Analysis of Rural Agriculture and Economic Development in Cingkes Village Through The Integration of Chillies and Chickens

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Abstract: **Convergence of the farmer's farming system's chili and chicken crop outputs. Both fresh and preserved chili waste can be utilized as poultry feed, while livestock excrement can be used as fertilizer for chili plants. A major focus of North Sumatra Province's agricultural development strategy is the use of simple innovations to turn livestock dung into organic fertilizer, boosting the nutritional value of agricultural land and repurposing agricultural waste as animal feed. It aims to create an integrated system that benefits both breeders and farmers by increasing and preserving income. The development association between these two factors could lead to increased household incomes and higher agricultural and plantation yields. Creating a plan that integrates the slaughter chicken business with optimal food crops is meant to improve the financial well-being of farmer and breeder households.**

Keywords : **Integration, Income, Welfare, Productivity**

I. INTRODUCTION

However, in this context, the term "development" refers to a specific type of change that is predetermined by definition, rather than the analysis of change as a whole (Purba, et al., 2021). It is impossible to overestimate the importance of economic literacy in today's society (Faried, et al., 2021). The member nations of the United Nations made a collective commitment in the year 2015 to support a total of 17 Sustainable Development Goals (SDGs). This initiative's second goal, or Sustainable Development Goal 2 (SDG2), is to "end hunger, provide food security and improved nutrition, and promote sustainable agriculture" by the year 2030 (United Nations, 2015). SDG-2 faces a significant obstacle as a result of the rapid population growth in the province of North Sumatra, as the need for primary cereals is expected to quadruple by 2050 and diets generated from animals are expected to double (Thornton, 2010; (van Ittersum, Van Bussel, Wolf, & Cassman, 2016). To accomplish other Sustainable Development Goals (SDGs) and ensure everyone has access to a nutritious meal produced sustainably, SDG 2 calls on the community to integrate food production and consumption. A "missing middle" between global targets and local implementation strategies could hinder SDG-2 achievement (Veldhuizen, et al., 2020). Natural resources are both an economic and biological growth source (Simarmata, et al., 2021).

People's productivity and economic growth are two metrics that can be used to measure the success of a country's development initiatives (Kurniullah, et al., 2021). Economic activity occurs when an individual, group, or society produces or consumes goods and services (Marit, et al., 2021). Environmentally-friendly food production efforts that take into account the farmers' willingness and ability to grow food in a manner that is sustainable. The Animals Crop Integration System (LCIS) is a way of increasing the efficiency of the farming system by including livestock into the management of natural resources and the environment. This approach also incorporates the usage of cattle as part of the company's daily operations. As a result of the creation of a community-based livestock-crop integration system, agricultural growth can be reinvigorated. The livestock crop integration system's farming components include beef cattle, food crops, horticulture, plantations, and fisheries. Livestock waste processing produces compost, granulated organic fertilizer, and biogas, while agricultural waste is processed into animal feed. Solid bio-gas waste is composted and mixed with other materials to make animal and fish feed, but liquid bio-gas waste is used as a liquid fertilizer for aquatic and aquatic plants and aquatic crops, respectively. (Rajendran, et al., 2017).

There must be synergy, or linkages between crops and livestock that benefit both parties, in order to integrate livestock crops. In agriculture, producers utilize manure as an organic fertilizer for their crops, which they later feed to their livestock. A lack of easily available feed necessitates the utilization of plant waste, such as rice straw, corn straw, bean waste, and other agricultural waste. Diversification of agriculture, including legumes, fruits, vegetables, and food derived from animals, has tremendous potential to improve nutritional diversity (ASF) (De Bruyn , et al., 2017). An integrated approach to improving crop yields and managing resources is needed to address all three of the most essential components of sustainability: economic, environmental, and social." Sustainability, food security, and poverty alleviation are just a few of the objectives that the IFS plan aims to achieve. Anywhere that is feasible, it involves utilizing the outputs from one part of a business as inputs for other processes that are closely connected. A good example of this is the creation of richly nutritious vermicompost from animal

dung and agricultural trash (Deka, 2020).

II. LITERATURE REVIEW

In rural areas, sustainable development is the priority. Smallholder farmers' sustainability depends on a wide variety of species, nutrient cycling, total production capacity, and economic efficiency. Sustainable development is an issue that affects all of us, at all levels of society. The Brundtland Report may have a different definition for ecologists than it does for economists, but in general, ecologists tend to embrace it (United Nations, 1987), with respect to which social, economic, and environmental factors are taken into account. Social, economic and environmental concerns arise when aquaculture and cattle are combined to enhance food sustainability. Change or conservatism can be influenced by a variety of variables, including culture and institutions. Off-farm resources are essential to the livelihoods of those who live in more complex situations.

Perceived well-being can be gauged by an individual's overall sense of contentment. The following two issues are raised as a result of this foundational information. A substance's second well-being can be summed up as an accumulation of its intensity, which is an important factor to take into account. All of a person's needs are met in a well-being state and this sense of well-being encourages them to work hard to improve their lives, their families, and society as a whole. This is the definition of well-being (Sunarti & Khomsan, 2012). A society can be regarded to be affluent if its overall well-being is taken into account. A person who aspires to a life of optimal well-being, health, and harmony must work as hard as they are capable of. According to economists, a society's ability to pay for goods and services for its members can be gauged by a decrease in well-being. In spite of the fact that there is no fixed upper limit to welfare benefits such as free food, education and healthcare, the term is sometimes expanded to cover additional social benefits such as work opportunities, protection for the elderly, freedom from poverty, and so on.

This suggests, in general, that examples of family use are taken into consideration as markers of financial transition events and government aid from people of a country. It is required to establish the degree to which the utilization design is put into reality in order to ascertain the family's level of usage, which can then be determined. Systems with few external inputs are more analogous to natural ecosystems, which results in fewer negative effects on the environment. By supervising the utilization of the draft, the families of the implementers play a role not only in evaluating the government assistance from families, but they also play a role in the financial turnaround of events and the government assistance from state community groups. This is because the families play a role in evaluating the utilization of the draft. This is because no family has a strategy and a measure of usage that are exactly the same as the others' families' strategies and measures of use. It is typically understood by referring to the example of family use because of the impact that its application has had on the way in which the government assists families in need of assistance. An individual's total profit is referred to as their income, and this profit can be expressed either in the form of actual money or in a conventional structure. Income can also be expressed as a percentage of total profit. The pay or so-called salary of the resident is a consequence of the agreement of the factors of creation that he possesses in this area of creation that "buys" the components of this creation to be used as a contribution to the creation cycle at the cost of winning over the search for the factors of creation in the cost of the main market. This area of creation "buys" the components of this creation to be used as a contribution to the creation cycle at the cost of winning over the search for the factors of creation in the This happens as a direct result of the factors of creation that he possesses in this region of creation coming together in agreement with one another.

The most significant issue is the potential for competition for a limited amount of feed between mature chickens and spicy peppers, in addition to the relative inefficiency of utilizing the grain that is now available. The effects can be observed on a national and international scale. The rising consumption of chile and chicken has had a beneficial effect, both on the long-term viability of feed sources and on the environmental problems that accompany such increase.

III. RESEARCH METHODS

The investigation was carried out in a number of steps, including the preliminary stage, the analysis of the data, the distribution of questionnaires to respondents, the processing of the data using the SEM method, the interpretation of the data, and the drawing of findings. The indicators of standard of life, farming productivity, income, and welfare are the criteria that were observed in this study. These indicators were based on the income of farmers and breeders in Cingkes Village who were incorporated in chili and chicken crop production.

IV. RESULTS OF RESEARCH

Due to the fact that the data cannot be utilized for the purpose of research due to the presence of multicholinerita issues or singularities indicated by extremely low determinant value,

Table 1. Normality of Critical Ratio Value Data

Variabel	Min	Max	skew	c.r.	kurtosis	c.r.
KS1	8,000	14,000	,528	3,709	-,560	-1,966
KS2	6,000	12,000	1,143	8,027	-,184	-,647
KS3	8,000	12,000	,898	6,310	-,347	-1,219
PN3	5,000	14,000	-1,094	-7,684	1,336	-4,691
PN2	5,000	13,000	,871	6,114	-,747	-2,623
PN1	7,000	12,000	-,365	-2,564	-1,046	-3,675
PT1	6,000	14,000	-1,354	-9,512	-1,521	-5,340
PT2	6,000	15,000	-1,159	-8,139	-2,302	-8,084

PT3	4,000	14,000	-1,685	-11,837	-2,749	-9,654
UT1	3,000	15,000	-,011	-,074	-,174	-,611
UT2	7,000	15,000	,102	,719	-,778	-2,733
UT3	7,000	15,000	,088	,616	-,830	-2,915
TH1	4,000	14,000	-,384	-2,695	-,642	2,254
TH2	5,000	14,000	-,153	-1,075	-,127	-,448
TH3	3,000	15,000	,363	2,549	-,063	-,221
Multivariate					292,026	111,238

Source : Output AMOS

If you want to be sure that the data are being distributed normally, you should check that the score in the C.R column is either greater than 2.58 or less than -2.58. (-2.58). Because 296 different sets of observational data were utilized in this analysis, the assumption of normalcy could be considered validated.

Table 2. Normality of Outlier Value Data

Observation number	Mahalanobis d-squared	p1	p2
295	130,663	,000	,000
290	123,848	,000	,000
289	100,919	,000	,000
70	97,560	,000	,000
296	87,872	,000	,000
288	86,512	,000	,000
294	79,500	,000	,000
293	72,175	,000	,000
281	62,400	,000	,000
291	60,621	,000	,000
292	60,621	,000	,000
279	60,228	,000	,000
282	58,133	,000	,000
280	57,584	,000	,000
286	50,974	,000	,000
285	49,780	,000	,000
278	48,773	,000	,000
284	39,653	,001	,000
287	39,455	,001	,000
266	38,220	,001	,000
283	37,705	,001	,000
62	36,658	,001	,000
26	34,614	,003	,000
85	31,357	,008	,000
1	31,000	,009	,000
46	30,102	,012	,000
86	29,865	,012	,000
267	29,466	,014	,000
57	28,696	,018	,000
272	28,421	,019	,000
74	28,077	,021	,000
25	27,935	,022	,000
268	27,786	,023	,000
77	26,890	,030	,000
87	26,418	,034	,000
273	25,366	,045	,000
221	24,771	,053	,000
101	24,610	,055	,000
102	24,610	,055	,000
38	24,209	,062	,000
261	23,713	,070	,000
276	23,584	,073	,000
249	23,282	,078	,000
222	22,774	,089	,001
2	22,235	,102	,004
80	22,161	,104	,004
3	22,100	,105	,003
103	22,081	,106	,002
168	21,958	,109	,002
151	21,842	,112	,002
149	21,775	,114	,002
190	21,685	,116	,002
56	21,649	,117	,001
271	21,455	,123	,002
277	21,164	,132	,005
61	20,865	,141	,013
148	20,730	,146	,016
155	20,384	,158	,045
29	20,090	,168	,092
247	19,980	,173	,100
224	19,638	,186	,210
229	19,403	,196	,302
73	19,387	,197	,263
265	19,317	,200	,259
65	19,121	,208	,338
274	18,969	,215	,393
27	18,901	,218	,390
60	18,877	,219	,355
244	18,605	,232	,508
269	18,579	,233	,474
114	18,494	,238	,485

201	17,987	,263	,802
47	17,827	,272	,852
42	17,596	,285	,918
18	17,261	,303	,975
15	17,211	,306	,974
113	17,171	,309	,971
275	17,166	,309	,962
225	17,093	,313	,964
100	16,541	,347	,998
223	16,500	,350	,998
196	16,493	,350	,997
218	16,403	,356	,998
59	16,250	,366	,999
146	16,186	,370	,999
199	16,026	,380	1,000
35	15,946	,386	1,000
238	15,505	,416	1,000
24	15,477	,418	1,000
16	15,342	,427	1,000
270	15,323	,428	1,000
41	15,221	,436	1,000
14	15,138	,441	1,000
49	15,105	,444	1,000
150	14,753	,469	1,000
215	14,615	,479	1,000
262	13,841	,538	1,000
174	13,695	,549	1,000
147	13,694	,549	1,000
55	13,467	,566	1,000

Sumber : Ouput AMOS

These are the results of a test using univariate summary statistics to determine whether or not the data are normal. It is possible to draw the conclusion, based on the findings of the normality test, that there are data sets that are normal. In which the majority of Mahalanobis d-squared P-values for p1 and p2 were more than 0.05.

Tabel 3. Feasibility Testing Results of Research Models for SEM Analysis

Goodness of Fit indeks	Cut of Value	Analysis Results	Model Evaluation
Min fit function of chi-square	p>0,05	(P =0.88)	Fit
Chisquare	Carmines & Melver (1981) Df=168 = 129.69	1961,49	Fit
Non Centrality Parameter (NCP)	Penyimpangan sample cov matrix dan fitted kecil<Chisquare	2634,962	Fit
Root Mean Square Error of Approx (RMSEA)	Browne dan Cudeck (1993) < 0,08	0,322	Fit
Model AIC	Model AIC >Saturated AIC <Independence AIC	2788,962>Saturated AIC (240) < Independence AIC (8398,657)	Fit
Model CAIC	Model CAIC <Saturated CAIC <Independence CAIC	2948,434 <Saturated CAIC (802,843) <Independence CAIC (8469,012)	Fit
Normed Fit Index (NFI)	>0,90	0.975	Fit
Parsimoni Normed Fit Index (PNFI)	0,60 – 0,90	0.653	Fit
Parsimoni Comparative Fit Index (PCFI)	0,60 – 0,90	0.658	Fit
PRATIO	0,60 – 0,90	0.819	Fit
Comparative Fit Index (CFI)	>0,90 (Bentler (2000)	0.981	Fit
Incremental Fit Index (IFI)	>0,90 Byrne (1998)	0.982	Fit
Relative Fit Index (RFI)	0 – 1	0.603	Fit
Goodness of Fit Index (GFI)	> 0,90	0.952	Fit
Adjusted Goodness of Fit Index (AGFI)	>0,90	0.975	Fit
Parsimony Goodness of Fit Index (PGFI)	0 – 1,0	0.396	Fit

Source : Output Amos 20

SEM models can be derived from any model analysis by using the results of the Fit Model Assessment as their point of departure. The results of the tests are presented in the table below, which include a path analysis (path analysis) of each variable, including direct and indirect paths. The dimensions of the AGFI was modified from that of the GFI so that it could accommodate a greater degree of flexibility in compared to other models. In contrast, a fit of 0.8 - AGFI >0.9 is only adequate at best. An perfect fit would be 0.8 > AGFI >0.9. The fact that the model's AGFI score of 0.975 is more than the threshold of 0.9 demonstrates that it fits the data very well. When contrasting different models, one can use either the Tucker-Lewis Index (TLI) or the non-normed fit index (NNFI), both of which take into consideration the total number of coefficients. When the TLI is greater than 0.9, the fit is considered to be excellent, but when it is greater than 0.8, the fit is considered to be just moderate. Because the TLI score is within the range of 0.8 and 0.9, which indicates a model that is at least passable, the model is judged to be of high quality.

The NFI value can be thought of as the degree of dissimilarity that exists between the target model and the base

model. NFI levels can range anywhere from 0 to 1. NFI values more than 0.9 indicate a good fit, whereas values between 0.8 and 0.9 indicate a moderate fit. The validity of the model is demonstrated by the fact that the NFI result is 0.975. The Incremental Fit Index can take values between 0 and 1, which is its range (IFI). In most cases, a match with ifi greater than 0.9 is satisfactory; however, a match with ifi 0.8 and IFI greater than 0.9 is only marginal. The fact that the model's IFI was given a score of 0.912 suggests that it is within the ideal range of 0.8 to 0.9 points.

The CFI scale has a range that goes from 0 to 1. A CFI of greater than 0.9 indicates a good fit, while a CFI of greater than 0.8 indicates a mediocre fit. The IFI value of the model is greater than 0.982, which indicates that it is a very good one. The Relative Fit Index, sometimes known as RFI, is a value that ranges from 0 to 1. RFI values more than 0.9 indicate a good fit, whereas RFI values between 0.8 and 0.9 indicate a reasonable fit. Because the RFI value of 0.803 is within the permitted range and falls within the parameters of the model, we can conclude that the model is accurate.

V. DISCUSSION

The t-CR value of 5,017, with a significance level of 0.000, reveals that the estimation parameter between the influence of Living Standards on community welfare shows significant results in Cingkes Village, demonstrating that there is a considerable influence of living standards on community welfare. This indicates that there is a significant correlation between the two factors. As a result, the first hypothesis has been validated, which indicates that the wellbeing of farmers and breeders will improve if the standard of living is raised or maintained. Prior to and throughout the duration of the good land convention, Cingkes Village maintained a high standard of living, which had a beneficial effect on the welfare and living conditions of local farmers. They attempted to make a living off of the production of string beans in the time before the invention of chilies and farms. Since they are always losing, pests are unable to produce fruit of a high grade since it is physically impossible for them to do so. The people of the town still make a significant portion of their living from raising hens for additional cash, but the cultivation of chilies has overtaken this role as their principal means of subsistence.

People’s income results in a substandard standard of living for those living in Cingkes Village, which is located in Simalungun Regency. As a consequence of this finding, the second hypothesis cannot be supported, which suggests that an individual's income is not influenced in any way by their level of life. Extension activities in Cingkes Village, Simalungun Regency, are not well run, the Village Head staff is unconcerned, and agricultural extension activities are rarely held, despite the fact that they are extremely beneficial to residents in increasing their experience and knowledge of managing and farming correctly and effectively. This is despite the fact that agricultural extension activities are rarely held, despite the fact that they are extremely beneficial. It is abundantly obvious that the time and outcomes are very different based on the results that farmers and breeders have achieved in terms of their income. The manufacture of chili provides results once a month, or once every two weeks, depending on how often it is done. The livestock yield cannot be estimated for a year or a month because it is based on the process of rearing animals for the purpose of selling them on the market. In the interim, this means that the livestock yield cannot be determined. Usahatani has a significant impact on the welfare of the community in Cingkes Village, Simalungun Regency, as shown by the t CR of 4.864 and the 0.000 significance level. This indicates that the estimation parameter between the influence of Farming on the welfare of the community showed significant results. As a consequence of this finding, the third hypothesis is validated, which indicates that farming is an important component in improving one's well-being as a whole. According to research, the total land area that is counted as part of the Farming 0.448 has a positive influence on changes in the welfare level of chili farmers. Another way to put this would be to say that if the total area of agricultural land is increased, chili farmers will have a greater opportunity to expand their businesses. The outcomes of the regression analysis provide evidence in favor of this contention. Due to the fact that farming that takes into account land area has a big impact on farmers and breeders, I have noticed that when the land area expands, farmers and breeders experience an increase in income and a general improvement in the wellbeing of their enterprises. The amount of land that is accessible for harvesting has a significant influence on the yield to the extent that it can be measured. It is to the advantage of cattle to use agricultural land as a location to produce anglicized chickens, and the size of the agricultural land is directly proportional to the degree to which this is the case. Farmers who cultivate less than 1 hectare of land are eligible for subsidized fertilizer aid to help offset the higher salaries and maintenance costs that are associated with bigger land sizes.

It is distinct from other products that the land size is more than 1ha, as it has been stated that they are able to acquire fertilizer and handle chiles of a high quality. Those who do not adhere to the guidelines are not eligible to get subsidized fertilizer, whilst those who do receive it are not penalized in any way. The results of the survey that employs fertilizer manufactured from chicken dung can be claimed to be good, and the growth process can be stated to be good as well; nevertheless, the processing of chicken manure can be a little bit hard. Residents who do not join the agricultural group and therefore do not qualify for subsidized fertilizer can use the chicken manure that they purchase to make chili instead of fertilizer for their crops. The integration system has a great many benefits, one of which is the exploitation of chicken excrement as a fertilizer, as well as the eating of plant fronds by hens, which results in the generation of chicken manure. In addition, the integration system has a great many other advantages.

VI. CONCLUSION

1. The standard of living has a considerable impact on the economic well-being of farmers and ranchers among the residents of Cingkes Village, which is located in Simalungun Regency. Where the CR value is 5,017, but the probability value is 0.000, this is where we are. People who make their living as farmers and ranchers in Cingkes Village, which is located in Simalungun Regency, do not see a substantial correlation between their level of living and their income.
2. The practice of farming has a considerable impact on the quality of life enjoyed by farmers and breeders in the community of Cingkes Village, which is located in the Simalungun Regency. In which case the CR value is 4.864, but the probability value is 0.000. People who make their living in agriculture and ranching in Cingkes Village, Simalungun Regency, do not see a considerable increase in their income as a result of their occupation. In such case the CR value is -2.283, and the probability value is 0.022.
3. Plantations can be utilized to cultivate biota that can be used as chicken feed, which can reduce the cost of chicken feed by up to 50 percent. Rice and ducks can be harvested simultaneously without causing a disruption in production thanks to the integrated agricultural approach that is used to raise chile and chicken crops. This is only one of the many benefits of this method. If the farming system is supported, then the earnings of farmers will rise as a direct consequence.

REFERENCES

[1] De Bruyn Julia [et al.] The chicken or the egg? Exploring bi-directional associations between Newcastle disease vaccination and village chicken flock size in rural Tanzania [Journal] // PLoS One. - 2017. - 1 : Vol. 2.

[2] Deka Bidyut C. Integrated Farming Systems for Doubling Farmers' Income in NEH Region of India [Report]. - [s.l.] : ICAR-Agricultural Technology Application Research Institute, 2020.

[3] Faried Annisa Ilmi [et al.] Sosiologi Ekonomi [Book] / ed. Simarmata Janner. - Medan : Yayasan Kita Menulis, 2021. - p. 1.

[4] Kurniullah Ardhariksa Zukhruf [et al.] Pembangunan dan Perubahan Sosial [Book] / trans. Kurniullah Ardhariksa Zukhruf [et al.]. - Medan : Yayasan Kita Menulis, 2021. - p. 1.

[5] Marit Elisabeth Lenny [et al.] Pengantar Ilmu Ekonomi [Book]. - Medan : Yayasan Kita Menulis, 2021. - p. 2.

[6] Purba Bonaraja [et al.] Ekonomi Pembangunan [Book] / ed. Watrianthos Ronal. - Medan : Yayasan Kita Menulis, 2021. - p. 1.

[7] Rajendran Srinivasulu [et al.] Does crop diversity contribute to dietary diversity? Evidence from integration of vegetables into maize-based farming systems [Journal] // Agriculture & Food Security. - 2017. - 1 : Vol. 6. - p. 50.

[8] Simarmata Marulam MT [et al.] Ekonomi Sumber Daya Alam Dan Lingkungan [Book] / ed. Karim Abdul. - Medan : Yayasan Kita menulis, 2021. - p. 82.

[9] Sunarti and Khomsan Ali Kesejahteraan Keluarga Petani Mengapa Sulit? [Book]. - Bogor : Institut Pertanian Bogor, 2012.

[10] Thornton Philip K Livestock Production: Recent Trends, Future Prospects [Journal] // Philosophical Transactions of the Royal Society of London B: Biological Sciences. - 2010. - 1554 : Vol. 365. - pp. 2853–2867.

[11] United Nations Report of the World Commission on Environment and Development : Our Common Future [Report]. - 1987.

[12] United Nations Transforming our world: The 2030 Agenda for Sustainable Development. General Assembley 70 [Report]. - 2015.

[13] van Ittersum Martin K. [et al.] Can sub-Saharan Africa feed itself? [Journal] // Proceedings of the National Academy of Sciences. - 2016. - 52 : Vol. 113. - pp. 14964–14969.

[14] Veldhuizen Linda JL. [et al.] The Missing Middle: Connected action on agriculture and nutrition across global, national and local levels to achieve Sustainable Development Goal 2 [Journal]. - 2020. - Vol. 24. - p. 100336.