Korea

Livestock Feedmills Construction Project

Field Survey: August 2003

1. Project Profile and Japan's ODA Loan

Project Site

Livestock feedmill constructed in Haman under the project

1.1 Background

In South Korea, the demand for formula feed[*1] has increased with the increase in demand for livestock products (beef, pork, chicken, dairy products, etc.). Livestock production substantially increased from 3,490 thousand tons in 1981 to 9,503 thousand tons in 1988. In particular, the National Livestock Cooperative Federation (NLCF) [*2] increased feed production 415% during the same period and raised its market share from 13% to 24%. Further growth in the demand for formula feed was expected. At that time, the feedmills of NLCF were operating in high gear in order to meet the increasing demand. As the mills were operating beyond their capacity, construction and improvement of feedmills was urgently needed.

The development of the livestock industry in South Korea increasingly led to polarization between large-scale livestock farmers and small and medium-scale livestock farmers. Since the cost of feed accounts for a large part of livestock raising costs, price fluctuations of formula feed greatly affect small and medium-scale livestock farmers with weak management bases. At that time, the South Korean Government had a policy of prioritizing support for small and medium-scale farmers to narrow the income gap between rural and urban areas so as to limit population inflow to cities. Under these circumstances, supply of inexpensive formula feed produced and sold by NLCF was necessary to help small and medium-scale livestock farmers in view of increase in their farming income.

1.2 Objectives

[1] Formula feed: livestock feed composed of more than one feed ingredient mixed at a certain ratio. Various ingredients are used including corn and other cereals as the main ingredient, protein-containing sub-ingredients such as soybean oilcake and fish meal , and various additives (vitamins, minerals, amino acids, etc).

[2] National Livestock Cooperative Federation: a special non-profit corporation established under the Livestock Cooperative Law. Its activities include support for production and distribution of livestock products, financial assistance and technical guidance to livestock farmers, and production of formula feed.

The objective was, by constructing and improving livestock feed mills managed by National Livestock Cooperative Federation in order to deal with an expected increase in the demand for formula feed and supply formula feed on a stable basis, thereby contribute to improve the management of small and medium scale livestock farmers.

1.3 Output

a) Construction of livestock feedmills (4 mills)

Haman 700 tons/day, Sunchon 300 tons/day, Inchon 700 tons/day, and Kunsan 700 tons/day (under the direct management of NLCF)）

b) Improvement of the existing livestock feedmills (12 mills: installation of machines and equipment for special feed production and replacement of other equipment)

Mills under the direct management of NLCF: Anyang, Taegu, Chongju, Naju, Andong, Hwengsong and Ulsan

NLCF member mills: Suwon, Chonan, Hongsong, Tangjin and Kwangju

1.4 Borrower/Executing Agency

Government of the Republic of Korea/ National Livestock Cooperative Federation (NLCF)

1.5 Outline of Loan Agreement

Loan Amount/Loan Disbursed Amount	5,414million yen/2,215million yen
Exchange of Notes/Loan Agreement	September 1990/October 1990
Terms and Conditions -Interest Rate -Repayment Period (Grace Period) -Procurement	 4.0％ 25 years (7 years) General untied
Final Disbursement Date	January 1996

2. Results and Evaluation

2.1 Relevance

2.1.1 Relevance at Appraisal Time

The Korean Government's 1975 audit of livestock feedmills revealed that private mills' feed was of low quality and high price. At that time, the member mills of NLCF (public sector) had a market share of approximately 7% and they were not able to control the prices of the products of private companies. A Presidential Decree issued in 1987 set the target of increasing the production share of NLCF to 30%. This Decree was intended to prevent steep rises in livestock feed prices and stabilize them by giving NLCF the ability to control prices. At the time of appraisal (1990), NLCF had a production share of 24% and the market price for its products was 10% less than those of private feedmills. While there was great demand

for NLCF products, the capacity utilization rates[*3] of its feedmills were nearing the limit. In order to achieve a market share of 30% and meet the growing demand, NLCF needed to expand its production capacity by constructing and expanding the livestock feedmills of its members. In terms of formula feed quality, there was growing demand for flake[*4] or pellet[*5] feed (see photos on page 5), which are easy to handle and digest. Therefore, it was essential to construct and improve NLCF's mills to meet the quantitative demand and produce special feed. Therefore, the project plan was relevant at the time of appraisal.

2.1.2 Relevance at Evaluation Time

Following the Uruguay Round of trade talks[*6], South Korea liberalized imports of livestock products by stages. Imports of pork and chicken were fully liberalized on July 1, 1997, and imports of beef were fully liberalized in 2001. In response to these trends, the domestic livestock sector was trying to enhance competitiveness by reducing costs, while generating additional value by using special feed to create a high quality brand of domestic beef. In addition, South Korea's economic growth boosted domestic meat consumption. As a result, domestic production of livestock products is increasing even after import liberalization. The demand for formula feed is also growing as domestic livestock production increases. Therefore, this project has maintained relevance in that it aims to deal with the growing demand for formula feed.

2.2 Efficiency

2.2.1 Output

At the time of appraisal, construction of 4 feedmills and improvement of 12 feedmills was planned. However, the construction of the Sunchon Mill was cancelled, and feedmills in Anyang and Hongsong were improved by the South Korean side with its own funds before the project was implemented. Construction and improvement of feedmills in Tangjin, Ulsan and Chonan, were cancelled for the following reasons: 1) with the import liberalization of livestock products after the Uruguay Round of trade talks and the increase in imports of inexpensive foreign livestock products, the number of less competitive domestic livestock farmers was expected to decrease and, as a result, the demand for livestock feed was expected to decline; 2) import liberalization of livestock feed was expected to cause an influx of inexpensive foreign-made feed into the market and the demand for domestic feed was expected to decline; and 3) since the Feed Control Law was revised on December 31, 1994[*7] to allow free entry into the market by private feed producers, competition among feed producers including NLCF was expected to intensify. Considering these changes (increase in the risk of reduced demand),outputs were adjusted.

2.2.2 Project Period

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[3] A capacity utilization rate of 100% means the mill is operating at full capacity for 8 hours a day, 300 days a year.

[4] Flakes: ingredients are steamed and processed into thin chips using a special grinder. Flakes are usually used to feed cattle.

[5] Pellets: minute particles of feed are processed with heat and moisture, and pressed into granules with a diameter of 4-20mm.

[6] A series of multilateral talks on trade based on the General Agreement on Tariffs and Trade (GATT). The talks started in Uruguay in 1986 and concluded at the end of 1993.

[7] Manufacturers of formula feed or supplementary feed are required to obtain permission for construction or expansion of feedmills from the Minister of Agriculture and Forestry. As of the appraisal in 1990, the South Korean Government did not permitt construction of private feedmills as a measure to increase the market share of NLCF.

At the time of appraisal, the improvement and construction of feedmills were scheduled to be completed by December 1991 and September 1992, respectively. However, improvements were actually completed in July 1993 and construction was completed in January 1996. These delays are attributable to the changes in the output in response to the changes from import liberalization of livestock products as well as the shortage of local currency funds of NLCF, the executing agency.

2.2.3 Project Cost

According to the estimation at appraisal, the ODA Loan was to finance the entire foreign currency portion accounting for 38.7% of the total project cost. The foreign currency portion was to cover the cost of purchasing equipment necessary for the construction and expansion of feedmills. The local currency portion, including the cost for land acquisition and civil works, was to be covered by the NLCF's own funds.

The ODA loan was used to cover the entire foreign currency portion as planned, and a total of 2,215 million yen, or 40% of the approved loan amount was disbursed. The total project cost, including the local currency portion borne by NLCF, was 10,417 million yen against the estimated 13,990 million yen. The project cost less than estimated because of the above-mentioned (downward) adjustment of the output and depreciation of the local currency at a greater rate than inflation.

2.3 Effectiveness

2.3.1 Increase in Production and Steps to Meet the Demand for Formula Feed

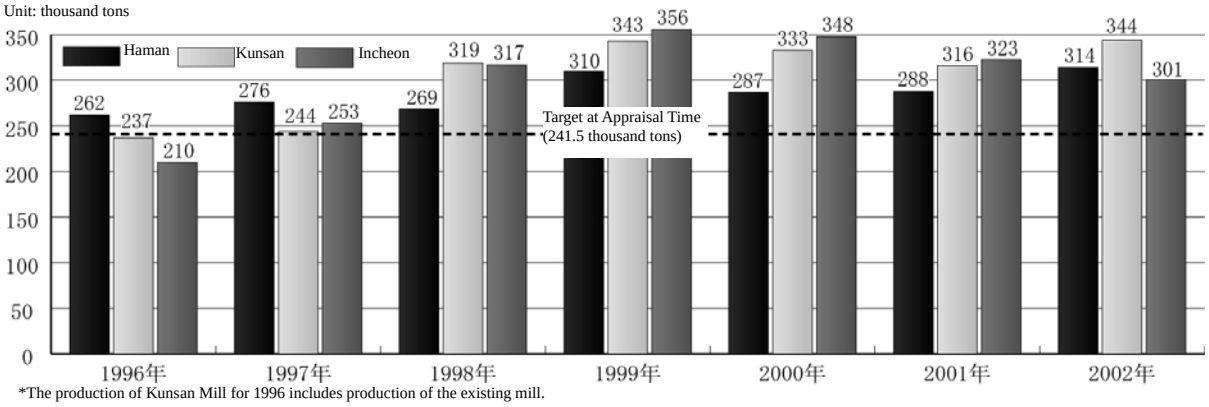
Fig.1 shows the production volume at 3 mills constructed under this project in Haman, Kunsan and Inchon, which started full operations in June 1995, November 1996 and October 1995, respectively. At the time of appraisal, the target[*8] capacity utilization rate[*9] of feedmills to be newly constructed was 10% for the 1st year of operation, 70% for the 2nd year, 100% for the 3rd and 4th years and 115% for the 5th year and after.

The Haman and Kunsan Mills achieved the ultimate target capacity utilization rate of 115% (241.5 thousand tons) in their second year of operation, and Inchon Mill achieved the same in the third year. Korea Agricultural Feed Inc. (KAFI), which manages the target mills, and National Agricultural Cooperative Federation (NACF), [*10] which has control over agricultural cooperatives, intend to increase the target mills' capacity utilization rate from 150% at present to around 180% in order to generate more profit. Each mill has been running smoothly without any major accident or failure so far.

[8] Which was used in calculating Financial Internal Rate of Return at appraisal time

[9] Capacity utilization rate of 100% means the mill is operating at full capacity for 8 hours a day, 300 days a year..

[10] The executing agency National Livestock Cooperative Federation (NLCF) was merged into the National Agricultural Cooperative Federation (NACF) in July 2000. NLCF feedmills covered by the project are under the control of Korea Agricultural Feed Inc. (KAF), a fully-owned subsidiary of NACF established in September 2002 (see 2.5.1 for details).



*The production of Kunsan Mill for 1996 includes production of the existing mill.

Source: Korea Agricultural Feed Inc.

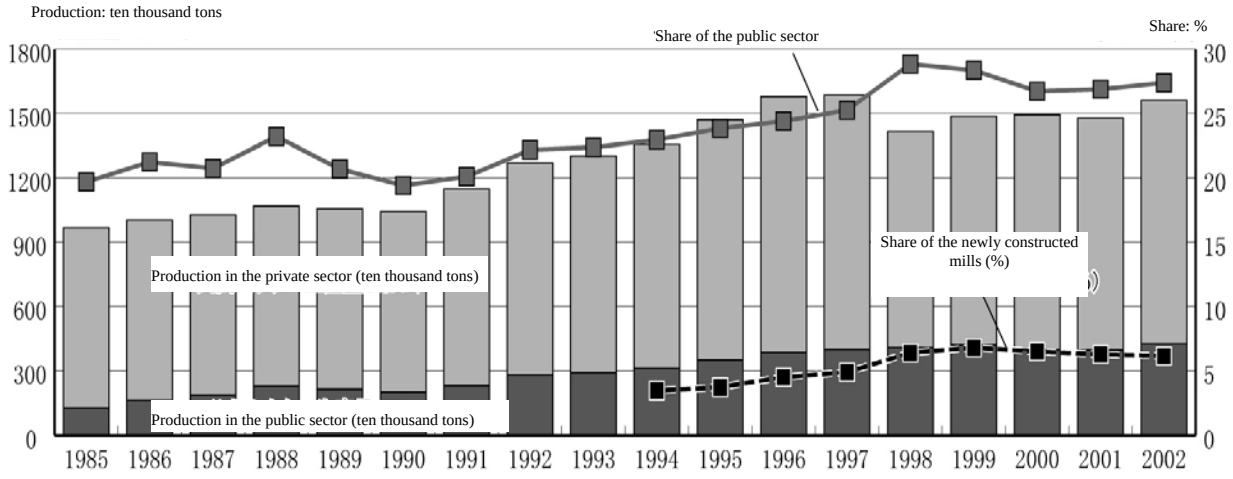
Fig.1 Changes in Annual Production of 3 Livestock Feedmills Constructed under the Project

2.3.2 Steps to Meet the Demand for Formula Feed

According to a survey by the South Korean Government's Ministry of Agriculture and Forestry in 2001, the percentage of the cost of livestock feed to the total breeding cost was as high as 29.5% for cattle, 52.4% for hogs and 50.3% for chickens. Therefore, fluctuations in livestock feed prices greatly affect the livestock industry, especially small and medium-scale livestock farmers with weak management bases. In an attempt to stabilize the supply and prices of formula feed, which were liberalized after July 1980, the South Korean Government tried to raise the market share of livestock feed produced at public sector feedmills to 30% by increasing their production capacity.

In Fig.2, the bars indicate the production of formula feed in the public and private sector as well as total production, and the lines indicate the production share of the public sector and of feedmills constructed under the project. Formula feed production in South Korea has been on the rise except for a temporary decline caused by the economic crisis and import liberalization of livestock products. Production in 2002, for example, was 155.97 million tons, or 1.5 times more than the 104.26 million tons produced in 1990, when the project appraisal took place.

The market share of the public sector has steadily increased from 25% in 1995 to 27% in 2002, although the appraisal-time target of 30% has not been achieved yet. The 3 feedmills constructed under the project are responding to the increasing demand for formula feed by producing 6-7% of all formula feed sold in the market.



Source: Agricultural cooperative statistics by the Ministry of Agriculture and Forestry

2.3.3 Quality Improvement of Formula Feed

Pellet feed

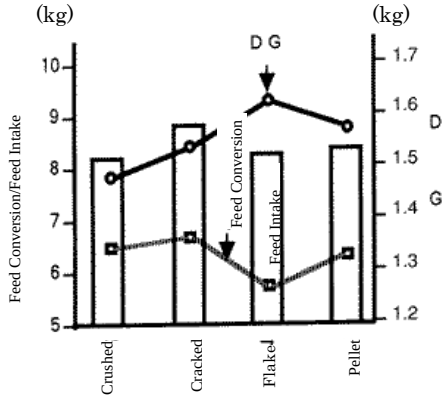
Flake feed

This project constructed the above-mentioned 3 mills that can manufacture special feed such as pellets and flakes. In addition, equipment necessary for manufacturing special feed[*11] were installed in the existing 7 mills.

Pellet feed is manufactured by press molding powdery formula feed. Pellet feed is sterilized in the process of molding with heating steam and high pressure. It can achieve high feed efficiency, maintain uniformity after feed mixture, and flow through the feed tank of each farmer. Flake feed is manufactured by heating and humidifying with steam to flattened ingredient grains (corn, milo, barley, soybean, etc.). KAFI uses corn as an ingredient in flake feed and mixes the pellets and flakes at a ratio of 75% to 25%. This feed is sold for cattle and milk cows.

The intake and feed efficiency of grains vary by processing method. Heat-processed grains are superior to non-heat-processed grains in fattening efficiency (feed conversion = the amount of feed required per 1 kg of gain). Fig. 3 presents the correlation between the processing method of corn feed and animal fattening outcome. It shows that flakes and pellets achieve larger daily gain (DG) and lower feed conversion than cracked or crushed feed, indicating higher fattening efficiency.

Fig.3 Corn Processing Method and Animal Fattening Performance



Source: Hentges et at. 1996

When this project was planned, most public sector feedmills of NLCF and member agricultural cooperatives did not have the machines and equipment for the production of special feed so they were not able to meet the demand for such feed. Under this project, such equipment were installed at 10 public sector feedmills. As a result, public sector production of pellet and flake feed accounts for 50.6% of the total.

2.3.4 Recalculation of Financial Internal Rate of Return (FIRR)

The Financial Internal Rate of Return (FIRR) of this project was 6.68% at the time of appraisal. This time, the FIRR was recalculated for 2 newly constructed feedmills in Haman and Kunsan for which data are available. The recalculation was made by taking into account the income from the sale of feed as the benefits, and operating expenses excluding depreciation expenses, general administration expenses of the mill and contributions to the expenses of headquarters[*12] as the costs. The project life was assumed to be 12 years, the same as at appraisal. As a result, the recalculated FIRR was 7.74% for Haman and 5.49% for Kunsan.

[11] The machines and equipment procured under the project were those for molding powdery feed produced with existing equipment into pellets and those for processing corn, which used to be processed into powdery feed together with other ingredients, into flakes.

[12] The contribution includes corporate taxes paid by NLDF headquarters.

■ Interview with a Korean Beef Cattle Farm Using Pellet and Flake Feed

Towan Farm in Chungcheongbuk-do is a medium-scale farm raising about 90 Korean beef cattle. The farm purchases a 5-month-old calf for around 2.5 million won and sells it for around 6.5 million won after feeding it for 27 months on average. The farm uses formula feed manufactured at Chongju Livestock Feedmill in addition to straw feed. Depending on the growth stage, 4 types of formula feed with different ingredients are used. Calves are fed high protein powdery feed containing skimmed milk for 5 months after purchase. Then, when the growing period starts, they are fed pellet and flake feed that is digestible and achieves high weight gain. A calf eats 3-4kg of feed a day in the growing period and 6-8kg of feed in the maturing period. The cost of formula feed expended by Towan Farm is 45-60 million won a year. In addition, 10 million won are paid a year as the expenses to purchase and convey straw.

Private feedstock mills usually target large-scale livestock farmers. Sometimes salespersons of private mills visit here and offer discount services. Still, the farm uses the products of KAFI, which is funded by agricultural cooperatives, because of their reasonable prices and stable supply.

Foreign beef imports were fully liberalized in 2001. However, this farm has not recognized any impact on its management. On the contrary, the farm maintains stable management because the number of farms raising beef cattle in South Korea has decreased and the prices of domestic beef have been rising thanks the success in creating a high quality brand of domestic beef.

Manager of the farm

Korean beef cattle in the growing period

Inside the farm

Formula feed used on the farm

2.4 Impact

2.4.1 Stable Supply of Formula Feed by the Public Sector

Almost all formula feed ingredients are imported. Therefore, when the South Korean currency sharply depreciated during the economic crisis that began in November 1997[*13], some private feedmills went under or suspended production because they could not settle the payment of imported ingredients in cash[*14], thus, the private sector's productivity drastically decreased (see Fig.3). Feedmills in the public sector including the target mills of this project have been meeting the demand of livestock farmers by supplying livestock feed on a stable basis even during such occasions. The 3 feedmills constructed under the project have been contributing to the stable supply of formula feed by producing 28.8% of the total in 1998, 28.3% in 1999, and 26.7% in 2000.

2.4.2 Impact on Small and Medium-Scale Livestock Farmers

One of the objectives of this project was to promote development of small and medium-scale farmers with weak management bases. However, as import liberalization of livestock products forced domestic

[13] The Asian currency crisis triggered by sharp depreciation of the Thai baht in July 1997 spread to Indonesia, the Philippines and Malaysia in only 2 months. Then the South Korean won began to be sold off in November. The annual average exchange rate of the won to the dollar was 771.3₩ in 1995, 804.5₩ in 1996, 951.3₩ in 1997, 1,401₩ in 1998, 1,189₩ in 1999, and 1,131₩ in 2000.

[14] Livestock feed was usually sold on credit of 2-3 months, whereas cash settlement was required for the payment of imported ingredients. After that, the US Department of Agriculture allocated 600 million dollars out of 1 billion dollars of export credit for South Korea for the purchase of soybeans, wheat and grains for livestock feed.

livestock farmers to reduce production costs, the number of less competitive small and medium-scale livestock farmers has been declining sharply as shown in Table 1 and the tendency towards the expansion of scale of farm management has been accelerated. The number of small and medium-scale farmers has been decreasing particularly remarkably in the production of beef cattle, milk cows and hogs that used to required larger production cost than foreign products.

Table 1: Changes in the Number of Livestock Farmers by Management Scale

	Beef Cattle		Milk Cow		Hog Raising		Chicken Raising	
	Small and Medium Scale	Large Scale	Small and Medium Scale	Large Scale	Small and Medium Scale	Large Scale	Small and Medium Scale	Large Scale
1990	620,115	151	33,163	1,434	131,994	114	-	-
1993	572,709	248	28,109	2,563	67,813	110	-	-
1996	512,799	520	20,972	3,671	29,605	157	184,735	2,732
1999	348,954	1,268	14,089	4,854	19,590	303	207,004	2,763
2001	234,307	1,108	12,375	5,103	14,428	452	197,986	2,968

*Large scale livestock farmers: farmers raising more than 100 cattle or milk cows, more than 500 hogs or more than 10,000 chickens
Source: National Agricultural Cooperative Federation (NACF)

Under these circumstances, small and medium-scale livestock farmers who are continuing business are thought to be benefiting from the supply of inexpensive feeds via the project. Still, the project had only a limited impact on the development of small and medium-scale livestock farmers due to external factors.

2.4.3 Environmental Impact and Standards for Working Environment

In order to determine if each feedmill satisfies the standards for noise and dust set by the Labor Standards Act, inspections are conducted twice a year by an institution designated by the division of industry safety of the local labor office of the Ministry of Government Administration and Home Affairs. Since each mill is equipped with dust collectors at dust generating points and isolated rooms, sound absorbing materials and mufflers at noise generating points, the monitoring shows that all the target mills satisfy the standards. In the field survey, it was confirmed during the field survey that feedmills in Chongju and Haman satisfy the standards.

As feedmills use heavy oil-fueled boilers, they are required to meet Ministry of Environment standards for smoke emissions such as the standards for the concentration of NOx, Sox and Total Suspended Particles TSP. Monitoring of these values is carried out by an organization designated by the Ministry of Environment 4 times a year. It is reported that all the target mills satisfy these standards, too. It was actually confirmed during the field survey that the mill in Haman satisfies the standards. No environmental problem such as water pollution or vibration has been observed.

2.4.4 Land Acquisition and Relocation of Residents

Land acquisition was not necessary for the construction of the feedmill in Haman because it was built on the site of the Haman-gun Agricultural and Industrial Complex owned by the government. As for the improvement of 7 mills, land acquisition was not necessary because new machines and equipment were installed on the premises of the existing mills.

2.5 Sustainability

2.5.1 Executing Agency

(1) Technical Capacity and Operation and Maintenance System

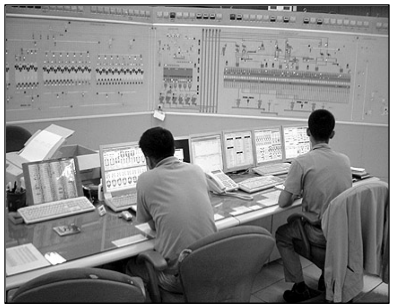


Fig.4: Operation Room of Haman Feedmill

At first, 10 livestock feedmills constructed or improved under the project were operated and maintained by the National Livestock Cooperative Federation (NLCF) and its member cooperatives. As part of structural reform in the agricultural sector, NLCF and the National Ginseng Cooperative Federation (NGCF) were merged into the National Agricultural Cooperative Federation (NACF) [*15] on July 1, 2000. At the same time, the amended Agricultural Cooperative Law took effect in July 2000. Under this law, the merger of 3 cooperative federations (NACF, NLCF and NGCF) and restructuring of their activities and member cooperatives took place. As a result, the formula feed production section of NACF was spun off[*16] to form Korea Agricultural Feed Inc. (KAFI) in September 2002.

At present, the feedmills in Haman (Fig.4), Kunsan, Chongju, Naju, Hwengsong and Andong, which used to be operated by NLCF, are operated and maintained by KAFI, and the mills in Kwangju, Suwon, and Degu, which had belonged to member cooperatives of NLCF, are operated and maintained by member cooperatives of NACF along with the Inchon Mill, which used to be operated by NLCF.

There is no specific problem with the operation and maintenance system and technical capacity of each mill.

(2) Financial Status

Korea Agricultural Feed Inc. (KAFI)

KAFI is a formula feed manufacturing company that is 100% owned by NACF. As of the end of 2002, its total assets amounted to 230.2 billion won (current assets: 108.3 billion won; fixed assets: 121.9 billion won), liabilities totaled 169.7 billion won (current liabilities: 159 billion won; fixed liabilities: 10.7 billion won), and equity capital was 60.5 billion won.

[15] The National Agricultural Cooperative Federation (NACF) was established in 1961 as a non-profit public corporation under the Agricultural Cooperative Law. NACF plays an important role in executing the agricultural policy of South Korea. In addition to providing government funds to the agricultural sector through policy-based loans, it engages in a wide –range of activities including the purchase and sale of government-controlled rice, etc.

[16] Loss-making activities that had been carried out by NLCF, such as support for production and distribution as well as guidance and education, were succeeded by NACF without being transferred to KAFI.

Table 2a: Profit and Loss Statement of KAFI (million won)

Item	Amount
Sales	165,452
Cost of Sales	143,298
Gross Profit on Sales	22,154
Selling and General Administrative Expenses	16,301
Operating Profit	5,852
Non-operating Income	1,635
Non-operating Expenses	1,744
Ordinary Income	5,743
Corporate Taxes	2,003
Current Net Income	3,739

Source: Data by: KAFI

Table 3: Major Financial Indicators of KAFI

Indicator	Value
Operating Profit to Sales Ratio	3.54%
Ordinary Income to Sales Ratio	3.47%
Current Ratio	68.12%
Equity Capital Ratio	26.28%
Fixed Ratio	201.47%
Fixed Assets to Long-term Capital Ratio	171.20%

Source: Data by KAFI

Table 2b: Balance Sheet of KAFI (million won)

Assets		Liabilities	
Current Assets	108,307	Current Liabilities	158,987
Fixed Assets	121,906	Fixed Liabilities	10,719
		Total	169,706
		Shareholders' Equity	
		Equity Capital	56,768
		Legal Reserve of Retained Earnings	3,739
		Total	60,507
Total	230,213	Total	230,213

Source: Data by KAFI

KAFI's profit and loss statement from September 2002, when KAFI was founded, to the end of December 2002, and the balance sheet and major financial indicators as of the end of December 2002 are shown in Table 2 and Table 3. Most of KAFI's costs are the cost of sales, such as material costs. Income from sales and profit are affected by the selling prices of feed determined by NACF, though there was no problem concerning profitability during the abovementioned period. With the improvement of profitability, stability is expected to improve in the future.

2.5.3 Operation and Maintenance Status

Each formula feedmill has a section in charge of the production of formula feed and related activities, a

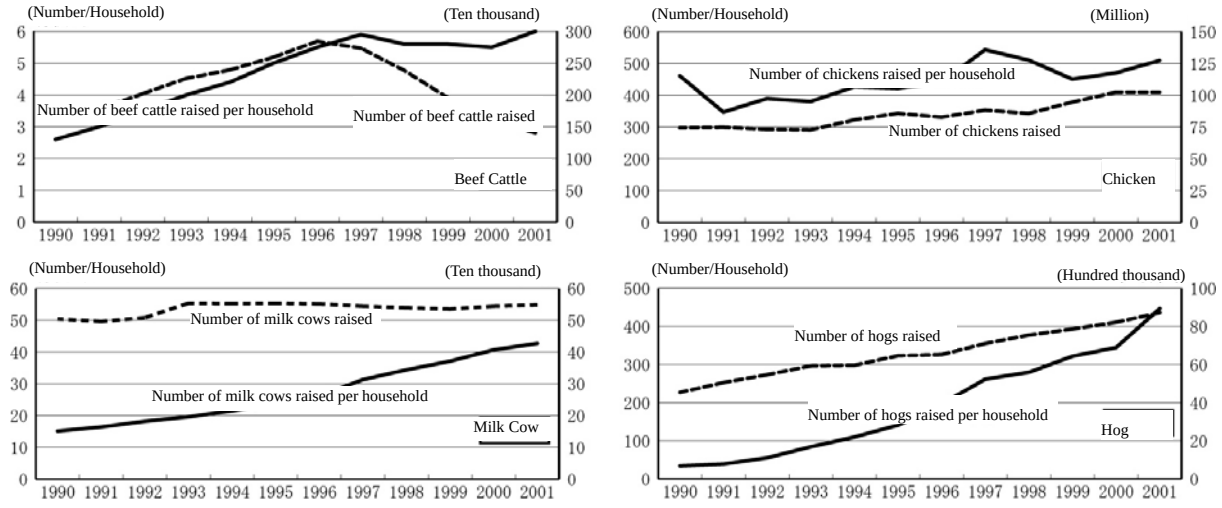
quality control section in charge of inspecting ingredients and products, a technical section in charge of operation and maintenance, a sales section and an operation section. For example, Chongju Feedmill, which was improved under the project, has a total of 71 employees, 43 full-time employees and 28 contract employees. Among them, 31 employees are in the production section and 9 in the technical section.

Equipment used in feedmills includes not only domestic products but also foreign products. However, since almost all manufactures of these machines and equipment have branches or agents in South Korea, a system is in place to promptly solve problems that cannot be handled by the technical section of the mill. The capacity utilization rate of the target feedmills has been high so far and operation and maintenance seems to be good in terms of both the technical capacity and system.

2.5.4 Future Prospects of the Formula Feed Market

At project appraisal, it was feared that the import liberalization of livestock products following the Uruguay Round of trade talks would deal a strong blow to the livestock industry in South Korea. However, as meat consumption has risen sharply with the development of the South Korean economy, the number of hogs and chickens raised in the country has been increasing despite the influx of foreign products, and the number of milk cows has remained at the same level (see Fig.5). However, the number of beef cattle, after peaking in 1996, has been decreasing due to the increased market share of inexpensive imported beef.

The South Korean Government announced a policy to support Korean beef cattle farmers in 1998 with the aim of improving the efficiency of the beef industry. In line with this policy, the government is supporting quality improvement of domestic beef (creation of a brand) through measures including subsidies for facility modernization, genetic improvement of beef cattle, establishment of a Livestock Production Center, establishment of the rating evaluation system, improvement of the distribution system, and establishment of the Korean Beef Research Institute. In spite of these efforts, the demand for beef cattle feed is expected to decline.



Source: South Korea National Statistical Office

Fig. 5: Changes in Total Number of Animals Raise and Average Number per Households

3. Feedback

3.1 Lessons Learned

None

3.2 Recommendations

None

Comparison of Original and Actual Scope

Item	Plan	Actual
I. Output		
1) Construction of livestock feedmills		
- Haman, Kunsan, Inchon	- 700 tons/day	As planned
- Sunchon	- 300 tons/day	Cancelled
2) Improvement of livestock feedmills		
- Chongju	- Flake system	As planned
- Naju, Andong, Kwangju, Suwon	- Pellet/flake system	As planned
- Hongsong	- Pellet/flake system	Implemented with South Korean side's own funds
- Tangjin	- Pellet/flake system	Cancelled
- Hwengsong	- Pellet system, packer scale	As planned
- Ulsan	- Extruder	Cancelled
- Anyang	- Pellet/flake system, extruder, main mixer, etc.	Implemented with South Korean side's own funds
- Cheonan	- Flake system	Cancelled
- Taegu	- Pellet/flake system, extruder, main mixer, vibration feeder, etc.	Extruder and vibration feeder were cancelled and roller mill, silo and automatic bagger were added
3) Consulting service		
- Detailed design, construction management	Local consultants	As planned
II. Project Period		
Construction of feedmills		
- Land acquisition	Jan. 1990 – Jul. 1990	Oct. 1989 – Aug. 1991
- Design	Aug. 1990 – Apr. 1991	Jul. 1991 – Apr. 1992
- Construction	Mar. 1991 – May 1992	Jan. 1992 – Dec. 1995
- Installation of equipment	May 1991 – May 1992	Mar. 1992 – Nov. 1995
- Trial operation	Apr. 1992 – Sep. 1992	Dec. 1995 – Jan. 1996
Improvement of feedmills		
- Taegu	To be completed by Dec. 1991	Completed in Jul. 1992
- 6 other mills	To be completed by Dec. 1990	Completed in Jul. 1993
III. Project Cost		
Foreign Currency	5,414 million yen	2,215 million yen
Local Currency	8,576 million yen	8,202 million yen
（In terms of local currency）	（40,076 million won）	（61,826 million won）
Total	13,990 million yen	10,417 million yen
ODA Loan Portion	5,414 million yen	2,215 million yen
Exchange Rate	1 won＝0.214 yen (Feb. 1990)	1 won＝0.133 yen（Dec. 1995）

Third Party Evaluator's Opinion on
Livestock Feed Mills Construction Project

Joon-Mo YANG
Associate Professor, Economics
Yonsei University

The main objective of livestock feed mills construction project was to support the small and medium scale livestock farmers who had to pay the high price for the capital intensive facilities such as livestock feed mills. At the time of the previous appraisal, it was essential to construct and to improve the capacity of livestock feed mills of the National Livestock Cooperative Federation (NLCF), which was merged into the National Agricultural Cooperative Federation (NACF). The capacity utilization rate and the profitability of feed mills under the project exceeded the expected target rate. Even though the foreign trade policy changed to import liberalization and the mad cow disease hit the market, the domestic livestock market will be stabilized. Therefore the project can be evaluated very successful.

Impacts

The project increased the public sector's supply capacity in order to meet the demand of the small and medium scale livestock farmers and to improve the competitiveness of these farmers against the larger scale livestock farmers and foreign livestock farmers. The construction of 3 livestock feed mills and the improvement of 7 livestock feed mills were tremendous achievements. The three constructed feed mills under the project produced 28.8% of the total in 1998, and the feed mills under the project affected the nationwide supply of feed.

The quality of formula feed also sharply improved, considering the fact that the public sector feed mills did not have the machines and equipment for the special feed production before the project was completed.

The large scale livestock farmers tend to be better educated than small and medium scale livestock farmers and their management situation has been known relatively better. The project has helped the small and medium scale farmers by reducing their costs, even though these benefits cannot overcome the other external negative factors. The project benefited the Korean farmers directly or indirectly by providing good facilities at the lower price.

Sustainability

The governance of the feed mills under the project has changed from NLCF to NACF and then partially to Korea Agricultural Feed Inc. (KAFI). This change is due to the changed environment of the financial conditions of the three major cooperative federations, followed by the amended Agricultural Cooperative Law. Regardless of this change, the governance will be better because KAFI is believed to manage more efficiently. Therefore the facilities under the project will continue to provide better service under the better management.

The import liberalization of livestock products overshadowed the future prospects. The demand for beef cattle feed is expected to decline, but considering the price difference between the domestic meat products and the imported ones and the government efforts of improving the competitiveness of the domestic farmers, the decline will not be sharp.

The improvement of 7 mills finished in 1993. The trial operation of the newly constructed feed mills began from in 1995 to in 1996. From then, those mills successfully provided much better services almost for ten years. Therefore, the project can be evaluated as sustainable, even though the external factors may hinder the expansion of its operation, and they cause the public sector to crowd out the private sector.