THE POTENTIAL INTEGRATION OF CHICKEN LIVESTOCK AND CHILI PLANT CULTIVATION IN CINGKES VILLAGE FOR THE PURPOSE OF RURAL AGRICULTURAL AND ECONOMIC DEVELOPMENT

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ABSTRACT

One of the flagship programs of North Sumatra Province is to strengthen the role of the agricultural sector by utilizing the potential for integration through simple innovations that can convert livestock manure into organic fertilizer, thereby increasing the nutrition of agricultural land and utilizing agricultural waste as animal feed. It attempts to establish an integrated system that serves to increase and preserve income while also considering the well-being of breeders and farmers. Increased household incomes and improved agricultural and plantation yields could result from the development relationship between these two variables With the goal of improving farmer and breeder households' financial well-being by creating a model for the integration of the slaughter chicken business with ideal food crops.

Keywords: Income, Integration, Productivity, Welfare

INTRODUCTION

The idea of development is normally seen to be inextricably linked to the process of analyzing change; but, in this case, development is understood to refer to a specific kind of change that is, by definition, predetermined (Purba, et al., 2021). Modern society's need on economic literacy cannot be overstated (Faried, et al., 2021). In 2015, the member states of the United Nations made a collective commitment to support 17 Sustainable Development Goals (SDGs). The second target (SDG2) of this initiative is to "end hunger, ensure food security and improved nutrition, and promote sustainable agriculture" by the year 2030 (United Nations, 2015). Rapid population expansion in North Sumatra Province poses a serious challenge for SDG-2 as demand for primary grains triples and animal-sourced diets doubles by 2050 (Thornton, 2010; (van Ittersum, Van Bussel, Wolf, & Cassman, 2016). In order to meet the other Sustainable Development Goals (SDGs) and ensure that everyone has access to a nutritious meal that is also produced sustainably, SDG 2 calls on the entire community to integrate food production and consumption. Food production and consumption are separated by a "missing middle" between global targets and local implementation strategies, which could impede progress toward SDG-2 (Veldhuizen, et al., 2020). Natural resources serve two purposes: they are a source of economic growth and they are essential to the functioning of biological systems (Simarmata, et al., 2021).

Productivity and economic growth of a population are two indicators that can be used to gauge the level of success that a country has had in its development efforts (Kurniullah, et al., 2021). The act of generating or consuming (using) products and services by an individual, a group, or a society is called economic activity (Marit, et al., 2021). Efforts made to sustain or expand food production in a manner that is compatible with the environment by taking into account the resources that are available as well as the farmers' willingness and capability. The Livestock Crop Integration System is the intensification of the farming system through integrated management of natural resources and the environment with livestock components as part of business activities. This system also includes the use of livestock as part of the business activities. A livestock-crop integration system is being developed to improve the productivity and well-being of the community so that agricultural development can be revitalized. Beef cattle, food crops, horticulture, plantations, and

fisheries are all part of the livestock crop integration system's farming components. Compost, granulated organic fertilizer, and biogas are all products of the livestock waste processing industry, while agricultural waste is turned into animal feed. While bio-gas waste in the form of solids is composted and blended with other materials for animal and fish feed, waste from biogas in the form of liquids is utilized as a liquid fertilizer for vegetable and aquatic crops (Rajendran, et al., 2017).

Integrating livestock crops requires that there be synergism, or connections between crops and livestock that benefit both parties. Manure is used by farmers as an organic fertilizer for their crops, which they subsequently feed to their livestock. Farmers use plant waste, such as rice straw, corn straw, bean waste, and other agricultural waste in the livestock crop integration model to get around the lack of readily available feed. There is significant potential to promote nutritional diversity through agricultural diversification including legumes, fruits, vegetables, and animal-sourced food (ASF) (De Bruyn , et al., 2017). Agriculture that is economically, environmentally, and socially sustainable takes an integrated approach to boosting crop yields and managing resources in order to meet all three of the most important aspects of sustainability: economic, environmental, and social. The IFS strategy seeks to accomplish numerous goals, including sustainability, food security, and the alleviation of poverty. It entails using the outputs of one component of an enterprise as inputs for other related operations wherever it is viable. For instance, animal manure combined with agricultural leftovers and farm waste can be turned into nutrient-rich vermicompost (Deka, 2020).

LITERATURE REVIEW

Rural development focuses on defining and measuring sustainability. High species variety, nutrient cycling, capacity (total production), and economic efficiency are crucial sustainability factors for smallholder farmers. Sustainability is a global, national, regional, community, and household issue. An ecologist can define sustainability differently than an economist, but most may support the Brundtland Report (United Nations, 1987), which includes social, economic, and environmental considerations. Integrating aquaculture with livestock to promote food sustainability socially, economically, and environmentally raises important questions. Culture and institutions, key factors for change or conservatism, should also be considered. Complex livelihoods depend on various off-farm resources.

An individual's overall level of contentment can be seen of as a measure of their level of well-being. As a result of this basic knowledge, two distinct debates arise: The first consideration is the extent to which the substance's second well-being can be described as an aggregate of its intensity. When a person's social, material, and spiritual requirements are all being met, they can be said to be in a state of well-being, and this state of well-being motivates them to work hard to improve their own lives, their families, and society as a whole (Sunarti & Khomsan, 2012). When a society's well-being is taken into account, it can be said that it has been prosperous. If one wants to achieve the ideal state of well-being, good health, and harmony, he or she must put out an effort commensurate with his or her ability. Weakness in well-being can be seen as a sign of a society's ability to pay for goods and services for its citizens, according to economists. Even while there is no definite upper limit to welfare, it does include food, education, and health care, and it is frequently extended to include other social benefits such as employment possibilities, protection for the elderly, freedom from poverty, and so on.

This generally indicates that examples of family use are considered as markers of financial transition events and government aid from residents of a country. In order to determine the family's utilization, it is necessary to establish the degree to which the utilization design is put into practice. Low external input systems are more akin to natural ecosystems, reducing

environmental consequences. The families of the implementers, by supervising the utilization of the draft, not only play a role 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 due to the fact that no family has a strategy and a measure of use that is identical to the other families'. Taking into consideration the influence that its application has had on the provision of governmental support to families, it is frequently understood by reference to the case of family use. The whole profit made by an individual is referred to as their income, and this profit can be expressed in the form of real money or in a conventional structure. 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 occurs as a direct result of the agreement of the factors of creation that he possesses in this area of creation.

The main problem is the potential for competition for a limited amount of feed between hot peppers and grown chickens, as well as the relative inefficiency of using available feed. The impact can be felt both nationally. The increasing demand for chili and chicken has had a positive impact on the long-term survival of feed sources and the environmental impacts that accompany such growth.

METHODS

The research was carried out in several stages, namely the preliminary stage, data analysis, distribution of questionnaires to respondents, data processing with the SEM method, data interpretation and drawing conclusions. The parameters observed in this study are the income of farmers and breeders integrated in chili and chicken crops in Cingkes Village which has indicators: standard of living, farming, productivity, income and welfare.

RESULTS AND DISCUSSION

Very small determinant values indicate an indication of the presence of multicholinerita problems or singularities, so the data cannot be used for research.

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

In order to verify that the data distribution is normal, the score in the C.R column must be more than 2.58 or less than negative 2.58 (-2.58). The assumption of normality was met because 296 observational data were used in this investigation.

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

Source: Ouput AMOS

These are the findings of a Univariate Summary Statistics test of the data's normality. According to normality results, it can be concluded that there are data sets that are normal. Where most of the Mahalanobis d-squared P-values for p1 and p2 were more than 0.05.

Table 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	> 0.90	0.952	Fit

Index (GFI)			
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 based on all model analyses based on the Fit Model Assessment results. The test findings can be seen in the table below that shows the path analysis (path analysis) of each variable, both direct and indirect. To accommodate the degree of freedom in comparison with other models, AGFI's size is a modification to the GFI. While 0.8 >AGFI >0.9 is an excellent fit, 0.8 - AGFI >0.9 is a marginal fit. The model's AGFI score of 0.975 is higher than the 0.9 cutoff, indicating that it is well-fitting. To compare models, the Tucker-Lewis Index (TLI) or non-normed fit index (NNFI) takes into account the number of coefficients. Good fit is TLI>0.9, and moderate fit is TLI>0.8. Since the TLI score is in the range of 0.8-0.9, indicating a decent model, the model is considered good. It is the amount of mismatch that exists between the target model and the base model that is the NFI value. NFI values vary from zero to one. Good fit is NFI >0.9, while moderate fit is NFI 0.8-NFI >0.9. The NFI result is 0.975, which indicates that the model is sound. Between 0 and 1 is the range for the Incremental Fit Index (IFI). In general, ifi >0.9 is a decent match, although ifi 0.8 >IFI >0.9 is marginal, A score of 0.912 indicates that the model's IFI falls within a desirable range of 0.8 to 0.9 points.

From 0 to 1, the CFI scale ranges. Good fit is defined as a CFI >0.9; marginal fit is defined as a CFI >0.8. Because the model's IFI value is over 0.982, it's an excellent one. The Relative Fit Index (RFI) is a number between 0 and 1. Good fit is defined as RFI >0.9 while moderate fit is defined as RFI 0.8 >0.9. There is a 0.803 RFI value, which is within acceptable range, hence the model is accurate.

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. Thus, the first hypothesis is accepted, which means that farmers and breeders' welfare will grow if the standard of living rises or is met. Farmer welfare and living conditions have been positively impacted by Cingkes Village's high standard of living prior to and during the good land convention. Prior to the development of chilies and farms, they attempted to make money through the cultivation of string beans. It is impossible for pests to produce fruit that is of high quality since they constantly lose. While keeping chickens for supplemental money is still a major source of income for the people of the town, chilies have become the primary source of their livelihood.

People in Cingkes Village, Simalungun Regency, have a subpar standard of living on the Mayarakat Income. As a result, the second hypothesis is ruled out, indicating that income is unaffected by one's standard of living. 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, farming correctly and effectively. According to the results of farmers and breeders in terms of income, it is clear that the time and results are vastly different. Once a month or once every two weeks, chili production yields results. In the meantime, because it is computed from the process of raising animals to be sold on the market, the livestock yield cannot be determined in a year or month. As shown by the t CR of 4.864 and the 0.000 significance level, Usahatani has a significant

impact on the welfare of the community in Cingkes Village, Simalungun Regency, showing that the estimation parameter between the influence of Farming on the welfare of the community showed significant results. As a result, the third hypothesis is supported, indicating that farming is an essential factor in raising overall well-being. Research shows that the land area included in the Farming 0.448 has a positive influence on changes in the welfare level of chili farmers, or it can be said that if agricultural land is larger, the greater opportunity for chili farmers to develop their businesses. This is supported by the results of the regression calculation. Farming that includes land area has a significant effect on farmers and breeders, which is why I observed that when the land area grows, farmers and breeders see a rise in income and the welfare of their businesses. To a considerable extent, the amount of land available for harvesting has an impact on the yield. The larger the agricultural land, the more beneficial it is for cattle to utilize the land as a place to raise anglicized chickens. Farmers who cultivate less than 1 hectare of land are eligible for subsidized fertilizer aid to help offset the higher wages and maintenance costs associated with bigger land areas.

It is distinct from items that the land area is more than 1ha, as it has been reported that they are able to buy fertilizer and handle chilies with good quality. They are provided subsidized fertilizer through agricultural groups, and those who do not follow the rules are not given subsidized fertilizer. The results of the survey that uses fertilizer made from chicken manure results and the growth process can be said to be good, it is just a little complicated to process chicken manure. Residents who do not get subsidized fertilizer because they do not join the farming group can add the chicken manure that they buy to be fertilizer for chili. The integration system has a great many advantages, one of which is the utilization of chicken dung as a fertilizer and the consumption of plant fronds by hens, which results in the production of chicken manure.

CONCLUSION

1. Living Standards have a significant influence on the welfare of farmers and ranchers in the people of Cingkes Village, Simalungun Regency. Where the CR value is 5,017 and with a probality value of 0.000. The standard of living does not have a significant effect on the income of farmers and ranchers in the people of Cingkes Village, Simalungun Regency.
2. Farming has a significant influence on the welfare of farmers and breeders in the community of Cingkes Village, Simalungun Regency. Where the CR value is 4.864 and with a probality value of 0.000. Farming does not have a significant effect on the income of farmers and ranchers in the people of Cingkes Village, Simalungun Regency. Where the CR value is -2.283 and with a probality value of 0.022.
3. Biota that can be used as chicken feed can be grown in plantations, reducing feed costs by up to 50%. Another advantage of the integrated agricultural method between chile and chicken crops is that rice and ducks can be harvested at the same time without disrupting production. As a result, farmers' incomes will rise if the farming system is supported.

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