A Value Chain Assessment of the Livestock Sector in Indonesia

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"Helping Indonesia to Grow"

A VALUE CHAIN ASSESSMENT OF THE LIVESTOCK SECTOR IN INDONESIA

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TABLE OF CONTENTS

ACRONYMS

ADG	Average Daily Gain
APFINDO	Association Pengusalia Feedlotter Indonesia
BBIB-Singosari	Balai Besar Inseminasi Buatam
BET – Cipelong	Balai Embryo Transfer
BPTP	Balai Pengkajan Technologi Pertanian
DGLS	Directorate General of Livestock Services
FMD	Foot and Mouth Disease
GOI	Government of Indonesia
HRI	Hotels, Restaurants and Institutions
NCBA	National Cooperative Business Association
NFT	Nitrogen Fixing Tree
NTT	Nusatenggara
PUSKUD	Pusat Koprasi Unit Desa
TAMU	Texas A&M University
USAID	United States Agency for International Development

1. EXECUTIVE SUMMARY

A rapid assessment was conducted of the beef value chain in Indonesia. The review team traveled to seven provinces and four islands and interviewed key participants in both the public and private sectors. Interviews were conducted with participants at each level in the value chain from input suppliers of feedstuffs to final retailers of beef in wet markets and supermarkets.

Findings

The following findings are drawn from the report.

- The productivity of the beef breeding herd in Indonesia is low compared to other meat exporting countries in the region. The reproductive rate of the native cattle is below levels necessary to expand the herd. The beef herd has contracted due to a large sell off of productive females, and the herd will be slow to expand because of the low level of fertility, low calving rates, and a high rate of calf mortality.

- The economics of cow/calf operations are not as favorable to investors as short term feeding of beef cattle. Smallholders of livestock may invest their time in cattle breeding if other alternative employment opportunities for household labor are not available.

Smallholder fattening schemes being undertaken by the National Cooperative Business Association (NCBA) in Central Java and West Timor are attractive investment opportunities because of the short time period (less than a year) to fatten and sell feeder cattle. There is a long list for farmer groups waiting for feeder calves (500 farmers in Central Java and 2,000 in West Timor) attesting to the attractiveness of the investment. However, the demand for feeder calves exceeds supply. It will be important to increase Average Daily Gain (ADG) for feeding Bali cattle from the current level of 0.3kg/day to 0.6kg/day as achieved in feedlots in Java.

- The market channels for beef cattle are crowded with large numbers of livestock traders. These traders serve an important function; however, their costs contribute to lower prices for producers. It will be important to better coordinate the transfer of cattle from producer to feedlot or slaughter plant with the most efficient marketing method.

- Inter-regional transport costs are high, and proper ships for transporting cattle efficiently are not present. The Government of Indonesia (GOI) will need to consider how to improve inter-island transfers of cattle.

- The GOI has improved slaughter houses in the larger provincial capitals with assistance from the Japanese government, but many of these renovated plants are still underutilized. Slaughter plants are a mixture of private and public ownership, indicating that a competitive environment exists for slaughter services.

- Indonesia is a beef deficit country importing approximately 30 percent of its annual consumption. Imports of live cattle from Australia and mainly frozen boneless beef

make up the shortfall. The projection to 2020 – 2025 is for Indonesia to import 70% of its meat consumption in live animals and beef if there is no special effort to improve the beef industry.

- The total number of wet markets is declining in the larger cities because of the expansion of larger supermarkets and hypermarkets. Consumers benefit with safer meat products. Supermarkets are seeking more direct linkages with producers to ensure product safety and supply consistency.
- There are 3 to 5 million Bali cattle in Indonesia, and 0.6 million are on Bali. This unique breed, which is indigenous to Indonesia, is well adapted to the Indonesian agro-ecological and sociological conditions. The breed is resistant to tropical diseases and has a good conversion from live to carcass weight. There is an opportunity to improve the breed and realize gains in marketing frozen semen, meat and hides for both the domestic and export markets.

Recommendations

The assessment team identified improving the efficiency of the beef industry in Indonesia as an overarching goal. The best course of action to achieve this goal is through better integration and vertical coordination within the beef value chain. The assessment team chose to focus on the Bali cattle, as it offers an opportunity to capitalize on a breed unique to Indonesia. We believe there are market opportunities focusing on this breed that have yet to be realized. There are certainly potential spillover effects to other breeds in Indonesia and to the whole beef value chain, e.g. improved genetics and feeding systems.

The assessment team set out three objectives to achieve the stated goal:

1. Improve the supply and quality of Bali cattle
2. Improve the market coordination for Bali meat production
3. Market development of Bali cattle products

Each objective has a set of activities with a specified budget, outputs and time frames. A summary of these recommended activities can be found in Chapter 4 and the Annex. The estimated budget for these activities is $ 737,200 expended over three years.

2. OVERVIEW

2.1. Current Situation

Domestic Livestock and Meat Production

Indonesia has approximately 10 to 11 million head of cattle. Cattle numbers have declined slightly over the past several years after the crisis in the foreign exchange market. The number of livestock declined after the foreign exchange crisis as older animals were slaughtered at an increasing rate, followed by younger animals. The slaughter rate exceeded the natural increase in numbers. Calving rates have also declined. Herd dynamics of current production systems requires retaining all weaner heifers for replacement breeding stock, but 40% of females are sold annually. The level of sales is unsustainable and accounts for the decline in stock numbers (Fordyce et al).

Java is the major cattle producing area of Indonesia, and has the major concentration of cattle with approximately 45% of the cattle in Indonesia. Sumatra has approximately 22% with Nusatengarra (NTT) and Sulewesi both having around 13%. There are approximately 3 million Bali cattle in Indonesia with the largest concentration in Sulewesi, followed by Bali and then NTT. Bali cattle are shipped to most provinces around Indonesia because of the breed's suitability and adaptability to most agro-climatic zones. The other important cattle breeds are the Onggol breed (Bos indicus), and Indonesian Holstein/Freisan. Popular breeds for crossing with the Onggol are the Simmental and the Limousin breeds. The crosses are favored for fattening. Most cattle that move in inter-island cattle trade will eventually find their way to Jakarta and West Java provinces.

Imported Livestock and Beef (fresh, frozen, bone-in, and bone-less) and Edible Offal

Indonesia is a net importer of live cattle and beef. Imports fill the gap between production and consumption and the gap is projected to widen in the future. Beef production in 2003 was 351,000 mt while consumption was 418,000 mt. There was a deficit of 67,000 mt filled by imports. In 2010 production is expected to be 362,000 mt while consumption is expected to be 447,000, a deficit of 85,000 mt. In 2020, the deficit is expected to grow to 111,000 mt.

Live cattle imports were estimated at 428,000 head in 2002, 374,000 head in 2003 and approximately 350,000 in 2006. The level of imports from Australia have returned to pre-1997 levels.

Beef imports are mainly fresh and frozen bone-in and boneless beef with the majority being frozen boneless beef. The major source of this beef is from Australia and New Zealand.

Edible offal is an important imported beef product. Edible offal is mainly used in the production of meat balls which is eaten by all strata of households but particularly by

low income households. The major offal product is liver which accounts for about 75% of beef imports (Hadi et al). Another item of importance is the heart.

2.2. Macroeconomic Conditions in Indonesia

The national estimate for consumption of beef in Indonesia (measured by domestic disappearance) is reported to be around 1.7 to 1.8 kg/capita. The majority of beef consumption occurs in Jakarta and West Java and it is reported that consumption per capita is around 7 to 9 kg/cap (APFINDO). This is much lower than poultry consumption estimated at around 4 kg/cap and fish at 12 kg/cap. The impact of bird flu could be reducing poultry consumption in the short run.

Beef can be considered a superior good. A greater than one percent increase in income results in a greater than one percent change in consumption of beef. Unlike rice, which the GOI considers a strategic food commodity, beef is consumed more by middle and upper income households.

Foreign exchange rates have influenced imports of live cattle, beef and offal. After the steep depreciation of the rupiah in 1997 double digit declines in growth in live animal imports occurred. As the rupiah has begun to increase in value, imports of live animals have again increased. Live cattle imports are reported to be back to pre-1997 levels at over 350,000 head per year.

Livestock are a source of savings for rural households. As urban growth rises, concentrations of income and population grow, livestock producers will have market pressure to sell off animals to meet household needs and rising demand for meat. Purchasing power is higher in urban areas again influencing the extraction rates of cattle from rural areas.

Indonesia's push for greater industrialization has influenced cattle production dynamics. Cattle once used in rice production declined as walking tractors were promoted by the GOI. This was done in tandem with increased efficiency in irrigation of rice to shorter fallow periods reducing grazing areas for livestock on Java and the need for faster field preparations to meet water scheduling. This may have been encouraged by subsidization of inputs because of rice was labeled a strategic commodity. All of these factors together have put pressure on the national livestock herd.

2.3. GOI Livestock Policies

GOI has a general policy to be self-sufficient by 2010 in beef consumption, but there are not sufficient government resources to support this policy. GOI did not have many policies for promoting the livestock – meat sub-sector. In the 1990s it did encourage with certain incentives to feedlots to develop nucleus and outreach programs with small farmers to feed imported cattle. After the crash in 1997, the partnership feeding initiative declined, and it is not mandatory though a few feedlots have continued on social development grounds.

The GOI began promoting decentralization with regional autonomy in 2000. Local governments have imposed regulations on livestock that affect the production and trade

of livestock. Imposition of taxes and levies has reduced the price competitiveness of local cattle relative to imported cattle. The Directorate General of Livestock Services (DGLS) plays the role of coordinating authority, but it lacks administrative power to enforce regulations. Each district now sets its own policies and programs.

The GOI has a program to make available subsidized credit to farmers at 12% interest while the market interest rate is higher. The loan is for one year and is for Rp 5 million per farmer. The loan is not enough to purchase feeder cattle, which cost about Rp 6 million, and a farmer needs to feed five head to be worthwhile.

The GOI has encouraged feedlots to retain pregnant females from the live cattle imports. The program calls for these animals to be purchased and then distributed to farmers to raise the calf. The cost of the pregnant heifer is around Rp 7 million plus feed and additional feed and other costs of Rp 1 million. The calf is worth Rp 1.5 to 2 million. The cow can then be sent to slaughter or kept for breeding. The buy back scheme is too expensive with these cattle, costing the GOI more than the market price to purchase these animals. There is no bank loan for smallholders to maintain these animals.

GOI has a regulation against the slaughter of productive females. The GOI has a scheme to buy back these animals at the slaughter plant. It was reported that 170,000 productive females (10% of slaughtered animals) are killed per year, so the regulation does not seem to be effective. Producers, traders and butcher have vested interest in selling their livestock and meat for the highest price regardless of government regulations. There is not a sufficient budget to have an effective buy-back program.

GOI had imposed a VAT of 10% several years ago on all agricultural products. With pressure from the industry, the VAT was removed in 2007.

In 2007 the GOI began a program to distribute Rp 100 billion to NGOs, which are mainly educational institutions. These institutions are tasked with developing beef cattle programs. It is too early to determine the effect of the program. The GOI distributed in 2006 another Rp 100 billion to the provinces for stimulating cattle breeding centers. One breeding center costs about Rp 1 billion to construct and supply with 150 head of Bali or local cattle.

2.4. Global Forces Affecting Beef

World Trade

Indonesia is becoming more reliant on live cattle imports from Australia to sustain its demand for beef. Global forces will impact on the live cattle price from Australia and fresh and frozen beef from the U.S., Australia, and New Zealand. (Brazil is the world's largest exporter of beef but because of Foot and Mouth Disease (FMD) is not allowed to export to Indonesia.) Australia is a major exporter of manufacturing grade beef to the U.S. This beef is from cattle (BX) that are sold live to Indonesia. Though there is competition for this beef with Indonesia, Australia faces U.S. import quotas, which helps Indonesian feedlots.

Cattle Competing With Energy

Some of the feedstocks that have been cheap by-products for animal feed are now sought for biofuels. The waste of palm kernels now have a market in Europe. Cassava starches are being demanded in China and the price has increased from Rp 300/kg to Rp 1,000/kg, and chipped cassava is selling for Rp. 1500/kg. Molasses is also a source of biofuels. The price for these raw materials is increasing. The world price for corn is increasing in response to U.S. policy for production of ethanol from corn. The impact on Indonesia is that the price of imported boneless beef is likely to remain high. This change in relative prices will also put greater value on manure, which currently sells for between Rp 100 to Rp 400 per kg.

Sanitary and Phyto-Sanitary (SPS) Standards

GOI has a firm policy on the importation of meat and livestock from countries with List A diseases, especially FMD BSE. Indonesia is free of FMD and this limits Indonesia to a few countries from which to import. For this reason, Australia, which is also free of FMD, is a natural trading partner.

Indonesia's disease-free status creates the opportunity for export of livestock, animal products and semen to countries in the region. Malaysia is purchasing Bali Cattle semen and bulls, and Sudan officials have recently visited Indonesia to enquire about semen and training programs in breeding.

Food safety is becoming more of a concern for Indonesian authorities and the general population. Indonesia closed its market to U.S. beef after the discovery of BSE. The markets have reopened as of January 2007, but with major conditions. However, some level of illegal trade has persisted with product shipped to Singapore and repacked and labeled for shipment to Indonesia. There is continuing illegal trade in meat products. The Beef Producers and Feedlot Operators Association (AFPINDO) has been vocal on tightening up on illegal imports of beef and blocking the import of Indian beef and buffalo meat, which is very cheap, because India has FMD.

Global Warming

The significance of global warming on livestock production in Australia and the extent to which Indonesia will be affected is speculative at this point. Australia is in a cycle of drought, which will affect herd numbers and decrease the availability of livestock imports for Indonesia.

3. THE BEEF VALUE CHAIN

3.1. Market Channels

The beef value chain is illustrated in Figure 1. Two main flows are shown in one figure: (1) the flow of cattle from smallholders outside Java, and the flow of cattle from Australia and imported beef. Cattle from Australia are being imported to other areas besides Java, e.g. Lampung and Medan for local consumption and export to Java and even Malaysia, but the flow chart does not capture these channels.

3.2. The Production Stage

There are probably several million smallholders of cattle in Indonesia. Cattle are mainly used as a source of savings for households, and can be sold for cash for household needs. Beef producers keeping cattle in their households in general do not invest in improvements in their livestock, preferring to use family labor and a local bull for breeding. Producers will avail themselves of GOI services such as veterinary care and artificial insemination. These practices contrast with dairy producers, who tend to have more cash expenses. Besides the sale of live animals, the producer will transfer manure to their cropland (if they have any) or sell it for cash. Landless households are more likely to keep livestock for themselves or others. In areas where cattle are raised under extensive grazing systems, cattle stealing can be a problem.

Veterinary and AI Services

Producers indicated that animal disease was not a pressing problem in breeding or their smallholder feeding programs. A veterinarian in the area of a farmer group feeding cattle will visit once per month. Cost per farmer is Rp. 3,000/head/year. There are no animal health risks.

There are two AI centers on Java at Singosari in East Java and Lempang in West Java. Both centers have stud bulls but many of the animals need to be replaced because of age. About 70% of the bulls are imported from Australia. Centers sell a straw of semen for Rp. 6,000 and inseminators charge Rp. 30,000 per insemination. Singosari distributes 1.2 million straws per year and currently has 600,000 straws in storage. Simmental and Limousin are the most popular breeds. The calving rate on the first attempt is 71 percent and the service to conception is 1.43. For the dairy industry, almost all insemination is done by the private sector. In the case of beef cattle, about 40% is done by private inseminators.

Livestock Structures

Many of the farmer groups have established their sheds away from their homes. The cost of a shed in Jogjakarta was estimated at Rp. 3 million. In some cases the municipality owns the land and yearly rent is Rp. 30,000 per farm shed which is 100x100 meters.

Animal Performance

The cattle being produced can have low reproductive rates, with cows taking upwards of two years to breed back after dropping a calf. The shortest period between calves was around 14 months. Bali cattle have a smaller frame size than Australian BX cattle and Onggol cattle and their crosses. The animals are indigenous to Java and adapted throughout the archipelago.

Onggol cattle (Bos indicus) are preferred in Central Java. A 2 year old female costs about Rp. 4 to 5 million at a body weight of 200 kg. These animals are preferred because they can be crossed with Simmental and Limousin and produce a very thrifty animal with ADG over 1 kg/day. Male calves at 200 kg are valued slightly higher than female at Rp 5 to 5.5 million per head. The hide of the white Onggol can receive a premium price. Bali cattle are reported to also be preferred by smallholders in Central Java. These breeds do not have any health problems.

3.3. Distribution System: Inter-District and Inter-Province

Traders are important to livestock smallholders. They provide the necessary liquidity and outlets for a farmer's livestock. At the same time, traders can be a cause of concern. A number of trade exchanges occur as animals move from farm to feedlot or direct to slaughter. For example, in West Timor the main live animal market is Camplong and there are traders who extract rent from buyers and sellers just by their presence during negotiations. The market has no weigh scale. They offer no value added services. The NCBA fattening cattle program now purchases animals outside the market place early in the morning on market day to avoid these traders. (It was interesting to hear a livestock trader in Yogyakarta report that he would lose Rp.500,000/head if he buys in the market because of unnecessary middlemen. He expects his margin per animal is only Rp 100,000 to Rp. 200,000 per head.)

The individual traders' margins are small but when added together can be relatively high. For example Bali cattle sells for Rp 12,500/kg (outside NCBA project) in West Timor and in Tanbung in Jakarta will sell for Rp 18,000/kg or higher. This is a mark up of over 33 percent. In Banjermasin, two Bali males from Lombok will cost around Rp 13 million, and a Limousin cross bull weighing 600 kg or more would be Rp 16 million

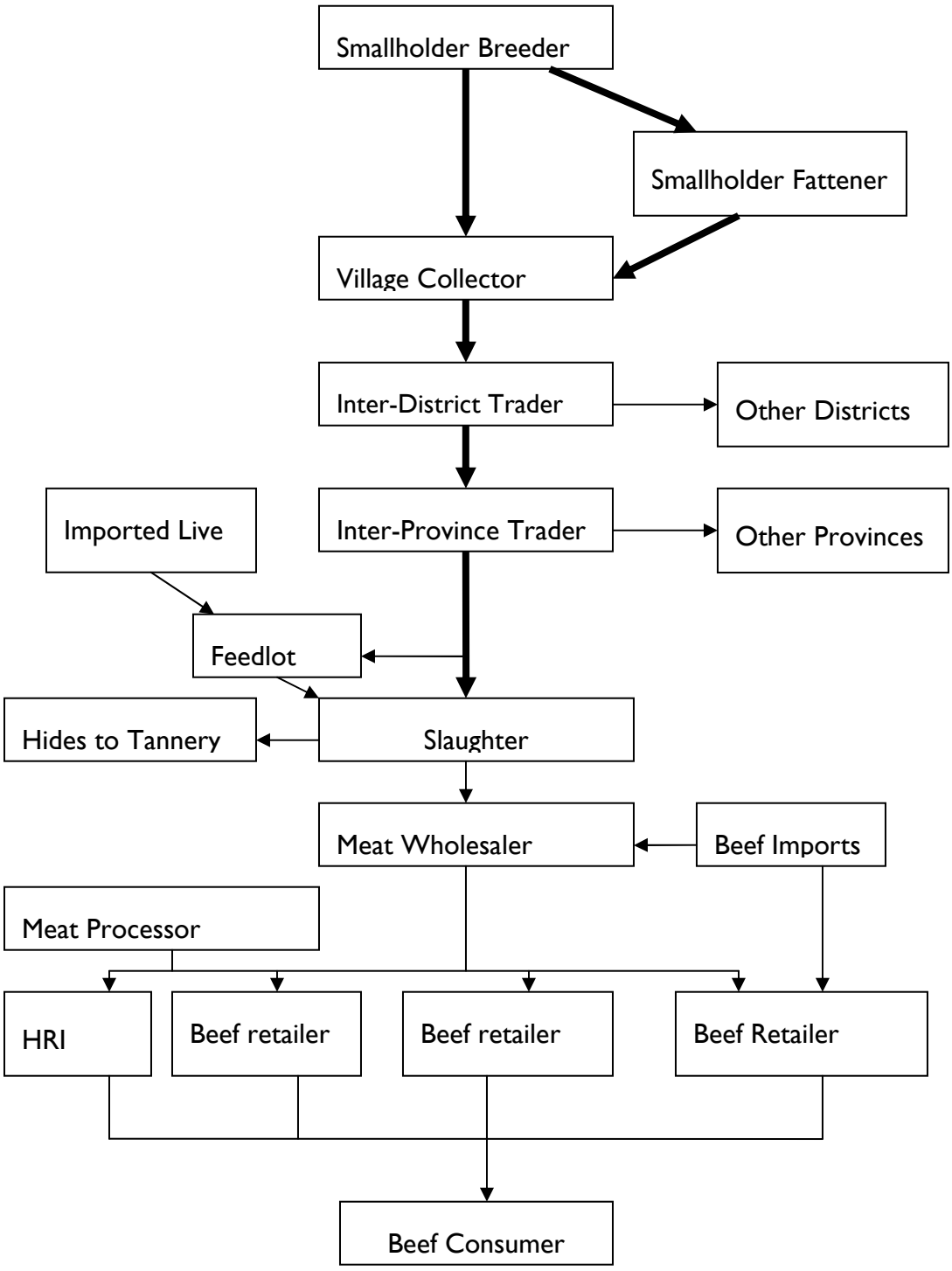

Figure 1 Components of the Beef Value Chain in Indonesia

Livestock handling during collection and transport varies greatly according to reports by traders. Cattle are loaded and unloaded without simple facilities such as ramps, increasing the risk of animal injury. In the case of the major ports, officials reported that animals walk on and off ships, but there were also reports of animals being lifted by the horns. One trader reported high mortality losses on ships and has chosen to contain animals on trucks for days at a time. Poor handling can lead to stress and sickness. For example, a large feedlot in Sukibumi bought 700 head of Bali Cattle last year to feed. Approximately 10% died from pneumonia caused by traders forcing animals to drink large amounts of water after transit from NTT. The feedlot operator is not interested in purchasing Bali cattle in the future.

The inter-island transport of livestock is reported to be controlled by a few individual companies, and costs are high. One company reported to be dominating the trade is the Erick's Group. This company and its subsidiaries have locked up key components of the trade: boats, loading facilities and quarantine space for their animals. The GOI has a role to play in opening the marketing channels to competition.

Data were collected on costs for shipping cattle. The shipping cost from Kupong to Surabaya was reported to be Rp 156,000 per head. The cost to hold cattle in the quarantine station while awaiting shipment is Rp 10,000 per head per week. The owner must supply feed for the animals. Transport from East Java to Central Kalimantan is Rp 19 million for a truck of 12 large cross-bred bulls. (Another trader in Jogjakarta said that he paid Rp 2 million for a truck of 20 animals to Kalimantan). The boat trip takes 16 hours. A barge of 100 head from Surabaya to Banjermasin costs Rp 156,000 per head and the trip takes two days and two nights. Intra-island transport by truck Jogja to Jakarta was Rp 100,000 per head.

Shipment during certain times can be delayed because of rough seas. From January to March there can be poor sailing conditions. There are also certain months when demand for meat is high, such as at Christmas, the end of Ramadan and the Easter period.

There is a livestock traders association in Jogjakarta with 60 members. The association is strong and is influential in setting prices for live animals. One trader reported receiving a bank loan of Rp 100 to 200 million to purchase livestock every month.

Quarantine Centers

There are a number of quarantine stations in Indonesia for receiving cattle from Australia as well as cattle from other islands. The quarantine stations visited in Surabaya had adequate facilities with pens and shade for cattle. Staff were knowledgeable. Traders use the quarantine stations as a holding ground while waiting for ships. Cattle from Eastern Indonesia will arrive in Surabaya for a rest and inspection before boarding trucks to West Java and Jakarta. The major entry point for Jakarta is located at Tunbung, 20 km from Jakarta. The fee for the quarantine station is Rp 10,000/ head per week, which seems low to maintain and operate the facilities.

3.4. Feedlots

There are a number of feedlots on Java and Sumatra receiving Australian cattle. In addition, there are twelve feedlots in South Kalimantan. These feedlots prefer local cattle to fatten because they do not cost as much as Australian cattle; however, one feedlot operator said that of the feedlots in West Java and Jakarta 85% of cattle are from Australia and 15% are local. The cost to construct local sheds for village feeding project is around Rp 30 million for 60 animals. A large feedlot operator (4500 head one time capacity) mentioned needing 1 employee in the yard for every 100 head of cattle.

Feeds and Feeding

There are feedmills on Java and on a few of the outer islands. The cost of feed can range from Rp 900 to Rp 1200/kg depending on the ration, and the roughage can be approximately Rp 110/kg. For example, in Banjermasin the cost of cattle feed is Rp 1,200/kg. The major feed ingredients in the feedlot are cassava (from Lampung), rice bran, wheat polar (there are four large wheat millers with the largest being Bogasari Flour Mill near Jakarta), wheat bran and rice bran. Other products include molasses, coconut cake, and palm nut cake. Soybean cake is imported but is expensive. A feed ration used in Central Java is made up of peanut and coffee hulls (70%) of the ration and rice bran, soybeans and molasses (30%). The cost to produce is Rp 750, and it sells to farmers for Rp 900/kg.

Animal performance

Average daily gain (ADG) can vary by type of cattle being fed. ADG for Bali cattle can reach 0.7 kg/day but averages 0.58 kg/day in Sukibumi. This is the lowest ADG of the cattle types. Onggol cattle from Sumba will average between 0.8 - 0.9 kg/day, while imported BX cattle from Australia will average around 1.1 to 1.2 kg/day.

Though the feed efficiency for Bali cattle is lower, the smaller size of animals allow feedlot managers to buy two animals for the price of one imported BX. The Bali cattle ration would be 5 kg of concentrates and 1 - 2 kg of roughages per day. Onggol cattle would receive 9 kg of concentrates and 2 kg of roughages, and BX cattle would receive 10- 12 kg of concentrates and 3 kg of roughages.

Financing Arrangements

Financial linkages have changed in the selling of fat cattle. Now, for example, a feedlot will sell 3 orders on credit and receive payment for one before extending the fourth order. Multinationals like Elders from Australia have moved into the feeding and downstream slaughter and processing activities. Great Giant Livestock Company and ACB are two other large feedlots selling cattle directly for slaughter.

The foreign exchange crisis in the 1997 shortened the credit situation and forced more liquidity into the feedlot industry. Before 1997, imports of live cattle were based on LCs (letters of credit) and payment could be deferred until all cattle were delivered and in some cases for a period of months beyond delivery. Now the system has changed to 20% payment at time of placing order, 60% after selection of cattle, and the final 20%

after all cattle are landed at the import destination. This 80% rule for payment before shipment has curtailed the ability of feedlots to operate and many have closed. Feedlots declined in numbers from over 50 to now about 15. The remaining ones are more solid and have direct investment from Australian companies.

Cattle are shipped into quarantine stations on Java and Sumatra. Jakarata (Tanjunpuri port) receives the largest number but Lampung has become a major destination point. The major feedlots are Santori, GGLC, and ACB. Australian exporters have developed efficient handling and transport of live animals, so stress and shipping fever have been reduced. This is not the case for inter-island transport of Indonesian cattle with a high number of reported cases of pneumonia and mortalities. The local transport services could benefit from technical assistance in handling and moving livestock by ships.

Sales of cattle by feedlots to butchers are highest around festivals and religious periods. One period in which sales decline is during the period of Shura, when there are no wedding feasts. Wedding months can be heavy beef usage months.

Association

An important cattle association is the Beef Producers and Feedlot Operators Association (APFINDO). It was started in 1993 with 45 members. Though feedlots are few in number, the association is still very influential in communicating with the GOI on policy issues it finds important to the industry.

3.5. Slaughter

There are public and private slaughter facilities operating in the same areas. For example, there are four slaughter plants in Bandung, and two are private and two are operated by the government (10% of the kill is in the government plants). The slaughter fee in the GOI plant is Rp 22,000 per head, and it is Rp 30,000 in the private plants. In Bali the slaughter plant is government owned, and it slaughters 30 head per day. In Kupong there are three slaughter houses (one is government and two are private). The slaughter houses serve just the local market. Each slaughter house has to have a minimum of four inspectors.

Recently there was a GOI and Government of Japan program to build 11 slaughter plants in provincial capitals. According to reports these slaughter plants have not functioned effectively.

The butcher relies on profits from the sale of the offal and the skin. Profit per head for a butcher can be Rp 200,000 per head. The butcher buys on carcass weight less another 30 kg. Butchers have a preferred slaughter weight of 400 to 450 kg per head in the high season and the live weight can fall to 300 to 350 kg during the low demand period.

A large number of productive females are being slaughtered even though there is a government regulation against slaughter, and despite a buy back program of females on the books at slaughter plants in some provinces. Traders have facilitated the slaughter

of these animals. It is estimated that 150,000 productive females are killed each year, according to the DGLS.

3.6. Tanneries

Hides are sold to traders or directly to tanneries and small-scale leather processors. The center for hide processing and leather works is in Garut in West Java. There are approximately 250 tanneries in Indonesia, a decrease from over 600 in 1996. Large and medium tanners have fallen from 116 to 40. At the same time, the number of employees in the industry has fallen from over 16,500 to now around 4,500. ECCO, a Danish company, established a large factory near Surabaya in 1984 and purchases 80% of the Bali cattle hides. The major problem facing tanneries and leather manufacturers is the supply of hides.

The price paid at the slaughter house for the raw hides is Rp 7,000/kg from NTT (due too many brand marks) and Rp. 8,500/kg for hides from Java at the slaughter plant. The price paid by the tanneries for raw hides is Rp 12,000/kg, so there is a margin of Rp 3,500 to Rp 5,000/kg for collection, salting and delivery to the tanneries. The price for quality Bali cattle hides is $1.30/kg which is equivalent to approximately $2.08/s.f.

Hide standards are set on the number of scratches, ranging from prime (minimal to no scratches) to fourth grade (over 40% scratches). Local tanneries have stopped using the international standards and have resorted to pass or no pass. This grading system is too subjective for shoe manufacturers, and it is hardly a system that improves price discovery or sends proper pricing signals to producers. In visiting farms and markets, cattle are butt branded as well as marked to certain degrees. More education could help to reduce the markings on animals and improve hide standards.

The price for low grade finished leather ranges from $1.20 - $ 1.80/s.f. The high grade of finished leather, like from Bali cattle, is paid a premium in the range of $2.50 to $3.50/s.f. The Italian market will pay the $3.50/s.f. for prime Bali hides for shoes, bags, and belts. If the average price is $3.00/s.f. for leather then the raw material to finished leather is 60%, which is reasonable for the industry. The GOI imposes a 25% export duty on leather which protects the local shoe manufacturers but hurts the overall industry.

The conclusion is that the hides from Bali cattle are recognized and valued in the international market. It is important to increase the supply of Bali cattle and to improve the quality of the product from production through to slaughter.

3.7. Processing

Meat ball production is a major meat processing activity and can be regarded as a cottage industry. Based on visits to these small shops, the hygiene can vary dramatically between each shop. The lowest quality of meat from the carcass is used in meat ball production. In additional, processors use non-meat filler in the product formulation. Meat balls are a major item in Indonesia and low income consumers spend a proportionally greater percentage of their income on this product.

Meat ball production requires large amounts of meat and it is estimated that 60% of the beef production goes into meat balls. The rest goes to retail sales, padang and restaurants. The price of meat balls depends on the amount of fat in the product and the brand. Meat balls come in various sizes.

We visited the Aroma Meat Plant in Bali, which purchases carcasses of Bali cattle for processing into a variety of products, e.g. smoked and canned meats. The plant processes 5 to 10 carcasses per day. In a separate building the company processes 30 carcasses of pork per day. The company supplies all the major tourist hotels on the island. The company faces competition from imported meat products.

3.8. Wholesale, Retail and the Cold Chain

There are four major market segments for consumers: wet markets, supermarkets, meat shops and the HRI (hotel, restaurant and institutions). The general trend is that conventional wet markets are declining 10 – 15% per year while the supermarkets are increasing their market share.

Wet Markets

In Jakarta there are approximately 150 wet markets, and 80% of the beef sold is in these markets. These markets normally are open only to about 10 am. There is a network of wholesalers who supply their butchers in these markets with beef. Meat traders will contract for the slaughter and distribution of meat to their predetermined sellers. The traders and their meat sellers have a long history of personal relationships. The trader receives cattle from a feedlot (reported to be 30-40 head per day) and the animal is slaughtered and then meat is delivered on credit. Cash is received within a week and the feedlot operator is paid.

Most of the trade at wet markets is in the form of hot meat because of the lack of cold storage. Prices for beef are less than in supermarkets (e.g. Rp 48,000/kg versus Rp 58,000/kg). The butcher's preference for different types of cattle changes based on market forces. When demand is high and rising during periods of the year, butchers want large animals because they can dispose of the whole carcass. If market demand is low, then smaller size animals are in demand. Beef prices reported in the market were:

Beef without bones	Rp 50,000/kg
Beef with bones	Rp 25,000/kg
Liver	Rp 36,000/kg
Stomach	Rp 35,000/kg

The meat prices vary by location based on the availability of cattle. The beef price in South Kalimantan is higher than Java with beef selling for Rp 65,000/kg in the wet market.

Supermarkets

Supermarkets sales have been growing, with Carrefour having the largest market share in the industry group. These companies are looking for direct marketing links with suppliers of beef, which would include Santori and Kibif. Beef prices were recorded at a Carrefour store in Jakarta.

Ground beef	Rp 44,900/kg
Ground beef in patties	Rp 52,000/kg
Steak cuts	Rp 80,000/kg
Meat balls	Rp 34,900/kg
Heart	Rp 32,000/kg

Beef sales in the store visited ranged from between 100 to 200 kg per day. The store is in a medium income area. Carrefour stores in the high income areas will sell twice this amount per day. Most of the variety meats sold in the supermarkets are imported because offal from local cattle goes to the wet markets.

Meat Shops

Meat shops are found mainly in provincial capitals, and they represent only about 1 – 3% of beef sales. Shops may sell only 1 to 3 carcasses per day. Households are the main consumers. Consumers will buy in meat shops because they are open all day and the food safety of the meat is perceived as being higher than the meat sold in the wet market.

Hotels, Restaurants and Institutions (HRI)

This market segment is large for sale of beef though no exact numbers are known. Beef from local cattle is preferred for certain Indonesian dishes because of its texture, for example for rendang. There may be an interest in promoting Bali beef in certain types of restaurants.

Up-scale restaurants and hotels are major users of imported Australian and New Zealand beef. U.S. beef had been banned for several years, but imports will resume in January 2007 and will be targeted to hotel and restaurant segment.

4. BEEF CATTLE PRODUCTION SYSTEMS

In an effort to bring a holistic approach to improvements in the beef cattle industry, we have identified beef cattle systems that are the framework for recommended interventions. This will allow for a more robust set of activities that will have more far reaching impacts than if one just looked solely at beef output without considering other important interactions. This approach avoids "stove piping" paradigm. The underpinning of the systems are based on resource capacities. The key interactions are between crops, livestock and available vegetative resources (See Figure 2).

In each of the following systems under consideration for AMARTA interventions, it will be important that environmental conditions be improved to improve human health. Well ventilated housing for livestock is important to realizing increases in animal productivity. This also leads to better health conditions for children and adults and reduction in the transfer of epizootic diseases. Household energy consumption in the household economy will increase with projected rises in kerosene and electricity. The use of biogas is a clean alternative to wood burning in unventilated kitchens.

4.1. Rice Straw – Livestock System (Java)

Java is the most populated island of the archipelago, and land is a limiting factor to livestock production. Rice is a strategic commodity for Indonesia, and the commodity receives special attention from the GOI. However, there are indications that with intensive irrigation scheduling, rice productivity has declined because of declining soil fertility. Available fallow land for livestock grazing has been reduced. It is not uncommon to see rice straw being burned in parts of West Java rather than utilized.

Rice straw can be fed to beef cattle, resulting in production of meat and manure. A hectare of cultivate rice produces around 3 to 3.5 mt of rice straw and supports 2 to 3 animal units. Approximately four bundles of rice straw valued at Rp 20,000 will feed four cows per day. (A dairy in Central Java is purchasing rice straw for Rp 9000/m^3 and there are 100 kg per m^3 or Rp 90/kg. In East Java rice straw was Rp 133/kg from a trader). The manure can be recycled within the farming activities, resulting in a closed system of nutrient cycling. The revenue stream to the household is increased from increased soil fertility for rice production or other crops, such as fruits and vegetables, and fish. The manure can also be dried and sold for compost if there is a surplus after on-farm applications. Manure can also be used for biogas before its removal to the rice fields.

For this reason, the project needs to examine better utilization of rice straw in animal feeding that is targeted to smallholders of livestock. This requires necessary simple techniques in the use of urea, application of propionic acid and proper drying and fermentation of straw to get maximum feed quality from this abundant resource. For these reasons it is proposed to undertake feeding trials of Bali feeder cattle from NTT using rice straw, concentrate and green vegetation in Java. Final finishing of Bali cattle on Java offers some attractive opportunities to the current slaughter of light weight feeder cattle weighing 250 kg. A simplified budget is illustrated below.

Cost of feeder cattle in Kupong (from NCBA project) 250kg*13100……..Rp 3,275,000

Transport to East Java…….....Rp 200,000

=========

Laid in cost of feeder cattle in East Java…….....Rp 3,475,000

Feed cost for 120 days at Rp11,000/day (3kg of concentrate)……..Rp 1,320,000

=========

Cost of 325 kg Bali finished cattle at the feedlot ……..Rp 4,795,000

Sale of 325 kg Bali finished cattle at the feed lot (Rp17,000/kg)…….....Rp 5,525,000

=========

Net revenue per head to the feeder…..…….....Rp 730,000

Total net revenue to feeder (based on 4 head)……..…...Rp 2,920,000

Minimum wage is Rp700,000/mo and based on four months…….…...Rp 2,800,000

Excess over minimum wage for the period of feeding…….…..Rp 120,000

The AMARTA project intervention will have linkages to the NCBA livestock project in NTT.

4.2. Coffee, Cocoa, and Nitrogen Fixing Trees – Livestock System (Bali)

Bali represents a unique situation where a close relationship between tree crops and cattle exists in harmony. A closed system for nutrient cycling can be implemented with daily copicing of trees used as shade (gliricidia, caliandra, and Leucaena) can be used as feed for cattle. In addition the waste product from washing of coffee and the fermentation of cocoa pods can result in feed for livestock. The outer shell of the cocoa pod can be fermented and used as cattle feed. The fermentation takes about one week and requires simple an area to spread the pods for applying and covering with plastic. The cost is Rp 20,000/lt to treat 2 mt of cocoa shells. The nutritive quality is approximately equivalent to rice bran.

The emphasis will be on establishing breeding units utilizing best management practices in reproduction, feeding and animal husbandry practices. Improved genetics and feed will increase the productivity of the livestock herd on Bali and result in higher incomes to households and provide additional sources of cash throughout the year.

Production of manure is important in this system, and it can be directly deposited around the trees to improve fertility if Nitrogen Fixing Trees (NFTs) are not in abundance. Also manure can be processed for composting and sale or used in the production of biogas. Other agricultural activities like beekeeping can improve the pollination of plants in the fodder bank.

4.3. Nitrogen Fixing Trees and Maize – Livestock System (NTT)

In the drier climate of Eastern Indonesia, cattle producers face a longer dry season lasting from eight to nine months. Eastern Indonesia has large areas of marginal lands more suitable for livestock production. Rainfall varies in the region from 700 mm to over 2000 mm during the short wet season. Feed availability during the dry season will be the limiting factor for beef production, but there is the potential of growing Nitrogen Fixing Trees for animal fodder.

Shifting surplus biomass from the wet season to the dry season can be done by conservation of forages through hay making, preparation of silage from corn production and planting a number of NFT species. This will provide vegetation at different times of the year. Currently, there is a heavy reliance on Leucaena species which has been vulnerable to the psyllid.

NCBA received a grant from the United States Agency for International Development (USAID) for establishing a revolving loan for producers in West Timor to obtain feeder calves. (A similar program is in East Timor). The project has been operating since 2003 and 17,000 cattle have been processed by farmers (6,000 head are currently being fed). There are over 6,000 farmers participating in the project. Approximately 25 farmers are organized into a farmer group, and there are 168 farmer groups. Feeder calves are purchased at an average weight of 150 kg and sold after 8 to 10 months at 250 kg per head. Local traders purchase the animals for cash (no credit) and farmers split the net revenues 70/30 with the NCBA and the PUSKUD cooperative. The price is set based on weight of cattle, with current price of Rp 13,100 per kg, while the GOI project is paying Rp 12,000/kg. This project model is successful because it is simple, transparent and reliable. The NCBA model can be adapted for establishing breeding units with farmer groups to increase the supply of feeder calves in the area. The program has a long waiting list; but with a lack of capital and available feeder calves, the program is maxed out.

The project will focus on improving the supply of quality feeder calves by establishing improved breeding units. These units will have direct linkages to farmer groups that are fattening Bali cattle at a central location.

4.4. Abundant Biomass – Livestock Systems (South Kalimantan)

Indonesia has large tracts of land that have low cattle and human populations. Areas in South Kalimantan and Sumatra have available large amounts of vegetative matter offering the potential for increased beef production. Cattle can be raised under cut-and-carry systems or extensive grazing in silvo-pastural systems. Estate crops such as palm nut, sugarcane and rubber plantations can be suitable for beef production. The GOI assisted a group of farmers to establish a breeding unit of 150 Bali cattle in South Kalimantan. The GOI has also established a loan program for producers to receive Bali cattle for individual rearing. Repayment is made in calves to the GOI which redistributes the calves to other households in the project area. The AMARTA project will benefit these areas through improved semen and eventually improved breeding stock.

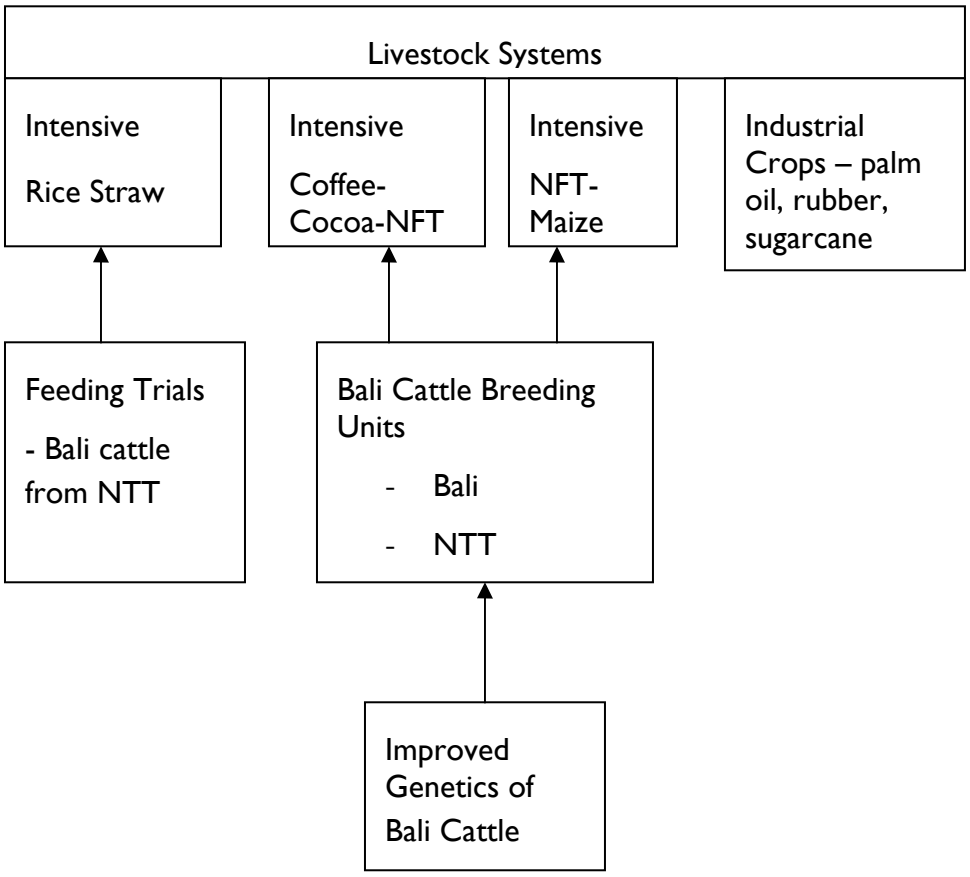

Figure 2 Schematic of Resource Availability and livestock Systems

5. INTERVENTIONS IN THE BEEF VALUE CHAIN

The overall goal of AMARTA's livestock project is to improve the beef value chain in Indonesia. To accomplish this goal the industry will need to be more integrated and vertically coordinated. We propose to achieve this through a series of objectives with definable activities and deliverables. When taken together there will be measurable results.

5.1. Objective 1. Improve the Supply and Quality of Bali Cattle

This objective addresses the heart of the problem facing the beef industry and especially the potential for Bali cattle for the industry. There has been serious degradation of the indigenous Bali cattle herd with high slaughter rates of productive females and better quality bulls. Our objective will be to undertake pilot projects in breeding to demonstrate the potential and to reduce calf mortality. The injection of better genetics will be an important first step. Also good breeding and feeding practices will reduce calf mortality, which currently can exceed 15%.

Activity 1.1 Establish Prototype Breeding Units for Bali Cattle

This activity will address the need for breeding units to increase the number and quality of calves and ultimately feeder calves for feeding in West Timor and Bali. This activity will establish one beef unit in both West Timor and Bali each year. A beef unit is considered to be 100 females. The project will purchase 100 pregnant females in each location and distribute 20 heads to a farmer group (minimum number of animals in a group). This group may or may not already be operating as a feeder farmer group. The purchase of the animals could be with a revolving fund like used by NCBA for feeder cattle.

Each farmer group will have to meet certain conditions (e.g. have a source of feed, agree to terms of management and distribution of calves, and other conditions modeled after NCBA program.

A breeding unit would be approximately 20 head provided to a group of farmers. Cows would be pregnant at time of purchase so calf would be received in first year. (The terms would be similar to those for the feeding unit except we would be taking calves and not cash.) The project would take 30% of the calves each year and over a five year horizon would pay back the initial investment in cow (Rp 3.5 million) at an interest rate of 6%. Value of calf is Rp 1.5 million. At the end of the five years the cow would be sold to repay the balance outstanding. In our calculations there may or may not be anything to the farmer with the sale of the cull cow. The system looks simple and would allow farmers to have the similar transparent deal as in the feeding unit in West Timor and Klaten.

As an incentive for farmers to establish a breeding unit, it may be necessary to also distribute two head of feeder calves for fattening, which has proven attractive for it short term profitability. These are details that will have to be worked out in conjunction with project collaborators and the farmers.

The cost of this activity is for the purchase of the pregnant cows. The estimated budget is $85,000 per year for two years for a total of $170,000. Over a five year period we would expect around 300 male feeder calves to enter the feeding program assuming a 10% mortality rate after birth.

Activity 1.2 Training of Lead Farmers in Good Management Practices

The project will start with a workshop attended by the main implementers: P3Bali, NCBA, PUSKUD, and BPTP-Bali. The workshop will design the improved technical packages for beef cattle production. BPTP will then be tasked with developing the training materials. The project will assist in training 15 farmers in Bali and in West Timor each year for three years. The training will focus on good management practices including animal husbandry, breeding and dry season feeding practices. The cost of the activity is $133,000 over three years.

Activity 1.3 Production of High Performance Bali Bulls

This activity has two parts. **Section: 1.3.a**: short course in breeding at Texas A & M University (TAMU) for representatives from Cipelang ET Center, Singosari AI Center and the Bali Research Station. The three week course will include introduction to latest techniques in AI and ET. Part of the training will be conducted by commercial operators in Texas. Cost of the training scheduled in the first year is $63,450. International Programs Office at Texas A & M University is investigating whether Cochran Funds could be available for this activity.

The second part of this activity is **Section 1.3.b**. TAMU animal scientist will travel to Indonesia to conduct a training workshop with technical specialists as well as representatives from the commercial sector. TAMU will supply some chemicals and testing materials which can be used in the training the first year. The TAMU professor will make one trip each year to Indonesia to work with the consortium of partners. Total cost of this activity is estimated to be $94,250.

A short description of the procedures involved would include:

First Year:

1. Use the current program on Bali to select females and males for breeding program.
2. Of the best bulls, 5% would be sent to Singosari,
3. Of the best females, 10 % would stay at the Bali Center and 5% would be sent to Cipelung (Bali cattle taken to Cipelung would have to be isolated from exposure to sheep and exposure to MCF)
4. The semen from bulls at Singosari will be used for females at the Bali Center, and the embryos produced at Cipelang.
5. The embryos will be used on females at the Bali Center.

6. Commercialization of semen from Bali will require approval from authorities. There are good bulls from NTB with Singosari having five on hand.

Second Year:

1. Selection of the best female and male calf from the station as well as introduce best females and males from the field in Bali to prevent inbreeding.
2. Calves will be ranked on birth weight, weaning weight, health, semen quality and reproduction.

5.2. Objective 2: Improve the Market Coordination for Bali Meat Production

Activity 2.1 Seal of Quality for Kupong Feeder Cattle

Because of the production system designed by NCBA we believe these animals set the standard for how feeder cattle should be raised. They would have increased value for fattening operators in Java. The purpose is to try to market these animals as having special benefits for which buyers would be willing to pay a premium. These cattle already are receiving a higher price than cattle fattened under the GOI assistance program. NCBA will be asked to conduct a feasibility study on how to establish a seal of quality for their program cattle in West Timor. The cost of the activity is $10,000.

Activity 2.2 Improved Handling and Transporting of Cattle

This activity will address the need to improve handling and care of animals in transport from West Timor and Bali to Surabaya and Jakarta. An Australian specialist in livestock transporting will be engaged to assess the transport facilities and handling procedures. The specialist will conduct a workshop in Bali for key private sector traders and transporters. Where appropriate GOI officials will be included who can make public sector infrastructure improvements. Cost of the activity is estimated to be $35,000.

Activity 2.3 Improve Feeding of Bali Cattle on Java

This activity focuses on introducing key feedlot operators to the quality of project cattle in Bali and West Timor. The activity will involve having 10 feedlot operators (five in Jakarta and five in Surabaya) visit the project areas to view the conditions under which feeder cattle are produced. This activity will help in the development of Activity 2.1. Feedlot operators will meet with farmer groups and inspect their cattle. A feedlot specialist from Texas A & M University will work with feedlot operators to design feeding trials testing feed rations for Bali cattle. The specialist will then set up a mechanism for obtaining animal performance data. It will be important to show how mortalities during feeding can be reduced. The government of East Java may have to provide permission for Bali cattle to be fed for a period of time in the province. The cost of this activity is budgeted at $31,500.

5.3. Objective 3. Industry Development of Bali Cattle Products

Activity 3.1 Market Plan for Sale of Bali Cattle Semen and Embryos

There are three components to this activity that will require a consultant. A market assessment is needed to determine the demand for embryos in the region. Singosari is selling some Bali cattle semen to Malaysia for $20/staw while in Indonesia it sells for Rp. 6,000/straw. Singosari does sexing of sperm which can increase the value of the final product. SPS conditionalities for the export will be required for both Indonesia, the respective provinces (Bali and NTB) and for the recipient countries. The project will have to work with individual provinces to set clear guidelines for the export of frozen semen. The SPS regulations can be modeled after the U.S. or EU. Trade leads will be developed for Bali cattle semen and embryos. Cost of this activity is estimated at $60,000.

Activity 3.2 Market Opportunities for Bali Meat Products

Consumers have realized that Bali meat has certain unique characteristics and certainly is preferred for certain occasions in Indonesia. The identity of Bali beef is not always clear. If it was identified and promoted, it is believe that untapped market opportunities exist as a premium product. Assessment of the market opportunities for Bali meat in both Indonesia and the region need to be assessed. Cost of this activity is estimated at $80,000 over the next three years.

Activity 3.3 Coordination of Improved Quality Bali Hides for Export

Cow hides from Bali cattle are highly regarded in the international market. ECCO, the international Danish footwear, sources Bali leather for its product line. Italian footwear, belt and handbag industry request and pay a premium for this product. Working with SENADA (USAID project implemented by DAI) we propose to educate producers in our other project activities on proper branding of animals. Slaughter operators will be instructed on the proper equipment and procedures for flaying carcasses to improve the quality of the hides in training sessions at several of the larger slaughter plants in East and West Java. We believe this activity will provide further incentive for producers and slaughter operators to take better care of the product so that it can receive the premium grade for the export market. Cost of this activity is estimated at $20,000 in the first year.

Activity 3.4 Beef Industry Roadmap

There is a need for a clear industry roadmap for the Indonesian beef industry. Private sector and government agencies have key roles to play. Some of the recent government directives and projects do not seem to have served the industry effectively. Targets set by the GOI are not realistic. This roadmap would provide clear benchmarks and realistic targets for the industry. Cost of this activity is estimated at $40,000.

6. ANEXES

6.1. References

Hadi, P.U. et al. Improving Indonesia's Beef Industry. ACIAR Monograph No. 95. Canberra. 2002.

Entwistle K. and D.R. Lindsay. Strategies to Improve Bali Cattle in Eastern Indonesia. ACIAR. Canberra. 2003

World Bank. Public Private Partnerships for Agriculture in Eastern Indonesia: A Comparative Study of the Beef Cattle and Cocoa Industries. November, 2005.

6.2. Travel Itinerary and Appointments

Date	Day	Activity and notes
15 Jan	Monday	Introduction and preparation at AMARTA to arrange the work schedule for 3 weeks. In afternoon visited Carrefour at TAMINI, Pondok Gede with Morante Taxi to interview the meat counter staff. Also interviewed several staff to identify meat price from different qualities, consumer's behavior, meat trading system (meat distribution system), meat producer, and everyday income. There were at least 3 kinds of meat from imported beef (2 kinds) and local beef, also there were offal.
16 Jan	Tuesday	Traveled to Disnak, West Java. Had a discussion with Kasbudin Pengembangan, Kasubdin Perbibitan & staff. Discussion with Ir. Yudi Guntoro Noor, Chief Executive Officer PT. Agro Nandini Perdana, and operates a feedlot. He is also the President of PB-ISPI. Received detailed information on fattening business, feeder cattle import, and beef trading/distribution system in West Java. Visited Disnas Pertanian Kota Bandung, and local RPH with the staff of Disnak Propinsi, Ir. Asep Abdullah. Met the vice Kadis and staff. We received information on beef cattle and meat trading in Bandung. Went to BIB Lembang. Met with Drh. Rochmat Sidig (Ka BIB), and staff. Received information on the history and work

system of BIB.

17 Jan	Wednesday	Traveled to Yogya and went straight to 2 groups of beef cattle breeder 'Model Pembibitan Ternak Sapi Potong dalam Sistem Integrasi Padi-Ternak, in Sleman DIY,: (i) Cattle Breeder of Sido Rukun, dusun Klampengan, desa Jogotirto, Kec. Brebah, Kab.Sleman, (ii) Cattle Breeder of Bibit Mulyo, desa Tegal Tirto, Kecamatan Brebah, Kab. Sleman. These groups are almost the same, but their conditions are slightly different. We met the group leaders of each group, Rahmad and Supomo. Afterwards, we went to Bantul, met with one of the well-known beef trader (Hadi Sumarto, Pleret-Bantul) that markets the product until West Kalimantan, West Java, Jakarta and local marketers. The visit was accompanied by Ka BPTP, Ir. Bambang Sudaryanto and staff (Suharsono Spt, MS).
18 Jan	Thursday	Visit in Klaten was begun with a discussion with Sam Filiaci at his office in Jl. Sugio Pranoto Gg III/No. 1. Sam explained about the dairy cow business that does not have a prospect. Breeders in Klaten, Boyolali, and surrounding areas changed their businesses from dairy to beef, since it is easier and more profitable. Visited a breeder group that joined PRORAM PENGGEMUKAN SAPI POTONG, cooperation with KJUB Puspetasari-NCBA. Here, (Bayat-Wedi-Klaten) breeders are more keen with cows from IB, credit scheme are profitable, and has a prospect to develop. This visit was accompanied by Mr. Prio and the Cooperative staff. Saw Crop Livestock System at PT LHM Solo, with Mr. Prio and Mr. Suharsono. In this visit, Ir. Suharto MS, met us personally and gave explanation with mbak Hesti and his daughter and son, mas Yos and mbak Novi. Dairy cows are profitable since it can use integration pattern, low external input using fermentation technology and using local source of feedstuff. The cost of feed for dairy cows is only about Rp. 5-6 thousand/cow/day. Marketing fresh milk is also still profitable.

Making compost is profitable; it is also its main income.

The waste of dairy cows can also be used as a feed for "ikan patin" (fish) "Eceng gondok" is good for waste processing, and its leaf is good for feed.Biogas is not implemented yet, although it has potential. Other business that was developed was calves rearing.

19 Jan Friday

The first visit in East Java was to BBIB and met the Ka BBIB (drh. Herliatien MS), and met all the related staff of BBIB activity. Toured the facilities. Next visit was to Koperasi Agro Niaga, Kan Jabung, in Jl. Suropati No. 4-6 Kemantren, Jabung-Malang. We met Ida Royani, Head of CBP, and several staff.

The information we received was surprising, since the dairy cow business is still prospective and continues in developing. Nestle are in a lack of milk supply. The number of breeders and cow population continues to increase, as for the number of production, milk quality, and milk price. This information is almost the same from the statement of Ir. Suharto MS, that the milk industry still has a good potential.

The visit to the breeders indicated that dairy cows are still promising. Even semen sexing application is well received. Also, the use of biogas is great. Now, there are 23 biogas unit for household needs with Rp 3.5 million for the building cost, and it will develop to 100 unit this year in that area.

20 Jan Saturday

Travel to Beef Cattle Research Station Grati, we met Dr. Endang Romjali and some staff, Dicky P and Dickyman, also Maryono. After a brief explanation at the Head's Office, we went to the entire cattle barns.

Visit to the mini feed mill (PT. Prima Feed), a partner of Research Station. It was very impressing, since most of the raw materials of feed are from the waste and local materials.

We went to a Cooperative that has some activity, such as dairy cows and fattening. The leader of the cooperation is Mr. Maryono, and was working quite good. He stated that dairy cow business is still profitable, and some cows could produce 25-30 liter. BEP is achieved if the level of production is 8 liter, so if the production is > 12 liter it would be very ideal. Here,

compost is given to workers to increase welfare. According to Mr. Maryono, the fattening business of PO cow is the most profitable since it has the highest price, IB and FH cows have cheaper price, and the cheapest are ex-imported cows.

We visited the Tanjung Perak harbor, Surabaya, to go to Balai Besar Karantina Pertanian. We interviewed a trader that sells his cows across islands (Mr. Sudirman), who brought his cow from Tulung Agung to South Kalimantan. It was a crossbred IB cow from Tulung Agung. That unique quality of cow is sent regularly, with a very decent price, around Rp. 16 million with a weight about 800 kg.

21 Jan Sunday

Travel to Bali and went to Kabupaten Jembrana, the location of 'Bali Cattle Improvement Project'. We were accompanied by drh. Ketut Sarjana (Director of P3-Bali) and the head of BPTP Bali (Bpk. Sudar). After receiving an explanation on P3-Bali's activities, we continued to look at the field. The activities are very good, since the cattle breeding activity credit are given to the plasma breeder. 93% of it has returned the credit, even though the breeder has to pay interest and other cost about 19%/year. Today, the breeders are waiting for other credits. The implicated scheme were graded very good by the Ministry of Finance

Traveled to Buleleng to see two groups of coffee farmers that breed PE goat. This group succeeded, since the mix-farming plantation pattern and the integrated business pattern could give more benefit, with 3 F products (food, feed, & fertilizer). In the future, it will be added with bio energy (fuel) product, like the ones implicated by the dairy cow breeders in East Java.

Coffee are the main plant alternating with cacao, also there are caliandra and gliricidia. Caliandra, gliricidia, coffee and cacao waste that have been fermented are used as the goat's feed. According to Mr. Dewa Ketut Gawe from 'Satwa Sari Ramban' farmer group at Bongacina, the main incomes are from goats, coffee, and cacao. The additional incomes are from honey and fruits (salak, durian, manggis, and oranges).

22 Jan Monday

Went to PT Aroma, a meat processing plant, located at Sesetan, Denpasar. The director, Mr. Adrianto Mulia, personally welcomed us, gave us explanation, and accompanied

us to the meat and pork processing. The production capacity for meat is only 20% from the available building, and 50% for pork. The meat is from the local RPH, and all are from Bali cows. The main market is in Bali and other big cities, especially Jakarta and Surabaya. The main products are sausage, meatballs, etc.

Visited animal husbandry of Mr. Bagus Sumantera, but he was not home and the cattle were all sold. Then, we continued to another place, at 13.00 arrived at a Bali cow breeding that implemented a fattening business, owned by drh. Wiwiek Susilowati located at Abuan, Susut, and Bangli. At 13.30 visited farmer at the same village owned by Mr. Mupu, which also implemented fattening activity and breeding. Both of the farmers are quite advanced with quite a lot of number around 50-100 cattle.

For an hour, we visited one of the Bali cow breeder group (Budi Sentana farmer group, at desa Tiga, Kecamatan Susut, Bangli) participant of (plasma) breeding program that was coordinate by P3-Bali. Here, there are around 1000 cattle owned by 300 breeders, We visited the breeding owned by Made Sudirta, who was also the group secretary. The Group Leader, Gede Wijaya Kusuma, was not there. The cows and barn condition was very good, 3 breed gave birth of 3 calf, 2 others was expecting, and 2 cows was in fattening. The breeder already processed compost and built a biogas installation. The overall management was very good.

There was an information from Mr. Atmaja on the number of animal slaughtered, productive cows slaughtered, and its percentage from 2001 – 2005:

2001	41.170	7.080	15,95%
2002	30.169	4.137	13,17%
2003	28.323	2.930	12,70%
2004	38.323	3.360	8,77%
2005	31.864	2.851	8,00%

23 Jan Tuesday Travel to Banjarmasin and met by drh. Hari Bagyo, KaSubDin

Pengembangan Disnak Prop. KalSel.

From the airport, we went to a breeding barn located near the airport, owned by an island to island trader Mr. Nurhamid. During the visit, Mr. Nurhamid was in Java, looking for cattle. There were a 120 cattle capacity of barn, but when we went there, there were only a few, because most of them were sold. Cattle that are sold are from Lombok and East Java. The business begun from a tofu factory. The waste was used for cattle feed, besides grass that is usually easy to get. There is no fattening here, every time a customer gives a suitable price, and the cattle are sold.

At 17.15 we went to another trader located in Jl. A Yani, Banjar Baru, owned by Mr. Rahmat. Cattle that are sold here are from the local breeders, which are Bali cows and PO or a cross (Brahman Cross). Cattle are from the local animal market. Cattle in the barn are quite a lot, usually sold to breeder or butcher. The owner is from Madura, which employs new-comers, not local people. The problem of the traders here is the limitation of capital access with low rate of interest..

24 Jan Wednesday With Hari Bagyo and Mr. Kun Hartono (Ka Seksi Bibit, Disnak KalSel) went to Kabupaten Barito Kuala. We visited 8 groups of breeders of Bali cows for cow-calf operation. We visited a transmigration area of people from East Java, Central Java, and West Java, since a few years ago.

The first visit was Taruna Tani Group, in desa Kolam Kiri, Kecamatan Wanaraya, Kabupaten Barito Kuala, where we met the Group Leader Mr. Haris and several field staff, Mr. Panji Sujarwo and Mr. Suharto. This group is quite advanced and has a high motivation.

The second visit was Berkat Bersama Group, in desa Sidomulyo, with its Group Leader Mr. Faqih. It's quite similar to the first group, where the entire members are so enthusiastic in using grass to raise Bali cows.

Sri Harta Group, located in desa Sidomulyo, Kecamatan Wanaraya, was the third location we visited. We met the Group Leader Mr. Suwito. This group is an as good as the previous group.

		The fourth group until the seventh group we visited are: Margo Makmur, Karya Tani Makmur, Mulyajaya, and Harapan Makmur, located in Sidomulyo, Pola Makmur (2), and Kolam Makmur, which we met personally with each of the leaders, Ladi, Tugiman, Darmono, and Aman Ahmadi. These groups are also good in raising Bali cows for breeding. The last group is a group that implements breeding action program that makes barn in groups like in Yogya. The location of this group is in Sidomulyo with the Group Leader Rusman.
25 Jan	Thursday	Traveled to Jakarta and met by Ka BET, drh. Hasa of DET Cipelang. Staff presented a seminar on the possibility to collaborate with P3-Bali, BBIB, and BET, also other aspects related to the development of ET for Bali cows and other stock. We toured the facilities.
26 Jan	Friday	Fly to Kupang, NTT arrived 13.30. Pick up by Pak Ali at the airport (NCBA-NTT), companied by pak Beni and pak Yos (PUSKUP-NTT). Team visited three farmer group at Kabupaten Kupang, located at kecamatan Amarasi Barat and Nekmese. At this visit there was beef cattle transaction although not much. The transaction process for selling beef cattle are as follows: Foreword by NCBA/PUSKUD-NTT Prayer lead by one of the member of farmers group Guidelines by the official: Information of current selling price, this is resulted from negotiation between buyer's candidate: which is Rp. 13.100/kg for body weight > 250-274 kg; and bonus Rp.100/kg for every 25 kg higher. Information of farmer output deduction, feeder cattle cost (Rp. 1.6 millions), cost of ear tag etc. (Rp. 42.000/head), village wages (Rp. 10.000/head), capital saving, for the beginner (Rp. 100.000/member) and obligation saving (Rp. 10.000/head). Information of feeder cattle price (Rp. 1.6 millions). Reminds the groups of weight scaling procedures and the regulation of minimum selling weight > 250 kg. Discussion or if there was any complained.

Animal is weighed using digital scale, procedures are:

Check the scale accurate

Any cattle less then 250 kg, even only 1 kg less, should not be sale. With some exception that could be judge.

The calculation to check farmer right:

feeder cattle cost (Rp. 1.6 millions)

Drug, ear tag, etc, Rp. 42.000.

Total cost Rp. 1,642,000/ekor.

Selling price (252 kg) X Rp. 13.100 = Rp. 3.301.200.

Gain Rp. 3.301.200 – Rp. 1.642.000 = Rp. 1.659.200.

The right for farmer is 70% from Rp. 1.659.200 (the right for cooperation is 30%).

The payment was cash and carry, after signing the notification paper, and shake hand.

After all it was closed by praying lead by one of the farmer group member.

On average each farmer could gain Rp. 1.1 – 1.5 millions/head for 8-10 months periods. The highest that they could reach was Rp. 2.4 millions. Each farmer received 1-6 heads, in averages 2 heads, depend on:

The availability of lamtoro,

Number of family member,

Barn condition, and

performance

Currently, there are about 2000 farmers in the waiting list asking for loan support. The scarcity of feeder cattle is the main problem, beside limited financial capital. At the start of the project in 2002, with the number of cattle 300 - 324 heads and now accumulatively there are 17.527 heads, and was sold for 10.245 heads. Which is mean there are 7000 heads left at the farmer hand and part of it are ready for sell on April-May.

27 Jan Saturday Visit to three farmers group in kecamatan Amarasi Barat and Nekmese. First farmer group visited is Monitfu in Oenif village, kecamatan Nekamese, the head of the group is pak Edison Nifu. The second group is Naotatuwin, at Taluetan

		village kecamatan Nekamese, and the head of the group is pak Filipus Lopmeta. The last group visited was Oemathonis, at Erbaun village, kecamatan Amarasi Barat. There was weighing process and some cattle were sold. At this occasion the Dinas Kabupaten was also borrow the animal scale, but with several significant differences procedure compare to NCBA-PUSKUD project, as follows: No clear explanation or ceremony that begins with paying. The selling and buying price was not transparent (buying price are higher than it should be about Rp. 200.000; selling price are lower, about Rp. 12.000/kg with the lowest weight is 200 kg, and bonus is Rp. 100 for every 25 kg higher than the lowest standard; the payment was not cash and carry). Visited Ferry harbor, visited quarantine that happen was empty.
28 Jan	Sunday	Meeting with pak Ali office, to get the picture of pak Sam activities in NTT. Pak Ali the scheme of cattle project implementation. After that went PUSKUD, and had discussions about the development project. Returned to Jakarta.
29 Jan	Monday	Meeting with APFINDO in Jakarta, to visit Ir. Teguh Budiono MSc., Executive Director APFINDO and as general secretary of PPSKI. At the same time met with Dr. Riwantoro from Direktorat Budidaya Ternak Ruminansia. Met Dr. Syamsul Bahri, Direktur Perbibitan to get full picture of government program on beef cattle development in Indonesia, especially on Bali cattle breeding and cow-calf operation business. Discussion at Cibubur, to summarize the result of 2 weeks field study, as well as made an outline of the report and made inventory for the substantial or supporting data needed.
30 Jan	Tuesday	Went to Cicurug Sukabumi, to visit PT. Karyana Gita Utama (KGU), and have a discussion with Bapak Ir. Wijoyo, the General Manager. This visit was accompanied by Ir. Teguh Budiono MSc. Several condition noted during this visit were: Recently the supply of local feeder cattle, as well as buffalo is relatively difficult, that's why most of the barn was filled back with imported cattle (including bull). In average Buffalo and feeder cattle from Sumbawa were small in its size and also thin, it was bought from animal market

		(holding ground) at Tambun-Bekasi. Currently KGU was no more fattened Bali cattle, because from the experience, Bali cattle from Kupang has high mortality (30-40%), small in size, slow in growth, although the price is relatively good. ADG of Bali cattle is about 0.58 kg/day, lower than SO which is about 0.9-1.0 kg/day and lower than BX (>1.2 kg/day). Most of the cattle were sold alive. The price was Rp. 18.000/kg, the buyer are trader or local butcher (40%) to fulfill the market at Sukabumi and Jabodetabek. From the overview at the barn most of the animals were fed by 2-3 kg/head/day of fermented rice straw and about 8-12 kg/head/day of concentrate. The price of the concentrate is about Rp. 1.200/kg while for rice straw is about Rp. 110/kg. Visited PSE to have discussion with several researchers that have an experience in livestock socio-economy. At this event 3 senior researchers (Dr. I.W. Rusastra, Ir. Prayogo Hadi, and Ir. Ilham) gave information, idea and their view. After that visited the director of PSE, Dr. Tahlim Sudaryanto.
Jan 31st	Wednesday	Work on the draft report.
Feb. 1st	Thursday	Work on the draft report.
Feb. 2nd	Friday	Work on the draft report.
Feb. 3rd	Saturday	Work on the draft report.
Feb. 4th	Sunday	Work on the draft report.
Feb. 5th	Monday	Debriefing with Rafael Jabbar, CTO, USAID and David Anderson, COP, AMARTA at USAID office.

Annex Table 5.3. Activities and Budgets for Interventions for the Indonesian Beef Industry

OBJECTIVE 1. IMPROVE THE SUPPLY AND QUALTIY OF BALI CATTLE

Activity 1.1. Establish Prototype Breeding Units for Bali Cattle	Year 1	Year 2	Year 3
Kupong - West Timor Units	1	1	
Animals (1 unit = 100 pregnant females)	42500	42500	
Bali Units	1	1	
Animals (1 unit = 100 pregnant females)	42500	42500	
Sub-total	85000	85000	

Activity 1.2. Training of Lead Farmers in Good Management Practices

	Year 1	Year 2	Year 3
Workshop of Collaborators in Bali, Timor	15,000	15,000	15,000
Set of training materials	10,000		
Training of lead farmers in Kupong (15)	10,000	10,000	10,000
Training of lead farmers in Bali (15)	10,000	10,000	10,000
Demonstrations on genetics, breed selection (no=30)	3,000	3,000	3,000
Demonstration on dry season feed supply (no. = 30)	3,000	3,000	3,000
	51,000	41,000	41,000

Activity 1.3. Production of High Performance Bali Bulls

1.3.a. Indonesian Technicians to Texas A&M Univ. (3 persons)	Year 1	Year 2	Year 3

Airfare	9000		
Lodging and incidentals (21 days)	9450		
Training Course ($12,000 per person)	45000		
Sub-total	63450	0	0
1.3.b. Workshop in Indonesia on Best Practices of AI and ET			
TAMU Specialist (21 days)	17200	17200	17200
TAMU Materials, etc.	2800		
Local participants (21 days) (30 people)	16200		
Trainers	3650		
Equipment and chemicals for training	20,000		
	59850	17200	17200

OBJECTIVE 2. IMPROVE MARKET COORDINATION FOR BALI MEAT PRODUCTION

Activity 2.1. Develop Seal of Quality for Feeder Cattle from Kupong	Year 1	Year 2	Year 3
Market Feasibility for Branding Kupong Feeder Cattle	10,000		
Sub-total	10,000	0	0

Activity 2.2. Proper Shipment of Kupong Cattle to Java	Year 1	Year 2	Year 3
Training of Traders and Transporters in: Kupong, Bali,			
Surabaya, and Jakarta	15000		

Livestock Transport Specialist from Australia	20,000		
Sub-total	35000	0	0

Activity 2.3. Improve Feeding of Bali Cattle on Java	Year 1	Year 2	Year 3
2.3.a. Coordination of the feeding trials			
Feedlot operators on Java tour West Timor and Bali farm groups			
Travel and workshop	1500		
Workshop on Feeds and Feeding of Bali Cattle in Feedlots	10,000		
Texas A&M Specialist on Feedlot Rations	20,000		
Sub-total	31500	0	0

OBJECTIVE 3. MARKET DEVELOPMENT OF BALI CATTLE PRODUCTS

Activity 3.1. Market Plan for Sales of Bali Semen and Embryoes	Year 1	Year 2	Year 3
Marketing Consultant		25000	
Trade leads in Asia Region		25,000	
SPS conditionalities for export sales of frozen semen	10,000		
Sub-total	10000	50000	0

Activity 3.2. Market Development of Bali Meat Poducts			
Market Feasibility Study for Retail and HRI Sales	$30,000		
Market Tests for Bali beef, fresh, frozen and processed		25,000	25,000
Sub-total	$30,000	$25,000	$25,000

Activity 3.3. Market Coordination for Supply of Quality Bali Raw Hides	Year 1	Year 2	Year 3
Workshop on proper flaying of Bali cattle hides at slaughter	$20,000		
Sub-total	$20,000	$0	$0

Activity 3.4. Strategy for Indonesian Beef Industry	Year 1	Year 2	Year 3
Develop Road Map for Indonesian Beef Industry	40,000		
Sub-total	40,000	0	0

Total by Year	435,800	218,200	83,200
GRAND TOTAL			737,200

Annex Table 5.4. Projection for Pay Back of Cattle in Breeding Unit

			Year					
			0	1	2	3	4	5
Preg. Cow	no.		1					
Calf	no.			1	1	1	1	1
Preg cow	Value	Mil. Rp./hd	3.5					2.5
Calf	Value	Mil. Rp./hd		1.5	1.5	1.5	1.5	1.5
Project Share	percent	Calf		0.3	0.3	0.3	0.3	0.3
Project Share	percent	Cow						0.5
Revnue Flow				0.45	0.45	0.45	0.45	0.45
Mortality rate				0.1	0.1	0.1	0.1	0.1
Adjusted Revenues				0.405	0.405	0.405	0.405	0.405
Salvage Value Cow								1.25
Interest rate				0.06	0.06	0.06	0.06	0.06
Interest				0.21	0.1983	0.185898	0.172752	0.158817
Principal				0.195	0.2067	0.219102	0.232248	0.246183
Outstanding Loan				3.305	3.0983	2.879198	2.64695	2.400767
Balance on the loan								-0.09923