Livestock Production Situation in Vietnam and Development Orientation

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1. Present conditions

Vietnam has long been known as an agricultural country. Recently its population which is more than 76 millions, about 80 percent is living in the rural area and their living depends on agriculture production. Livestock is closely integrated with crops production; it has an important role in the overall agriculture production system and plays various functions, namely:

- Significant contribution to the agricultural GDP (about 27%)
- Employment of about half of the rural population
- Important role in integrated crops production
- Improvement of the annual income of farmers.

Traditionally, Vietnamese farmers are agricultural producers, cattle and buffaloes being kept as a source of power for farm work. Cattle and buffaloes utilize agricultural by-products and provide remunerative employment.

A similar situation is found in neighbouring Asian countries. The country can be divided into seven agro-ecological zones, each with different economic potential and environmental condition, i.e.:

Ecological Zone	Area (%)	Human Population (%)
1) The Northern Mountains and Uplands	32.0	17.4
2) Red River Delta	3.6	19.4
3) North Central Coast	15.4	13.9
4) South Central Coast	13.5	10.4
5) Highland	16.5	4.6
6) North East of Southland	7.0	12.5
7) Mekong River Delta	12.0	21.8
Total Vietnam	100.0	100.0

In 1995 the total area of agricultural land was about 7.3 million hectares. Of this approximately 4.2 million hectares were for rice production. There were about 0.3 million hectares for grass production and almost 0.3 million hectares for surface water acquaculture.

The forest area comprises some 9.6 million hectares, of which 8.8 million hectares were natural forest and almost 0.8 million hectares forest plantation.

Uncropped land resources amounted to about 14.2 million hectares. This included some 9 million hectares of upper land and rangeland, the remainder being grassland used for grazing ruminants.

Basic grain production has increased rapidly during the last five years. In 1995 grain production was 27 million tons of rice equivalent. This comprised some 24 million tons of rice. In 1995 about 2 million tons of rice were exported and the average grain production per capita was 365 kg.

In 1994 the agricultural production output value was about 35.4% of GDP, industrial production represented 26.6% and trade and services 38% of GDP respectively. In 1995 livestock production as a proportion of agricultural output value amounted to some 25% of the total.

2. Livestock production situation

The changes in livestock populations from 1990 to 1995 are shown in table 1.

The average annual increase rate of the individual populations species from 1990 to 1995 has been as follows:

Species	Annual increase %
Pigs	4.96
Cattle	2.84
Buffaloes	0.73
Chicken	5.15
Ducks	5.25
Goats	6.47
Dairy Cows	8.23

Table 1. Livestock populations statistics 1990-1995 ('000 heads).

Year	Buffalo	Cattle		Pig	Chicken	Duck	Goat
		Total	Dairy				
1990	2 854.1	3 120.8	11.0	12 260.5	80 184.0	23 636.4	372.3
1991	2 855.6	3 151.0	12.1	12 183.2	80 578.2	24 680.5	312.4
1192	2 883.4	3 193.8	13.1	13 881.7	89 704.9	28 170.7	312.3
1993	2 960.8	3 353.0	15.0	14 873.9	95 081.2	31 312.3	353.2
1994	2 971.1	3 466.7	16.5	15 569.4	99 627.1	23 041.2	427.8
1995	2 963.1	3 638.7	18.7	16 307.4	107 958.4	32 045.6	550.5

The most significant rates of population increase for most species have been achieved between 1993 and 1995, the period in which basic grain production advanced to yield a significant surplus above human food requirements in the country.

3. Livestock production statistics

Livestock production statistics in terms of animal live weight for the years 1990 to 1995 are shown in Table 2. The main livestock product is meat, of which 73.5% is produced by pigs, 15.0% by cattle and buffaloes and 11.5% by poultry.

Table 2. Livestock production in terms of live weight (1,000 tons) 1990-1995.

	Live weight (1,000 tons) in which								
		Pork		Poultry meat		Beef		Eggs	Milk
Year	Total	Total	%	Total	%	Total	%	(1,000)	(Tons)
1990	1 007.9	729.0	72.3	167.8	16.6	111.9	11.1	1 869 400	9 300
1991	1 015.2	715.5	70.4	146.3	14.4	123.4	12.1	2 016 960	9 352
1992	1 078.8	797.1	73.8	154.4	14.3	127.3	11.8	2 269 086	13 043
1993	1 171.5	878.3	75.0	169.8	14.5	123.2	10.5	2 346 940	15 073
1994	1 235.9	937.7	75.8	186.4	15.0	111.8	9.0	2 672 108	16 234
1995	1 322.1	1 006.9	76.1	197.1	15.0	118.0	8.9	2 825 025	20 925

The average annual rates of livestock production increase for 1990-1995 were as follows:

Pork production	7.26%
Poultry meat production	3.48%
Beef production	1.10%
Egg production	10.00%
Milk production	25.00%

Livestock production per capita per year.
The per capita availability of livestock products in 1995 is summarized hereafter:

	kg	%
Average per capita production of		
Animal live weight	17.75	100
of which:		
Pigs	13.51	76
Poultry	2.64	15
Cattle and buffaloes	1.58	9
Average egg consumption per capita	38 eggs	
Average milk production per capita	280 ml	

In Vietnam, the consumption of livestock products per capita is still very low.

4. Cattle production

The local cattle population has traditionally been maintained to provide draft power for agriculture therefore, the productivity in terms of meat is relatively low. The herd structure in many areas includes thirty to forty five percent of draft male animals and female cattle are also used as a source of draft power. With tractor mechanization the demand for draft power has started to change, so that changes in herd structure and productivity can be expected as mechanization proceeds. Current annual beef production is estimated at 118 000 tons (including buffalo meat) and annual commercial milk production at 27 000 tons.

4. 1. Natural distribution of cattle population

The distribution of the cattle population is given in table 3.

Table 3. Distribution of the cattle population in Vietnam

Ecological zone	Cattle population %
Northern Vietnam	
North Mountains and Upperland	18.7
Red River Delta	8.7
North Central Coast	22.5
Southern Vietnam	
South Central Coast	23.0
Highland	10.7
North East of Southern land	11.9
Mekong River Delta	4.5
Total Vietnam	**100.0**

Some 45.5% of the cattle population is concentrated in the Central Coast Provinces. These areas have traditionally provided replacement of draft animals to the Mekong and Red River Delta areas. About 54.5% of the cattle population is distributed among the other five ecological zones where cattle provide a major source of draft power. The Highland zone, despite its large grazing areas suited to ruminant production, has only 10.7% of the cattle population.

4.2. Structure of cattle breeds

Eighty five percent of the cattle population are local Yellow cattle. The breed is characterized by a small body size with mature males weighing from 230 to 250 kg and females 180 to 200 kg. The dwarf breeds also show a low slaughter performance, when measured on conventional basis, so that the total carcasses may be only 40 to 44.2% of live weight.

Zebu and crossbred zebu cattle represent some 14.5% of cattle population, mainly crosses of Red Sandhi with local Yellow cattle.

About 0.5% of the cattle population are dairy animals mainly crossbred animals of the Holstein/ Friesian type.

The current livestock extension sub-component of the Agricultural Rehabilitation Project, supported by World Bank funding (Credit VN 2561), assists in livestock crossbreeding through artificial insemination and natural service in 23 project provinces throughout Vietnam. The project funding totals $ 7.7 million US (World Bank) and $ 2.3 million US (Vietnam Government). National and provincial artificial insemination courses are funded to train eight hundred field extensionists in AI technique and to transmit priority extension messages on improved animal health, animal nutrition and management. The programme includes supplying of inputs to establish an efficient and effective livestock extension service to assist farmers in raising productivity and profitability of cattle production.

4.2.1. Productivity of the dairy cattle population

Two major Government farms in Moc Chau and Lam Dong imported Holstein/Friesian cattle from about 1970 onwards. These animals produce an average yield of 3 000 to 3 500 litres in a 305 day lactation.

Crossbred dairy animals between local improved Red Sindhi/Local Yellow cattle and Holstein/Friesian are reared by individual farmers. Their first and second generation crosses (F_1 and F_2) produce milk yields of 2 500 litres in a 300-day lactation. These types of dairy animals are mostly found in the peri-urban areas of Hanoi, Ho Chi Minh City and North East of Southern land.

Lai Sind crossbred dairy cattle are found in the suburban areas of Hanoi and Ho Chi Minh City with average milk yields of 1 500 to 1 600 litres per lactation.

4.3. The structure and size of cattle herds

Some forty five per cent of the cattle herd provide draft power in the smallholder agricultural sector. Most cattle are kept by smallholders who have only one or two animals. Animals are traditionally housed at the farm. In cultivated areas they are grazed on field boundaries and on river bank retention funds. Locally cut grass is also carried to feed stock on the small holding. Weed grass and forage by-products stovers are used from field crops and these include maize together with rice straw. There is some cultivation of forage grass, such as mapier. *(Pennisetum purpureum)*, which is cut and carried to stock. In the Central Coast and Highland areas some leading farmers keep from 50 to 100 cattle in larger herds which are grazed on rangeland areas. Dairy farms normally keep a small number of cows, (usually less than ten animals), though there are a few larger holdings with 50 to 100 cows in the region of Ho Chi Minh City.

4.4. Cattle nutrition and feeding system

Semi-intensive feeding system is only applied to dairy cattle and extensive feeding system is most common in traditional cattle production. Total pasture land in Vietnam is only about 3 200 00 ha. Pasture production is frequently limited by prevailing conditions such as poor soil quality, steep sloping land, inadequate rainfall or lack of irrigation. Main feed sources in most cattle systems are agricultural by-products. The lack of forage during the dry season is a common problem. In the northern provinces, during the winter months, poor forage growth due to cool temperatures combined with dry weather leads to forage scarcity. Rice straw is the most common forage reserve for these times of shortage.

4.5. Infrastructure facilities for cattle husbandry and cattle breeding

Artificial insemination and breeding services include the following facilities: Bavi Frozen Semen Centre, in the Hatay Province; national cattle breeding stations, and provincial breeding centres.

The provincial A.I. and district A.I. stations include: the cattle breeding farms; the Red Sindhi breeding farm; Brahman, Sahiwal breeding farm, and Zebu crossbreeding farm (Bavi)

In general, poor infrastructure and insufficiency of public and private investments are also constrains to livestock and cattle production in Vietnam.

5. Buffalo production

The buffalo population is about 2.9 million and the distribution of buffaloes is shown in table 4.

Table 4. Distribution of the buffalo population in Vietnam

Ecological Zone	Cattle population%
Northern Vietnam	
North Mountains and Upperlands	51.80
Red River delta	8.60
North Central Coast	22.00
Southern Vietnam	
South Central Coast	4.60
Highland	1.58
North East of Southern land	6.38
Mekong River Delta	4.96
Total Vietnam	100.00

More than 50 percent of the buffalo population is located in the Northern Mountains and Upperland. The local swamp buffalo are mainly used for draft purposes and for breeding. Traditional buffaloes feeding in Vietnam depends mainly on grazing and on agricultural by-products. Dry rice straw is the most common forage reserve for ruminants all through the year.

6. Livestock feed resource

Table 5 shows the planted areas, productivity and yields of some feed grains and feed crops.

The estimates of maize production and utilization in 1995 were as follows:

		% of total
Total soya bean production	127600 tons	100.0
Of which:	18000 tons for seed	14.2
	90000 tons for human consumption	70.5
	10000 tons for export	7.8
	9600 tons for animal feed	7.5

Corn crop prices fluctuate between harvest and other times of the year due to the lack of adequate processing and storage facilities to keep the crop. This results in depressed prices at harvest time and so stimulates export. Table 6 shows the planted areas, productivity and yield of peanut and sorghum.

The estimates of soya bean production and utilization in 1995 were as follows:

		% of total
Total soya bean production	127600 tons	100.0
Of which:	18000 tons for seed	14.2
	90000 tons for human consumption	70.5
	10000 tons for export	7.8
	9600 tons for animal feed	7.5

Soya beans in Vietnam are mainly used to produce curd, soya milk and soya sauces for human consumption. Productivity of the soya bean crop is still quite low.

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Table 7 shows the estimated total utilization of animal feed for livestock production in 1995.

Table 5. Planted areas, productivity and yields of maize, sweet potato and cassava during the year 1990-1995.

Year	Maize			Sweet potato			Cassava		
	Area 1 000 ha.	Prod. 100 kg/ha.	Yield 1 000 tons	Area 1 000 ha.	Prod. 100kg/ ha.	Yield 1,000 tons.	Area 1,000 ha.	Prod. 100 kg/ha.	Yield 1 000 tons
1990	431.8	15.5	671.0	321.1	60.1	1 929.0	256.8	88.60	2 275.8
1991	447.6	15.0	672.0	356.1	60.0	2 137.3	273.2	89.8	2 454.9
1992	478.0	15.6	747.9	404.9	64.0	2 593.0	283.3	90.4	2 567.9
1993	496.5	17.7	882.2	387.1	62.1	2 404.8	278.0	88.1	2 450.0
1994	535.3	18.6	1001.0	343.7	61.8	2 125.7	279.4	86.9	2 430.0
1995	550.1	19.5	1200.0	385.7	62.0	2 350.7	281.2	87.0	2 496.5

Table. 6 Planted areas, productivity and yields of soya beans and peanuts 1990-1995.

	Soya Beans			Peanuts		
Year	Area 1,000 ha.	Production 100 kg/ha.	Yield 1,000 tons	Area 1,000 ha.	Production 100 kg/ha.	Yield 1,000 tons
1990	110.0	7.9	86.6	201.4	10.6	213.1
1991	101.1	7.9	80.0	210.9	11.1	234.8
1992	97.3	8.2	80.0	217.3	10.4	226.7
1993	120.1	8.7	105.7	217.2	11.9	259.3
1994	131.9	9.4	124.2	246.6	12.1	300.6
1995	133.0	9.6	127.6	247.0	12.5	308.2

Table 7. Estimated Animal Feed use for Livestock Production in 1995.

Animal Type	Feed production 1 000 tons	Average feed conversion/kg bodyweight gain	Feed used for livestock production 1 000 tons
Pigs	1 006.918	5.0	5 034 590
Poultry	197.0	3.0	591.0
Beef Cattle			60.0
Dairy Cattle	20.0	0.5 per kg milk	10.0
Total			5 695 590

Table 8. Estimated production and utilization of commercial mixed concentrate feeds in 1995.

Production	Total animal feed (1 000 tones)
State enterprises and individual organizations in Vietnam	200.0
Joint Venture or 100% investment from overseas	450.0
Small private producers	300.0
Mix at farms	150.0
Total	1100.0

Animal feed sources for livestock and poultry production in Vietnam include the use of the following main ingredients: rice bran, broken rice, cassava, sweet potato, maize, groundnut and soya beans and soya cakes.

Table 8 shows the estimated production of commercial animal feeds used for livestock production in 1995.

The ratio between commercial concentrate mixed feeds to total animal feed use is 19.7%. In developed countries with intensive livestock industries the ratio could be as high as 70%.

Table 9 provides details of the value of exported animal products.

Table 9. Animal product export values 1988-1991 and estimates 1992-1995.

Animal products	Value of exported animal products (1 000 000.0 US$)				
	1988	1989	1990	1991	Estimate 1992-1995
Combined totals	4.5	9.0	16.0	25.0	10-15

- The value of animal products exported annually is still low.
- There are more than 20 organizations, many operated by provincial governments, for animal product processing with a total production of about 60 000 to 80 000 tons per year mainly of frozen products.
- Many of the organizations are not operating and this is a major financial constraint on provincial economics.

7. Evaluation of livestock production in Vietnam

In the five years 1990-1995, animal production in Vietnam increased rapidly to produce more meat, eggs and milk. This has met the demand for local consumption and provided a great social benefit.

However, animal productivity is still low and the quality of animal products is poor. In pork, for instance, there is an insufficient proportion of lean meat and too much fat. Average per capita meat production is still low.

Basic technical equipment and infrastructure for animal production and animal health are still limited and investment is dispersed. A government decree (or law) on animal health, animal breeds management and animal feed management has been issued, but there is still no quality control system to administer these aspects.

Animal product processing facilities are limited in number, sometimes not well equipped and processing technology is often poor.

Animal production is changing from subsistence to commercial systems, but it faces problems in marketing and trading of the production. Local demand is still low and fluctuates. Export demand is constrained by price and quality problems, which limit access to market. Some 90% of dairy products and 80% of high quality beef for the tourist market are imported.

Limited research capacity and extension service facilities are a constraint to the transfer of new technology to farmers.

The Vietnam Government invites and strongly welcomes all organizations and individuals either national or from overseas to invest or participate in joint ventures for animal production. However, the number of such investments is still small.

8. The orientation of livestock production development from 1996 - 2000

Objectives

- To develop all forms of animal production, but concentrate on animals that meet local and export demand. More attention to pig, poultry, beef and dairy production is required . Other animal species , such as buffalo, goat rabbit and bees are likely to develop according to the resources available in the different ecological regions and to the requirements of the market.
- To expand animal husbandry by using extensive feeding systems to improve animal productivity and quality so as to get more commercial products. At the same time improve the exploitation of traditional feeding systems in rural areas.
- Improve the investments in basic infrastructure, techniques of animal breeding, feeding and in animal health. Simultaneously upgrade the processing industry and establish the requirements for the management of quality regulation on animal feeding, animal breeding, veterinary products and meat quality.
- To meet the demand for meat, eggs and milk in accordance with the requirements of the market.

Aims

To improve the average animal production per capita per year to achieve by the year 2000 the following availability:

- Carcass meat 18 kg (equivalent to 30 kg livestock)
- Eggs 62 - 70
- Milk 0.8 - 1 litre.

The main production parameters

Serial No.	Animal breeds	Index		Plan Objectives 1996	Plan Objectives 2000
1.	Pig population (head)	1 000 000	16.5	17.5	20.0
	- Slaughtered pigs (head)	1 000 000	13.6	14.0	16.8
	- Pig live weight prod.(tons)	1 000	10500	11800	16400
2.	Poultry population (head)	1 000 000	142.0	180.0	300.0
	- Chicken population (head)	1 000 000	109.0	140.0	200.0
	- Duck population (head)	1 000 000	33.0	40.0	60.0
	- Poultry meat (tons)	1 000	210.0	270.0	450.0
	- Poultry eggs	Billion	2.9	3.5	5.0
3.	Cattle & buffalo population	1 000 000	6.5	6.75	7.7
	- Buffalo population	1 000 000	2.9	3.0	3.3
	- Cattle population	1 000 000	3.6	3.75	4.4
	- Dairy cows	1 000	20	25	63
	Milk production (tons)	1 000	21	30	60
	Cattle live weight prod. (tons)	1 000	125	150	250
4.	Goat Production (head)	1 000	470	530	840
	- Dairy goat (head)	1 000	3.0	4.0	7.0
5.	Honey bee	Hives	200	250	500

Solutions

Nutrition is the key to increased animal productivity. In view of increased annual demand for animal products (meat, milk and eggs), there is an increasing need for large quantities of good animal feed. Feed ingredients production is still limited and this affects animal production. In the coming years importation of feed ingredients to meet the demand for development of livestock and poultry production will be essential.

- Encouragement for investments to build a fish meal plant to produce high quality fish meal are required.
- It will be necessary to import feed ingredients, especially corn and extracted soya bean meal, where local production cannot meet the demand.
- To encourage the investment on equipment and technology for animal feed processing, storage of ingredients and specialized transportation of animal feeds.
- To improve policy on tax, loan or credit for the production or importation of feed ingredients.
- To help dairy farmers to produce good quality grass varieties such as kingrass or legumes and make better use of crop residues such as molasses and urea, feed blocks and other feed stuffs.

9. Animal breeding program

There are many livestock and poultry breeds in Vietnam. Many of the exotic breeds are well adapted to agro-climatic conditions of the country. They have contributed substantially to increasing animal production, by three to four times in the last ten years. However, there are some limitations e.g.: the exotic breeds were imported some 15 - 20 years ago and, at that time, the feeding and management systems were still very poor.

In order to upgrade animal breeding programs in the next few years the Government is requested to invest funds for the importation of good quality breeding animals. Commercial organizations or individuals in Vietnam and overseas should be encouraged to import livestock and poultry breeds.

The investments on animal breeds and on establish breeding systems for pig and poultry production should be increased. As regards cattle and buffalo breeding systems, more attention should be paid to dairy breeding and high quality beef breeds.

9.1 Animal health

- A veterinary service network and a vaccination plan for the control of common animal diseases should be established.
- To improve animal health and reduce the mortality rate.

9.2 The proposed policy

- It should encourage organizations or individuals to develop animal production without limitation on the size of herds and the number of animals.
- The Government, as a matter of priority, should exempt from taxes and fees for five years, the organizations and individuals who establish an animal husbandry farm in the mountainous areas.
- The Government should offer credit grants and loans at a low rate of interest to farmers involved in animal production, namely:
- For pig and poultry production the interest rate should be 0.6% per month for a period of 6 months.
- For dairy production, farmers should be entitled to borrow money over a period of 60 months. During the first 36 months there should be no interest and for the last 24 months the rate should be 0.6% per month.
- For beef production, the duration of loan should be 36 months, there should be no interest during the first 24 months and the rate of 0.6% should apply during the last 12 months.
- To use one part of the slaughter tax in the commune for building the veterinary net work and organize disease security for farmer in order to help them to overcome the adverse situation (e.g. Animal losses due to diseases). To provide every commune with one technician with vaccine and drugs for disease prevention and control.
- As regards importing of milk powder, the Government should consider the following points:
- Imports of milk powder should only be permitted when the fresh milk produced by local farmers can be purchased by milk processing organizations at a suitable price, remunerative to local dairy farmers.
- To utilize the tax on imported milk powder to support dairy development e.g.: through dairy breeding programs and for local farmers to purchase dairy cattle.
- The Government should consider increasing investments in research activities on animal husbandry.
- To pay more attention and give more support to animal extension and to the transfer of new animal technologies to the farmers in the villages and communes.

There is a need to encourage organizations or individuals, from Vietnam or from overseas, to invest in animal production, feed ingredient processing and animal product processing. There are, in particular, needs for investments in ruminants production (dairy production and beef); pig breeding (hybrid pigs from GGP, GP and PS stock); and in breeding hybrid poultry birds.

Other encouragements to the farmer could include low interest loans or credit for dairy cattle breeding, sow breeding, pork production, beef production and apiculture and on exempting animal breeders from taxes

9.3 Extension network and extension services

The expansion of extension which can deliver messages to apply new production technologies profitably can help the farmer to increase farm income.

9.4 Animal recording experiences in Vietnam

In Vietnam more than 80% of the population is in the agriculture production sector, smallholders livestock production plays an important role in their income but animal recording implementation in small farms is limited. However, we have some animal recording systems which are described hereafter.

10. State annual animal recording (on 1st October)

The statics data on animal production will be reported every year on 1st October by the villages, districts and provinces to State level. They cover the following parameters.

Animal population

- Cattle Population: local cattle population; crossbred cattle population, and dairy cattle population
- Buffalo population: Swamp Buffalo population; Revine Buffalo population, and Crossbred Buffalo population
- Small ruminant animals population: Goats, Sheep
- Local small ruminant animals population: crossbred small ruminant animals population and Dairy Small ruminant animals population.

Animal production (Meat)

- Total live weight of cattle.
- Total live weight of buffalo.
- Total live weight of small ruminant.
- Total milk production.

Off-take rate

This recording system is very well organized and is working perfectly under the State regulations. All the personnel working for this system are employees and their monthly salary is paid by the state government or the local authorities.

10.1 Annual, monthly and daily animal recording data from state farms

All the state farms in Vietnam have the duty to produce breeding stock and to supply breeding services to the provincial breeding farms and to individual farmers. State dairy farms are mostly keeping Holstein Friesian cattle and other pure breeds. These farms carry out an annual, monthly and daily recording system including animal population, animal production parameters, animal breeding traits, animal reproductive parameters, off take rate.

The dairy record of state farms includes identity records, pedigree, production, reproduction, nutrition, body condition and health status of each individual cow.

All the state farms keep both herd records as well as individual record by means of computer programs. However, sometimes data analysis and feedback information are still facing difficulties due to insufficient of experience of personnel and to the lack of operating funds.

10.2 Animal recording in smallholder farmers

In Vietnam, the livestock extension project funded by the World Bank to improve cattle production has been implemented as from 1995. The objective of this project mainly focuses on enhancing farmers' income from cattle production by introducing an artificial breeding service on local cattle using, to this effect, the frozen semen of Zebu. At the same time, new feeding and management techniques were also demonstrated and transferred to the farmers.

The whole recording system has been implemented to record herd structure and other parameters of the farm as well as details in respect of inseminations carried out with the use of a project fund. In total, 27 provinces throughout the country, with over 300 000 farms, were covered by this project. The project was most welcome by all the farmers in the project area.

All the AI recording parameters have been collected and analysed at regular intervals. Achievements have been made in the fields of animal breeding, feeding and management techniques. Crossbreeding of cattle resulted in improving production and the total income of the farmers involved in this project.

10.3 Milk recording for leading farmers (Dairy production project /National dairy development project 1991-1995)

Within the framework of the dairy development project, animal recording was introduced to farmers who raise cattle and goats for dairy production, through organizing relevant training programmes.

Animal recording has been introduced to farmers who raise cattle and goats for dairy production under the dairy development project by organising the training programmes for farmers:

- Dairy production technique for smallholders
- Dairy farmers cross visits
- Demonstration on feeding and management of dairy animal
- Milk production management and recording
- External and internal control of parasites in dairy animals.
- Free training for farmers, free AI. service and free vaccination against common diseases.
- In this period with the help and under the guidance of the extension worker at village and district level recording sheets were available to the leading dairy farmers.

- Under this programme breeding and production parameters were recorded and kept on the farm and village level.
- Recording dairy production was going on well when the project was being implemented under government funds.

However, when the project came to an end there were some constraints to pursue the implementation of animal recording. The reasons for this are given hereafter:

- Farmers' awareness of the benefit which would derive from animal recording was still limited.
- Dairy development projects were few and their financing limited.
- Facilities for data collection and analyses were not sufficient.
- The feed back to farmers was limited.
- Labour at farm level was not sufficient.

11. Future plan

- In Vietnam, animal recording among smallholders is not well developed due to the fact that farmers and the leaders concerned still do not realise its importance also from the economic standpoint. So, first of all, this limitation must be overcome.
- A national recording system should be established with proper funding for operations and a positive feed back mechanism.
- Vietnam should apply the suitable animal recording methods for low and average production systems.