

## Livestock and Poultry Industry in Indonesia: Policy, Potential and Problems

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**ABSTRACT:** This paper focuses on the production and demand potential of livestock and poultry products as related to development policies to meet the dynamic change of production structure, scale, commodity programs and improvement of farmer's welfare especially to alleviate poverty. By means of intensive survey on available secondary data and information analyses and interpretation were conducted. Indonesian animal production system is characterized by 3 major agro-ecological systems e.g. wet, dry and semiarid zones and 2 economic sectors e.g. traditional and modern. In terms of gross domestic product (GDP) during the first 25 year economic development, the contribution of the animal subsector declined from 2.25 % to 2.11%, but within the agricultural sector it grew from 6.00% to 11.30%. During the same period, meat, egg and milk production grew at the rate of 6.06%, 11.92% and 12.18% per year respectively. Interns of farmer's income animal production contributes up 60% especially in dry and semiarid zones. However, the rapid production is offset by high growth of demand due to human population increase, improved

purchasing ability and high demand elasticity to income change. The problems in animal production aspect in the tropical country such as Indonesia, is low productivity and some socio-economic issues such as low investment capability, low technology adoption, land size and tenure system, market structure and infrastructure which affect price. This complex of problems known as (skill-land-technology-feed-animal-market) complex varies in its intensity between traditional and modern sector animal industries. The above dynamic changes in production and trade, enhance new prospects for production to meet the strong domestic demand and at the same time to meet global requirements. The government has played an important role and backed up by private, BUMN ( government owned enterprise ) and cooperative sectors to develop strategy on partnership between traditional and modern sector, technology, infrastructure, environmental improvement and farmer's group or institutional establishment. The concept of agribusiness becomes the pillar to promote animal production and Farmer's welfare.

Key Words: Production Structure, Commodity Programs, Farmer's Welfare, Low Productivity, Trade and Tariffs, Agribusiness

### Introduction

The Indonesian archipelago includes about 13,667 islands covering an area of 192,000,000 ha. Out of this, 122,000,000 ha are forest, 20,000,000 ha devoted to crops, 12,000,000 ha to pasture and the remainder accounted for by other uses (BPS, 1984). The high concentration of population is found on Java, and Bali. The density of agricultural land in Java and Bali is clearly reflected by the smaller average size of land as compared to the other islands. In general, land and water resources are fully exploited to economic potential on Java and Bali. The fact mentioned above shows the diversity of environments in Indonesia.

Livestock and poultry as a subsector in agricultural sector are developed under this diversity. Humid tropical zone in Western part, dry area in Central zone and semiarid in lesser island of Timor then wet tropical zone in Irian Jaya. Minimum temperature ranges from 16 °C to 22 °C. While maximum temperature from 25 °C to 34°C. Rainfall ranges from 1500 mm to 3000 mm/year.

The diversity is further enriched by varieties of tradition across regions which affects farmers motivation and practical management in animal raising.

The objectives of this paper are to study all information and data and develop analyses in order to draw together all aspects of policies, potential and

problems related to animal industry especially during the period of the 1st long term economic development.

### Livestock and Poultry Production and Demand Potential

Indonesian animal production has dualistic sectors, traditional and modern. These sectors differ in the development modes, objectives, decision making process, investment capability and technology adoption. The existing agroclimatic, socio-economic and traditional as well as cultural aspects have influenced these sectors. In general terms, animals in traditional sectors provide draft power, food, manure, transport and other products. It is a wealth accumulation, productive savings, prestige as well as source of earning (Sabrani and Koeswardhono, 1991). The role of animal component in village economy is dominant in marginal areas and remote areas. The animal component role is as buffer to absorb the effect of crop failure. They are easily sold to get cash to meet farmers household needs. The sale of animal may be used to pay school fees, house improvement, health and food (Anonymous, 1992). Because of this role, some farmers consider animal component as indicators of wealth and social status.

The animal component may be as a sideline activity or as a component of diversified farming. When the number grows, it may be a major source of income for traditional farmers.

The structure of animal production today however is dominantly by small farmers in diversified farming system and all factors of production are available locally.

This model of production is still relevant in the future. Because of different man/land ratio across regions, the production system in traditional sectors quite varies. In high man/land ratio such as Java and Bali, animal are partially confined and cut and carry is practiced in feed collection. In low man/land ratio, animal usually grazing.

The animal modern sector has developed for beef, milk, modern breed of chicken and eggs. The development however is highly motivated by changes in consumer's preference as the economic condition has improved and the inability of traditional sector to fulfill consumer's demand. In this system, production is motivated by profit maximization and related to market. The weakness of the modern

sector is that some inputs of production are imported such as soybean, corn, breeding stocks and calves.

The growth of animal population and production during the first 25 year development is presented in Table 1. Based on yearly increase, livestock and poultry population grew unevenly. However the average increase per year during 1969 - 1992 ( $\ln X = \alpha + \beta T$ ) was 2.68 % for beef cattle, 8.38% for dairy cattle, 0.98% for buffalo, 3.24% for sheep, 2.72% for goat, 5.62% for village chicken 21.24% for modern breed of chicken, 33.81% for broiler and 6.09% for duck. Cattle, buffalo and small ruminant, showed low rate of increase due to low investment to improve production structure small land size owned by farmer and long distant source of feed lower animal productivity.

The production however showed a significant increase as the demand has increased. Red meat production increased by 2.23% per year, village chicken meat by 2.54% and broiler by 19.85%. Structural changes have occurred also in production. Meat production in 1969 composed of 87.33% red meat, 12.67% village chicken and 0% broiler. At the end of 1991 red meat production was 46%, village chicken 21% and broiler 33%. The same phenomena can be observed also in egg production. In 1969, village chicken egg was 53.55% , improved breed 7.27% and duck 39.18%. Now it was 17.17%, 59.52% and 23.31% respectively. Changes in production structure also reflected in demand structural changes. In 1969, meat was 61.85% of total animal product consumption, eggs 5.19% and milk 32.96%. Now it was 46.59%, 17.49% and 35.92% respectively. Eggs component in total animal product consumption increased.

To improve animal production, commercial farm have developed in poultry and dairy cattle. The input systems which support this modern sector are provided by well established feed, medicine vaccine factories and breeding farms. Table 2 and 3 present the data on number of traditional unit and commercial unit (Anonymous, 1983). The role of commercial farms is predominant in dairy and modern poultry production. Cattle, buffalo, sheep, goat, duck and village chicken production are predominantly traditional and small farmers. These are species that contribute significant role in the rural economic development and farmer's welfare. It can mobilize available resources for productive uses and less effected by price fluctuation .

Table 1. Animal population and production<sup>a</sup>

Description	Year		% increase
	1969	1989	
<b>Animal Population, x1000 heads</b>			
Beef cattle	6447	10040	2.68
Dairy cattle	52	277	8.38
Buffalo	2940	3242	0.98
Goat	7544	10943	2.72
Sheep	2998	5866	3.24
Village chicken	61788	187433	5.62
layers	688	41163	21.24
Broiler	-	285409	33.81
Duck	7269	25386	6.09
<b>Meat Products, x1000 tons</b>			
<b>Ruminants</b>			
Cattle	164.9	254.4	1.47
Buffalo	48.5	42.2	-1.17
Goat	12	70.9	10.08
Sheep	9.7	33.2	7.04
	235.1	400.7	2.23
<b>Non Ruminant</b>			
Pig	34.2	149.1	8.43
Hourse	0.8	1.6	4.31
	35.0	150.7	8.36
<b>Poultry</b>			
Native chicken	-	201	2.54
Layer	-	17	4.88
Broiler	-	228.2	19.85
Duck	-	10.5	1.09
	39.2	456.7	13.76
	309.3	1008.1	6.06
<b>Egg</b>			
Native chicken	30.9	78.7	5.27
Layer	4.2	266.7	21.38
Duck	22.6	118.8	9.01
	57.7	464.2	11.92
<b>Milk</b>			
Dairy cattle	28.9	279.2	12.18

<sup>a</sup>Source : DGLS, 1992

Table 2. Number of farm companies and production structure of animal industries.<sup>a</sup>

Item	Traditional		Enterprise	
	Household	Heads	Unit	Heads
Beef cattle	4051000	8862000	-	34000
Dairy cattle	65000	180000	403	18000
Buffalo	935000	2391000	-	7000
Sheep & Goat	4736000	15762000	536	400
	1399000	4065000	-	170000
Horse	303000	528000	-	400
Village chicken	15234000	159463000	-	-
Lying strain	110000	28102000	960	5989000
Broiler	-	-	182	2754000
Duck	-	23781000	-	-

<sup>a</sup>Source : BPS., 1983.Table 3. Number of farm household in 1983.<sup>a</sup>

Description	Total Farm household (000)	%
1983 Census agriculture	17628.70	100.00
With Cattle	4053.40	22.99
With Buffalo	934.50	5.30
With Sheep and Goat	4735.80	26.86

<sup>a</sup>Source : BPS., 1983.

In modern poultry industry, input/output price ratio has fluctuated erratically which created chaos in the industry. Now the problems of day old chick-feed-market complexes are hardly controlled through market mechanism. Is this the typical or characteristic of modern poultry industry ?. If that so, we have to develop a system which can work under such condition.

The condition of demand for beef and milk which is well above production will continue. Trade in beef and milk reflects the strong domestic demand. Beef prices during the period of 1989 to 1994 increased by over 200%, and price differential between beef and other animal products widened in favor of beef. Table 4 shows the changes in price

ratio between beef and other animal products (chicken meat, eggs and milk). It has widened from 2.01 to 2.82 for chicken meat, 3.62 to 4.88 for eggs and 11.5 to 16.26 for milk.

In terms of animal product consumption (Table 5.) it grew at 4.17% per year for meat, 12.18% per year for eggs and 5.17% per year for milk. If the rate of population increase (2.10%) is added to the respective increase, it becomes 6.27%, 14.28% and 7.27%. Egg consumption had the highest rate of increase while meat had the slowest rate of increase. Milk is commonly consumed in processed form rather than fresh. Greater market potential in beef production as shown by expanding price ratio of beef and other product should be anticipated by

Table 4. Ratio of beef price to other animal product prices in Jakarta.

Year	Beef / Chicken meat price ratio	Beef / modern breeds chicken egg price ratio	Beef to milk price
1989	2.01	3.62	11.50
1990	2.18	3.69	12.40
1991	2.35	3.74	13.10
1992	2.50	3.80	13.90
1993	2.67	3.85	14.20
1994	2.82	4.88	16.26

Table 5. Meet, egg and milk consumption 1969 - 1992

Year	Meat	Egg	Milk
	----- kg/person/year -----		
1969	2.74	0.23	1.46
1992	6.34	2.38	4.89
Increase	4.17	12.18	5.17
Total increase	6.27	14.28	7.27
kg increase	0.15	0.12	0.14

better production. Intermis of kg increase per year, meat had the highest increase (0.15 kg/person/year) followed by milk (0.14 kg/person/year) and eggs (0.12 kg/person/year). These figures show the significant demand potential which stimulate production. Meat demand had the highest increase in kg/person/year and eggs the lowest. Meats consist of meat and poultry meat, while eggs compose of native poultry and improved breed of chicken. Based on this fact the strength of animal development depends on population increase, economic growth, expanding disposable income and high income elasticity of demand.

#### Animal Industry and The Economy

##### Contribution to gross domestic product (GDP)

Based on constant price, the animal subsector contributed to GDP 2.11% in 1992. If compared to 1969 (2.54%) it declined. In terms of agricultural

sector, its contribution grew from 6.00% to 11.30%. In absolute terms, the volume and value of animal contribution increased (Table 6.). This structural changes in farm sector is due to the rapid rise in non farm sector both values and quantity and quality. The productivity of non farm sector is significantly higher than farm sector. The increase of animal contribution in agricultural sector shows the stronger demand for animal products. The elasticity of demand of animal products to income changes is greater than 1. Therefore the increase in demand for animal products as a result of income rise and population increase is greater than food crops. The fact shows that greater opportunity is opened to improve animal production which is more orientated to demand growth.

Even though the economic potential of animal industries in GDP is relatively small, but at farmer's level in each agroecological zones, the contribution of animal component in farmer's income is great

(Table 7). In wet zone the contribution may reach 13% of farmer's income in lowland, and up to 20% in upland. In dry zone, it could be up to 16% in lowland and up to 41% in up land. In semi arid zone, it was up to 60%. The fact shows that the contribution is highly significant in up land area where farm diversification is more intense. Therefore, from economic potential point of view, animal industries is relatively significant in dry and semi arid zone, except for dairy and improved breed

of chicken which must be close to processing plants and markets.

Based on the data discussed above, animal production in dry and semiarid zones is important in sustaining the stability of the rural economy which largely based on low opportunity cost resources. Because animal productivity is influenced by agroclimatic condition and feed supply capacity, animal production or commodity zoning is important. The zones are related to economic, social physical and institutional infrastructural support.

Table 6. Contribution of animal industry to GDP. (Rp. billion) based on constant price.<sup>a</sup>

Year	Animal as % total	Animal as agricultural	Agriculture as % total
1969	2.54	6.00	42.38
1970	2.40	5.81	41.25
1971	2.57	6.52	39.46
1972	2.33	6.31	36.93
1973	2.56	6.38	40.13
1974	2.56	6.62	38.67
1975	2.65	7.20	36.84
1976	2.65	7.33	36.09
1977	2.00	5.95	33.61
1978	1.94	8.63	22.54
1979	1.92	7.91	24.27
1980	1.90	6.20	30.66
1981	1.82	6.12	29.81
1982	1.87	6.28	29.77
1983	2.26	9.91	22.78
1984	2.28	10.25	22.23
1985	2.40	10.60	22.61
1986	2.29	10.48	21.88
1987	2.24	10.48	21.35
1988	2.22	10.53	21.07
1992	2.11	11.30	-

<sup>a</sup>Source : DGLS, 1992.

Table 7. Major agroclimate zones of Indonesia and livestock production system.

Zones	Area	Production system	% contribution of animal to farmer's income	Source
Wet area	West Java	Lowland production system	5 - 13 %	IFAD - 1992
	Sumatera			
	Kalimantan	Upland tree crops animal system	10 - 20 %	
	Irian Jaya			
Dry area	Central Java	Lowland production system	10 - 16 %	IFAD - 1992
	East Java			
	Bali	Upland production system	25 - 41 %	Mulyadi et al 1986
	Sulawesi			
	Maluku			
Semi arid area	NTB	Crop pasture animal	up to 60 %	IFAD - 1992
	NTT			
	East Timor			

### Rural labour.

Based on Agricultural census 1983 there were 17,628,700. farm house holds in Indonesia. Out of this number, there were 4,053,400. households raised cattle, 934,500. had buffalo and 4,735,800. households kept small ruminant. However, female work force in animal production was significant in poultry and small ruminant production (Sri Wahyuni, 1992). In large ruminant production, the role of women is significant in feeding and heat detection. Because rural animal production is operated by small holders the whole farmer family members participate in the whole farm activities. Very few farmers hire labour. This means that animal production utilizes all family labour force up to optimal level. This is a very strategic aspect of animal industry to create high employment in rural area.

### Costs and incomes.

The traditional and modern sectors of animal industry differ in cost structure. In traditional system, costs are predominantly unpaid components. About 95% of costs were unpaid resources which had low opportunity cost (DGLS, 1992). The major

unpaid cost components are family labour, land and multi use equipments.

In the modern system however almost 100% of cost components are paid or purchased. Out put and input price fluctuations affect significantly the modern sector especially improved breed of chicken, dairy and commercial farms. This cost/price fluctuation reduces farm income.

The major problem to day in Indonesian animal industries is continuing decline of farm terms of trade as shown by cost/price squeeze. This condition is worsened by low productivity, poor management skill, low equity and weak resource base, especially capital to improve the economies of scale.

### Animals and animal products import and export

Indonesia is a net importer of animal and animal products. The major commodities imported are animal breeding stock, calves, meat, milk and other dairy products. The major commodities exported are animal hides, bones, pigs (DGLS, 1992).

To expand dairy cattle population and quality, dairy breeding stocks have been imported from USA, New Zealand and Australia. The cattle were

distributed to dairy farmers on credit basis. The impact of dairy cattle importation on local milk production is shown by the declining trend of milk importation. The ratio between local milk production and imported, was reduced from 1 : 20 in 1979 to 1 : 1.6 in 1994 (Soehadji, 1992).

To supply quality meat to hotels, restaurants and other users, the importation of calves has been implemented. The development of calf fattening scheme is encouraged to certain extent for domestic as well as export markets.

### Livestock and Poultry Development Problems

The potential problem in animal production development in traditional sector is low investment capability of farmers, feed quality, low animal health, low reproductive capacity, less efficient management skill, lack of market incentive and lack of institutional support. As long as the development approach in traditional sector is horizontal expansion of livestock and poultry production, the above mentioned problems are the 7 major constraints. The impact of these constraints are slow rate of expansion, high young animal mortality, low productive as well as reproductive performance. The nature of the constraints is highly related to location specific conditions. The dominant traditional production structure has not been supported by adequate infrastructural development. The support services such as credit, better market and input as well as output delivery system, hardly reach small farmers.

In the modern sector however, the problems are mostly economic in nature such as cost/price squeeze, inflation, exchange rate and institutional. The quality of breeding stocks, feeds and other inputs very often create problems. The vertical approach of animal development, requires high adoption of technology to improve efficiency. Therefore cash input is dominant in the structure of cost of production. The product quality and international market penetration are the major concerns of the modern sector of animal production.

To improve the over all performance of animal industries, *partnership between the traditional and modern sector* must be established. The concept of agrobusiness to support the development of agro industries in animal production is now being implemented. Three agribusiness activities are operated : 1) beef cattle in which calf for fattening still imported, 2) dairy in which breeding stock

importation is required, 3) poultry (egg and broiler) in which GPS still imported.

To support this concept, a solid institutional reorientation must be implemented, which requires conducive environments for small farm development.

### Policy Needs

To anticipate the downward trend in cost/price and to improve infrastructural support several policies have been developed. They can be grouped in 4 areas e.g. which has tried to relax the forces that create cost/price squeeze; the other one is to reduce the impact of that forces the third is to develop rural institutions, information and education which stimulate farmer's participation through farmer's group, and the fourth is decentralization of animal development.

The first area of the existing policies mainly involving exogenous approach by means of the tariffs manipulation and export taxes through deregulation. The aim is to slow down the cost/price squeeze by improving farmer's price received and paid. The most popular deregulation policies are elimination of import tariffs for breeding stocks, feed stuffs, supplements, drugs and vaccines. In export sector, taxes were reduced. The result of these policies are hardly notified at farmer's level especially small farmers. The inflation however increases cost and worsened the condition of cost/price squeeze.

The second area, stimulates productivity improvement, improves economies of scale by improving farmer's resource base to maintain farm income. The productivity growth is enhanced by research and extension. The improvement of farmer's resource base is done within the frame work of the family labour optimization to full employment as long as industrial sector can not absorb farm labour surplus. The impact of this policy is seen in modern poultry industries, but hardly observable in traditional sector except in animal credit or sharing schemes.

The third area is aimed at developing and strengthening rural institutions through group or cooperative movements to improve information and education which increases farmer's participation. Farmer's groups are growing and rural cooperative movements are encouraged.

The fourth group are decentralization of animal development and responsibility to Kabupaten level. This is a new policy which aims at improving



efficiency and effectiveness. This is a long term policy perspective which can not be measured in a short term period.

To improve the effectiveness of decentralization, the focus of development should be centered to :

- 1) optimize the utilization of low opportunity cost resources such as family labour, forage under tree cropping, agroforestry and grazing land .
- 2) intensify application of technology which is fitted within the existing socio-economic frame work which can improve reproductive capacity, growth and live ability.
- 3) improve access to factors of production, credit and market.
- 4) encourage the development of partnership for sustaining production system.
- 5) encourage the improvement of environment and animal production zoning.

Decentralization relates development issues to geographical perspective. This policy is directed to improve development approach to location specific environment and to improve the effectiveness and efficiency of project planning, implementation, evaluation and control. The regional staffs are encouraged to develop any livestock employment opportunity which supports livestock agro-industries and to create added values within the available market frame work in the region or outside the region.

The four policy areas involved, relate animal industries growth to anticipate demand increase. However, the basic strategy of animal production growth must emphasize 3 aspects, *increased production, increased rural employment opportunity and improved environment for long term sustainable production*

### Conclusions

Since animal production is crucial to fulfill demand increase, rural employment and improved environment, major programs of *capital and technical assistance* for high animal production growth are needed. In addition to that, investment in infrastructure and development of rural institutions should follow.

The development requirements are of necessity in the second 25 year national development in which demand growth of animal products will be higher than that of the first 25 year national development. Since ruminants (beef, milk and draft power) are important animal species in the development of rural economy, the stronger domestic demand growth in the second 25 year national development can accelerate growth in animal production. Therefore more *infrastructural support* should be directed to small and medium farm development. Better incentives should be given to modern sector of animal industries. *Input quality control* must be implemented. Breeding farm must be encouraged to produce better calves for fattening, better dairy cows, better quality chicks.

To realize the basic animal development strategy above, emphasis should be focused to improving reproductive capacity, the development of technology that can be adopted by small and medium farms which can utilize resources with low opportunity cost such as marginal land (dry and semiarid zones), animal - tree - crop integration, native pasture, crop residues and animal - agroforestry integration within specific production zones.

This enhance the development of agrobusiness and partnership between the modern and traditional sectors..

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