



WORKING PAPER 99.22

**THE IMPACT OF THE ECONOMIC CRISIS ON
INDONESIA'S POULTRY SECTOR**

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A joint research project on

**Linkages Between Indonesia's Agricultural Production, Trade and the Environment
funded by the Australian Centre for International Agricultural Research,**

between

CASER (Bogor) • CIES (Adelaide) • CSIS (Jakarta) • RSPAS (ANU, Canberra)

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**CASER/CSIS/CIES/ANU
joint research project on**



**Policy analysis of linkages
between Indonesia's agricultural
production, trade and
environment**

Rapid economic growth in Indonesia has been accompanied by significant structural changes, including for its agricultural sector and its unique natural environment. Recently questions have been raised about the impact of Indonesia's agricultural, industrial, trade and environmental policies on sustainable rural development. The nature of interactions between the economic activities of different sectors and the environment are such that an intersectoral, system-wide perspective is essential for assessing them. An international perspective also is needed to assess the impact on Indonesia of major shocks abroad, such as the implementation of the Uruguay Round agreements, APEC initiatives, or reforms in former centrally planned economies. There is increasing pressure on supporters of liberal trade to demonstrate that trade reforms at home or abroad affecting countries such as Indonesia will not add to global environmental problems (e.g., deforestation, reduced biodiversity). Again, this requires system-wide quantitative models of the economy and ecology, because typically there are both positive and negative effects at work, so the sign of the net effects ultimately has to be determined empirically.

To begin to address these issues, the Australian Centre for International Agricultural Research (ACIAR) has generously provided funds for a collaborative 3-year project (to mid-1999) involving the University of Adelaide's Centre for International Economic Studies (CIES) as the lead institution, Bogor's Centre for Agro-Socioeconomic Research (CASER) which is affiliated with the Ministry of Agriculture, Jakarta's independent Centre for Strategic and International Studies (CSIS), and the Economics Division of the Research School of Pacific and Asian Studies (RSPAS) at the Australian National University in Canberra. Being based on Indonesia with its rich diversity of environmental resources (and on which there are relatively good data) and its rapid economic growth, the project could also serve as a prototype for similar studies of other developing countries in Southeast Asia and elsewhere.

The key objective of the project is to assess the production, consumption, trade, income distributional, regional, environmental, and welfare effects of structural and policy changes at home and abroad particularly as they will or could affect Indonesia's agricultural sector over the next 5-10 years. Among other things, the analysis will focus both on the effects of economic changes on the environment, and on the impacts on Indonesia's agricultural production and trade of resource and environmental policy changes. The implications of regional and multilateral trade liberalization initiatives and Indonesia's ongoing unilateral trade reforms will be analysed, along with other potential domestic policy changes and significant external shocks such as the entry of China and Taiwan into the World Trade Organization. The analysis will draw on and adapt computable general equilibrium (CGE) models such as the national INDOGEM Model (built as part of an earlier ACIAR project) and the global GTAP Model.

The project is being undertaken in close collaboration with the Indonesian Ministry of Agriculture and ministries involved in trade, planning, and the environment. A Research Advisory Committee has been established to encourage close collaboration of representatives from those and other ministries.

ACIAR INDONESIA RESEARCH PROJECT

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Introduction

During the first twenty five years national development (1965-1990) population growth and improvement in welfare have pushed food demand upward which in turns food composition consumed by the household change gradually over time. In addition, the direction of change tends to increase in the consumption of animal protein such as meat, milk, eggs, and fish. Within that period livestock products have contributed to provide daily protein consumption in 1969 from 1.40 gram/day/capita consisting of 1.2 gram meat, 0.1 eggs and milk respectively to 3.77 gram/day/capita protein consumption (2.52 gram meat, 0.85 gram eggs, 0.40 gram milk) in 1994. Therefore, livestock sub-sector indeed has its strategic roles in the food consumption dynamics. However, all the above improvements have reversed immediately after mid year of 1997 when the exchange rates of local currency to US \$ weaken and the crisis begun.

The crisis has further triggered all sectors in the economy to slow down business sector including importation of livestock inputs. Poultry industry has been sharing some 85% of its import component (feeds, day-old chicks, drugs, and others) as factors of production. Indonesian poultry industry, including broilers and layers has growth dramatically through application of both output-increasing and cost-saving technologies particularly since 1970s to achieve maximum productivity and high production efficiency. The achievements of this industry has help the poultry product demand such as eggs being fulfilled which is indicated by consumers' income elasticity of less than 1.0 meaning that eggs already being consumed by most of people and no longer income elastic products. Similarly with broiler meat, but it is further indicated that the cross price elasticity with beef is positive, meaning that the two products are substitutes.

Modern poultry industry in Indonesia begun in early 1990 by importing commercial breed to produce egg. During its early development of poultry industry in Indonesia, the local native (*kampung*) chicken dominated the market and contributed to a large portion of chicken meat consumption, for instance, consumer preferred to eat *kampung* chicken meat or eggs due to various reasons from more nutrition, tastes, etc. However, due to its low efficiency in producing meat or egg commercial layer or broiler begun to develop. Currently broiler meat contribute more than twice of those *kampung* chicken meat while commercial eggs production representing more than 4 times of egg from native chicken. In total meat supply from chicken contribute more than 60% of meat supply of Indonesia.

Poultry products trade

Broilers.- Poultry farming is one of the most important components of livestock sector in Indonesia, due to its practicability and can be managed from a smaller scale, hence, the market for poultry products is very large and widely distributed. However, broiler and layer chickens raising is relatively new to Indonesia which begun in 1970s through the *Bimas* program. The rapid increase in broiler production has even outnumbered the beef production in 1979, in fact broiler, beef and pork are major contributors to the total national meat production. Presently the domestic market for broiler has been saturated by the large amount of production in line with the national campaign of increasing non oil exports, and it may be one of the reasons why broiler price has been falling drastically in recent years. Exports of broilers is therefore expected to increase every year in which statistics show some 213,400 ton (1991) up to 1,000,400 ton (1995) were exported with the value of US \$ 459,300 and US \$ 3,443,300 respectively.

Eggs.- Similar to the timing when broiler production was developed in 1970s, modern layer farming producing eggs also grows with highly specialised management in nature. High concentration of layer chicken population in west Java is due to the proximity of large markets around big cities near the nation capital of Jakarta, the largest single market for chicken eggs. Hence, the necessary farm supply factories as well as feed industry are located near the production centers. Eggs export from Indonesia may be considered small and negligible, which was started in 1986 with only 6 ton of consumption eggs and jumped to 55 ton in 1987, a good sign that Indonesia has the potential to export chicken eggs a contrary situation to the years before 1984 during which Indonesia was a net importer of chicken eggs. The imported components were hatching eggs, fresh consumption eggs, and yolks. Recently, exports of consumption eggs amounted to 959,500 eggs (1991) decreased to 198,200 eggs (1995), while hatching eggs exports reduced from 1,756,300 eggs (1991) to 737,500 eggs (1995). The reduction in export volumes were due to increased domestic demand for consumption eggs as well as for the derived demand for hatching eggs.

Poultry inputs trades

Poultry and swine enterprise extensively utilise concentrate feeds, which composed basic ingredients such as corn, soybean, rice bran, cassava, wheat pollard, fishmeal, meat meal, and crude palm oil. Major government intervention on feed stuffs in the past were only on rice, which indirectly influence rice bran production, corn, soybean and cassava. For examples, floor pricing for corn and soybean at the farm

level but not on cassava. With new regulation, only rice is left for the government to intervene through the National Logistic Agency (*Bulog*). Up until last year, 1997, *Bulog* controlled the trading of corn, soybean, soybean cake and fishmeal which are mostly imported, while domestic market of these feed stuffs were controlled through market operation to satisfy both producers and consumers by stabilizing their prices.

Corn

Corn is considered the most important feed ingredient of complete ration which amounts to around 50-60 per cent, and practically can be produced in almost all provinces of Indonesia, although each of the producing region may have different comparative advantage in producing corn. The domestic resource cost ratios at most provinces are less than one, indicating its comparative advantage. In general, corn yield in Java is higher than the rest of the country and the increase in production is mainly due to the increase in yield. Presently, Indonesia is both importing and exporting for corn, but on the average it is a net importing country. Indonesia became an importing country at the first time in 1976 at the amount of 68,773 ton and increased up to 169,398 ton (1987). Corn exports fluctuate with season and occurred during the harvesting season when the domestic price falls. Exports begun in 1970 for some 282,196 ton reduced to only 50,723 ton in 1975.

Domestic corn consumption are for human consumption, the largest one but decreasing in trends (70% in 1970 and 56% in 1986), livestock feed at an increasing rates (15% in 1970 and 44% in 1985), and industrial inputs with steady shares (3.4% in 1970 and 3.6% in 1986). Before 1980, the food balance sheets (FBS) estimated 2% of corn went to livestock feeds, after then it was adjusted upward to 6%, for instance, in 1995 it was estimated 547,000 tons of corn, which was 6% of domestic supply of 9,113,000 tons were used as livestock feeds. Recent records (1996) Directorate General of Livestock Services (DGLS) that Indonesia's 60 large feed mills used 3,551,190 tons, six times the estimate of the FBS, while actual use by just this few identifiable large feed mills was 40% of 1995's availability.

Soybean

Another important feed ingredients for protein source is soybean. Central Java is considered as the largest soybean producing region of Indonesia, while Sumatra and Sulawesi are another producing regions outside Java. Indonesia has been a soybean importing country since 1975, with imported components such as grain, soybean cake and soybean flour. Soybean is not economically feasible to produce, which is indicated by the domestic resource cost ratio of greater than 1.0. Soybean is imported from

comparative advantage country such as the USA, China, and Brazil. Local soybean production which is around 1.5 million ton is not sufficient to satisfy domestic demand both for livestock feeds and human food. Therefore, soybean import continue to increase each year at the rate of about 9% per year.

For soybeans, the FBS approach derived the 1995 consumption estimate, domestic production of 1,689,000 tons was added to the soybean import of 607,000 tons, plus stock changes. The import of soybean cake for livestock feed was almost equal in value to the value of import of the beans (US \$ 194 million of cake versus US \$ 216 million of beans in 1996).

Drugs and vaccines

The number of animal medicines producers, distributors, wholesalers and special shops increase each year from 1,300 (1991) to 1,500 (1995) selling different variety of drugs including biological products such as vaccines, pharmaceuticals, premixes and other types. Available biological products in the form of chickens vaccines which are locally produced increase from 929 million dosage (1991) to 1,564 million dosage (1995), while imported products rose from 1,029 million dosage (1991) to 2,679 million dosage (1995). Imported vaccines for ruminants (small and large) share smaller portion of the total available biological products which was only 88,000 dosage (1991) declined to 76,300 dosage (1995). The total value of imported animal medicines increased slightly from Rp 100,739 million (1991) to Rp 131,690 million (1995), while the value of the domestically produced amounted to Rp 159,656 million (1991) and rose to Rp 233,200 million (1995). The value of domestically produced animal medicines indicated that Indonesia has put its effort toward reducing dependency of animal medicines supply from foreign sources.

Poultry Production

Most of the indigenous or native chicken are raised by small holder farmer in free range system with little or no external inputs. Farmers keep them to produce egg for family consumption or to be sold when they need cash. Only few (1-10) chicken are raised per household with very low in productivity 20-40 kg/year or grow to 0.8 kg body weight in 4-6 month. It is estimated that in 1996 total number of village chicken was close to 260 million with annual increase of 2-3%. Given minimal inputs to the production system while the price of meat or egg is more attractive (almost double), the native chicken are still being raised by many farmers, while suffered the least with current economic crisis. However native chicken can not sufficiently produce both meat

and eggs to meet the increasing demand for meat and eggs by the consumers even when their per capita incomes are raised, therefore, more of poultry products supply from commercial chicken is considered necessary.

Table 1. Local production figures and Repelita VI targets, 1994-1996.

	1994	1995	1996
Layers			
	1,000 of birds		
Target	59,555	64,498	69,851
Actual Production	63,355	69,034	77,563
Achievement	106%	107%	111%
Broilers			
	1,000 of birds		
Target	683,519	762,807	854,725
Actual Production	622,965	669,793	755,082
Achievement (%)	91%	87,8%	88.3%
Ducks			
	1,000 of birds		
Target	26,549	26,937	27,341
Actual Production	27,536	28,341	29,245
Achievement (%)	103%	105%	107%

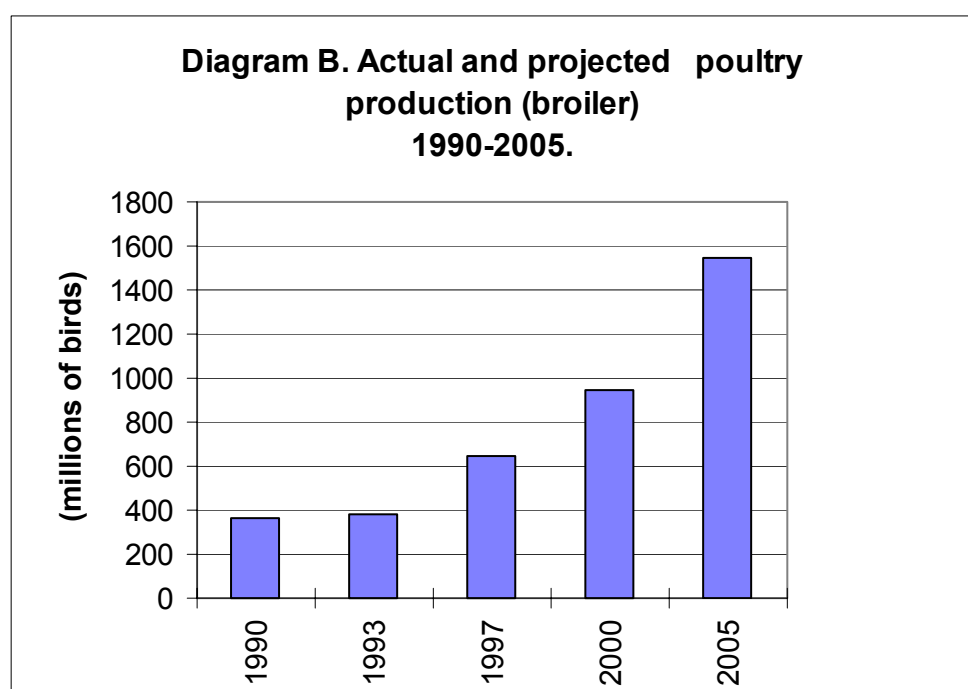
Source: Ministry of Agriculture

Commercial broiler and layer production were increased at much higher rate than native chicken in the last 20 years. Before 1997, the growth a broiler can reach more than 12% from 1995 to 1996. During the Repelita VI (Five Year Development Plan), livestock sub-sector production is targeted to increase at the rate of 6.4% per year, and this is largely contributed by broilers and layer production. The target was met during the last 3 years of the Repelita VI and, hence, Indonesia was self sufficient in broilers and eggs consumption. Furthermore, it is projected that by year 2005 Indonesia can produce more than 1.5 billion bird.

Table-2 .Ratio of real production to production capacity for purebred chicken feed, 1990-1994

Year	Prod. capacity (ton/y)	Real prod. (ton/y)	Ratio prod. to capacity (%)
1990	2,798,367	1,602,624,8	57.27
1991	2,800,368	1,797,156,3	64.18
1992	3,363,395	1,896,154,8	56.38
1993	3,083,322	1,977,366,2	64.13
1994	4,434,300	2,352,935,3	53.06

Processed by CIC from various sources.



Source: Directorate General of Livestock Services, Jakarta.

Most of broiler/layer farms are owned by small farmers with capacity to hold 1,000-3,000 birds. There are few farmers which are considered large with capacity to have layers of more than 1 million bird and for broiler population up to 1-3 million but these large farmers are normally poultry integrator which also have feedmills or breeding farm or slaughter house. Among some 20 poultry integrators only 5 are the major layers producers, namely Charoen Pokphand, Japfa Comfeed, Anwar Sierad, Subur and Wonokoyo.

Although poultry production can be located in most of Indonesia archipelago, the major provinces to raise broiler or layer have been concentrated on Jawa island and North Sulawesi. This is probably related to supply of raw materials for feeds and the proximity to markets. Most of broiler meat or layer eggs are consumed by people living in the big cities. Jakarta alone, before economic crisis received

around 1 million birds/day. Broiler farms therefore located in nearby areas such as Sukabumi, Bogor, Tangerang, Serang, Tasikmalaya, etc. For layer, major areas include Tangerang, Bogor, Lampung. In central Jawa major layer farm located in Semarang, Jogjakarta, Solo while in East Jawa located in Sidoarjo, Blitar, Tulung Agung, Kediri, etc. In North Sumatera, majority of farm are located closed to Medan.

Table-3 . Market share for broilers, 1997

Charoen Pokphand	33%
Japfa Comfeed	19%
Anwar Sierad	16%
Subur	12%
Others	20%

Table-4 . Import totals of GPS DOC broiler by company breeding line, 1996.

Strain	Importing company if known	Total (# of DOC)
Arbor Acres	Charoen Pokphand	39,489
Hubbard	Subur	21,259
Lohmann/IR	Japfa Comfeed	15,485
Ross		15,373
Hybro	Charoen Pokphand	17,797
Indian River		3,634
Cobb	Subur	16,767
Tegel		5,209
Starbio	Cargill	2,000
Peterson		8,580
Avian		39,460
Total		185,053

Source: GOI

In its early development, Indonesia imported Parent Stock for both broiler and layer farm various countries, however, breeding farms have developed rapidly through importing the Grand Parent Stock (GPS). From 14 GPS farms, parent stocks were distributed to 104 companies. Major breeds in the world are available in Indonesia include Arbor Acre, Raw Cabb, Hubbard, Avian, Lohman, Hybro, Starbro, Peterson (for broiler) and Isa, Hyline, Hisex, M&N, Golden Comet (for layers). Indonesia also has pureline called the *Bromo*.

Table-5 . Market share of 12 leading Indonesian producers of purebred chicken feed, 1995.

No.	Company	Production capacity (tons/year)	Market Share %
1	Charoen Pokphand Indonesia	1,000,000	20.3
2	Japfa Comfeed Indonesia	830,000	16.85
3	Gold Coin Indonesia	342,000	6.94
4	Artacitra Terpadu Feedmill	294,000	5.97
5	Cargill Indonesia	260,000	5.28
6	Cheil Samsung Indonesia	240,000	4.87
7	Buana Superior Indonesia	210,000	4.26
8	Central Proteinaprima	190,000	3.86
9	Probolinggo Pelletizing	140,000	2.84
10	Wonokoyo Jaya Corporation	125,000	2.54
11	Wirifa Sakti	120,000	2.44
12	Sierad Feedmill	100,000	2.03
	Other Feedmills (approximately 30 Companies)	975,546	21.82
	Total (approximately 45 companies)	4,434,300	100.00

Source : CIC publication : The Animal Feed Industry and Market in Indonesia, 1996

Production System & Productivity

With high density of human population on Jawa, broiler houses are located in villages close to community. Houses made of bamboo or concrete with roof from asbestos, file or *pandan* leaf and open sided type with concrete floor or soil. Ricehull has been used as litter. Most farmers operate in all in all out system and they sell live bird at the age of 38-45 days with average weight between 1-1.8 kg. Day Old Chicks (DOC) are purchased from breeding company and broiler feed in the form of crumble or pelleted form are obtained from modern feedmill. Holding system for brooding is provided using heater with energy sources from gas, herosene or coal. Broiler starter is given for 3 weeks and contain with broiler finisher up to market. Vaccination is carried out for New Castle Disease (ND) & Invectious Bursal Diseases (IBD) or *Gumboro*. Major diseases are ND, *Gumboro*, *Mycoplasma* and *Ecoli*. *Coccidiocis* is normally prevented by feed addition given in the feed. Mortality is varied from 3-10% while feed conversion ratio is 1.8-2.2.

For layer farm, birds are raised in growing houses up to 13-16 weeks and then transferred to an open sided caging raised about ground

in 2-3 tier system. The cages are made from bamboo or wire while feeder or daringly are made of bamboo, PVC pipe or wood. Most of feeding and egg collection are done normally. Eggs are sold through agent as table egg without further processing. Depending upon economic advantage, majority of layer farmers produced their own feed by mixing concentrate from feedmill with corn and rice brans purchased locally. Some farmers especially from outside Jawa purchased complete feed from feedmill ,while large layer farms use their own formula feed.

Table-6 . Typical poultry feed ration used by Indonesia's feedmillers.

Component	% composition
Corn	51
Soybean meal	18-20
Fish meal	5
Rice bran	15
Wheat Bran	10
Pre-mix, l-lysine, vitamins	1

Source: Industry

All layer feed are given in several form without pelleting. Almost all layer are brown type although during its early development Indonesian people consume white egg. Each layer can produce 260-280 egg/year with feed/egg ratio vary from 2.5-3.0. All hens can be sold as meat with price almost similar or above broiler price. There are also specialized farmers who raise male layer to produce meat which reach body weight of 0.7-0.8 kg in 7-8 weeks. These type of chicken is also sold at a higher price than broiler because the taste of meat are close to those native chicken.

Economic Crisis

Recent Asian economic crisis was triggered when central bank of Thailand trying to give up trying supporting its currency and the Bath collapsed in mid 1997. The crisis was spread out to neighboring countries in Southeast Asia who has a similar economic structure to Thailand. Over the previous years, a large portion of Korea corporate, Thailand, Indonesia, and Malaysia had taken to gamble on their currency. Many large conglomerates in the region borrowed as many dollars as they could and large companies were sailing to make money doing what they support to he doing. Many companies also speculated in real estate investment, high rise building, new condominium housing estate increased dramatically. When local currency collapsed, the banking system also collapsed. The situation are getting worse in Indonesia because the economic crisis brought on a political crisis.

Table 7 . Increases in broiler complete feed price, August 1997- January 1998

Dates	Increase (Rp/Kg)	Exchange rates (Rp/US\$)
Prices before crisis	725/kg	
18 Aug 1997	40	2.760
01 Oct	30	3.660
13 Oct	130	3.565
08 Dec	40	4.140
17 Dec	100	4.980
19 Dec	150	6.125
29 Dec	150	5.875
09 Jan 1998	200	9.700
23 Jan	200	7.500

Average prices before the following increases Rp. 1765/kg

When the exchange rate of local currency devalued and fluctuated, most of imported product became very expensive include all materials required for poultry production. Soybean meal price jump up from Rp 800/kg to Rp 3,500/kg this resulted on increase price of feed sold by feedmills. The price change can be 8 times within a month and makes difficult for the farmers to raise poultry. There are some companies who decided to cancel the contract and to set up new feedmills. The investment cars of machinery jump from Rp 5 billion (\$2 million) to became 18-20 billion and make investment was not attractive.

The crisis is not only affecting Indonesia or Southeast Asia Region but it also affected the whole world. Whether this crisis has reached its bottom or not, it has profoundly affected the volume and pattern of world base in grain and meat. For example, as a result of the Asian Crisis, a decade rapid growth in world of poultry meat trade has ended. Grain imports, by Asia have also been temporarily reduced and in addition to that the patterns of world trade have changed. For example, Thailand is now more competitive in the Japanese market while the United State and China are less competitive in that market.

The decrease in these demand for grain and soybean meal resulted on the over supply of grain from US and Argentine and soybean meal from United States, Argentine, Brazil and India. Last year (1998) has been considered the lowest price of grain (\$80mt) and soybean meal (\$160/mt). Although recently price increase but it is still lowers than the previous year. Due to lack of cash, 1998 is the year when South Korea importing large amount of US soybean meal by credit scheme.

Table-8. Increases in feed price in June 1998

Dates	Increases (Rp)	Exchange rates (Rp/US\$)
Preceeding price Rp. 1500/kg		
01 June 1998	150	11.100
08	200	13.150
12	200	14.000
18	150	16.650
20	200	15.000
24	200	14.100
29	200	14.415

Average prices before the following increases Rp. 2.800/kg

Poultry Demand & Supply.

In 1997, income per capita of Indonesia is about \$1,000/year. Ako (1998) claimed that at that point poultry consumption supposed to increase quickly as found in other countries such as Malaysia. Poultry demand however is very elastic in which poultry product consumption is affected significantly by income of people and it is more obvious in high income group of people either in rural or urban areas. Sudden decrease in the income of people, in terms of US\$, or dramatic increase in price of poultry product in local currency will certainly decrease the demand for poultry products. Based on income elasticity of demand, it can predict the amount of poultry consumption by Indonesian people when income per capita drop from \$1030 to \$430. On the basis of feed conversion rate at 2.0 for broiler and 2.7 for producing egg, the number of broiler or layer in Indonesia and feed production figure can be calculated. It was predicted that in 1998, broiler production decrease to only 30% and egg production to only 40% from previous year (1997) before economic crisis.

Reduction in feed production will influence the amount of corn and rice brans required. The excess supply of both products, world is open apparently for export as expected. It was reported that corn from Lampung, Medan or even East Jawa have been exported recently. ASA Jakarta (unpublished) reported more than 400.000 mt of corn was exported to Malaysia, Thailand, and Korea. However the price of corn is very much affected by world market in this global economic situation. The owner supply of American corn will certainty push the price of world corn price as it was happened during 4-5 month ago when corn price is only US \$ 85/mt (CBOT).

Table-9. Indonesian economic growth and per-capita GNP (1990-1996)

Year	Growth (%)	GNP per capita US \$)
1990	7.2	561.3
1991	6.9	595.0
1992	6.3	649.7
1993	7.3	842.0
1994	7.5	886.0
1995	8.2	978.0
1996	8.0	1,155.0
1997	4.7	1,089.0
1998	13.68	436.0*

Source: BPS (1998) Inflation: 77.63% estimated figures

Indonesia within Asean

With a huge population (204 million) and steady growth of income or GDP (\$1045 in early 1997) before economic crisis, Indonesia is still expected to continue to be the largest poultry consumer in Asia. Previously poultry consumption is estimated around 3.0-3.5% as purchasing power increase, it was expected that equal amount of poultry will be consumed as in Malaysia (37 kg/capita/year) which has similar dietary preference. Indonesia suffers the most among Asean countries in term of the exchange rate. The rupiah value had ever been decreased more than 80%, currently the exchange rate is Rp 9,000/1US\$ which is decrease 10% compare to before crisis. Economic crisis is still continue to resolve, this is in contrary with Thailand which has already recovered. In term of poultry consumption, poultry meat consumption is less than other neighboring countries such as Malaysia or Philippine.

In relation to poultry production inputs, poultry production in Indonesia is the most potential among Asean countries, for example, soybean, corn and rice bran are commodities which can support poultry production in Indonesia. Malaysia does not produce corn and almost all soybean meal are imported. With huge national resources and land availability, Indonesia should have a capacity to produce feeds compared to its neighboring countries. In relation to labor availability and fuel cost, Indonesia is the most competitive among Asean countries. However, currently Thailand is one of the most competitive countries in the world, which is probably due to experiences and good business climate to support efficient poultry production there.

Table-10. Market situation for broiler and eggs in Indonesia (1996-1998)

Items	1996	1997	1998
Market demand for broiler (hd/day)	1.811.000	953.000	750.000
Left over demand (%)	2.762.000	1.500.000	1.000.000
Market demand for eggs (Kg/day)		54	36
Left over demand (%)	2.825	2.700	7.500
Market price for broiler (Rp/kg)		5	278
Change in market price (%)	2.200	2.400	5.500
Market price for eggs (Rp/kg)		109	229
Change in market price (%)	800	2.800	3.100
Price of broiler feeds (Rp/kg)		350	111
Change in price (%)	550	1.800	2.100
Price of layers feed (Rp/kg)		327	117
Change in price (%)	245.531	279.698	126.894
Imported GPS broiler (ekor)	1.050	1.100	430
Per capita income (US\$)			

Sumber : Pinsar Unggas Nasional (1998)

Table-11. Demographic characteristics of Asean, (Population-1996: 426,500,000)

	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Population (Million-1996)	200	20.5	69	3	59	75
Population Growth Rate (%)	1.6	2.4	2.2	2	1	2.1
GDP (US\$ Million) 1996	175	71	64	69	143	15
Real GDP Growth Rate (% - 1996)	4.5	8.5	5.4	6.2	6.1	8
GDP Per capita (US\$-1996)	1,045	3,280	775	22,500	1,937	220
Inflation Rate (CPI-1996)	6.8	3.3	4.8	1.5	4.6	4.5
Unemployment Rate (%)	3	2.8	9.5	2.6	2.7	25
Interest Rate (Prime-%)	14.5	9.1	14.5	6	13.25	16.2

Source: Far Eastern Review and CIA Factbook.

(Note: For unemployment figures all are 1995 except Indonesia, which is 1994. Indonesia also has 40% underemployment).

Table-12. Animal Population & Feed Production in Southeast Asia (1996)

Items	Indo	Mal	Phi	Sin	Thai	Viet	Total
Population							
Broiler	650	328	298	0	750	75	2,072
(slaughtered)	60	17.6	15	2	35	20	152
Layer (SPP)	2	4	9	0	11	11	36
Swine (slaughtered)							
Feed Production (MMT)							
Broiler	1,852	1,320	874	0	3,024	455	7,525
Layer	2,409	803	626	60	1,405	273	5,576
Swine	680	980	2,837	0	3,630	182	8,309
Fish	288	3	15	-	120	-	426
Shrimp	150	5	45	-	400	-	600
TOTAL FEED	5,379	3,111	4,397	60	8,579	*910	21,836

(Note: * Vietnam's commercial feed requirement is 4.8 MMT)

Table-13. Soybean meal production and utilization, 1996 (000 MT)

Country	Production	Import	Consumption	U.S. Share of Import
				MT
Indonesia	48	897	880	86
Malaysia	350	480	795	0
Philippines	86	718	800	421
Singapore	0	50	41	0
Thailand	398	830	1,280	79
Vietnam	13	135	142	0
Total	895	3,110	3,938	586

Source : Industry, Agatt and Government Reports

(Note : Majority of soybean meal consumption in Singapore is for soy sauce)

Impact of Economic Crisis

As reported earlier that economic crisis affects commercial poultry production more than native chicken production due to several reason, among others:

1. Commercial poultry production is an industry type of business rather than a substance of agriculture.

2. Source of inputs for its production are derived from imported materials which is valued in dollar, there include feed ingredients (soybean meal, fish meal, premix additive), breeding stock (broiler & layer Grand Parent Stock) and drug/medicine.

The impact of economic crisis affect several trial of business involve in animal husbandry include:

Feed Industry

The increase of price of raw materials especially protein meal sources such as soybean meal, fish meal, meal & bone meal resulted in the increase in price of selling feed from feedmills. Feed industry also did not like to sell feed on credit rather than they prefer selling on the cash basis. This was done in order to protect further possible bad debt when farmers can not afford to pay. These situation resulted on the drop of feed demand by poultry producers and, hence, decrease in fed production.

Feed industry turmoil became worse due to high investment in the previous year in increasing the capacity to anticipate the poultry production and demand. In 1997 only less then 60% of capacity was utilized, and huge drop in production in 1998 (20% drop) resulted in idle capacity of several feedmills. These were reported that many new big feedmills in Serang area were not in operation. The older feedmills produced less feed and less stuff or decreasing its operation to only 4 days/week. Few of feedmills were closed down leaving a huge bad debt while many foreign consultant/employee had to terminate the job and returned home.

Distributor/agent to support poultry industry

Poultry industries were supported by many other business lines includes drug, premix, or additive, equipment supplier, etc business. The significant drop in poultry industry certainly affected much of these line of business since the majority are rely upon imported goods. This affected the sales of the product while other overhead cost such as car or utility, increase. Many drug distributor reduced the scale of operation and have to reduce the number of employees no other investment in equipment resulted the distributor or agent have to rely upon selling spare part to maintain their operation. Certainly travel budget or other expense have been dramatically cut. Sending people for training or seminar overseas have been decreased unless it was necessary.

Breeding farms

Many breeding companies decided to reduce number of GPS import due to price high in local currency and less demand. In 1998,

imported GPS is only 50% from previous year. It is predicted that only 5 strain of broiler breeder are in operation and only 2-3 strain from brown layer. Many parent stock farm have been rented out or convert the facilities to a commercial broiler farm or layer farm. many hatchery facilities become idle.

Farmers

Association of Poultry Producer (PPUI) predicted that around 80,000 farmers involved in broiler operation in Indonesia particularly in Jawa. In ability to buy the feed or drug on cash basis while price of broiler can not increase readily compared to price of feed from feedmill resulted in the huge less of business or broiler were not fed properly. (some farmers fed papaya leaf). The situation caused a decreased in number of farmers and closed down the business leaving huge debt. It is not known how many farmers left as broiler farmers. Many broiler houses are left empty or rented to integrator. It is predicted that large integrator will take over broiler operation or broiler farmer joint as contract farmer with the integrator.

Table-14. Impacts of monetary crisis on poultry business in Bogor district, West Java, Indonesia, 1997

Business types	Degree of reduction (%)
Grand Parent Stocks production	83.68
Parent Stock production	37.36
Final Stock production	65.50
Number of small farmers	75.24
Bird population on small farm	64.60
Broiler propulation raised by large farm	43.65
Layer population raised by large farm	57.79

Source: Saptana dan Rivai, Puslitbangnak (1998)

Decreasing amount of raw materials import for feed industry resulted in many trader change to become exporter. The decreasing amount of local corn consumption resulted on the excess. Supply of local corn, similarly with rice bran or cassava. The difference in price between local and imported corn from neighboring countries such as Malaysia, Philippine or Korea made the export business of raw materials attractive. Last year it was recorded that more than 500,000 mt. corn were exported to Malaysia, Thailand. The export was not only for raw materials, several feedmill in Medan was exporting broiler feed to Malaysia. Recently several breeding companies exported day old chick (DOC) or hatching eggs to Brunei or Philippine.

Future challenges and opportunities.

According to Ako (1998), the Asian Economic Crisis presents a serious short term problem for the feed, poultry and livestock industries of Southeast Asian and a long term opportunity. The currency crisis is likely to have continuing effects for two or three years on the overall health of the Asian economy in particular the banking and construction sectors. This is a serious situation. However there is a confidence that the region will, for the most part, deal appropriately with the crisis and team to rely on markets to make investment decisions in the future.

Despite the current economic problems in Southeast Asia, the production and consumption of poultry and eggs is likely to rise rapidly in the future once the current problem are resolved. This will happen to those countries with the most rapid decline in consumption. Income elasticity of demand has been considered as the main factor. When income of people recovered rapidly, the purchasing power increase and demand for poultry eventually increases. For Indonesia decrease in broiler consumption by 70% while egg consumption dropping by 60% is equivalent with drop in income per capita from \$100 to \$430. The challenging question is when the income per capita recover or when the economic problem is resolved.

Business climate. Decreasing on poultry consumption in Indonesia is certainly the by factor affecting poultry industry. Huge capacity of industry due to a rapid expansion in the last few years make business become very competitive. Several companies have already closed their operation. However there is indication that some changes have happened.

Integrated farm.- Many large companies who own breeding farm and feedmill become broiler integrators by raising broiler for themselves or having contract farmers. Further processing of broiler will be expanded to have a value added products such as cut up or ready to eat broiler.

Processing.- Farmers who did not produce efficiency will have to close down the business, besides that company who has huge foreign debt will get difficulty or may closed down the business. Number of small farmers will decrease, economic scale of farming have to considered. It was suggested that cooperative farmers will increase its competitiveness or efficiency. crystallization in business operation will make poultry production mature.

Export oriented.- Considering competitive advantage of Indonesia's agriculture among Asean countries together with cheap and abundant labor force and recent economic devaluation of currency can make Indonesia become important exporter of poultry product to other

countries. Availability of corn grown locally as feed ingredient together with huge amount and cheap rice bran make feed production become cost effective. Since feed contribute 65-85% of poultry production, poultry product can be exported to Japan. As Ako (1998) reported that countries competitiveness to export poultry is depending upon cereals and labor cost plus government support.

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Appendices

Appendix-1. Southeast Asia - Per Capita Consumption for Milk, Meat, Eggs, Soybeans and Oil (FY96)

Country	Milk (lbs)	Pork (lbs)	Broiler (lbs)	Eggs	Food Soybeans (lbs)	Edible Oil (lbs)
Indonesia	12.36	52.3*	8.2	62	18.9	29.89
Malaysia	N/A	67.8*	51	224	1.3	147.6
Philippines	N/A	17	8.8	52	0.4	15.2
Singapore	N/A	68	86	284	22.4	157.13
Thailand	7.66	25.6	37	135	0.2	23.8
Vietnam	2.02	29.8	2.3	50	3.7	3.41

* In pork consuming population, N/A: Not available

Source: Industry, Agatt and Government Reports, Food Soybeans data - Stanton Emms & Sia 1996 Market Study.

Appendix-2. Local production figures of chicken breeding stock and corresponding Repilita VI targets.

Items	1994	1995	1996
Breeding Stock ('000)			
Target	233,634	242,979	252,699
Actual Production	243,260	253,654	270,662
Achievement (%)	104%	104%	107%

Source : Ministry of Agriculture

**Appendix-3. Production, harvest area,
productivity of rice, maize and soybean,
Estimated for 1998, and fixed figures for 1997**

Commodity	Estimated for 1998 (ton)	1997 Figures (ton)	Growth Est.98 vs Figure 97
Produktion (ton)			
Rice	46.443.044	49.377.054	-5,94
Maize	9.793.668	8.770.851	11,66
Soybean	1.313.253	1.356.891	-3,22
Harvest area (ha)			
Rice	11.055.840	11.140.594	-0,76
Maize	3.747.044	3.355.224	11,68
Soybean	1.102.962	1.119.079	-1,44
Productivity (100 kg/ha)			
Rice	42,01	44,32	-5,21
Maize	26,14	26,14	0
Soybean	11,91	12,13	-1,81

Appendix-4. Targeted and actual livestock production and population 1998

Targetted	Sixth Repelita	Target		Growth (%/yr)	Achievement over targetted (%)
		1997	1998		
Population (juta ekor)					
• Beef catle	13,2	11,9	12,2	1,77	92,7
• Dairy cattle	0,4	0,3	0,3	3	77,2
• Buffalo	3,7	3,1	3,1	(0,33)	82,0
• Goats	13,3	14,2	14,8	3,77	111,4
• Sheep	6,8	7,7	7,6	(1,3)	111,6
• Swine	10,2	8,2	9,8	3,35	96,4
• Hors e	0,7	0,6	0,6	(1,19)	78,6
• Native chicken	273,3	260,8	267,9	2,45	98,0
• Laye rs	81,9	70,6	48,2	(31,73)	58,8
• Broilers	28,2	641,3	540,2	(15,76)	50,3
• Itik	-	30,3	30,0	(0,99)	106,5
Production (ribu ton)					
• Meat	1.647,0	1.551,1	1.472,2	(5,33)	89,4
• Eggs	784,4	765,0	599,9	(21,58)	76,5
• Milk	530,2	423,7	405,5	(4,30)	76,5

Source: Ministry of Agriculture

Appendix-5. Human population under the poverty line

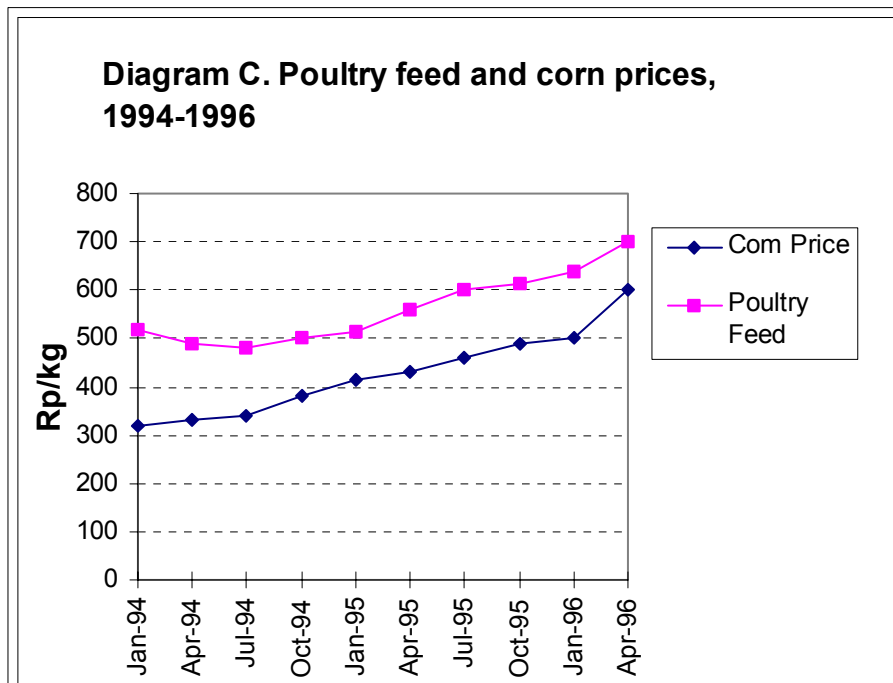
Year	Urban areas		Rural areas		Total	% of total Population
	Numbe r	Poverty line (Rp)	Number	Poverty line (Rp)		
1976	10.0	4.522	44.2	2.849	54.2	40.2
1978	8.3	4.969	38.9	2.981	47.2	33.4
1980	9.5	6.831	32.8	4.449	42.3	28.7
1981	9.3	9.777	31.3	5.877	40.6	26.9
1984	9.3	13.731	25.7	7.746	35.0	21.9
1987	9.7	17.381	20.3	10.294	30.0	17.7
1990	9.4	20.614	17.8	13.295	27.2	15.1
1993	8.7	27.905	17.2	18.244	25.9	13.6

1996	7.2	38.246	15.3	27.413	22.5	11.3
1996	22.6	52.47	56.8	41.588	79.4	38.8

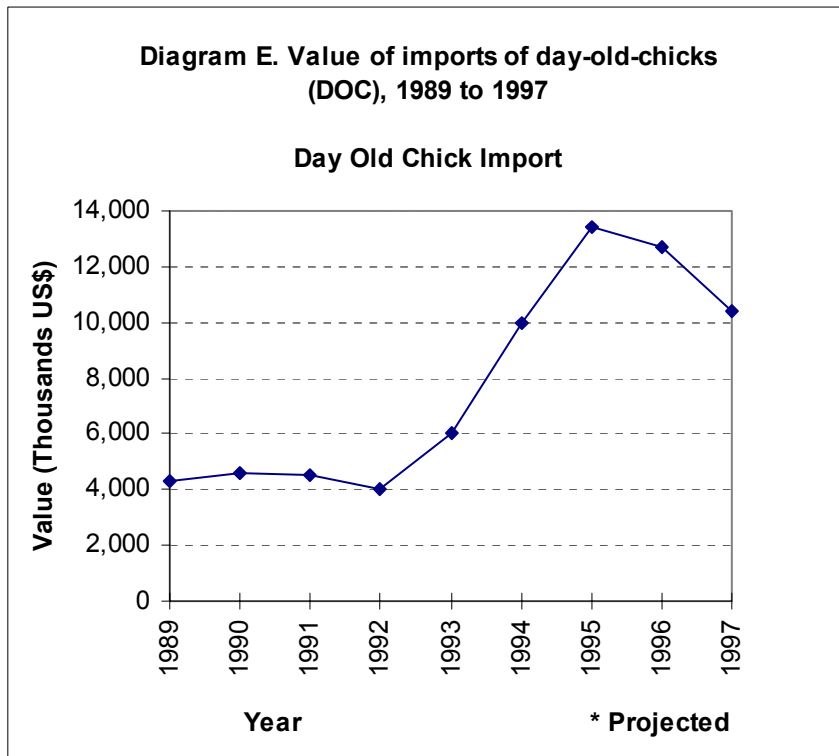
Source: Central Bureau of Statistics, Jakarta(1998)

Appendix-6. GPS Broiler imports (FMDL) 1995 – 1997

Galur	Perusahaan	1995	1996	1997
ARBOR ACRES	CP JAYA FARM	77.284	39.489	19.500
AVIAN	CENTRALL	39.123	36.352	58.500
COBB	AVIAN	15.114	35.304	46.140
HUBBARD	GALUR	38.199	27.897	53.691
HYBRO	PALASARI	17.379	26.414	18.462
INDIAN RIVER	CIPENDAWA	7.980	5.461	1.000
ISA VDT	AYAM MANGGIS	-	-	-
LOHMANN IR	HIDON	31.119	23.339	31.176
PETERSON	ANWAR SIERAD	14.542	21.250	25.665
ROSS	MULTIBREEDER	14.543	20.816	21.564
STARBRO	MULTIPHALA	4.010	4.000	4.000
TEGEL	CIBADAK	6.769	5.209	-
	CARGILL			
	MISSOURI			
TOTAL		266.062	245.531	279.698



Source : GOI



Source : BPS (Central Bureau of Statistics)

