Report #6

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Livestock Farm Economic Study

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A farm study developed under contract number ASB-0148-C-00-5156-00

between

THE INSTITUTE OF AGRICULTURE AND ANIMAL SCIENCE
UTAH STATE UNIVERSITY, USAID/N & WORLD BANK

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I. INTRODUCTION

A. Terms of Reference

The farm economic analysis consultant's terms of reference dated March 8, 1986 require completion of two tasks:

a. Recommend actions to be taken to run the farm more effectively.

b. Recommend: (1) the optimum number and breeds of livestock to support teaching, research, extension, and production; (2) the optimum number of hectares that should be under crop and fodder cultivation and pasture; and (3) the variety of crops to be grown and level of cultivation.

B. Agricultural Development Theory Background

Recent theoretical developments in the economics of agricultural development have demonstrated that institutional and technical change are the fundamental factors that accelerate the growth of agriculture. Hence, research and teaching institutions such as the IAAS and the Livestock Farm have a key role in increasing the rate of growth of agriculture and in increasing farmer's income and the nation's income.

C. Current Problems of the Livestock Farm

There is general agreement that until about six months ago the performance of the Livestock Farm was poor as judged by the condition of the animals and fields and their yields (see for example Kharel and Shrestha). Some fields have been left untended, except for some grazing. In the past, a faculty member has been given part-time responsibility for managing this very large farm, and provided with little reward for a difficult, time-consuming task. The recent reduction of the farm budget by 25 percent for the operation of the farm in the now ending fiscal year is an indication that the University, or the government of Nepal, places insufficient priority on supporting the rapid development of a most fundamental, scarce, critical resource for the development of the largest, most important economic sector in the nation; agriculture.

D. Scope of the Problem

The fact that the Livestock Farm is the third largest farm in Nepal has not been fully recognized by those who make decisions about its management. This farm should be compared to a very large business, with a number of departments requiring a top management team that gets rewarded for good performance. At full capacity, the farm could produce three to four times as much livestock and crops. Many of the fields could produce three crops a year. At a minimum, the farm requires a full-time manager and four assistant managers (see details below). To satisfy successfully teaching,

research, extension and income generation needs, for further development of the farm, outstanding management is required.

E. Guiding Production Economic Theory for the Recommendations

The Livestock Farm has a large amount of resources (land, animals and labor) that have been operated at a low level of productivity. A better, full-time management team is a complimentary resource that can draw on available technical advice from the Animal Science and Agronomy faculty to greatly increase the productivity of the farm's resources. Such a team could earn considerable income for further farm development. This, however, can only be achieved if certain institutional changes are carried out so that the IAAS and the Department of Animal Science will have a much greater incentive to develop this farm.

II. PROPOSED CHANGES TO INCREASE THE MANAGEMENT PERFORMANCE ON THE LIVESTOCK FARM

A. The Need for More Management Independence

To accelerate the development of the Livestock Farm requires more management independence. Good management systems provide the manager with control of all the resources he needs to function effectively and delegates responsibility to him to achieve the agreed objectives. The manager should spend most of his time planning and assuring that crop and livestock activities are carried out effectively and on time. He should not have to spend a lot of time off the farm trying to get needed administrative actions accomplished. Specifically, the proposed agreement should be implemented that any money earned by the farm through the sale of animals, crops, or other things is to be split 40 percent to the Institute to augment research funds for faculty and 60 percent to the Department of Animal Science for further development of the Livestock Farm.

Greater administrative independence for the IAAS is also critical for effective operation of the farm. The Institute needs to be able to have the right to increase or decrease the number of permanent and temporary positions on the Livestock Farm and their pay levels. Management is greatly handicapped when it takes much lobbying to get a decision about needed changes in farm labor made.

B. The Required Management Team

The task facing a single manager on the Livestock Farm is overwhelming. To attempt to gain all the needed technical knowledge to obtain high productivity in the many different kinds of animals, and 50 or more hectares of crops that should be cropped at least two times a year and also to satisfy the teaching, research, and extension demands of the faculty as well as to produce additional income from the farm is clearly not possible. A minimum management

team for effective operation of the farm is a Farm Director (see Figure 1) with minimum qualifications of a bachelor's degree but preferably an M.S. degree and four assistant farm managers at the J.T. level (at least two years of college in agriculture and/or animal science). These positions could be phased in. But of utmost importance immediately is the Assistant Manager for forage and crop production. The development plan for crops and livestock outlined below hinges on greatly increased crop production. Note also in Figure 1 that I have suggested that the newly appointed manager of the farm (Mr. Tiwari) would, in a first trial period, have responsibility for livestock extension and management of the artificial insemination facility. He would not, however, have control of decisions and policy with respect to the semen to be obtained and how it was to be used - except for some of the semen for extension purposes. Artificial and natural insemination breeding policy would be the responsibility of the farm manager and the faculty advisor assigned to the particular types of animals. Mr. Tiwari's role and responsibilities will have to be worked out with the Farm Director. Note also that a part-time farm veterinarian, who is a faculty member, would be responsible for animal health on the farm. A farm accountant is needed full-time at the farm, seconded from the IAAS accounting staff. One technician is also needed to operate both the veterinary and dairy laboratories.

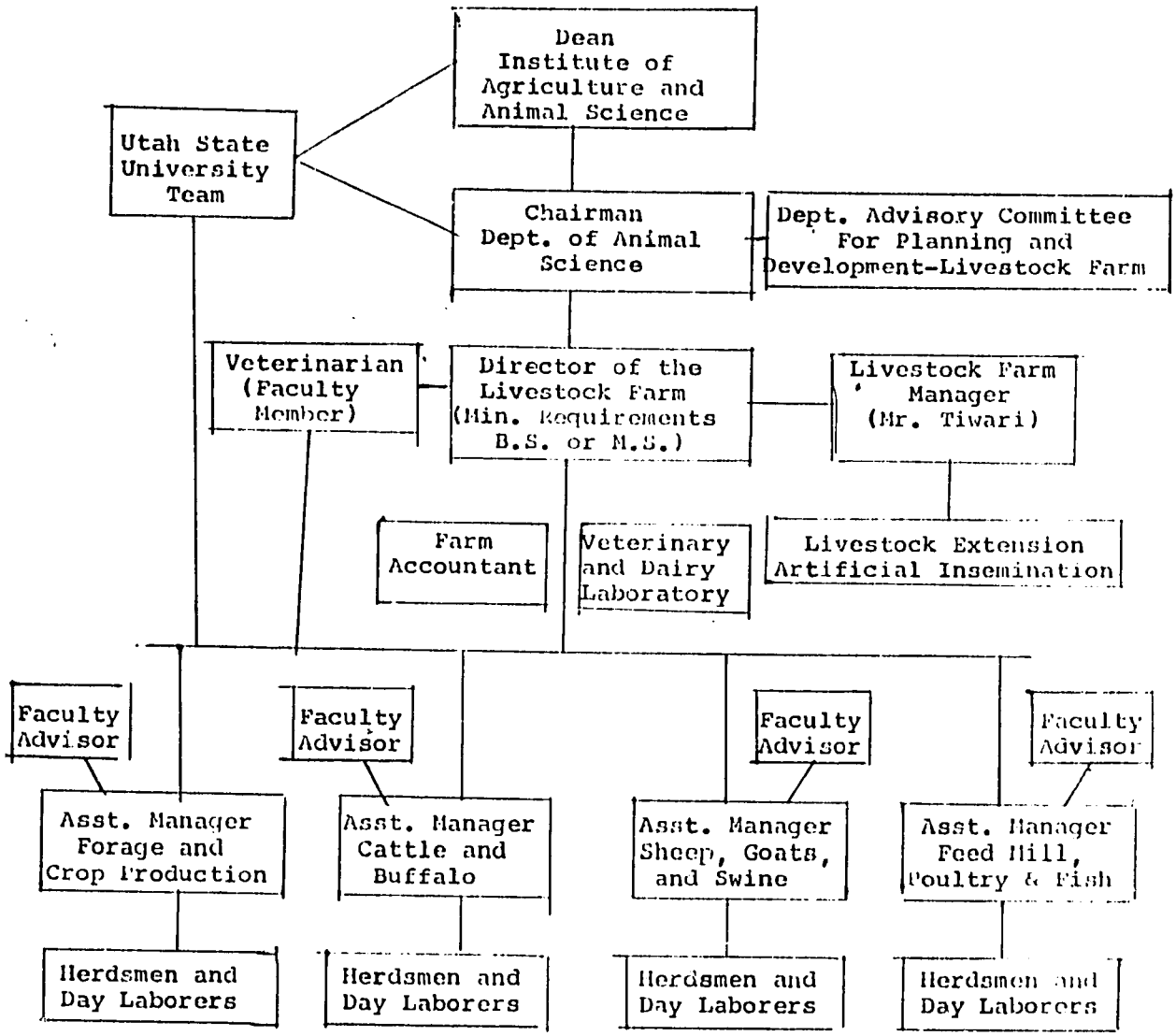
C. The Need for Clear Lines of Authority

Good management requires clear lines of authority. Figure 1 indicates that the Director of the Livestock Farm will report to the Chairman of the Department of Animal Science, who can be aided as needed by an advisory committee of his faculty on major questions about the planning and development of the farm. The Animal Science Chairman should report directly to the Dean of the Institute on Livestock Farm matters. An Institute level review committee containing persons not directly interested in, knowledgeable about, or concerned with the farm is not advisable. Such a body would only slow down decisions, confuse authority, and reduce management effectiveness without improving decisions.

D. Personnel Matters and Incentives for Good Management

Good management practice requires financial rewards for extra effort and good performance. Since managing productively the very large resources on the Livestock Farm is one of the most important positions in Nepal, the Director of the Livestock Farm should have a salary that is somewhat close to that of the Dean of the IAAS, say 4,500 Rs. per month. To retain a high performing manager who is on-call for problems on the farm day and night will require such a salary. If the Farm Director is a faculty member, he should be relieved of all required teaching duties, although he may teach if he wants to. He would, however, be expected to do research.

Figure 1. Proposed Livestock Farm Management Organization



Some policies should also be established so that high levels of performance by the assistant managers and other farm workers can be rewarded. Also, it should be a policy to transfer to another job, probably to another station, any healthy workers who are not doing their work.

III. LIVESTOCK AND CROP PRODUCTION LEVELS TO ACCELERATE TECHNICAL CHANGE IN LIVESTOCK IN NEPAL

A. Economic Theory of Agricultural Development and the Choice of Animal and Crop Production Levels on the Livestock Farm

The central objective of research and teaching stations such as the Livestock Farm is to aid in accelerating increases in livestock productivity in Nepali agriculture. To accomplish this, the primary criteria for livestock numbers and crop acreages should be the research, teaching, and extension needs of the IAAS. The second criteria is to use the remaining resources on the farm to produce income for the further development of the farm and to generate research funds.

The specific task of a livestock teaching and research farm is to facilitate rapid transfer of more productive agricultural technology to the millions of farms in the nation. The phases in technology transfer are: (1) material transfer, (2) design transfer and (3) capacity transfer. The least costly and most rapid impact on productivity in the early stages of development can be obtained by focus on importing and testing appropriate technologies available in different parts of the world - material transfer. These materials include seeds, animals, semen, machinery, pesticides, veterinary supplies and so forth. Many kinds of material transfer of high yielding crop varieties and more productive animals have had very large impacts on national agricultural production in many nations, as occurred, for example, during the well known "Green Revolution" in grain production. The cost of material transfer activities is lowest of the three phases of technology transfer and hence, attention to this phase should be pursued first. After the currently available, more productive material technologies available in the world have been tested and either adopted or found not useful, focus has to turn to more costly design transfer research in which significant adaptations and modifications of agricultural and livestock technology is undertaken. Examples of these are extensive animal breeding trials, animal feeding trials, developing modified crop strains, and so forth. This work is carried out by trained professionals who can use textbooks and designs and can replicate standard adaptive research procedures to identify agricultural and livestock technology that is most productive in different regions of the nation.

In livestock development, there are three fundamental variables that affect productivity: (1) genetic potential, (2) proper feeding, and (3) animal health. In the material

transfer phase, increasing genetic potential would mean importing animals and frozen semen with proven very high productivity potential. To determine optimum animal feeding programs with locally available materials, considerable design transfer phase activity in which least cost animal rations are identified is appropriate at the IAAS. For it is unlikely that already mixed feeds could be imported and used profitably by farmers. In animal health, many medicines will have to be imported but considerable numbers of trials in farmer's environments will be required to determine the profitability of using these medications.

B. Livestock Farm Production Objectives, Livestock Numbers, Crop and Fodder Production Levels, and Implimentation

1. Background

The optimum number of animals and level of crop production depends upon the level of management provided on the farm. With poor management few animals can be kept in good condition and only a small part of the land can be cropped. The recommended changes in livestock numbers, kinds of animals and the increases in crop production are dependent upon the management changes recommended in this report. Poor farm management will both hamper research and will result in continued low productivity of animals and crops on the farm.

Optimum livestock numbers will change each year depending on research needs and production plans to earn income from remaining resources on the farm. Thus the farm manager, Animal Science faculty and the Animal Science Department chairman should establish a proceedure for reviewing and annually establishing a plan for livestock numbers, crop production and a budget for the operation of the livestock farm to be approved by the Dean.

Two shifts in thinking are required to achieve a high performance research and Livestock Farm at the IAAS: (1) focus must be shifted to sharply increasing productivity per animal and to understanding the economics of animal production as an indicator of management performance instead of increasing livestock numbers; (2) animal numbers and crops produced should be determined first by the animals needed for teaching, research and extension and secondarily by the need to earn income for further development of the farm. It follows that optimum numbers of animals and crops will vary from year to year and should be determined in an annual plan by the Farm Director in consultation with the Animal Science faculty. The current numbers of animals on the farm are presented in Table 1. This table also shows recommended target numbers of animals for the current farm fiscal year, 043/44. The recommended livestock numbers were determined after considerable consultation with the members of the faculty available at Rampur and reviewed by Drs. Monty and Thompson of the Utah State University

team. Note that the needs for teaching, research and extension are identified first, then consideration was given to other needs. The following four objectives present the principles that guided these recommendations.

a. Demonstrate with a small number of animals the high levels of productivity that are attainable with animals of high genetic potential, provided good feeding practices and good disease control.

b. Demonstrate the use of feeds, feed mixtures and forages that a large number of farmers have access to.

c. Reduce the amount of purchased feed concentrates as much as possible to both reduce milk production costs and to attempt to more nearly mirror milk production conditions on Nepali farms. Heavy use of purchased concentrates in this environment is an indicator of poor quality roughage production on the farm and uneconomic management of the farm resources. The low levels of milk productivity of the animals currently on the farm may be able to be sustained with good quality roughage and no concentrates. Higher productivity animals, however, will probably require some concentrate feeding. The economics of alternative feeding programs for dairy cattle on the Livestock Farm and in the villages needs to be intensively studied.

d. Carry out low cost disease control methods.

C. Detailed Comments on the Livestock Recommendations

1. Cattle and Buffalo

The objective for the cattle cow herd is to maintain milk production in the 80 to 100 liters per day range by greatly increasing milk production per cow and greatly reducing the number of animals. This is to be achieved by reducing the number of low productivity Haryana cows and importing 5 bred high milk producing cows from India to replace more than half of the Haryana cows.

The objective for the buffalo cow herd is similar, to import 3 bred high producing milk buffalos from India and to sell half the present low productivity animals.

2. Goats

The objective for goats is to add a trial 50 female and 5 buck meat production unit to produce 150 kids per year for sale for meat. If this proves profitable, four more 50 female units might be established to earn additional income for the farm.

- Other Animals

  It is not clear at this time that significant income could be earned by expansion of the numbers of any other animals. As I did not have an opportunity to talk with the fish specialists this is also an unknown potential. If high fish productivity can be attained, significant income might be earned from the sale of fish.

Specific Crop Recommendations

Crop recommendations are based on the economic tenant that available productive resources should be used as productively as possible as long as they will provide a net return to the operator. The greater the area of crops that provide additional net income whether the crops are sold directly or by feeding through livestock, the greater the income of the farm. The six crop budgets in Appendix Tables A1-A6 indicate estimates of the relative profitability of a number of crops that are recommended for the farm.

It should be noted here that one of the reasons these crop budgets, which are based on the experience of the agronomy farm, indicate such a large profit is that the cost of tractor services is exclusively diesel oil. To maintain the tractors and to replace them in several years requires the accumulation of a capital fund, otherwise when these tractors break down crop production would have to be greatly reduced. Therefore, the farms should be charged at least twice the cost of diesel fuel, so funds can be accumulated by IAAS to repair and replace the tractors and their equipment.

These crop recommendations are made under the assumption the Livestock Farm will have first priority on the use of one of the tractors when the new ones arrive, and that this tractor should be garaged on the Livestock Farm so the Assistant Managers do not have to chase after the tractor on the main campus. In the meanwhile, before the new tractors arrive, arrangements should immediately be made so that the present machines are available for use from 6 am to 6 pm, by hiring temporary tractor drivers if necessary, who will work early and late hours at reasonable pay.

Crop production plans for the 1986-87 academic year are indicated in Map 1 and Table 2 based upon the judgements of Mr. Kharel, Dr. Mishra, Chairman of the Agronomy Department, and the Utah State Team. Enterprise budgets for a number of crops are also attached in the appendix. Fodder nutrients produced by this plan are estimated in Table 3. Table 4 estimates the forage feed requirements that are compared on the bottom of Table 3 with production, indicating a considerable surplus of feed. Hence, if the cropping plan has to be curtailed, some of the forage crops may be dropped. A summary of land use on the Livestock Farm under these plans is given in Table 5.

E. Budget Estimates and Management Tools

A budget was prepared to estimate the impact of the recommended changes on the expenses and receipts of the farm. The strategy undertaken in this plan increases the costs of management which have to be matched by increased earnings from the sale of farm products. The labor budget is indicated in Table 6 and the receipts from farm sales are given in Table 7. The summary of projected receipts and expenses for the Livestock Farm (Table 8) indicates that the plan can produce net earnings of some Rs. 100,000; funds that should be split 40 percent to the IAAS to augment research funds for faculty and 60 percent to be used by the Department of Animal Science to further develop the Livestock Farm. It should be emphasized that this budget can only be achieved if the required management changes have been implemented and the indicated crops have been grown.

It is important to recognize that these budgets were put together in a short period of time. They should be considered tentative and reviewed carefully to check for accuracy, carry out further refinements and to make sure important items have not been left out. Budgets and farm plans such as those presented here are important tools for the farm director in improving the profitability of the farm. Many more farm management tools are available to improve management skills. Collaborative work with agricultural economists in the development of these tools will aid further increases in farm productivity. The enclosed management tools and others should be periodically used in planning the next production period.

F. Other Important Teaching, Research, Extension, and Production Activities Required on the Livestock Farm

1. Artificial Insemination Capability

The most rapid and low cost genetic improvement of large animals is achieved with artificial insemination. AI has been operated at the farm before. It is essential for teaching, research, extension, and production proposed that this capability be reestablished as soon as possible. A local veterinarian is offering AI services. No university level group of animal scientists can contribute effectively to increasing animal productivity in a nation without this powerful tool. Superior semen could also be sold to support the AI unit.

2. Feed Mill

The placing in working order of the feed mill and building sufficient feeds storage is essential in order to capitalize on the crop production capabilities of the farm. It will enable low cost concentrate production on the farm and is invaluable for teaching and research on least cost animal feeding programs. Also, some high quality mixed feeds might be sold by the mill to increase farm income.

3. A Dairy Plant

The complex issue of whether and what kind of a dairy plant would be best for the Livestock Farm and the IAAS needs to be explored in detail in cooperation with an agricultural economist. It is almost certain that the Livestock Farm today is a high cost milk producer, which is to say it may be losing money on producing milk. Farmers in the surrounding area are probably lower cost producers. So one alternative to increase milk flow to the IAAS is to set up an effective local collection system such as has been achieved in India by the famous Amul dairy. This would have the advantage of providing income to local farmers and to gaining greater access to them for teaching, research, and extension purposes. Another issue relates to the size of any dairy plant and the types of equipment it should have. A highly capital intensive U.S. style dairy is likely to be irrelevant to Rampur conditions. A small plant using mostly modified local materials and technologies that would demonstrate operations that could be replicated by entrepreneurs in the cities and towns of Nepal could have large impact on the nation and would be useful for teaching and research purposes. The value of further expansion of the dairy herd on the Livestock Farm is also a question. To do so may lose money for the farm.

IV. SUMMARY OF KEY RECOMMENDATIONS

A. Recommendations to Increase Management Performance on the Livestock Farm

1. A management team is required for the Livestock Farm of at least one Farm Director (B.S. Degree or above) and four J.T.s (2 years of college at IAAS).

2. The Farm Director should be appointed at an increased salary and he should be given greater control of the resources he needs to manage the farm, including particularly more control of a tractor. The waste of his time on administrative transactions should be reduced.

3. The Livestock Farm should have a separate annual budget developed by the Farm Director and approved by the Animal Science Department for submission to the Dean of IAAS for approval.

4. It is essential for improved management of the Livestock Farm that the agreement be implemented that any earnings from the sale of Livestock Farm products be retained on a 40/60 basis by IAAS and the Animal Science Department for further development of the farm and to provide research funds for faculty.

5. A full-time farm accountant is required on the farm, seconded from the IAAS accounting unit.

6. Personnel policies need to be changed so that those who perform well will be rewarded and those who perform poorly can be transferred off the farm.

B. Recommendations on Livestock and Crop Production Levels

1. The central focus of management on the Livestock Farm should be to increase crop and livestock productivity rather than animal numbers. The Livestock Farm should be known as one of the highest productivity farms in Nepal.

2. The kinds of livestock and crops on the farm should be determined primarily by which ones will aid the transfer of more productive crop and animal technologies to the millions of farms in Nepal.

3. Cattle and buffalo milk productivity should be increased rapidly by importing from India, high productivity milk animals. The total number of animals should be reduced by sales of the less productive animals so as to achieve the current level of milk production. Also, early calf weaning should be implemented and studies and actions to achieve reduced calving interval.

4. The addition of a fifty-female goat herd should be made to earn income from the sale of meat.

5. The artificial insemination capacity should be reestablished and the feasibility of embryo implants be investigated.

6. The feed mill should be put into operation.

Table 1 - Current (July, 1986) and Recommended Livestock Numbers for FY 2043/44

Animal	Purpose								Total	
	Teaching		Research[a]		Extension		Production			
	July 1986	Recommended	July 1986	Recommended	July 1986	Recommended	July 1986	Recommended	July 1986	Recommended
Haryana Cattle for Milk	2	2			1	1	28[b]	10[c]	31	13
Haryana Cattle Males							13[d]	13[d]	13	13
High Producing Dairy Cattle from India								10[e]		10
Calves-female				20[f]			33	25[c]	53	25
Calves-male							19	6[c]	19	6
Murrah Buffalo female	4	4			1	1	45	20[c]	50	25
Murrah Buffalo male							2	1	2	1
High Producing Buffalo from India								3	0	3
Sheep	7	7	50	50	1	1	30	30	88	88
Goats	7	7	30	30	1	1	26	81[g]	64	119
Swine	6	6	3	3	1	1	15	15	25	25
Chickens	30	30	50	50			107	107	187	187
Ducks	4	4	23	23					27	27
Guinea Fowl	17	17							17	17
Fish			1000	1000					1000	1000

[a] Depends on Research needs

[b] Includes 5 unproductive animals that should be sold if possible

[c] The lowest productivity animals should be sold

[d] Includes 10 draft animals

[e] Five to be purchased pregnant

[f] Murrah Buffalo Calves

[g] Keep 50 females and 5 males for a 55 animal meat producing unit (150 kids per year)

Map 1. Livestock Farm

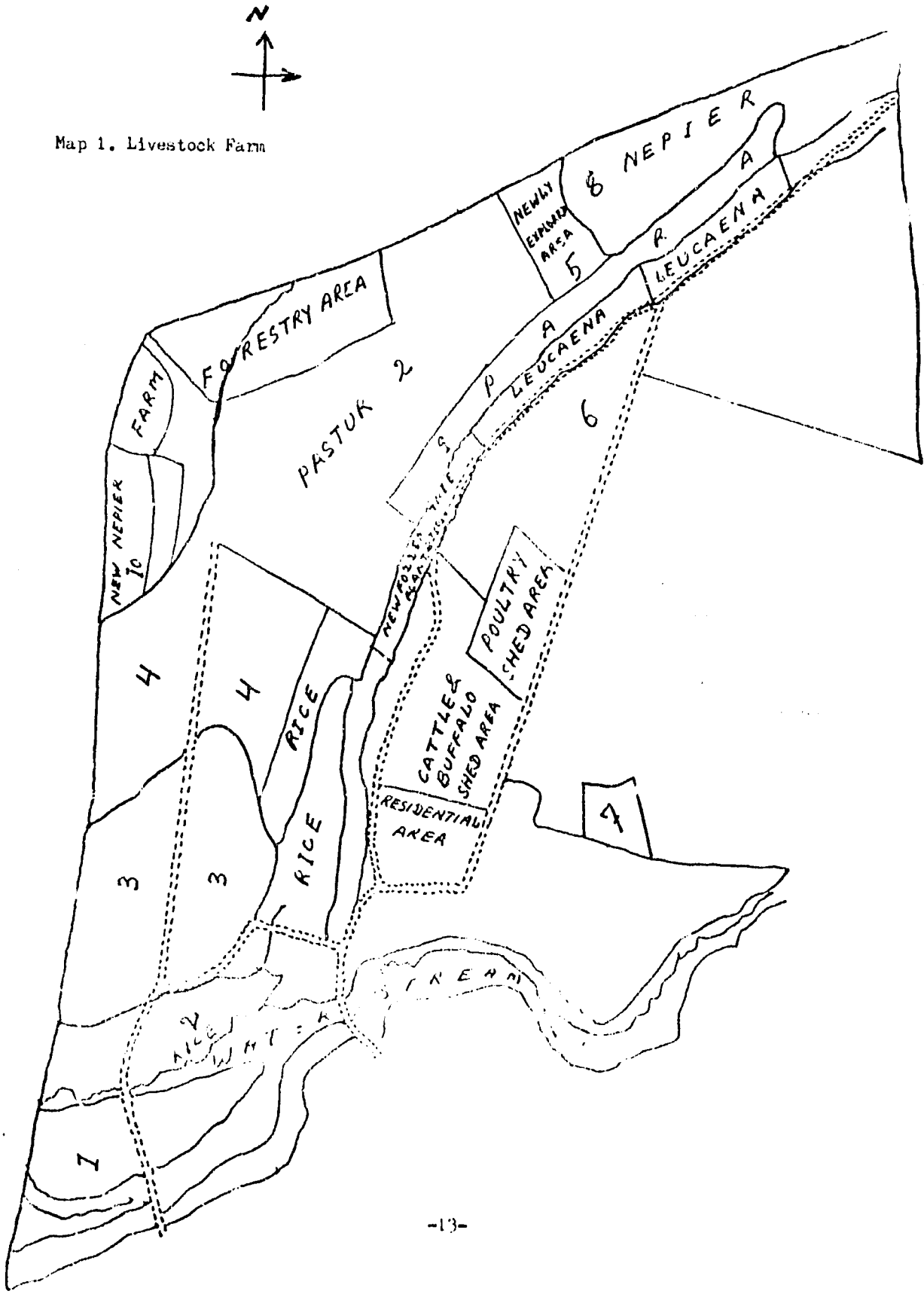


Table 2 Ulilization of land for folder and grain production.

Plot No.	Area (ha)	Soil Type	Crop Rotation in 1 year	Months to be croppe in FY 2043/2044 (7 8 9 10 11 12 1 2 3 4 5 6)	Average ield/ha (quint e)	Production from each plot (quintle)
1	5	Well drained sandy loam	Mustard → (Maize + Cowpea)	→ Mustard ← / → Maize ← / → Cowpea ←	Mustard 12 Maize 350 Cowpea 300	312 x 5 = 60 (grain) 350 x 2.5 = 875 200 x 2.5 = 750
2	7	Swampy land organic soil	Rice	→ Rice ←	Rice = 20 grain	20 x 7 = 120 quintle grain
3	8	Excessively drained gravelly sandy loam	Oat + Lentil → Johar + Teosinte	Oat Lentil or Sesamum ← / → Johar ← / → Teosinte ←	Oat = 300 Lentil = 4 Johar = 300 Teosinte = 300	300 x 4 = 1200 4 x 4 = 16 (grain. 300 x 4 = 1200 300 x 4 = 1200
4	8	Moist salt Loam layer	Berseem → Maize + Cowpea	→ Berseem ← / → Maize ← / → Cowpea ←	Berseem = 600 Maize = 20 Cowpea = 300	600 x 8 = 4800 20 x 4 = 80 (grain) 300 x 4 = 1200
5	2	Moist salt Loam layer	Lucerne = Senje → Black grain	→ Lucerne ← / → Senje ← / → Black grain ←	Lucerne 500 Senje 250 Black grain = 3	500 x 1 = 500 250 x 1 = 250 3 x 2 = 6 (grain)
6	3	Well drained Sandy loam	Oat → Maize + Gwar + Bean	→ Oat ← / - Maize - Guar - Bean -	Oat = 300 Maize = 350 Gwar = 250 Bean = 200	300 x 3 = 900 350 x 1 = 350 250 x 1 = 250 200 x 1 = 200
7	1	Well drained Sandy loam	Oat → Maize	→ Oat / → Maize ←	Oat = 12 Maize = 20	12 x 1 = 12 (grain) 20 x 1 = 20 (grain)
8	5	Well drained Coarse sandy loam	Perennial	→ Napier ← / Napier ←	Napier 600	600 x 5 = 3000
9	4	Moist silt loam	Perennial	→ Para ← / → Para ←	Para = 700	700 x 4 = 2800
10	2	Essentially drained gravel	Perennial	→ Napier ← / → Napier ←	Napier 600	600 x 2 = 1200
Total	45					

Basic Hand Book of Agriculture 1980 Indian Council of Agricultural Research, New Delhi

Table 3 Nutritive Value of the Total Fodder Produced from the Livestock Farm

Name of Fodder	Nutrient		Fodder to be Produced (kg)	Nutritive Value of the Fodder to be Produced	
	TDN	DCP		TDN (kg)	DCP (kg)
Maize	16.5	1.17	122500	20702	1433
Cowpea	10.5	3.52	195000	20475	6864
Oat	16.7	2.63	210000	35070	5523
Johar	16.2	1.03	120000	19440	1236
Teosinte	16.2	1.03	120000	19440	1236
Berseem	11.9	2.51	480000	57120	12048
Lucerne	12.0	3.24	50000	6000	1620
Senji	11.9	2.51	25000	2975	627
Guar	9.8	1.33	25000	2450	332
Bean	10.5	3.52	20000	2100	704
Nepier	13.5	6.91	420000	57960	3822
Para	11.4	1.51	280000	51920	4228
Total Production				275382	39678
Requirement of Forage				149069	34324
Estimate of Excess Forage				126323	5349

Although total production of TDN seems to be higher, DCP production is almost the same as required. It suggests to go more for legume fodder cultivation.

Table 4 Herd Strength of Livestock Farm, average body weight and nutritional requirement.

	Herd Strength				Av. body wt (kg)	TDN & DC Pregnant - requirement for 1 year *			
	Female		Male	Total		TDN (kg)		DCP (kg)	
	Lactating	Pregnant				Maintenance	Prod.	Maintenance	Prod.
Buffalo	30	20	2	52	400	46391	3613	5711	854
Cattle	20	8	13 *	4	350	42728	1937	6268	479
Calves		34	19	53	100	27053	--	12775	-
Sheep & Goats	90	90		180	15	32557	--	6570	-
				Total Required		149059		34324	

* Sources - Ranjhan, S.K. 1977 Animal Nutrition and Feeding Practices in India Vikas, Publishing House Pvt LTD

Table 5 - Proposed Livestock Farm Land Use FY 2043/44 *

	Hectares
Residential and Farm Buildings	15[d]
Swampy Land and Stream	10
Slope Area (Fodder Trees)	5[a]
Cropped Land (See Table)	34
Perennial Grass (See Table)	11
Pasture	15
Other Unusable and Unaccounted For	20
	110[a]

Table 6 - Summary of Estimated Labor Expenses, Livestock Farm * FY 2043/44

	Rupees
Farm Director 4,500 x 13	58,500
Farm Manager (Mr. Tiwari)	26,650[a]
J.T. Level - 4 @ 16,900 Rs/y[a]	67,600
Fieldman - 2 @ 6,000 Rs/y x 13 mo.	15,600[a]
Herdsman - 12 @ 5,330 Rs/y	63,960
Chaukidar - 2 @ 5,330 Rs/y	10,660
Day Labor + Grass Cutter - (27 persons x 365 days) 10,000 Days @ 10 Rs/d	100,000
Tractor Helper - 1 @ 5,330 Rs/y	5,330
	357,855

* Source Karel and Shrestha, P. 10, 18

Table 7 - Recipts from Sales of Animals, Animal Products and Crops

Livestodk and Products		Rupees
Milk	80 Liters/d x 365 d x 4.5 Rs	131,400
Piglets	300 @ 300 Rs	90,000
Calves	28 @ 600 Rs	16,800
Eggs	10,000 @ 1.0 Rs	10,000
Kid Goats	200 13 kg Kid (Live wt.) @ Rs/kg	65,000
	Total	313,200

Crop Sales

Crop	Field No.	Ha	Yield	Total Prod.	Price(Rs)	
Mustard Seed	1	5	120	600	800	48.000
Rice	2	7	200	1400	400	56,000
Lentils	3	4	40	160	800	12,000
Maize	4	4	200	800	280	22,400
Black Grain	5	2	30	60	1200	7,200
Oats	7	1	120	120	700	8,400
Maize	7	1	200	200	280	5,600
Total		24				159,600

Table 8 - Summary of Projected Expenses and Income, Livestock Farm Hampur, FY 2043/44 *

	Rupees
Expenses	
Labor (See Table 6)	357,855
Concentrate to be purchased	
Cattle and Buffaloes ½ of 176674[a]	88,000
Swine, Poultry and Fish	37,000
	125,000
Medicine	15,500
Animal Purchases	?
Crop Expense	
Diesel Oil 30,000 L. @ 7.5 Rs/L.	22,500
Fertilizer and Pesticide	30,000
Total Livestock Farm Expenses	550,355
Income	
IAAS Budget for Livestock Farm	200,000
Animal and Animal Product Sales	313,200
Crop Sales	159,600
Total Livestock Farm Income	672,800
Net Earnings	122,445
(To be split 40/60 in IAAS for development of farm and for research funds.)	

* Source Karel and Shrestha, P. 20

Table A1 - Crop Budget for 1 Hectare
Lentils - yield 3 Quintals
(Planted in, or after early Rice)

		Rupees
Land Preparation (after rice)	35 L. diesel oil x 7.5 Rs/L.	262
Fertilizer 20-20-0	400 Rs/Q x 1 Q	400
Seed	40 kgs @ 8 Rs/kg	320
Harvesting and Threshing	40 Man-Days 10 Rs/day	400
Tractor for Threshing (4 hours)	3 L./hr. x 7.5 Rs	90
	Total Costs	1,472
	Gross Receipts 3 Q x 800 Rs/Q	2,400
	Net Receipts	928

Table A2 - Crop Budget for 1 Hectare
Sesemum - yield 5 Quintals

		Rupees
Cultivation	40 L. diesel oil x 7.5 Rs/L.	300
Fertilizer 20-20-0	400 Rs/Q x 1 Q	400
Seed	8 kgs @ 12 Rs/kg	96
Harvesting and Threshing	30 Man-Days 10 Rs/day	300
	Total Costs	1,096
	Gross Receipts 5 Q x 1000 Rs/Q	5,000
	Net Receipts	3,904

Table A3 - Crop Budget for 1 Hectare
Mustard - yield 10 Quintals of seed

	Rupees
Cultivation	
40 L. diesel oil x 7.5 Rs/L.	300
Fertilizer	
20-20-0 400 Rs/Q x 1 Q	400
Pesticide	
(1 Application) - Metasystox	200
Seed	
12 kgs @ 10 Rs/kg	120
Harvesting and threshing	
30 Man-Days 10 Rs/day	300
Tractor for Threshing*	
(3 hours) 10 L. x 7.5 Rs	75
Total Costs	1,395
Gross Receipts 10 Q x 800 Rs/Q	8,000
Net Receipts	6,605

*Custom Tractor Hire for 3 hours = 450 - 500 Rs

Table A4 - Crop Budget for 1 Hectare
Summer Corn - yield 20 Quintals (grain)

	Rupees
Land Preparation	
50 L. diesel oil x 7.5	375*
Fertilizer	
20-20-0 400 Rs/Q x 4 Q	1,600
Top Dressing	
1 Q of N (Am. Sulfate)	400
Seed	
18 kgs @ 5 Rs/kg	90
Pesticide	
(1 Application) - Boral	300
Weeding	
30 Man-Days 10 Rs/day	300
(Two weedings)	
Harvesting and Threshing	
40 Man-Days 10 Rs/day	400
Total Costs	3,465
Gross Receipts 20 Q x 270 Rs/Q	5,600
Net Receipts	2,135

*Or 18 Man-Days with Bullocks @ Rs/day = 900 Rs (Three Plowings)

Table A5 - Crop Budget for 1 Hectare
Wheat - yield 18 Quintals (grain)

	Rupees
Land Preparation	
50 L. diesel oil x 7.5 Rs/L.	375
Fertilizer	
20-20-0 400 Rs/C x 3 Q	1,200
Top Dressing	
1 Q Nitrogen @ 400 Rs/Q	400
Seed	
1 Q @ 400 Rs/Q	400
Weeding	
1 Time (?)	200
Harvesting and Threshing	
15 Man-Days 10 Rs/day	150
Tractor for Threshing	
(4 hours) 3 L./hr. x 7.5 Rs	90
Threshing Labor	
5 Man-Days 10 Rs/Day	50
Total Costs	2,865
Gross Receipts 18 Q x 325 Rs/Q	5,850
Net Receipts	2,985

Table A6 - Crop Budget for 1 Hectare
Rice - Late Paddy - yield 23 Quintals

	Rupees
Cultivation	
(Three)* 50 L. diesel oil x 7.5 Rs/L.	375
Seedbed and Transplanting	2,000
Pesticide	
(1 Application) - Furadan	250
Fertilizer	
20 kgs Nitrogen @ 10 Rs/kg	200
Seed	
40 kgs	150
Weeding	300
Harvesting and Threshing	
30 Man-Days 10 Rs/day	300
Total Costs	3,575
Gross Receipts	
Paddy 23 Q x 400 Rs/Q	9,200
Paddy Straw	1,000
Net Receipts	6,625

*Custom Tractor - Rs/ha. x 5 hours = 850 Rs
Bullock - 900 Rs. for land preparation, seedbed preparation by hand in swampy areas - 120 Man-Days @ 10 Rs/day = 1200 Rs

References

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