

# Response and Feasibility of Kub Chicken on Household Business Level in Rural Area Sigi District

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## ABSTRACT

The Indonesian Agency for Agricultural Research and Development (IAARD) already launched many technology innovations including Kampung Unggul Balitbangtan (KUB) which is disseminated in some programs in the Ministry of Agriculture. The success of an innovation is whether the product or technology innovation is accepted by the user. Therefore the study aims to know the response, adoption of the user to KUB chicken technology and the feasibility of KUB household business level, then correlate it with the government recommendation strategies. A survey had been conducted to users in Sigi District Central Sulawesi, and a quantitative and descriptive analysis approach were employed in this study. Proportion analysis was used to measure the general response of users while the detailed responses were calculated using a scoring method. The findings show that more than 50% users have preference for KUB chicken for some characteristics, namely: the higher egg productivity, the higher meat measurement, and the texture of KUB chicken meat which is similar with original native chicken. Even though it is feasible and has a prospective market, the KUB household business level is still in low profit because of its small business scale and not all of the technology recommendations are adopted. The development of KUB chicken needs more chicken nurseries, the specific recommendation of feed arrangement, and the assistance of the technology application.

**Keywords:** adoption, feasibility, KUB chicken, response.

## 1. INTRODUCTION

Native chicken is identically with rural area which are generally people in rural area practiced it. It is common not only in Indonesia but also in other developing countries throughout the world. The significance of native chicken roles for the rural economy in different countries is stated by (1). The native chicken has contributed to a large area on agrarian economy over the years. This contribution supported by rural backyard poultry production which plays a vital role in the rapidly growing economy. It provides livelihood security to the household and securing the availability of food. The backyard agribusiness also provide employment especially women which can also earn an income through poultry farming (2)

The culture of raising native chicken becomes a consideration for some empowerment program of family in rural area such as Bedah Kemiskinan Rakyat Sejahtera

(Bekerja) Program. The Bedah Kemiskinan Rakyat Sejahtera (BEKERJA) program is an effort to alleviate poverty and empower the poor in order to increase income and welfare through integrated agricultural activities which is mostly in rural area (3). The reasons that native chicken was chosen as one alternative way to raise poverty in rural area are: 1)The native chicken usually nurtured in backyard system in rural area in Indonesia. 2). It has a major function especially in providing nourishment, employment, and income generation to meet people's daily need (4). However, since native chicken usually cultivated in traditional way and in a small number, therefore it is mainly purpose as family saving. For example, people harvest the native chicken in occasional time for the feast days or a new school academic year to pay the school expenses.

Alongside the existing of chicken broiler which is commonly being cultivated in commercial business, the native chicken still has a competitiveness to survive. It

has its own particular market. The preference on meat and egg of native chicken considered on its taste, meat leanness and their believe on its healthy nutritions. Although some consumers and farmers opine that native chicken has longer sexual maturity, lesser egg production, smaller size, but the superior characteristics such as disease resistance and large adaptability become a concern (4). Furthermore, other research stated that although the breeds growth rate of native chicken is not as fast as the commercial chicken, has lower egg rates and less meat, but it has many advantages such as: disease resistance, heat tolerance, high adaptation to the tropical climate, and the ability to scavenge for food (5). The last advantage is preferable by the household because it save the feed. The indigenous breeds also well known for their tropical adaptability and capability in protecting themselves against predators (1).

The competitiveness of native chickens is also on those specific markets. Especially in Sigi District, native chicken has market in traditional food namely Ayam Bakar Biromaru, Uta Dada, and other specific occasion foods. The traditional foods specifically use native chicken as material. Other area in Indonesia also uses a native chicken such as Ayam Taliwang in Lombok. Additionally, some consumers prefer the taste of native chicken meat to that of broiler chickens due to its unique taste and texture being more suitable for Central Sulawesi's traditional menus. Finally, native chicken meat is the healthier alternative in that it is low in fat and cholesterol as increasing people's income and knowledge of balanced nutrition intake and healthy food products. As a result, native chicken meat has a higher selling price than commercial broiler meat.

Based on the culture of rural area which are reared native chicken in backyard and the potency of native chicken to raise the household income and also other benefit, government include these innovation technologies into Bekerja Program. Government assistance carried out in connection with the BEKERJA Program by the Agricultural Research and Development Agency in the context of promoting innovations in agricultural research results. One of the innovations in supporting Bekerja Program is Balitbangtan Superior Native Chicken (KUB). KUB is a purebred chicken from the selection of females for six generations with the advantage of high egg production, 60% henday with incubating properties of 10% of the total population. The advantage of KUB chickens when compared to ordinary native chickens is their higher egg production, because the selection is directed at egg production. has the power to grow according to market demand without reducing the quality of local chicken meat in general. (6). Improvements of native breeds through selection are being carried out, but still it has to be given more importance in different countries of the world. According to the Food and Agriculture Organization (FAO), 53% of native breeds of farmed and domesticated animals are at risk of extinction in. (7)

KUB chicken as a new technological innovation needs to be evaluated how the acceptance of the community as its users and how it contributes to the economy of the community in rural areas. Bekerja program develop rural area and reduce poverty by introducing KUB chicken and assistance the technology. Therefore, there is a need a study to know the response of farmers whom get the program and the contribution of the program to the household in rural area.

## 2. METHODOLOGY

The study used primary and secondary data. Primary data were conducted by survey on 60 respondents of users, used simple random sampling method in 2020. The study conducted in two sub-districts in Sigi district. Those sub-districts consist of Sigi Biromaru and Marawola. The data were analyzed used statistical and descriptive methods.

1. Proportion analysis was used to measure the general preferences as response respondents toward KUB program. Hypothesis for respondent to KUB are:

$$H_0: P \leq 50\%$$

$$H_1: P > 50\%$$

$H_0$ : Being expected that less than or equal to 50% users in Sigi have high preferences KUB chicken technology

$H_1$ : Being expected that more than 50% users in Sigi have high have high preferences KUB chicken technology

The significance level is 0.05, used formula

$$: Z_{hit} = \frac{\frac{x}{n} - P_0}{\sqrt{\frac{P_0(1-P_0)}{n}}}$$

2. The respons of farmers to each characteristics of KUB chicken were evaluated using scoring method. The scoring method used Likert Scale for measurement. The value range of respondents' closed response was 1 – 5 from positive statements (expected responses) with a score of 5 up to negative statements (unexpected response) with a score of 1.

The score value calculation used the following formula (8)

$$\text{Score value} = \frac{n_i \cdot s_i}{N_i}$$

$n_i$  = number of respondents who stated in column  $i$

$$(i = 1,2,3, \dots, 5)$$

$s_i$  = score of statement  $i$  ( $i = 1,2,3, \dots, 5$ )

$N_i$  = the number of respondent in row  $i$  ( $i = 1,2,3, \dots, 5$ )

3. Revenue and RC ratio are calculated based on formula from (9)

$$\Pi = TR - TC$$

- $\Pi$  = Revenue
- TR = Total revenue
- TC = Total cost
- TC = TFC + TVC
- TFC = Total fix cost
- TVC = Total variable cost

The total variable cost or TVC:  $\sum_{j=i}^5 C_j = \sum_{j=i}^5 P_j X_j$

$C_j$  = total cost of each input variable of production input  
 j. j=1, 2 ...6. 1–DOC, 2–labor, 3–feed, 4–vitamin and medicines, 5–equipment

RC ratio

R/C is comparison between total revenue and total cost. In calculating the R/C, the decision rule is that if the R/C is greater than 1 (R/C<1) then the farming is detrimental; R/C equal to 1 (R/C = 1) farming is considered break-even and R/C greater than 1 (R/C>1) the farm is profitable or feasible to implement. Mathematically R/C is calculated by the following equation:

$$\frac{R}{C} = \frac{\text{Total revenue (TR)}}{\text{Total cost (TC)}}$$

4. To find out the contribution of the KUB broiler farming business, it is calculated using the formula according to (10):

$$\text{Contribution} = \frac{\text{Revenue of KUB}}{\text{Total Family income}} \times 100\%$$

### 3. RESULT AND DISCUSSION

The Bekerja program has main objective to raise income of household especially that under poverty line in rural area by applied technology innovation. Some indicators are need to know whether the technology were good delivered and how the process worked. However, the success of the program also related with the condition in the location which support the program such as the characteristics of the users or receiver of the program and also support system in the whole system such as the technology assistance from the extension officers, the availability of input and the support of market.

**Table 1.** The Characteristics of respondents KUB chicken business in Sigi District

Characteristics	Average value
Age (years)	43,58
Education	Senior High School
Occupation	
farmer	39%
housewife	61%
Household size	5
Experience (years)	7

The social-demographic influenced the technology adoption in native chicken business (11). As stated in Table 1, the average age of 60 respondents was 43,58. This age is in productive age, which should have enough power to work. Even though the respondents live in rural area but mostly graduated from senior high school. The higher education makes information easier to absorb. The average family size was composed of 5 members. The households living in rural areas and the respondent whom are mainly are engaged in farming activities. Even though most of respondent are woman, but they are come from families who have farming background. Other unique characteristic which are common in rural area is people really care about the animals they are raising. They do a lot of works and efforts to make sure that their animals are in good cared and that crops are well planting. However the limitation of capital and resources made the application of technology not fully applied which shown in Table 3.

Generally respondents are in the age which active to work so that they still have a high level of effort to get informations about recent technology innovations. It stated that one of parameter to get success in agribusiness is the age of farmers. A person in the active age generally has enough enthusiasm to develop their capability in receiving new innovations (12). The way of thinking of farmers will be affected by the age, in line with the bhavior of farmers towards innovations, productivity's efforts, and physical skills. Moreover, the younger in age and experiences generally have a bigger interest of new things and less enthusiastic to the old method. The youth also tend to have the effort to practice new things therefore they will adopt innovations faster, even if these new innovations have not been tried before.

The other factor that affect to the adoption is education. It determine whether a material will be easily to be understood while it delivered by extension officer. There is a correlation between the level of education and the level of absorption capacity to technology, therefore the higher education will be the faster in receiving innovation. Based on Table 1, we know that the education level of respondents is senior high school, it mean that they have enough education to receive new innovations.

The experience on farming also influence the method of farmers to manage their farms. More experienced mean more knowledge get in managing farm. Furthermore (12) stated that technology demonstrations method was found to be concerning the younger farmers to implement long-term innovations. However, there is also possibility to more difficult to change based on the experience in years.

The success of an innovation is whether the product or technology innovation is accepted by the user. The general response of respondent to the technology of KUB chicken was performed in Table 2.

**Table 2.** Summary proportion test on Farmers perception to KUB chicken technology in Sigi District

Null hypothesis	Significance level	Proportion test significance	Decision
Being expected that less than or equal to 50% respondents have high response to KUB chicken technology	0,05	0,000	Reject Ho

Generally farmers in Sigi district is significantly have high preferences in KUB chicken. It shown in the proportion test is 0,000 or lesser than significance level 0, 05. It means that H0 was rejected or means that more or equal to 50% of the respondents have high preferences to KUB chicken. The detail of preferences to the characteristics of KUB chicken is presented in Table 3.

**Table 3.** Response to characteristics of KUB chicken in Sigi District

No	Characteristics of KUB chicken	response
1	Egg production	3.45
2	Meat texture	3.15
3	Mothering ability	2.30
4	Disease resistance	3.25
5	Physical characteristics/posture	3.30
6	Weight of meat measurement	3.15
7	Selling price	3.25

The result shows that characteristics of KUB chicken were mostly as respondents' expectation. The value of preferences generally above of 3 means suit able with the expectation, exceptt one characteristic namely mothering ability. Which some of respondent want to breed chicken but got difficulties as not all KUB chicken have good mothering ability. KUB chicken actually has high number of hatchability which is 82 percent (13), however the brood capability of KUB is lower compare to other native chicken. These related to the purpose of KUB is in intensive cultivation, means the egg will be brooded by machine which more efficient.

The culture of raising the native chicken in backyard has done from long time ago. KUB chicken needs intensive system to get the optimum result. However to change the old system is not easy thing. Farmers usually used non-intensive system which mainly reared the chicken in the yard and giving the chicken feed from the leftover of their kitchen. The availability of the capital also becomes one challenge in improving the level of

cultivation. The culture system and the lack of capital limit farmer to apply the technologies. The technology application of farmers in KUB chicken business is shown in Table 4.

**Table 4.** The application of technology package in KUB chicken household business level

Technology	Technology recommendation	Technology application
Feed		
Feed according to phase		
1) starter	concentrate feed	concentrate feed
2) finisher	bran	bran
	ground corn	ground corn
	concentrate feed	
3) layers		
Chicken coop	intensive	semi intensive (reared with fence and perch place)
Equipment (feeders, drinkers, lamp)	available	available
Raising process		
1) feeding frequency	twice a day	twice a day
2) drinking frequency	adlibitum (continuously)	adlibitum (continuously)
3) vaccine ND and Gumboro	twice	none
4) biosecurity/ prevention of chicken diseases (ex. sanitation)	implemented	none
5) harvesting	70 days	more than 70 days

KUB chicken business will be successful whether its practiced is in accordance with the technology recommendation. The recommendation is one package starting from the chicken coop, feed, to raising process. However, the limited capital from farmers gives difficulty to fully apply the technology. In addition, the consideration that KUB chickens business is only as an additional income or side job so it has not become a priority. This is indicated by the chicken coop which is still uses a semi-intensive system, which is only a fence and part of it is given as perch. This type of chicken coop is a typical of the free-range chicken rearing system in rural areas.

Furthermore, the provision of feed is still adjusted for purchasing ability so that lacking of the nutritional needs of chickens for the formation of chicken body weight. Farmers also still have not prioritized the use of vitamins and medicines to prevent chicken diseases because in

their opinion, a native chicken are relatively resistant to the chicken diseases. Moreover, mixing chickens with other native chickens also makes it easier for chickens to get sick quickly. Therefore, a program should continuously to be accompanied and supported by its related institutions so that technology adoption can be sustainable.

Some alternative ways to improve the adoption of technology, such as activating farmer group who support the input production and the market of output. The pre-practiced also success in increase the adoption of native chicken technology production (14), adding value of egg and meat to increase the output price (15), and the availability of contract buyers made them easy in marketing their chicken (16).

The sustainability of the business also related with the economic value of the product. A profit of a business can be one of the motivations for raising native chickens. If a business is profitable, farmers will be motivated to be active in doing their business.

**Table 5.** Feasibility of non- intensive broiler chicken KUB

items	value (IDR)
Depreciation of chicken coop and equipment in 70 days.	20 000
DOC 20 chickens @ Rp. 8.500 per chicken	255 000
Complete feed	99 600
Finisher feed	148.200
Vitamins and medicines	-
Labor	70.000
Total cost	592.800
Selling 19 chickens @ Rp. 45.000 per chicken	855.000
Profit in 70 days	262.200
Break Even Production	13,17
Break Even Price	31.200,00
R/C	1,44

Based on Table 5, we know that the total revenue when compared to the total cost is more than one or profitable. However, when converted into rupiah, the monthly income is very small, only 131 000 rupiah. This figure is very small when compared to the needs of daily life today, where the average family has 5 family members. However, as mentioned before, this KUB chicken business is a side job for the family. However, if the business scale is developed, the KUB free-range chicken business will increase their profit in accordance with (17) which examines the KUB chicken business intensively with 200 chickens able to generate a profit of Rp. 1 088.349 per one business cycle. In some area in

Indonesia also has succeed in raising income by develop KUB chicken such as Gorontalo (18).

Other alternative is to choose business in DOC production which the feasibility can be seen in Table 6.

**Table 6.** Feasibility of non- intensive layer chicken KUB

Items	Value (IDR)
Depreciation of chicken coop and equipment for 23,5 month	840 000
DOC 20 chickens @ Rp. 8.500	170 000
Feed	1 107 900
Vitamin, medicine, and mineral	-
Water and electricity	587 500
Labor	1 410 000
Total Cost	4 115 400
Selling DOC	7 616 000
Selling chicken	700 000
Total Revenue	8 316 000
Provit	4 200 600
Break Even Production	484.16
Break Even Price	4 593.08
R/C	2.02

The adding value to produce DOC generate more profit so that the Revenue Cost ratio become 2,02. This value is higher compare to the RC ratio of broiler. It means that DOC production is more profitable compare to broiler/meat production. However the DOC production needs more effort and long term to be practiced compare to egg or meat production.

The other indicator of the role of a business in household income is its contribution. Generally the contribution of KUB chicken business is shown in Table 7.

**Table 7.** The contribution Chicken KUB to Household in Rural Area Sigi District

No	Total revenue per month (Rp)	Contribution (%)
1	< 1.500.000	8,74
2	1.500.000 - 2.500.000	5,24
3	2.500.000 - 3.500.000	-
4	3500000>	-

From the analysis, it is known that the contribution of KUB chicken business to household income in Sigi district < 1,500,000 is 8.74% while to the income is Rp. 1,500,000.00 up to Rp. 2,500,000.00 is 5.24% (Table 6). The higher of the household income, the lower the contribution of the KUB chicken business that is cultivated. The small contribution affected by chicken farming system which is still a subsystem and in small number scale.

The success of the program need support from all stakeholder from the upline up to downline. The availability of the input such as nursery for providing DOC, the quality of the breeding, and also the support from support system such as extension (19) and capital source.

Other positive aspect of the KUB chicken development in household level is the empowerment of woman which contribute also in family income. Women empowerment is an essential point since woman in rural area generally be seen as unproductive family member in getting income and spending mostly of their time in house. By women empowerment they can give more contribution on advancing development and reducing poverty. Furthermore, it also contribute to the health and productivity of the communities, and improve the quality of the next generation. In general, the native chicken works as productive resource for rural area household (20)

#### **4. CONCLUSION**

More than 50% users have preference to KUB chicken for some characteristics namely: the higher egg productivity, the higher meat measurement, and the texture of KUB chicken meat which is similar with original native chicken. The KUB chicken on household business level is feasible and has a prospective market. However, it's in small number contribution on income family which is less than 10 per cent since the number of chicken and the non-intensive system. The development of KUB chicken needs more chicken nurseries, the specific recommendation of feed arrangement, and the assistance of the technology application and capital.

Based on the conclusion, what the authors can suggest is to increase the contribution of raising KUB chickens to the household income is to increase the scale of KUB chicken business and to reduce the high cost of production, the procurement of livestock production facilities in the form of DOC, feed, vitamins and medicines. The farmers also should be managed through groups so that lower input prices and higher output price are obtained.

#### **AUTHORS' CONTRIBUTIONS**

All authors have contributions in putting the ideas, gathering data, and writing process.

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#### **REFERENCES**

- [1] Padhi MK. Importance of Indigenous Breeds of Chicken for Rural Economy and Their Improvements for Higher Production Performance. *Scientifica* (Cairo). 2016;2016:1–9.
- [2] Desta TT. Indigenous village chicken production: a tool for poverty alleviation, the empowerment of women, and rural development. *Trop Anim Health Prod* [Internet]. 2020;53(1):1. Available from: <https://doi.org/10.1007/s11250-020-02433-0>
- [3] IAARD IA for AR and D. Program Bedah Kemiskinan Rakyat Sejahtera (BEKERJA). IAARD Press. 2018. 34 p.
- [4] Agarwal S, Prasad S, Kumar R, Naskar S, Kumari N, Chandra S, et al. Phenotypic characterization and economic traits of native chicken of Chotanagpur plateau of Jharkhand. *J Entomol Zool Stud* [Internet]. 2020;8(5):2328–33. Available from: <https://www.entomoljournal.com/archives/2020/vol8issue5/PartAF/8-5-239-175.pdf>
- [5] Saengwong S, Koksantia C, Resources N, Technology C. Development of a mobile app for enhancing the performance of smallholder native chicken management and production. *Asia - Pacific J Sci Technol*. 2019;25(01):1–9.
- [6] Iskandar S. *Produksi Ayam Lokal Pedaging Unggul*. Bogor: IAARD Press; 2017. 55 p.
- [7] Franzoni A, Gariglio M, Castillo A, Soglia D, Sartore S, Buccioni A, et al. Overview of native chicken breeds in Italy: Small scale production and marketing. *Animals*. 2021;11(3):1–13.
- [8] Hendayana R. *Persepsi dan Adopsi Teknologi*. Jakarta: Badan Litbang Pertanian (IAARD) Press; 2016. 53 p.
- [9] R H. *Analisis Data Pengkajian*. IAARD Press; 2016. 180 p.
- [10] Reprint BA. and *Feeding Methods*. 1945;(199).
- [11] Setiana L, Sugiarto M, Djatmiko OE. Socio Demographic Factors Influencing the Income of Native Chicken Farming in Rural Area of Ciamis Regency. *Anim Prod*. 2020;21(2):110.
- [12] Sutherland LA, Burton RJF, Adamsone-Fiskovica A, Hardy C, Elzen B, Debruyne L, et al. Inclusivity of on-farm demonstration: gender, age, and geographic location. *J Agric Educ Ext* [Internet]. 2020;0(0):1–23. Available from: <https://doi.org/10.1080/1389224X.2020.1828115>
- [13] Suryana. Development of KUB Chicken in South Kalimantan. *Wartazoa*. 2017;27(1):45–52.
- [14] Sangameswaran R, Pvk S. Strategies for Promotion of Improved Native Chicken Strain in Rural Family Poultry: Evidence from Rural households of Ramanathapuram district. *Indian J Ext Educ*.

2019;55(2):106–10.

- [15] Mufeeth MM, Thariq MGM. Evaluation of consumer preference for value addition to native chicken meat and egg. *SEUSL J Mark.* 2019;4(1):2019.
- [16] Bejar FR. Respondents' Preferences and Profitability of the Native and Upgraded Chickens in Samar , Philippines. *Countrys Dev Res J.* 2018;6(1).
- [17] Asnidar, HSP R, Wardi, M T. Profitability Study of KUB Chicken Business for 12 Weeks. In: *Teknologi Peternakan dan Veteriner Mendukung Kemandirian Pangan di Era Industri* 40. 2019. p. 691–8.
- [18] Munawaroh S, Rouf AA, Rohmadi D, Anas S, Rosdiana, Nur A. Additional income for poor families through native chicken farming (KUB and Sensi) development in Gorontalo Province. *IOP Conf Ser Earth Environ Sci.* 2021;807(3).
- [19] Leotaragul, A.; Pangmao, S.; Prathum C. Satisfaction of farmers toward native chicken breed produced by government agency . In: *Proceedings of the 49th Kasetsart University Annual Conference*, Kasetsart University. 2011. p. 42–7.
- [20] Rajini A, Tanuvas RA. Rural Women Empowerment Through Native Chicken Rearing. 2018;(December):2018.