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PREFACE

The preparation of this report was part of the activities for the FAO project "Future prospects for the contribution of village poultry production to food security in developing Asian economies" (GCP/RAS/228/GER) that was funded by the "Deutsche Gesellschaft für Technische Zusammenarbeit GmbH (GTZ)". The production systems of small poultry producers show a significant variety from very low input systems with scavenging birds to those with improved genetic resources, supplementary feeding and animal health interventions. In many countries the exact type of poultry used in the small production systems is presently not well understood. The recognition of the needs to fully consider poultry genetic resources and their genetic diversity has only recently got momentum due to the outbreaks of Avian Influenza and the related control measures. A good understanding of the production systems of small poultry producers including their priorities and constraints is also required to design and implement appropriate control strategies for the small poultry producers. This will help to achieve cooperation and proper involvement of small farmers in disease prevention and control programmes. It will also assist Governments to make appropriate plans for designing and implementing their disease control strategies. The present bibliography summarizes published reports and grey literature about poultry production in Indonesia in the fields of (i) Management and feeding systems, (ii) feed resources, (iii) poultry genetic resources, (iv) marketing systems, (v) poultry health and health control systems and (vi) cultural issues. The report also includes abstracts of research papers without an English summary. A database with the abstracts of the remaining papers is available on request from the author or from the Animal Production Service (AGAP)[1] of the Food and Agriculture Organization of the United Nations (FAO). We hope this report will provide accurate and useful information to its readers and any feedback is welcome by the author and AGAP.

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Poultry Management, Poultry nutrition, Poultry breeds, Marketing, Poultry and Culture

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ABSTRACTS

1. EVALUATION ON THE DEVELOPMENT OF THE MOJOSARI-ALABIO DUCK AND EGG MARKETING AT THE PRODUCTION CENTRE OF THE BLITAR REGENCY

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(Source: Seminar Nasional Teknologi Peternakan dan Veteriner 2005/National Seminar on Animal Science and Veterinery: 836-844)

The aim of this research is to obtain data on annual egg production and to obtain technical information, socio-economics, the MA (Mojosari-Alabio) duck progeny production material, and its marketing potential. This research is carried out in 2 phases i.e. 1) field observation and 2) survey. The observation activity is conducted each month for one year which includes four plasma (associated) farmers and one core (investor) farmer at a scale of 540 – 7000 ducks. The data collected in this activity consist of growth, feed consumption, mortality, production, and production cost. The survey is conducted to know the chain of business in marketing of duck eggs in Blitar through interviews with market doers (sellers, farmers and others). Technical and economical data is presented in a descriptive and the financial analysis is done in a simple manner.

The main feed for ducks is a mixture of concentrate, prawn waste (head), and rice bran that is prepared by the main farmer. Concentrate and the prawn heads are bought by the core farmer which payment can be made a few days later after purchase while the rice bran is acquired by the plasma farmer. The financial analysis reveals that the core farmer receives the highest profit. The lowest profit is earned by the plasma farmer at the small scale business.

Marketing chain of duck eggs is relatively long. Plasma farmers must sell eggs to core farmers. Core farmers sell them to egg agents. Usually an agent is someone who is already known and is trustworthy (still buying even though the price is high or low). This agent is someone with a reputation of buying twice from the grocer and they thus have business ties. These agents sell eggs to retailers, who in turn are doing direct transactions with consumers. Sometimes (only incidentally) there are also consumers who buy eggs directly from the plasma farmer.

Duck eggs supply fluctuates due to the farming pattern and weather condition. Supply of eggs increases high in the month of September until February. Duck eggs' price varies and are grouped based on their sizes. This grouping is divided into three categories, i.e. grade A (diameter >4.7 cm); grade B (diameter 4.2 < d ≤ 4.7 cm); grade C (diameter ≤4.2 cm). Eggs are usually sold per egg, not by weight (in kilograms). The relationship between core and plasma farmers is based on trust. Both realise their role and position. To bind the trustworthiness between plasma and core farmers, core farmers usually give loan to acquire feed and plasma farmer will pay the equivalent price when he sells the eggs to the core farmer.

2. Survey on Marketing of Indigenous Chicken in Solo and Semarang (41)

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(Source: Jurnal Ilmiah Penelitian Ternak Klepu Volume 1 Nomor 1 Maret 1993:7-13)

Central Java Province is the producer of indigenous or local chicken. This research is aimed to gain information on the marketing pattern of local chicken, especially in Solo and Semarang (Central Java province). This research is conducted quantitatively through a survey with 30 respondents (15 respondents in Solo and the other 15 in Semarang). The parameter that has been noted is the identity of the seller, purchasing, delivery, selling, storage, standardisation and economic analysis.

From the survey result it is known that sellers in Solo and Semarang each formed a trader association. This association conducts routine meetings to discuss and decide many things that relate to their business. With such routine meetings, togetherness amongst them is created and this can be used to regulate the selling/buying price of the local chicken.

The activity carried out by the vendor consists of buying, packing, storing, selling and providing financial support. Most of local chickens (60%) that are sold in Solo are originated from East Java province such as Blitar, Tulungagung, Caruban, Ngawi, Nganjuk, Jombang and Kertosono, and the rest are from around the Solo area (Central Java), such as Sragen, Boyolali, Klaten, Karanganyar and Delanggu. Most of the local chickens that are sold in Semarang (90%) are from Pati (90%) (Central Java) and the rest are from areas close to Semarang. The lowest price of local chickens is found at the beginning of the year, changing of the weather and in the planting season. The highest price occurs in the period approaching the Id'l Fitri (Moslem holiday) festivities, new year, and Christmas, Chinese's new year (Imlek) and at rice harvesting time.

The local chicken selling process is quite long. Farmers sell the chicken to collector-sellers in the village. The collector-sellers sell to collector-sellers at the "kecamatan" (district level) area. Sometimes collector-sellers at the village level sell their chickens directly to collector-sellers at the regency (Kabupaten) area. Collector-sellers at the regency will extend their commodities to wholesale traders in Solo and Semarang and the last mentioned traders in turn will supply the commodity to grocers in Jakarta and also sell to restaurants and slaughter chicken sellers.

The next activity is packing. This activity is carried out to distribute chickens to other regions. Chicken are placed (packed) in square baskets with the capacity of 14-30 chickens per basket. Usually the baskets are made of bamboo interweaving. The baskets containing chickens are delivered to Jakarta (about 85.7%) whilst those for the local market are around 14.3%. The system of payment from the vendor in Solo/Semarang to vendors in Jakarta is by cash payment.

Chickens that belong to collector vendors in the regency have been standardised based on age group. Young chickens are divided into 7 groups (young I-VII) and hens are divided into 3 groups (special hen, young hens and old hens). Vendor spends money in conducting their business in local chickens and the way they do it varies. The cost that needs to be spent includes transportation, baskets provisions, labour, feed, retribution, and security cost. Chicken delivery cost from Solo to Jakarta is cheaper as compared to delivery from Semarang to Jakarta, it is because the number of chickens delivered is larger.

3. REARING Local LAYER Chicken USING BATTERAY SYSTEM (SMALLFARMER'S EXPERIENCE) (42)

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(Source: unpublished report 1986: 27-30)

This research is carried out to identify egg production of local chicken that are caged in batteries compared to free roaming systems. A battery cage consists of 70 chickens consisting of 47 adult local chicken hens and 5 black Kedu chickens at a productive state, and 18 young local chicken hens that have not reached the reproductive state. In the limited free roaming system, there are 26 chickens reared which consists of 1 rooster of black Kedu progeny, 3 young rooster local chicken, and 22 young local chicken hens. All chickens are released during the day and housed in a cage at night. Feed that is given is from all kinds of feedstuffs that are obtained from the garden, with additional feeds bought from the vendor such as concentrate, mineral, grit, and bone meal. The composition used in the producing hen ration and young hens is 12 kg of concentrate, 15 kg of ground corn, 25 kg rice bran/polishing, 1 kg grit, 1 kg B-12 mineral, and 1 kg bone meal. For starters, the feed given is ready used starter ration.

The reason why people like to rear local chicken and expects to get eggs is because it can give additional income to the family, and their children can also help the family in rearing chicken. Also local chicken rations can be made in accordance with the chicken's environment. Each local chicken can produce monthly around 35 eggs or more. From the egg production records in 3 months it is shown that the common local chicken production is a little less profitable as compared to black Kedu chicken production. The common local chicken produces around 43-65 eggs in 3 x 25 days whereas the black Kedu chicken produces 77 eggs in 3 x 35 days.

4. EXPERIENCE IN REARING LOCAL CHICKEN

(SMALLFARMER'S EXPERIENCE) (43)

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(Source: unpublished report 1986: 30-36)

Developing local chicken these days still uses the traditional method, thus its development seems very slow. Due to that it is necessary to find new ways/breakthrough in developing local chicken rearing. The research was conducted by using 5 local chicken hens and one rooster of a superior (imported) breed. Chickens are reared according to the free ranching system in accordance to what people usually do.

From the 5 hens mentioned above, 2 are chosen which in the future will be used to naturally brood the eggs. This selection is based on how big and the thickness of the fur. Hens that are not selected are bathed (soaked wet) if that hen shows any indication that it will brood for 3 days in a row. This hen will lay eggs again after being released for 15 days with the rooster. The cage for laying eggs is made of bamboo. Before the cage is used, the floor of the cage will be spread with used tobacco leaves to prevent lice infestation. For the chosen hens, after they finished brooding the eggs, the newly hatched chicks will be separated and reared separately. This hen is supposed to brood eggs twice. After they are finished with brooding, the hen will be bathed (soaked wet), similar to the other hens. Usually this hen will lay eggs again on the third week.

The separated chicks are reared in a small box made of board or wooden planks or used boxes with newspaper as lining. To adjust the surrounding temperature, the heat from a kerosene lamp is used for 10 days. The ration given for the initial 15 days is commercial feed. At the age of 15 to 30 days, the chicks are given starter ration in the morning. In the afternoon and evening, the chicks are given additional feed consisting of concentrate, ground corn, and rice polishing (bekatul) (1:2:10 kg). After they are 2 months old, the chicks can be released and given additional feed consisting of concentrate, corn, and rice bran, with the composition of 1:6:30 kg. To maintain their health, the chicks are vaccinated against New Castle Disease at the age of 4 days, 4 weeks and 3 months. Vaccination at 4 days and 4 weeks are given by way of mouth drops, while the vaccination at 3 months of age is through injection.

Observation on egg hatching results shows that 152 chickens are hatched and 143 out of 152 chickens can live until adulthood. Another advantage is that 29 eggs can be sold and consumed while the hen is still hatching. Of course the number of chicken produced is larger than the number of chicken hatched in a conventional way, and it only produces 35 chicks. Due to that fact, the use of hens for hatching eggs is similar to the ability of hatching machines. Using brooding hens for hatching is not as difficult as maintaining hatching machine.

5. REARING AYAM BURAS IN BATTERY CAGES

(INFORMATION FROM MEDIA) (**44)**

I Putu Sumantra

(Source: Indonesian Poultry Magazine No. 84/Year VII, December 1986: 36-37)

To start rearing local chicken in battery cages, the first phase that needs to be done is to select the chickens. The selection is carried out based on the origin of the chicken (stock of local chicken and free of diseases), age (3-4 months), and body shape. The second phase is to arrange the cages. Cages used for rearing hens are staged. The cage is an individual battery cage. The next step is feeding. The feed given is a mixture of concentrate, rice bran, and ground corn with a composition of 3:4:3. The feeding is carried out twice per day in the morning and in the evening, with total consumption of 60 to 80 grams per chicken per day. In addition, the chickens are fed additional feedstuffs consisting of spinach, taro leaves, elephant grass, and other feeds which are minced (cut in small pieces) before being given to the chickens. To maintain their health, vaccination for chickens is also carried out. The vaccination given is ND vaccination that can be done by the farmers themselves.

To support or start a new business in intensive chicken farming, farmers can borrow money from banks or other financial institutions. Usually they will be given loans for a period of two years as capital with 2% interest per month for 3 months. This loan will not be a burden to the farmers as it can be paid in instalment for 21 months.

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6. LOCAL CHICKEN in Village Condition (Traditional) and IN Appropriate Rearing (45)

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(Source: Unpublished Report, 1986: 61-76)

The development of local chicken farming has spread all over Indonesia, however its population is still low and the population increase is also slow. Besides, the obstacles faced by the local chicken farmer are high mortality and low egg production. Data on local chicken performance conducted in a traditional manner and by rational rearing is summarized and presented here. The idea of putting local chicken rearing business as a side business is dominating the village society's activity. The local chicken rearing condition seems not being looked after (roaming/wandering around and seeking for its own feed). With such rearing pattern, the growth of the local chicken rooster is faster than the growth of the local chicken hen (1697.78 vs 1450.63 grams at the age of 32 weeks). However, if it is compared to the improved imported chicken breed, the growth of local chicken is much slower. Improved chicken weight can reach 1449.48 grams in 24 weeks.

One of the reasons why local chicken productivity is low is due to its long weaning time (107.09 days), apart from its unselected breed status, feed quality, and hatching performance. There is a positive correlation between DOC body weight and weaning body weight and their sex maturity. No correlation exists between weaning age and sex maturity. The carcass percentage seems to decline in relation to age increase.

Intensive rearing gives better results. It is noted that mortality amongst chickens at the age of 1-12 weeks is only 4%. For meat purpose, rearing local chicken is uneconomical because of the high feed conversion (4.5) at the age of 0-12 weeks and

around 7.12 at the age of 12-20 weeks. The age for sex maturity that is reared rationally decreases and it is close to that of improved breeds.

When local chicken is crossbred with improved broiler, the crossbred chicken has higher feed conversion compared to the original broiler. However, this crossbreed still needs to be further examined from numerous competent sources. The effort to fatten the chickens is through castration amongst the roosters at the age of 12 weeks. The castrated chickens will gain weight by 796 g with little feed conversion (8.07) compared to those without castration with weight gain by 682 g and feed conversion (8.62). The carcass percentage of castrated rooster is higher (65.47%) compared to that of non castrated rooster (64.16%).

7. LOCAL CHICKEN Rearing Pattern ON Farmer Income Level in Dry Land East Nusa Tenggara (46)

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(Source: Prosiding Pengolahan dan Komunikasi Hasil Penelitian/Proceedings of Management and Communication of Research Results: 256-260)

The local chicken rearing pattern in NTT is far more different to the rearing pattern in Java. Chickens are free roaming in the yard and are only given a place to perch at night. To increase the farmers' income, they tried to use the semi-intensive rearing pattern. The aim of this research is to identify local chicken semi-intensive rearing on farmers' income in the dry land of NTT.

The research was conducted for one year. Farmers are divided into four groups and are given different treatments. Group I did the extensive rearing and was used as a control. Group II, did the extensive rearing and routine vaccination. Group III was given cages, routine vaccination, and feed. Group IV were given a full subsidy and cages, routine vaccination, feeds, and chickens (10 female + 1 male). For group III and IV, chickens are given additional treatment i.e. by separating chicks, providing good quality feed, limitation of egg hatch, and providing additional feed such as rice bran, corn and fish meal.

Based on the research result, there is an increase in chicken population in the groups that are given animal production facilities and are fully subsidised, because during rearing time, chicks are separated at the age of 2-4 weeks. The average weight of the chicken at the age of 5 months for group I and II does not relatively show that much of a difference, i.e. 730g vs 767g for rooster and 786g vs 744g for hen. This indicates that providing feeds, maintaining good environment and good management will affect local chicken growth. Mortality rate of the chickens is still high (above 10%). This is due to predators including pigs and dogs in Nusa Tenggara Timur.

Increase in the farmer's income is obtained from eggs and chickens. For groups III and IV, the income is 2-3 times higher that that for groups I and II. This is due to availability of eggs and chickens in groups III and IV at the time when the price of that commodity rises on certain days.

8. The Development of Local Chicken Rearing Thorugh Women Farmer's Group in Dry Land (47)

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(Source: Prosiding Pertemuan Ilmiah Hasil Penelitian Peternakan Lahan Kering, Malang 26-27 Oktober 1994)

(Proceedings of Scientific Meeting on Animal Research Results in Dry Land, Malang 26-27 October 1994: 424-429)

This observation is carried out to identify the rearing management system, marketing, and local chicken productivity that are reared by the woman farmers group in the District of Prambanan, Klaten Regency[2]. The observation is performed by a survey method through an interview with 25 members of the farmers group and to the group organizers, group supervisors, and agricultural extension workers. The District of Prambanan has 2,433 ha land area consisting of 56.8% rice fields and 43.2% dry land. The number of population (in 1992) is 64,199 people which consisted of age productive groups (15-40 years) for men and women and each was 30.65% and 16.5%, respectively. Local chicken, improved breed chicken, and duck populations are 61,815 local chickens, 22.459 for improved breed chicken and 3,566 ducks. The women farmer's group is formed as cooperation between the staf of the Family Planning Institution and that of the Agricultural Extension Association and its goal is to increase the intensification of family planning extension. The organizer and member of the women farmer's group originates from members in the Sedyo Luhur Kencana and Sedya Langgeng Kencana Family Planning Associations (usually productive couples) in the District of Prambanan, who have the desire to do business through local chicken rearing. The survey result shows varieties of data of local chickens as follows. The ownership of local chicken is aorund 5-106 chicken averaging 29.4 ± 24.4 chickens per person. Egg production is around 7-12 eggs per chicken per period with 9.1 ± 1.6 eggs and production times around 5-6 times per year. The average number of of hatched eggs using a brooding hen is around 8-10 eggs per chicken with hatching ability of 75-85%. The ratio between rooster and hen is 1:10 (according to standard custom). The caging system is done intensively using a ranch system (caging chicken in fenced cages). The advantage of the caging system is that chickens cannot roam around freely and by this way it can reduce or press the mortality rate. In relation to feed, consentrate is given to the chicken during the age of 1 day – 1 month and is 1 kg/10 chickens per month. At the age above 1 month, chickens are given rice bran/polishings, corn, and vegetables (kangkung, papaya leaves, and sprouted bean skin) or kitchen leftovers (dried rice and residue), in the amount of 0.15 – 2.5 kg per chicken per day; 0.2 – 3.5 kg per chicken per day; and as considered sufficient. Attempts to prevent diseases, include ND vaccination carried out routinly every 4 months. For egg marketing, farmers sell directly to comsumers in the market or fried chicken seller at the marketing department of the association. The positive impact of having coordination in chicken trade is that there is no competition among association members in the price of chicken and eggs. Beside that, the number of chickens reared in the association is well controlled.

[2] The occurrence of women farmer's group in rearing local chicken are reported in Boyolali and Bali, respectively by Anonymous, (1990) and Anonimous, (1993) (see references used by the respective authors).

9. Evaluation of the Potential of Local Feed Sources and Institutionalised System in Supporting the Continuity of Local Chicken Business (48)

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(Source: Laporan Proyek Rekayasa Teknologi Peternakan ARMP II Tahun 1999/2000/ Project Report on Animal Technology Manipulation, ARMP II 1999/2000: 21-28)

The research performed is to identify the potential of local feed sources, the variety of institutionalization of breeding activities, hatchers, and fattening, as well as business opportunity. The research is carried out in the village of Kebumen, District of Sukorejo, Regency of Kendal, Central Jawa from July 1999 until March 2000. The research is performed through direct observation and interviews with 8 parent stock breeder with the ownership of 50 hens and 5 roosters, 2 hatchers with a capacity of 500 egss per period, 2 local chicken meat farmers, 2 local chicken layer farmers. The research result shows that the potential of feedstuffs resources for local feed that are used by the farmers are corn and rice bran. However, the average monthly supply of corn and rice bran in the District of Sukorejo is only 59.75 ton (13.3% for what the farmers need) and 38.38 ton (17.9% of the farmers need), respectively. The stategy used by the farmer to overcome insufficiency in the feedstuff supply is to offer ready made feed (they buy it from the factory) to the birds mixed with rice bran in the proportion of 1:2, 2:3, or 2.1.

Institutionalization as seen from the viewpoint of target and realisation for parent stock includes production of eggs for hatching (85 vs 80%), egg production (60vs 45%), and mortality (5.25 vs 3%); hatcheries, include fertility (95 vs 90%), hatching capacity (500 vs 400 chicks/farmer), hatching capability (90 vs 80%), DOC production (800 vs 600 chicks/brooder/month), production of 1 month old chicks (600 vs 500 chicks/brooding/month), body weight at 1 month of age (150 vs 140 g), and mortality (10 vs 7%); and fattening reaching a body weight at the age of 3 months (700 vs 650 g), body weight of layers at the age of 5 months (850 vs 850 g), body weight for broilers at the age of 7 months (1 vs 0.8 kg) and mortality (12 vs 19%).

Concerning parent stock growers, mature hens are crossbreed with pelung roosters and kedu roosters, with a composition for each farmer-parent stock grower, each 50% and 50%. For the hatchers, the different target and realisation of hatching capability, DOC production and production of chicks aged 1 months is relatively small, so the farmer doing fattening are able to have more reared chickens (2000 vs 2998 chickens). In addition, the mortality level of the chickens in the fattening group is quite high due to the unsuitable use of vaccine during the second vaccination and this has caused the chickens to be susceptible to diseasaes. From the **business opportunity** point of view, there is a price increase every month in feedstuffs, ready for use feeds, hatched eggs and eggs for consumption, DOC, young and adult layer chickens and live chicken meat. Regarding feedstuffs, the highest and lowest price for corn is Rp 1,100 and Rp. 700/kg and the highest and lowest rice bran price is Rp. 950 and Rp. 500/kg. The highest and lowest price for ready made feed is Rp. 1,500 and Rp. 1,100/kg. The highest and lowest prices for hatched eggs are Rp. 700 and Rp. 550 per egg. The highest and lowest price of consumption eggs are Rp. 550 and Rp. 400 per egg. The highest and lowest prices for DOC are Rp. 1,300 and Rp. 750 per chick. The highest and lowest price for young layer chickens is Rp. 12,500 and Rp. 7,500. The highest and lowest prices for mature layer chickens are Rp. 20,000 and Rp. 10,000. The highest and lowest price for chicken meat is Rp. 13,000 and Rp. 7,500/kg. The increase in price that happens each month is causing the farmers to have difficulties in determining the nett profit, developing business and determining investment needs for business.

10. Local Chicken Rearing Profile in South Kalimantan

(Case Study in the Murung Panti Village, District of Babirik, Regency of Hulu Sungai Utara and in the Rumintin Village, District of Tambarangan, Regency of Tapin)(49)

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(Source: Seminar Nasional Teknologi Peternakan dan Veteriner 2004/National Seminar on Livestock and Veterinery Technology 2004: 555-561)

The research was performed to compare the local chicken rearing profiles of intensively and semi-intensively production systems[3]. The research was carried out in the Murung Panti Village where most of the rearing system were done intensively[4] and in the Rumintin Village where all rearing systems were done semi intensively. The research method applied was observation of the rearing system and through interviews with local chicken farmers. The research results show that there is a high similarity in the farmer's profile, the average production of eggs per chicken per period, and the effort to prevent diseases in the villages of Murung Panti Village and Rumintin. The farmer's average age (46.9 vs 42.9 years old), percentage of the family labour usage (81.9 x 100%), status of chicken rearing as side job/business (72.7 x 100%) and activity in the farmer's group/association that conduct regular meeting once a month. The average for egg production in both villages are 12 eggs per chicken per periode with the effort to prevent diseases was done by regularly cleaning the cage once to twice per week, ND vaccination, and medication to sick chickens.

The difference in both villages is found in the farmer's profile, rearing system, productivity, socio economic, and farming obstacles. The difference in farmer's profile in Murung Panti Village and Rumintin is that there is a dominance in formal education upbringing which is SLTA (High School, 45%) vs SD (Primary School, 76.93%), main working status composition which is trader (45.5%), chicken farmers (27.3%) and teachers (27.3%) vs rubber farmer (100%). Chicken farming experience which is 10.9 vs 2.5 years.

The difference in the **rearing system aspect** in Murung Panti Village and Rumintin is the shape of cages, which is battery individual vs caged during the night; the number of chicken that are reared is around 200 -2,000 chickens vs 10 -100 chickens, feed percentage, which is rice bran 70 vs 80%, starch 5 vs 0%, commercial feed 19 vs 2%, salted fish 3 vs 0%, grit and mineral 2 vs 0%, kitchen leftovers 0 vs 5%, corn 0 vs 2%, vegetables 0 vs 5%, rubber seed 0 vs 2.5%, and yams 0 vs 2.5%; and the comparison between man made hatching and natural hatching is 50 and 50% vs 13.3 and 86.7%.[5].

The difference in chicken **productivity aspect** in Murung Panti Village and Rumintin is that there is a difference in frequency of egg laying, which is 9 vs 6 times per year, average eggs weight is 41.57 vs 40.69 g, budding capability is 88.92 vs 63.68%, hatching capability is 61.53 vs 45.94%, and chicken mortality until the age of 12 weeks is

[3] The meaning of "intensive" perceived by the author is chicken kept in cages all day long by the battery system and the level of dependence on the farmer is 100%, whereas "semi-intensive" is chicken being released freely from morning till evening with a level of dependency to the farmer of < 100%.

[4] There is no data found on percentage of the population doing the intensive chicken rearing system.

[5] The tendency in the difference of occurrence in hatching method is caused by the high intensity of electricity black-outs in the village of Rumintin.

23.76 vs 28.71%. Chicken productivity difference is caused by the feed quality and rearing management while the difference in budding and hatching capabilities are influenced by the different additional factors which are ratio male-female and hatching method. Difference from the **social aspect** of view are each in the estimation of the components of chicken rearing, easy rearing (66.6%) and is profitable (33.3%), gives added value (33.4%), and disease resistency (33.3%). Differences from the **economical** aspect in Murung Panti Village and Rumintin are composition of the product to be sold, i.e. eggs (83.3% vs 50%), chicken (0 vs 33.3%), and chicken droppings/excreta which is relatively the same, 16.7%; selling intensity as routine (weekly) vs non-routine (every 1 – 3 months), marketing area boundaries, which is inter province vs inter-regency; investment sources composition, private capital (33.3 vs 13.3%) and loan capital (66.7 vs 86.7%); and cost allocation, that is the germ (57.58 vs 50%), cage (23.29 vs 25%), feed (18.86 vs 25%) and medicine (0.24 vs 0%). The difference perception amongs the farmers toward **obstacles** that are faced by the farmers are marketing (0 vs 13.2%), selling price (0 vs 20%), capital (0 vs 20%), feed (41.7 vs 20.2%), mortality (0 vs 20%), diseases (8.3 vs 6.6%), parent sock (8.3 vs 0%), no obstacle at all (41.7 vs 0%). Generally, the problems faced by the farmers in Murung Panti Village is the high price of feeds and difficulties in obtaining good and healthy parent stock in relatively large quantities. The problems faced by the farmes in the Rumintin village is the selling price which fluctuates, capital, feed price and the high mortality of chickens.

11. A Study on Management of Hatched Eggs Production of Domestic Chicken Rearing in Village Areas (50)

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This research was carried out to identify the difference in the performance of local chicken at the brood-unseparated chicks (*eram-asuh*) rearing system with brood-separated chicks (*eram-pisah*) rearing system in relation to its economical analysis. The research was carried out for six months (November 1992 to April 1993) at Cibiyuk village, district (Kecamatan) of Ampelgading, Regency (Kabupaten) of Pemalang, Central Java. The research methodology applied was through observation of 4 farmers consisting of 2 farmers using *eram-pisah* rearing system and 2 farmers who use *eram-asuh* rearing system. Each farmer rears 14 hens around the age of 5-6 months (have never laid eggs) and 2 roosters around 1 - 1.5 years of age fed the same rations. The research result shows that there is a difference in egg performance between *eram-pisah* rearing system and *eram asuh* rearing system; each from the average of egg production per 6 months (211.5 vs 184.75 eggs), frequency of laying eggs during production (2.3 vs 1.1 times), percentage of eggs hatched (76 vs 57%), eggs production hen-day (16.78 vs 14.43%), feed consumption per chicken per day (94.22 vs 90.13 g), feed efficiency (2.59 vs 2.47), body weight of one month old chicks (7.1 vs 3.8 g), body weight of 2 months old chicks (14.2 vs 6.6 g), and mortality (16.23 vs 25%). Apart from those, there is similarity in the performance of the chickens that are reared using the *eram-pisah* system and *eram asuh* system, i.e. the weight of the egg (36.25 vs 36.47 g each), the ability to hatch from the total number of eggs (47 vs 48%), and the ability to hatch from fertile eggs (between 69 – 84%). Analysis of the *eram pisah* and *eram-asuh* rearing system production data shows that (1) there is a difference in eggs production due to existing difference in the frequency of egg laying. (2) The total number of eggs hatched at the *eram-asuh* system is relatively higher because they have more time to lay eggs, (3). There is a difference in the number of eggs that were hatched which resulted in the different number of egg selling for egg hatching and eggs for consumption. Eggs for hatching is more expensive compared to eggs for consumption (Rp. 700 vs Rp. 300 per egg). (4) The ability to hatch is relatively lower than the ideal condition (69 – 84% vs 81 vs 96%). This condition may be caused by the relatively young hen and rooster used in the research, (5) There is a difference in body weight between chicks in the age of 1 and 2 months due to the feed consumption and efficiency at the *eram-asuh* which is lower compared to the *eram-pisah*, and (6) There is a difference in the mortality rate because the hens at the *eram-asuh* system has limited ability to nurse chicks, especially for cases with > 8 chicks. Despite that, the economical analysis for 6 months observation by considering the cost of feed, cage, and medicines[6], shows that the *eram-pisah* system is more beneficial compared to the *eram-asuh* system (Rp. 494 vs 402 per chicken). This condition is caused by several factors, i.e. (1). Egg production in the *eram-pisah* rearing system has relatively high egg production due to the ability of the hen to reproduce after the eggs are hatched, (2) The cost for making and wearing off of the cage in the *eram-pisah* rearing system is relatively low compared to *eram-asuh*, which is Rp. 250,000 and Rp. 25,000 vs Rp. 200, 000 and Rp. 20,000. This is due to additional cost allocated for making the special cage for the hen to take care of the chicks, and (3). Feed and medicine costs at the *eram-pisah* rearing system are relatively lower compared to *eram-asuh* because there is an additional cost allocated for feed and medicines.

[6] Comparison between cage feed cost, and medicine is not explained in details because the photocopy reproduction result is unclear

12. DUCK FARMING PROFILE AT THE FARMING SYSTEM IN THE SWAMP AREA AT LEBAK (A CASE STUDY IN DESA SEIAB, HULU SUNGAI TENGAH, SOUTH KALIMANTAN)

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This research is conducted in order to identify the contribution and prospect in developing duck farming business at the farming system in the swamp area of Lebak. The research is carried out in the village Desa Setiab, Hulu Sungai Tengah, South Kalimantan in August 2003. The research method used is a field observation and survey with structured questionnaire to 10 randomly selected respondents. The research result shows that description of Lebak swamp land is characterized as stagnated water that can reach more than 200 cm high during the rainy season and no stagnated water in the dry season. The stagnated water height varies depending on the hydrotopography, rain pattern, and river water level. In the rainy season, mud settles as a result of mud carried by the rain from the highlands so that it enables to increase the fertility of the land. Description of farming in Desa Setiab is characterized by planting of paddy (rice) and or peanuts and rearing ducks. Rice planting is carried out when the rainy season is approaching (for the paddy type surung) and or during the dry season (for the paddy type rintak season), while peanuts planting is carried out during the dry season. Duck rearing is carried out in a traditional way, i.e. ducks are herd in the rice field from morning until evening. At night, ducks are confined in a cage and are fed with a ration consisting of rice bran and steamed snails (1 kg: 3-4 ducks). However, ducks are put in the cage all day when the dry season comes (around 4 months). Duck ownership is around 50 –100 ducks per farmer with the objective of getting the eggs. Purchasing of duck progeny seed material is obtained from earnings through the selling of unproductive ducks. Based on the economic analysis of the farming, duck rearing provides the biggest contribution to the farmer's income, which is Rp. 4,914,000 (58%) vs Rp. 1,938,750 (23%) for paddy rice planting and Rp. 1,597,500 (19%) for peanut crop production.

Supporting information for the above economical analysis are as follows: (1). The level of the farmer's income from paddy as commodity is Rp. 3,500,000 per planting season with a land area of around 0.5 – 0.75 hectare per household, productivity 3.5 tons per hectare, and ratio value R/C 2.24, (2). The farmer's income level from peanut crop production is Rp. 4,175,000 per planting season with a land area around 0.5 – 1.5 hectare per household, productivity 1.67 tons per hectare and the ratio value R/C 1.6 and (3) Farmer's income from duck farming is calculated with the assumption that the price of each egg is Rp. 600 and 13,440 eggs were produced from 100 ducks for 6 months. Based on the income consideration and the high ratio value R/C, duck farming development thus, has a big chance to be improved with better feed and rearing management through selection and modification of the production system which is in line with the agroecosystem.