pay for.

294. The management of these routes should be entrusted to a mixed company. The Government asked FAC to send an expert mission to study this in May 1970, and the report of this mission was expected by the end of June 1970.

Role of External Assistance

295. The Fonds d'Aide et de Cooperation (FAC) will finance the two eastern routes which, starting from Markoye and Dori, carry about 65,000 animals (cattle). The project, for which financing was provided in the last quarter of 1970, will comprise (for a total amount of CFAF 80 million):

- (i) Demarcation of routes in order to prevent cultivation on them and to ensure sufficient grazing areas for transit, holding, and commercial transactions under the best conditions.
- (ii) Provision of a holding zone above Ouagadougou for animals intended for export on the hoof; the European Development Fund (FED) is expected to finance equipment of the local market and the establishment of a holding ground for animals destined for the abattoir.
- (iii) Provision of watering points every 25 to 30 kilometers (average distance traveled each day by the herds) thus making it possible to ensure, at all times of the year, a sufficient supply of non-polluted water free of parasites. However, the service fee will have to be as low as possible.
- (iv) A study of the equipment of markets to facilitate health control and control of commercial transactions at Markoye, Dori, Gorom, Kaya and Puytenga. Provision of holding and loading facilities at the Puytenga and Ouagadougou terminals (holding grounds with water and feed for animals).

- (v) Establishment of a very stringent veterinary infrastructure to prevent the spread of contagious diseases that are responsible for a loss of profits probably larger than the fiscal revenue.
- (vi) Determination of investments needed and of the cost of maintenance and depreciation.
- (vii) Assessment of the economic impact on the animals using these routes after determination of the service fee to be collected.
- (viii) Definition of the legal and administrative basis for this levy and assistance in setting up the agency to be responsible for the management of the stock routes.

296. The investment (comprising the establishment of three markets, a livestock sector, a terminal area at Ouagadougou and 700 kilometers of track of which 60% would be newly demarcated and provided with watering points) is expected to amount to CFAF 100,000 per kilometer. The maintenance charges are provisionally estimated at CFAF 8 million and could be covered by the following levies based on the 1969 traffic:

Cattle	:	650,000	x	CFAF 100	=	6,500,000
Sheep and goats:		100,000	x	CFAF 20	=	<u>2,000,000</u>
						8,500,000

297. The European Development Fund (FED) appears to be interested in a similar project covering one or more routes in the west, the study of which has not yet been started. Its primary purpose might be to ensure the provisioning of the mixed livestock breeding and fattening ranch which German experts have been studying. However, FED is expected to await the completion of the FAC project before deciding on any financing. Other institutions such as the World Bank could participate in the equipment of the central routes leading to the loading points of Koudougou and Ouagadougou. These would thus ensure, under the best possible conditions, the provisioning of possible feed-lots at Bobo-Dioulasso and Banfora.

Problems of Evacuation by Rail

298. The large number of animals awaiting shipment by rail at Ouagadougou at the beginning of December 1969 (see table 46) demonstrates the lack of organization as well as of means affecting the transport of cattle by rail. At that time it was found that 35% of the cattle had been awaiting shipment for as long as two to three months and that 62% of the sheep and goats had been waiting one month or less. These findings make it all the more necessary to provide holding grounds some distance up country from the railway.

Table 46: NUMBER OF ANIMALS AWAITING LOADING AT OUAGADOUGOU

	Cattle	Sheep	Goats
Tax paid <u>a/</u>	791	240	81
Tax not paid	<u>1,237</u>	<u>1,256</u>	<u>240</u>
Total	2,038	1,496	321

a/ The earliest receipts date from July 1, 1969 (28 head); the others run from August 27 to November 27, 1969.

299. Equipment is also an acute problem. The requirements are not simple for more rolling stock, the renovation and modernization of rolling stock and improvement in turn-around, but also for the provision of a platform, stock yards and rapid loading facilities at the five stations used at present: Ouagadougou, Koudougou, Bobo-Dioulasso, Banfora and Niangoloko. However, the management of the Abidjan-Niger Railway (RAN) has not yet taken the necessary measures to correct this situation.

300. The railway is operating with a deficit, and the transport of cattle appears in fact to be heavily subsidized. However, to what extent poor organization is the cause of this deficit must be ascertained.

301. Although six cold-storage cars available appear for the time being to be adequate, they would be insufficient for shipment of more than 1,800 tons unless turnaround is speeded up. Since 1,700 tons were shipped in 1968, it is evident that the saturation point is very close.

302. SCET/Cooperation has noted that "the predominant role played by railroad in exports to the Ivory Coast would become even more important if the waiting time of the cars were shorter". If there were sufficient freight cars, all the animals -- regardless of their species -- would be transported to the Ivory Coast by rail. At present, 75 to 80% of the cattle and 60 to 70% of the sheep are exported by rail to the Ivory Coast, but only at the expense of loss of time and weight which robs them of a good part of their value and discourages livestock owners.

Table 47: MODES OF EVACUATION OF ANIMALS TO IVORY COAST
(percentage)

Embarkation Point	Cattle			Sheep and Goats		
	Railroad	Truck	On Foot	Railroad	Truck	On Foot
Ouagadougou	99.5	0.5	-	96.0	4	-
Koudougou	100.0	-	-	100.0	-	-
Bobo-Dioulasso	76.0	3.0	21	86.0	14	-
Banfora	100.0	-	-	?	?	?
Niangoloko	27.0	15.0	58	34.0	61	5
National average	78.0	4.0	18	66.0	32	2

303. Export of animals from Ouagadougou and Puytenga to Ghana must in theory be by truck, since all other means of transport are forbidden. In practice, however, the condition of the roads, which are not asphalted, still makes this impossible, at least at certain times of the year. This state of affairs should be rapidly corrected in order to take advantage of the Ghanaic market with its 9 to 10 million consumers and an animal production that is still insufficient to satisfy domestic demand.

Conclusion

304. In order to modernize the routes for the evacuation of cattle on the hoof, the studies and corresponding projects should be put into a very general context and should take into account:

- (i) The results of the establishment of the eastern artery (cost, management, profits or losses, rate of use).
- (ii) The location of existing and planned investments for abattoir cold-storage plants, railroad or truck loading platforms, and equipment of markets.
- (iii) The general trend of livestock and meat marketing and the decisions that will be taken in that respect by the Entente countries (Niamey, March 1970).

These factors, either separately or together, may have considerable influence on the extent to which a particular route is used and therefore may modify the size of the estimate for equipment.

305. As means of evacuating cattle by truck or by rail are gradually provided, export on the hoof must be forbidden south of the railroad-Ouagadougou-Niger road axis. For railroad transportation, a complete technical and economic reorganization is necessary. It should be the subject of a special report and of a proposal to the Government.

H. Livestock and Meat Marketing Companies

306. Upper Volta's geographical position has always attracted cattle dealers from Mali, Mauritania, and Niger for handling trade with the French-speaking countries and others, primarily Ghanaians, for handling trade with the remaining countries. As these dealers were believed to be doing excellent business, Voltaic nationals have been led to establish a great many local companies to engage in this trade. These have all encountered the common problem of liquidity arising from the general need to pay cash for livestock bought upcountry and the long wait for payment from buyers in the coastal countries.

307. Inexperienced private individuals and companies find it difficult to compete with traditional traders who have learned how to reduce overheads, partly by repatriating the proceeds of their sales in the form of consumer goods, thus engaging in effect in a two-way commerce. Since the Voltaic companies are not effectively represented in the markets where they sell, they often find it difficult to collect, thus suffering losses in liquidity.

308. In view of a general situation which is alarming for the economy and for the banking system, the commercial services have suggested the establishment of a Merger Committee. While this proposal is inspired by a praiseworthy objective, it does not go far enough since it cannot by itself solve the important problem of means of payment required at both ends of the distribution chain. A fortiori, a non-professional trader is bound to fail. Any reorganization designed to put trade in meat and cattle in Voltaic hands, must be planned in association with influential professional traders with representatives not only upcountry, but, above all, in the consuming countries where the most serious delays in payment occur.

309. It is difficult to form an accurate opinion of the actual ability of all the Voltaic companies dealing in meat and cattle. This trade is obviously attractive, and the geographical situation of the country to some extent justifies the general desire to share in it. SEMBEV 1/ will undoubtedly be the most serious contender for the cattle trade, it takes over the operation of the new abattoir at Ouagadougou and thus acquires control of the processing facilities. The abattoir should, however, be a financially autonomous public establishment capable of safeguarding in an equitable manner the rights of all users of the abattoir (both public and private, consumers and exporters) and in particular the priority rights of the State. Impartial management and sound depreciation practices are indeed essential for the proper operation of this facility. No private company is likely to be interested in the "production" and "management" of a public development project like the abattoir as such. It is likely, therefore, to be necessary to entrust operation of the abattoir to the proposed mixed company, the Societe Nationale pour le Developpement de l'Elevage (SONADEL) which FAC, at the request of the Voltaic government, has asked SCET/Cooperation to study.

310. The plan for merging the various existing companies will have to be carefully considered. The relevant documents and information are at present being studied at the initiative of the commercial services of the Ministry of the Economy and Finance. The study will need to be completed soon, in order to clear up the financial situation of the market once and for all, in particular to find a solution to the serious problem of delays in payment and of unpaid bills at the terminal markets in Ghana and Ivory Coast, much more serious than on collection and marshalling markets located upstream on the national territory.

1/ Societe d'Etudes pour l'Organization des Marches de la Viande et du Betail en Haute-Volta, founded on January 2, 1969.

I. Animal Industries

Cattle feed ^{1/}

311. The development of industrial and farm fattening of cattle and the improvement of stockraising throughout the country will give rise to a steadily growing demand for cattle feed and concentrates. The Government is concerned about this situation and has asked for the dispatch of an expert to ascertain:

- (i) the nature and volume of by-products available in 1969;
- (ii) production prospects around 1975 and 1980, following the establishment of new agro-food industries;
- (iii) the food value of these by-products;
- (iv) the composition of the most economical rations that could be prepared from them.

312. The establishment of an animal feed plant will have to be considered when the findings of this mission are known. At present, one can only emphasize its potential economic significance. Establishment and operation of the plant could be entrusted to private interests which will produce ingredients for the plant or utilize its products (sugar mill, flour mills, feed-lots, ranches).

313. The report of the mission is now available, and we can, therefore, give its preliminary conclusions. With respect to the supply of cereals it should be noted that human needs are barely satisfied in a normal year and that deficit years are by no means exceptional. Food crop production cannot therefore be counted on to supplement cattle feeding, unless success is achieved in introducing varieties of high yield sorghum that would produce more than is required to meet the food needs of peasant families. Moreover, such bran and broken grain as become available on **family farms are used for feeding to small stock kept on a family basis and cannot be collected for commercial purposes. Manufacturers of cattle feed must therefore rely on industrial by-products for their raw material.**

314. It is likely that the following quantities of such by-products will be available from 1975 onward:

Cotton seed	40,000 - 50,000 tons
Cottonseed cake	5,000 - 6,000 tons
Groundnut cake	1,000 tons
Molasses	7,000 tons (provided the sugar mill project is carried out)
Various industrial brans	6,000 - 7,000 tons (including rice bran)

^{1/} See Annex 7.

These quantities, together with abattoir by-products, should make it possible to set up an animal feed plant. The Government is following this matter closely of higher productivity, particularly in terms of the volume of meat available for the domestic and foreign markets, depends on the supply of animal feed.

315. The use and price of cattle feed will have to be determined in the light of the value of the final product, i.e. meat. However, the possibility of exporting animal feed may also be a factor in justifying this investment.

316. For the feeding of poultry, action should be limited to the collection of household waste and an artisanal approach. The price of cereals does not allow of intensive poultry raising if the product is to remain within the reach of most consumers.

Cold-Storage Abattoirs

Ouagadougou

317. The present establishment at Ouagadougou will be replaced in 1974 by a more modern complex constructed with FED credits. This project has had many ups and downs since the preliminary project was drawn up in 1964 and rejected by Brussels. An Italian company has now been authorized to carry out the project. It is to be feared that the extremely long period that is to elapse before it is put into service may in the long run affect the validity of the experts' conclusions on its optimum capacity (6,000 tons per annum initially, capable of extension to 13,000 tons).

Bobo-Dioulasso

318. This abattoir, which was put into service in 1962, can still be used for a few more years, but considerable maintenance work and modernization are required. The coldstore, on the other hand, does not meet foreseeable export requirements. Apart from its technical deficiencies, it can only be used for up to 1,000 tons of refrigerated products per year. The complex, which cost CFAF 70 million, was built with various grants (CFAF 40 million) and a loan of CFAF 30 million contracted in 1960 from the Caisse Centrale by the municipality of Bobo-Dioulasso. This loan, which bears interest at 2.5%, is repayable over fifteen years. A similar investment is not advisable before this debt has been repaid. A study should be made to compare the relative advantages of setting up a new abattoir or of carrying out fairly extensive remodeling. The Government should have this study carried out in 1972 so as to have a definite plan available in 1973. Construction would thus be possible in 1974 and operation in 1975. Although apparently not urgent, experience shows that five years is not an excessive interval between a study and its realization.

Other projects

319. When the Bobo-Dioulasso and Ouagadougou projects are completed, Upper Volta will have an annual processing capacity of 15,000 tons, which should under normal conditions be sufficient up to 1985. A well-designed and above all well-maintained abattoir can be kept in service for 20 years. An expansion rate of 7 to 8% a year, which is quite reasonable in an urban area, implies a doubling of domestic consumption in ten years. Meat exports, which have already reached a level of 1,700 tons (average for the last three years: 1,500 tons), will probably increase at the same rate.

320. Table 48 gives an estimate of production and its destination in 1980.

Table 48: MEAT PRODUCTION, EXPORTS, AND CONSUMPTION:
FORECASTS 1980
(in tons)

Abattoir	Domestic Consumption	Exports	Total Production
Ouagadougou	6,000 - 7,000	1,500 - 2,000	7,500 - 9,000
Bobo-Dioulasso	5,000 - 6,000	1,500 - 2,000	6,500 - 8,000
Total	11,000 -13,000	3,000 - 9,000	14,000 -17,000

By 1985, it will be necessary to decide whether to enlarge one or both of the urban abattoirs, or to establish an industrial abattoir in an intensive fattening area, at Banfora for example.

Hides and Skins

321. The first results of a survey undertaken in the bush by SVCP are given in Annex 3. In the first part of this report (Section C) the situation in this sector in 1969/70 was described. FAC has confirmed its promise to support the setting up of abattoirs/dryers in the bush and of the additional depots that would be required when an exact picture of existing installations and a justification of the needs have been presented to it.

322. The seasoning collection, and trade in skins and hides does not require heavy investment and the national program envisaged by the Animal Industries Service does not call for more than CFAF 200 million for depots and market equipment (wells, abattoirs, and dryers). Since private interests are also prepared to invest in this field, the Mission's estimate that public investment of CFAF 300 million may be required in the decade of the seventies appears to be generously calculated. The immediate problem is more one of management than equipment. Moreover, there is a prior need to put to full use the means already available, to recruit qualified government personnel and to ensure adequate budgetary funds to permit this personnel to be effective.

A N N E X E S

1. NUMBER, WEIGHT, AND PRICE OF ANIMALS SLAUGHTERED
FOR MEAT
2. EXPORTS OF LIVESTOCK AND MEAT STATISTICS
3. ANIMAL HIDES AND SKINS (EXPORT, EQUIPMENTS,
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7. BYPRODUCTS - SUMMARY OF TOTAL PRODUCTIONS

ANNEX 1

NUMBER, WEIGHT AND PRICE OF ANIMALS SLAUGHTERED FOR MEAT

Table 1/1: SUPERVISED SLAUGHTERINGS (1969)^{a/}
(number of animals)

District or town	Cattle	Sheep	Goats	Pigs	Horses	Don-keys	Camels
Ouagadougou (excl. town)	5,109	1,880	10,257	1,265	1	884	-
Ouagadougou abattoir	18,711	3,628	10,627	862	267	6	27
Bobo-Dioulasso (excl. town)	5,597	762	3,423	2,000	-	-	1
Bobo-Dioulasso abattoir	<u>16,016</u>	<u>4,914</u>	<u>2,160</u>	<u>2,270</u>	<u>349</u>	<u>1</u>	<u>17</u>
Sub-total	45,433	11,184	26,467	6,397	617	891	45
% of total supervised slaughterings	69.7	50.3	35.0	74.7	98.2	92.5	34.6
Kaya	4,837	2,322	10,074	378	-	-	4
Ouahigouya	4,141	2,483	11,803	147	-	-	-
Dori	1,312	2,187	12,296	-	-	-	48
Fada	6,400	3,121	10,747	1,294	8	19	32
Dédougou	<u>3,014</u>	<u>921</u>	<u>4,056</u>	<u>314</u>	<u>3</u>	<u>53</u>	<u>1</u>
Sub-total	19,704	11,034	48,976	2,163	11	72	85
Total supervised slaughterings	65,137	22,218	75,443	8,560	628	963	130

^{a/} The figures include animals slaughtered for domestic consumption and for export.

Source: Livestock Service.

Table 1/2: DEVELOPMENT OF SUPERVISED SLAUGHTERINGS
(number of animals)

Year	Cattle	Sheep	Goats	Pigs	Horses	Donkeys	Camels
1959	37,034	15,099	55,310	3,426		142	-
1960	42,995	19,041	60,435	4,541		264	-
1961	50,820	19,024	73,973	6,629		624	-
1962	53,348	18,906	80,810	6,220		739	-
1963	62,866	25,225	96,712	5,716		1,200	-
1964	75,239	24,575	102,102	6,903		1,419	-
1965	73,979	29,479	102,158	7,452		1,492	-
1966	72,096	29,370	112,065	7,709		1,802	-
1967	79,150	38,643	131,481	10,310		2,107	-
1968	82,895	33,671	124,303	9,868	1,048	1,208	64
1969	65,137	22,218	75,443	8,560	628	963	130

Source: Livestock Service.

Table 1/3: PUYTENGA ABATTOIR - CARCASS WEIGHT OF ZEBU CATTLE
SLAUGHTERED IN NOVEMBER/DECEMBER 1969

(in kg)

Age group	Males		Females	
	Number of weighings	Average carcass weight	Number of weighings	Average carcass weight
2 - 3 years	15	86	2	55
4 - 5 years	26	111	-	-
6 - 9 years	14	127	37	107
Over-age	1	94	6	97
Average weight	108		103	

Source: SCET/Coopération.

Table 1/4: BANFORA ABATTOIR - WEIGHT OF TAURINS SLAUGHTERED DURING
A 12-DAY PERIOD IN NOVEMBER 1969^{a/}

(in kg)

Age group	Males		Females	
	Number of weighings	Average carcass weight	Number of weighings	Average carcass weight
2 - 3 years	17	66.4	1	63
4 - 5 years	9	79	4	74.7
6 - 9 years	14	80.7	11	80.4
Over-age	2	89	6	64.6
Average weight	75		74	

a/ Animals reared in the Banfora cercle.

Source: SCET/Coopération.

Table 1/5: BOBO-DIOULASSO ABATTOIRS: SAMPLE SURVEY COVERING ANIMALS SLAUGHTERED DURING THE PERIOD
NOVEMBER 14-25, 1969

(weight in kg)

Age-group	Males					Females				
	Number of weighings	Average live weight	Carcass weight		Yield based on	Number of weighings	Average live weight	Carcass weight		Yield based on
			(1)	(2)	(2)			(1)	(2)	(2)
<u>European-type cattle (3)</u>										
2 - 3 years	7	175	89	92	52.5	1	146	62	65	44.5
4 - 5 years	5	206	105.6	109	52.9	-	-	-	-	-
6 - 9 years	5	250	123	127	50.8	9	244	126.7	130	52.6
<u>Zebus and Crossbreeds (4)</u>										
2 - 3 years	4	160	82	85	53.1	-	-	-	-	-
4 - 5 years	6	232	122	126	54.3	2	247	142	145	58.7
6 - 9 years	8	279	126.8	130	46.5	8	256	124.7	128	50
Over-age	1	297	139	143	48.1	1	250	101	105	42

(1) Obtained by weighing the carcass after slaughtering.

(2) Estimated and rounded off to allow for share customarily taken by butchers working on commission.

(3) Average carcass weight, taurins: 113 kg.

(4) Average carcass weight, zebus and crossbreeds: 123 kg.

Source: SCET/Coopération.

Table 1/6: AVERAGE WEIGHT OF CARCASSES IN 1968/69

Use	Cattle	Sheep	Goats	Pigs	Horses	Donkeys	Camels
National average	105/110	15/16	10/11	40/45	120	40	150
National exports ^{a/}	140/150	13 ^{a/}	10 ^{a/}	40	125	-	-
Local consumption	90	15/16	11/12	40/50	120	40	150

^{a/} Average figure for live and dead animals. The small ruminants show a wide range of variation:

Ouagadougou: average weight of exported carcasses 3.5 kg (kids) and 8 kg (lambs)

Bobo-Dioulasso: average weight of exported carcasses 5.0 kg (kids) and 15 kg (adults).

Source: SCET/Coopération.

Table 1/7: PRICE OF ANIMALS SLAUGHTERED FOR MEAT (1969/70)

I. <u>Cattle</u>				
A. <u>Weighed at the abattoir</u>				
	<u>Carcass weight (kg)</u>	<u>Price (in CFAP) per kg of carcass meat</u>		
		<u>Males</u>	<u>Females</u>	
<u>Bobo-Dioulasso</u> (zebus and crossbreeds)	less than 100	86	82	
	100-130	100	98	
	more than 130	98	116	
<u>Puytenga</u> (zebus)	less than 100	83	83	
	100-130	85	86	
	more than 130	91	96	
<u>Banfora</u> (taurins)	less than 70	95	111	
	more than 70	113	108	
B. <u>Estimated on the hoof</u>				
	<u>Carcass weight (kg)</u>	<u>Price per kg (net)</u>		
		<u>Males</u>	<u>Females</u>	
<u>Markoye</u> (zebus)	130/150	90	-	
<u>Kaya</u> (zebus)	130/140	95	-	
<u>Ouagadougou</u> (zebus)	130/140	100	-	
II. <u>Small Ruminants</u>				
	<u>Sheep</u>	<u>Goats</u>	<u>Sheep</u>	<u>Goats</u>
Sahelian area	15/20		100/120 ^{a/}	
Southern area	10/15	10/12	150/200 ^{a/}	120/150

^{a/} Depending on the time of year (prices rise in the holiday season) and the degree of fattening of the animal.

Source: SCET/Coopération.

A N N E X 2

EXPORTS OF LIVESTOCK AND MEAT

STATISTICS

Table 2/1: EXPORTS OF MEAT AND OFFAL (1969)

(in kg of refrigerated meat)

Abattoirs and Destination	Cattle	Sheep	Goats	Horses	Pigs	Offal	Poultry slaughtered	TOTAL
Ouagadougou to Ghana ^{a/}	54,401	-	-	-	-	200	-	54,601
Ouagadougou to Ivory Coast	<u>844,650</u>	<u>51,083</u>	<u>1,812</u>	<u>29,613</u>	<u>34,917</u>	<u>18,118</u>	<u>6,083</u>	<u>986,276</u>
Sub-total	899,051	51,083	1,812	29,613	34,917	18,318	6,083	1,040,877
Bobo-Dioulasso to Ivory Coast	<u>114,529</u>	<u>64,899</u>	<u>3,154</u>	<u>30,773</u>	<u>71,004</u>	<u>5,556</u>	-	<u>289,915</u>
Total in kg	1,013,580	115,982	4,966	60,386	105,921	23,874	6,083	1,330,792 ^{b/}
As % of total	76.16	8.71	0.39	4.54	7.95	1.80	0.45	100

^{a/} Made up of 21,844 kg to Bolgatanga meat processing plant in January 1969
 32,557 kg to Bolgatanga meat processing plant in February 1969
 54,401 kg

and 200 kg of beef livers to Bolgatanga meat processing plant in February 1969.

The overall percentages for the various types of animals vary little from year to year. Cattle represent 65-75% of total shipments; the variations between abattoirs are greater, but offsetting movements enable demand to be met.

^{b/} Rounded off in the present report to 1,331 metric tons.

Table 2/2: EXPORTS OF MEAT AND OFFAL (1967 and 1968)

(in kg of refrigerated meat)

Year	Abattoirs and Destination ^{a/}	Cattle	Sheep	Goats	Horses	Pigs	Offal	Miscellaneous		Total in kg
								Poultry	Rabbits	
1967	Ouagadougou to Ivory Coast	585,064	96,067	7,799	34,239	19,831	16,317	3,455	-	762,752
	Bobo-Dioulasso to Ivory Coast	<u>357,657</u>	<u>156,980</u>	<u>9,729</u>	<u>67,385</u>	<u>78,559</u>	-	<u>54</u>	-	<u>670,364</u>
	TOTAL	942,721	253,027	17,528	101,624	98,390	16,317	3,509	-	1,433,116
	As % of total	65.78	17.65	1.22	7.10	6.86	1.13	0.25	-	99.99
1968	Ouagadougou to Ivory Coast	947,207	44,829	2,633	26,223	3,135	13,441	2,714	491	1,040,673
	Ouagadougou to Ghana	<u>73,999</u>	-	-	-	-	-	-	-	<u>73,999</u>
	TOTAL	1,021,206	44,829	2,633	26,223	3,135	13,441	2,714	491	1,114,672
	Bobo-Dioulasso to Ivory Coast	<u>288,485</u>	<u>156,418</u>	<u>15,830</u>	<u>64,251</u>	<u>54,967</u>	-	-	-	<u>579,951</u>
	TOTAL	1,309,691	201,247	18,463	90,474	57,102	13,441	2,714	491	1,694,623
As % of total	77.28	11.87	1.10	5.34	3.36	0.80	0.20	-	99.95	

^{a/} It should be noted that no refrigerated meat was exported to Ghana prior to 1968, and that these shipments ceased in February 1969 in view of delays and difficulties in receiving payment.

Table 2/3: EXPORTS OF ANIMALS ON THE HOOF - TOTAL SUPERVISED EXPORTS^{a/}

(number of animals)

Year	Cattle			Small ruminants		
	Voltaic or presumably Voltaic animals	Animals in transit	Total Exports	Voltaic or presumably Voltaic animals	Animals in transit	Total Exports
1953	30,200	50,000	80,200	135,600	108,400	244,000
1954	47,000	55,000	102,000	192,000	46,500	238,500
1955	51,000	49,000	100,000	210,000	75,000	285,000
1956	61,000	45,000	106,000	196,000	54,000	250,000
1957	56,000	47,000	103,000	257,000	46,200	303,200
1958	48,000	70,000	118,000	266,000	58,000	324,000
1959	-	-	122,000	-	-	-
1960	86,949	40,500	127,449	204,442	64,557	268,899
1961	92,865	47,198	140,063	222,994	56,795	279,789
1962	102,709	61,018	163,727	250,753	45,556	296,309
1963	112,234	63,292	175,526	267,565	44,507	312,072
1964	114,576	54,543	169,119	232,079	70,285	302,364
1965	135,189	56,716	191,905	293,171	45,724	338,895
1966	97,989	119,336	217,325	195,921	83,405	279,326
1967	92,639	110,061	202,700	246,301	72,791	319,092
1968	95,311	29,902	125,213	279,090	5,387	284,477
1969	83,675	60,445	144,120	219,026	33,815	252,841

^{a/} The figures for 1953-1959 have evidently been rounded off. For 1968, the figures reported by the Customs have been taken in preference to those of the Livestock Service in view of numerous inconsistencies in the monthly report figures. As a general rule, however, the "official" exports are always lower than those reported by the field service. This difference cannot be explained solely in terms of fraud or final importation of some animals entering the country in transit.

Source: Livestock Service, except for 1968 (Customs).

Table 2/4: EXPORTS OF VOLTAIC (OR PRESUMEDLY VOLTAIC) ANIMALS ON THE HOOF IN 1969

(number of animals)

A. According to the Livestock Service

District	Destination	Cattle	Sheep	Goats	Poultry (kg)	Pigs
Bobo-Dioulasso:	Ivory Coast	29,682	79,504	18,448	1,218,401	72
	Ghana	60	-	-	-	-
Ouagadougou:	Ivory Coast	28,836	55,789	20,685	1,341,193	293
	Ghana	8,052	5,865	9,081	-	-
Fada N'Gourma:	Ghana	13,587	6,930	16,355	-	-
	Togo/Dahomey	3,458	3,633	2,736	-	-
	Niger	-	-	-	-	491
TOTAL EXPORTS		83,675	151,721	67,305	2,559,594	856
Total to Ivory Coast.		58,518	135,293	39,133	2,559,594	365
Ghana		21,699	12,795	25,436	-	-
Togo/Dahomey		3,458	3,633	2,736	-	-
Niger		-	-	-	-	491
Total for small ruminants			219,026			

B. According to the Customs

Agency	Cattle	Small ruminants	Pigs
Livestock Service	83,675	219,026	856
Customs	69,905	227,949	1,035
Difference	- 13,770	+ 8,923	- 179

Table 2/5: COMPARISON OF IMPORTS, TRANSIT AND EXPORTS,
1968 and 1969^{1/}

(number of animals)

Movement	Cattle		Small ruminants		Pigs	
	1968	1969	1968	1969	1968	1969
Imports	9,329	3,159	28,454	15,702	-	-
Transit	29,902	48,715	5,387	18,062	-	-
Exports	95,311	69,905	279,090	227,949	397	1,035
Transit + Export	125,213	118,620	284,477	246,011	-	-

^{1/} Internal variations are significant, even if total exports show a less pronounced difference. In view of the difficulty of controlling the frontiers with Mali and Niger (as the frontier area is also a transhumance area), it is impossible to identify Voltaic livestock, particularly cattle, in caravans of foreign livestock.

Source: Customs statistics provided by Mr. Arnaud.

Table 2/6: MOVEMENTS OF ANIMALS ON THE HOOF IN 1966 (AND AVERAGE FOR 1966-1969)

(in thousands)

Movement	Cattle		Sheep and Goats	
	SEDES	IBRD Mission (Robinet)	SEDES	IBRD Mission (Robinet)
Imports from Mali and Niger	18	25	84	100
Transit from Mali and Niger	<u>82</u>	<u>100</u>	<u>116</u>	<u>100</u>
Total incoming livestock	100	125	200	200
Exports to all destinations	83	100	220	375
Transit to Mali and Niger	<u>82</u>	<u>100</u>	<u>116</u>	<u>100</u>
Total outgoing livestock	165	200	336	475
Exports of Voltaic livestock	65	75	136	275

Note: After studying the potential and estimated outgoing movement of livestock from Upper Volta's northern neighbors, and estimates of consumption in Ivory Coast, Ghana, Togo and Dahomey, SEDES arrived at the figures shown in Table 2/6 for 1966. We have compared these figures with our own assumptions, which do not differ appreciably with respect to exports of Voltaic livestock except for the small ruminants. We have the impression that movements of goats have always been disregarded, if not ignored, particularly between Upper Volta and its southern neighbors.

ANNEX 3

ANIMAL HIDES AND SKINS

EXPORTS, EQUIPMENT, PREPARATION

Official Exports

Following the set back resulting from the halting of the Tanning Center's activities in 1968, official exports have not reached the 1967 level again except for goat skins, which have benefited from favorable market demand. Finished articles are not included in these exports.

Table 3/1: OFFICIAL EXPORTS OF TANNED AND RAW HIDES AND SKINS
(weight in m.tons)

<u>YEAR</u>	<u>CATTLE HIDES</u>		<u>SHEEPSKINS</u>		<u>GOATSKINS</u>	
	<u>Number</u>	<u>Weight</u> <u>Uw = 4.800 kg</u>	<u>Number</u>	<u>Weight</u> <u>Uw = 0.600 kg</u>	<u>Number</u>	<u>Weight</u> <u>Uw = 0.400 kg</u>
1966	90,608	434.92	44,903	26.94	123,041	49.22
1967	46,475	203.08	47,840	28.70	255,367	92.15
<hr/>						
1968						
Var.	40,880	195.22	40,202	24.12	187,069	74.83
SVCP	-	-	-	-	3,416	2.51
<hr/>						
1968	40,880	195.22	40,202	24.12	190,485	77.33
<hr/>						
1969						
Various	1,330	3.99	-	-	1,500	0.70
SVCP	91,160	260.19	43,550	24.62	150,814	73.06
<hr/>						
1969	92,490	264.18	43,550	24.62	152,314	73.76

Source: Livestock Service.

The unit weight (Uw) adopted by the Service for goatskins (0.400 Kg) is slightly below that taken by SVCP (0.430 Kg) and used by the Mission in Part I, Chapter C of this report.

List of Dryers Theoretically in Service

Table 3/2: LIST OF DRYERS THEORETICALLY IN SERVICE

Location	Size	Used	Water	Capacity	Condition
Barsalogho	5.5 x 4.5	No	No	Adequate	Good
Koudougou	10.5 x 7	Yes	Yes	Inadequate	Bad
Leo	6.7 x 6	"	No	Adequate	Average
Po	6 x 5	"	"	"	"
Ouahigouya	10.5 x 7	"	"	Inadequate	"
Youba	6 x 5	"	"	"	Bad
Bango	6 x 5	Little	"	"	"
Dijibo	6 x 5	No	"	"	"
Yako	6 x 5	"	"	"	"
Gorom-Gorom	5 x 5	Yes	Yes	"	"
Markoye	6 x 5	"	"	"	"
Dori	10 x 8	"	"	Adequate	Very good
Sebba	8 x 5	?	?	?	Not visited
Fada-					
N'Gourma	10 x 5	Yes	Yes	Adequate	Good
Puytenga	10 x 7	Yes	Yes	Inadequate	Fairly good
Koupela	6 x 5	No	"	"	" "
Tenkodogo	6 x 5	Yes	No	"	Average
Tougan	6 x 5	"	"	"	Very bad
Kaya	11.5 x 8.5	"	Yes	"	Bad
Korsimoro	6 x 5	Little	No	"	"
Boulsa	6 x 5	"	"	Adequate	"
Ouagadougou	40 x 10	Yes	Yes	"	Good
Bobo-					
Dioulasso	20 x 10	Under construction	"	"	To be checked

Personnel

One technician is at present working at the Ouagadougou abattoir, after a period of training at Maradi. He goes out with SVCP staff on their collection rounds and explains to the butchers how they can best prepare their hides and skins. SVCP also trains its own personnel.

Condition in which Hides and Skins are Supplied: Preparation

The Ouagadougou and Bobo-Dioulasso abattoirs, which have better trained staff, supply hides and skins "abattoir dried and arsenic cured".

The Ouahigouya and Kaya Centers could very quickly reach the same standard, but arsenate is not readily available in the up country regions.

SVCP sends its staff out into the countryside to improve the situation. As of April 1970, wooden frames capable of drying 60 hides per day in all had been put up at fifteen locations.

Establishment of a Corps of Specialists in Preparation of Hides and Skins

The draft of the revised personnel establishment regulations of the Livestock and Animal Industries Service is under study. The addition of a corps of specialists/inspectors to this service is planned. These specialists would cover the abattoirs, dryers and collection depots.

Legislation and Organization

The existing legislation in respect of the trade of butcher, the preparation of hides and skins and their collection and sale will be revised and brought into line with the requirements of the development of the sector.

THE DISEASE TOLL FROM 1965 TO 1969

(CATTLE)

Table 4/1: CATTLE DISEASES, 1969

Disease	No. of Foci	Morbidity	Mortality
Rinderpest	1	?	? (1 slaughtered)
Bovine pleuropneumonia	73	1,122	565
Anthrax	19	116	106
Symptomatic anthrax	45	444	441
Pasteurellosis	28	402	320
Trypanosomiasis	24	895	148
Hoof and mouth disease	24	12,883	0

Table 4/2: CATTLE DISEASES, 1968

Disease	No. of Foci	Morbidity	Mortality
Rinderpest	1	27	27 (of which 23 slaughtered)
Pleuropneumonia	88	1,972	802
Anthrax	28	126	124
Symptomatic anthrax	83	828	765
Pasteurellosis	49	495	309
Trypanosomiasis	37	1,452	276
Hoof and mouth disease	71	10,961	128
Tuberculosis	1	1	1

ANNEX 4

THE DISEASE TOLL FROM 1965 TO 1969 (CATTLE)

Table 4/3: CATTLE DISEASES, 1967

Disease	No. of Foci	Morbidity	Mortality
Rinderpest	0	0	0
Pleuropneumonia	45	630	234
Anthrax	24	143	133
Symptomatic anthrax	54	672	609
Pasteurellosis	43	356	218
Trypanosomiasis	13	134	14
Hoof and mouth disease	14	8,894	0
Tuberculosis	2	9	6

Table 4/4: CATTLE DISEASES, 1966

Disease	No. of Foci	Morbidity	Mortality
Rinderpest	0	0	0
Pleuropneumonia	50	2,306	1,267
Anthrax	17	63	63
Symptomatic anthrax	67	526	496
Pasteurellosis	42	333	287
Trypanosomiasis	16	359	85

Table 4/5: CATTLE DISEASES, 1965

Disease	No. of Foci	Morbidity	Mortality
Rinderpest	21	381	234
Pleuropneumonia	35	1,246	890
Anthrax	21	88	86
Symptomatic anthrax	49	411	398
Pasteurellosis	36	337	172
Trypanosomiasis	18	487	78

ANNEX 5

LIVESTOCK PROGRAM

IN THE

KOUDOUGOU, OUAGADOUGOU AND DEDOUGOU ORDS

Mossi ORDS (Ouagadougou and Koudougou) - Utilization of FAC Funds

Introduction

The small amounts in which these funds were provided made it impossible to embark upon a large-scale program designed to cover all livestock, particularly cattle, sheep and goats.

Objectives

The aim of the operation was to:

- (a) Keep a check on the state of health of draft animals and to ensure for them constant protection against trypanosomiasis in particular. 5,000 treatments per ORD are accordingly planned for a two-year period, the majority for donkeys.
- (b) Extend this health cover to judiciously selected herds, especially by treating 50,000 sheep and goats in each area concerned for parasites.

Means

- (a) Personnel: two veterinary assistants to begin with.
- (b) Equipment:
 - (1) Transport: one Peugeot 403 van
 - (2) Technical: (i) a standard kit comprising various receptacles and drugs, bottles, sample-taking equipment, syringes, needles, jet injectors, miscellaneous small items, castrating tongs, refrigerated container.
 - (ii) two high-pressure sprayers
 - (iii) a medicine chest.

- (c) Funds allocated: CFAF 4 million per ORD for two years.
- (d) Origin: FAC, under a combined program.
- (e) Staff provided by: SATEC to begin with, ORD after Voltaics are trained and available.

Scope of the Operation

The operation was to extend to:

- (a) Prevention by drugs and treatment of trypanosomiasis
- (b) Measures to prevent and cure parasitic diseases
 - (i) External: scab, mange, etc.; mites, streptothricosis, ixodidoses.
 - (ii) Internal: gastro-intestinal "strongyloses", liver fluke, etc.

In major cases these measures were to be supplemented with adjuvant treatments (arsenical, vitamino-therapy, oligo-elements, etc.). Individual health care of a minor character were to be provided by the same veterinary teams incidental to their rounds.

Utilization of funds allocated to the project (CFAF 4 million per ORD)

A. Equipment

Two "Bucket-Pump" sprayers	CFAF	50,000
Syringes, parts, needles		30,000
Jet injectors, castrating tongs		30,000
Water filters, scissors, lancets, surgical tweezers, probes, cutters, thermometers		33,000
Metal carrier, wood for division into compartments and making up medicine chests, various receptacles		30,000
Contingency and sundries		50,000
Total	CFAF	223,000

B. Pharmaceutical products

Trypano-prevention products and trypanocides	CFAF	1,000,000
Pharmaceutical products in current use		100,000
20 boxes of saltlicks		200,000
4,000 bags of thibenzol		1,700,000
400 liters of Ixogal		400,000
Tonics (vitamins)		120,000
Total	CFAF	3,520,000
Funds available in 1968	CFAF	2,000,000
" " " 1969	CFAF	2,000,000
Total	CFAF	4,000,000
Total expenditure (A+B)	CFAF	3,743,000

Unexpended balance ^{1/} CFAF 257,000

1/ This balance will be set aside for the purchase of camping equipment for the veterinary assistants and to meet any contingencies.

A charge is made for treatment of trypanosomiasis and the income thus obtained has been used for working capital. The amount allotted was based on the assumption that there were 5,000 working donkeys per ORD. In actual fact the development of donkeys as draft animals has been much slower than anticipated as explained in Part II (F). In 1969 the two ORDs concerned did not have more than 2,000 donkeys (Koudougou) and 4,000 (Ouagadougou), respectively. The schedule for the utilization of the funds must accordingly be adjusted to allow for the treatment of draft oxen, the number of which SATEC hopes to increase -- on a very modest scale -- in 1970/1971.

Volta-Noire ORD

The program here has been more sustained and also more fruitful right from the start. The information comprising the rest of this Annex has been extracted from the technical and financial report on the execution of the program in 1969.

Families reached by the extension service

The number of farmers reached by the extension program is estimated at 18,500. Bearing in mind that a family includes an average of nine members, this amounts to saying that the ORD has reached 170,000 of the roughly 500,000 inhabitants of the area concerned. One may therefore assume that 30% of the population was influenced by the extension work in 1969 and that one farmer in three was reached.

	<u>1968</u>	<u>1969</u>	<u>Percentage Increase</u>
Farmers reached	13,150	18,500	33
Farm-level extension workers	124	145	17
Number of farmers	58,500	59,600	1.8
% of farmers reached	22	31	
Number of farmers per farm-level extension worker	472	411	

Utilization of draft animals

The increase in the use of draft animals has been slow, for several reasons:

- (a) It would be risky to encourage the purchase of draft oxen as long as the veterinary service cannot provide regular care and before the mortality rate has been brought down to a normal level.

- (b) The farmers consider draft animals primarily as a means of cultivating a larger area. However, since the areas with a high cotton production -- even those where the farmers are prosperous enough to have funds to invest -- are thinly populated, so that difficulties are encountered in finding enough hands to pick the cotton. In fact, the production of cotton tends to vary inversely with the number of oxen employed. (See Table 5/1).
- (c) The extension service has concentrated on inducing farmers to make better use of the teams they already have. The fact that on the average 3.3 hectares of cotton land is plowed by, but that only 0.8 hectares are maintained with draft-animals show that animal draft is properly used for plowing but that much progress must still be made in using animal-drawn implements for ridging and weeding.

Table 5/1: UTILIZATION OF DRAFT ANIMALS IN COTTON CULTIVATION - 1969
(Ox Census of September 1969)

Sector	Yoke of oxen in use	Expected cotton production '69	Area plowed (ha)	Area ridged or weeded with animal-drawn equipment	Area plowed per yoke	Area maintained with draft animals
Dedougou	72	3,900	292	118	4.0	1.6
Hounde	48	8,500	156	40	3.2	0.8
Kougny	151	900	607	70	4.0	0.4
Nouna	441	600	1,541	437	3.4	0.9
Solenzo	51	3,200	172	19	3.3	0.3
Sourou	69	180	103	92	1.4	1.3
Tougan	94	280	264	15	2.8	0.1
ORD	926 ^{/a}	17,560	3,135 ^{/b}	791	3.3	0.8
					average	

^{/a} After deducting teams already counted in the CIDR zone (Hounde, Boromo), the number of teams in the CFDT district may be estimated at 900. The regional distribution is as follows:

CFDT zone.....900 yoke
 CIDR zone..... 26 yoke
 Bobo-Dioulasso-Oradara
 zone 170 yoke
 Total.....1,096 yoke
 or.....2,192 head

^{/b} These areas do not include land plowed for others against payment; the owners of ox teams do in fact frequently rent out their services to farmers without draft animals.

Livestock Service

It has been agreed with the Service that its staff detailed to the ORD will take charge of two types of program:

- (a) An intensive program for the villages of Poundou (Dedougou cercle) and Guiedougou (Lanfiera irrigated area) and comprising:
- Maintenance of records on individual cattle.
 - A coprological and hematological examination of all animals.
 - Treatment of cattle and horses for external parasites with Ixogal.
 - Comparative weighing of sheep to determine the effect of Thibenzol treatment on weight gain.
 - Testing trypanidum on cattle and donkeys.
- (b) An extensive program covering the entire ORD, confined almost exclusively to draft animals (i.e. oxen, donkeys, horses) with the principal objectives of:
- Elimination of internal parasites by treatment of Thibenzol.
 - Treatment of external parasites with Ixogal.
 - Chemoprevention using the antrycide Prosalt, now being replaced by Trypanidum.
 - Propagation of the use of saltlicks.
 - Increasing the receptivity of farmers to building up of fodder reserves at the end of the rainy season.

Thibenzol and Ixogal are supplied free, while Trypanidum is sold at CFAF 30 per dose in order to obtain some working capital. The saltlicks are initially distributed free of charge in order to make the farmers aware of their advantages.

(c) Utilization of funds

The veterinary team did not really start operations until June 1, 1969, since until that date the Livestock Service at Ougadougou and the Director of the ORD had not been able to agree on the nature of the program. The CFAF 8 million allocated for purchase of supplies in 1967, 1968 and 1969 was not therefore all spent. A schedule for utilizing the balance has been drawn up by the Livestock Service and the ORD. From June 1, to December 31, 1969, a total of 21,640 treatments were carried out under the health program the breakdown being as follows:

<u>Treatment</u>	<u>Cattle</u>	<u>Donkeys</u>	<u>Sheep</u>	<u>Goats</u>	<u>Horses</u>
Thibenzol	9,366	292	3,284	1,590	37
Ixogal	4,862	61	-	-	10
Trypanidum	1,819	87	-	-	6
Prosalt	214	11	-	-	-

The veterinary team has had a second vehicle since November 1969.

ANNEX 6

PROJECT FOR THE ESTABLISHMENT OF A LIVESTOCK ORD FOR THE SAHEL

TERMS OF REFERENCE OF THE PRE-FEASIBILITY STUDY

Background

In 1965 the Government decided to entrust rural development to Regional Development Offices (Offices Regionaux de Developpement --- ORD). As of April 1, 1970; eight ORDs were functioning (Ouagadougou, Koudougou, Ouahigouya, Kaya, Dedougou, Bobo-Dioulasso, Banfora, Gaoua). Three are in the planning stage (Fada N'Gourma, Koupela and Dori).

The existing ORDs have made some progress in including livestock activities in their program, particularly within the framework of measures to develop the use of draft animals (health protection, anti-parasite treatment, etc.). Nevertheless, they are basically crop-oriented and have therefore not provided the means for defining and putting into practice a general stockraising policy for the country as a whole.

Such a policy is, however, essential, in view of the importance of Upper Volta's livestock herd -- 2.5 million bovines and 4 million sheep and goats -- which accounted for 11-12% of the country's GDP and 55% of its exports in 1968. Together with the other animal species involved, this herd represents a capital of between CFAF 28 and 30 billion.

Choice of area

Of the three ORDs planned, priority is given to the one in the Sahel, which would have Dori as its headquarters and comprise the Dori, Gorom-Gorom, Arabinda and Djibo subdivisions, with 600,000 cattle and a million sheep and goats.

This area was chosen for three main reasons:

- (a) the livestock in it represents about a quarter of the country's total herd;
- (b) it forms a transit area through which animals move from the stockraising north (the Sahel) to the coastal consumer states in the south;
- (c) the people of the area (Peul and Tuareg) have a stockraising tradition going back many hundreds of years.

Prior conditions

However, three prior conditions would first have to be met if the ORD is to be established and to function satisfactorily:

- (a) The livestock policy defined by the ORD would have to be closely integrated with the rest of the region's activities. While one might be tempted at first sight to consider the region as primarily a pastoral zone, closer study reveals that -- for reasons attributable to the evolution of the actual structure of local society and to the traditional forms of balance between the physical environment and the inhabitants -- crop farming has become far from negligible, and serves primarily to cover the farmers' own consumption but also, to a lesser extent, to provide some source of cash income. Therefore, before any attempt is made to formulate the policy to be followed, a very detailed appraisal of all the socio-economic aspects of the region's activities will be needed. If development programs were to lay too much emphasis on animal husbandry, this might well aggravate the present difficulties and would be likely to lead to serious disequilibria in the more or less long term.
- (b) This fact in no way detracts from the imperative needs, both immediate and longer term, of the country's economy, considered from the angle of home and foreign trade in particular: cattle and meat remain the key problems of Upper Volta's production for both export and domestic consumption. Rationalization of existing trade channels starting from or passing through the area, the development of complementary specialization by livestock raising and livestock fattening areas, the possibilities for processing and utilizing by-products, are all elements of a program that must be covered by the terms of reference for the project.
- (c) Before making any decision on initiating a livestock development program, careful consideration should be given to the magnitude of the investment and operating costs involved. This will be all the more necessary since external financing on a considerable scale will be needed to establish and operate the ORD. The pre-feasibility study will have to define the framework to be adopted and the plan of action to be followed. The resulting data should help the Government to make the relevant decisions in full awareness of the facts and provide the basis for actual formulation of a workable project.

Execution of the study

The preliminary feasibility study should:

- (1) Use the following criteria
 - (a) Take advantage of the documentation already available in Paris and Upper Volta and supplement this with investigations
 - (b) Center on the following main points:
 - analysis of the present situation
 - orientation of programs to be undertaken
 - means to be used
 - results to be expected.
 - (c) Present its conclusions in schematic form without a precise calculation of the economic return which in any event could be determined only in the light of the choice of alternatives revealed by the study.
 - (d) Indicate the type and provisional cost of studies that will still have to be undertaken, taking into account those already available.
- (2) Carry out an analysis of the existing situation and of studies available or under way
 - (a) The physical environment: climatology, relief, soils, vegetation, hydrography, agrostology, grazing areas and watering places.
 - (b) The human environment: demography (total population, distribution, development); traditional societies (tribes, types of social organization, land tenure by tribe).
 - (c) Traditional activities: stockraising and crop farming (structures, production, pastoral and farming systems according to tribe, bottlenecks, etc.), trade (organization agents, articles traded, routes, importance, price structure and fluctuations, etc.).
 - (d) Living standards and incomes: gross incomes, auto-consumption, net incomes (origin, breakdown, uses, etc.), taxes and other fiscal aspects.

- (e) Infrastructure: administrative, economic and social (technical services, roads, tracks, wells, watering places, etc.).
- (f) Conclusions: factors conducive to equilibrium or disequilibrium at the technical, sociological and economic levels; prospects for the development of crop and livestock production.

Steps to be taken

The collation of information already available and the analysis of the present situation, carried out in relation to the establishment of the ORD and its principal objectives will show which studies should still be carried out and which need to be pursued in greater detail. The requirements for such studies should be specified in the following fields:

- (a) inventory of water resources (hydrogeology, surface hydrology, types of water supply works and responsibility for their maintenance);
- (b) the livestock of the region (numbers, influence of seasons on feed supply, pathology, range management, marketing problems);
- (c) pedo-agrostology (map, direct observation);
- (d) the local crop farming and stockraising systems (traditional methods, combinations or juxtapositions of the two, combinations of production, auto-consumption and trade, etc.);
- (e) the economic importance of different types of production.

It will also make it possible to lay down, in broad outline, the nature, manner and general schedule of the action to be taken by the ORD, and in particular:

- (a) the ORD's own responsibilities (management proper, plus programs relating to stockraising, crop farming, trade, and in the other development sectors: health education, tourism, mining, technical training, extension work);
- (b) coordination with other government services (livestock, rural equipment and engineering, rural development, water and forestry resources, public works, education and health);
- (c) cooperation with the producers (integration of programs with the traditional system, utilization of dynamic elements in the local society, organization of the producers, agricultural credit, new forms of grazing management, watering points, etc.)

Means to be used and anticipated results

The study will provide approximate data on:

- (a) the cost of fresh or supplementary studies;
- (b) the costs relating to the establishment and functioning of the ORD (studies, investments, equipment, personnel);
- (c) the approximate proportions of outside finance and local contributions for both the investments and the support period;
- (d) the general phasing of the expenditures;
- (e) the receipts expected, by type and by financial year;
- (f) the recurrent costs and how they will be met when the ORD is functioning normally.

Finally, it will indicate in broad outline the prospects that will be opened up by the programs at the level of the producer of the region and, if the data permit, of the entire country.

A sum of 100,000 French francs will be required for the pre-feasibility study, which will be financed by FAC and entrusted to SEDES and SCET/Cooperation, who will employ an economist and a veterinarian respectively, for the purpose.

ANNEX 7

SUMMARY OF TOTAL PRODUCTION 1/

Production in 1,000 tons (Raw products)

	<u>1969</u>	<u>1975</u>	<u>1980</u>
Millet and sorghums	916	1,180	1,430
Corn	82	108	-
Rice	42	60	67
Cotton seed	36	120	150

Products and by-products recoverable for animal feed

	<u>1969</u>	<u>1975</u>	<u>1980</u>
Rice polishings (tons)			
Industrial	40	300	700
At the farm	2,700	4,000	5,000
Cotton seed (tons)			
3rd grade	2,400	8,100	10,200
1st grade	15,000	45,000	46,000
Oil cakes (tons)			
Groundnut	800	750	1,500
Cotton	0	5,350	10,700
Industrial milling (tons)			
Wheat middlings	0	5,500	6,900
Sorghum middlings	0	1,400	1,800
Sugar refinery (tons)			
Molasses	0	5,400	9,000
Bagasse	0	45,000	75,000
Meals (tons)			
Meat	4	60	80
Blood	5	80	210
Fresh bones	4	435	590

1/ Extract mission report by Mr. Siméon.