

Original Article

Residents' Perception on the Swine and Poultry Farm in Untaga, Alicia, Bohol

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Abstract: The global surge in meat consumption has led to a significant boom in swine and poultry farming. The agricultural practice involves raising domesticated pigs (swine) and various fowl (poultry) to meet the growing demand for meat, eggs, and other animal products. The study determined the residents' perception on the swine and poultry farm in barangay Untaga, Alicia, Bohol in terms of health, odor, and water resources. The study also determined the profile of the selected 150 respondents as to their estimated monthly income, highest educational attainment, occupation and purok address and analysed if there was a significant difference between residents' profile and their perception. Through descriptive study design, the study used survey questionnaires to determine the residents' perception about the swine and poultry farm. Before final survey, the questionnaire systematically underwent pilot testing using Exploratory Factor Analysis in barangay La Hacienda, Alicia, Bohol where there is also a poultry farm nearby before doing the final survey in barangay Untaga, Alicia, Bohol. The R Studio was utilized in computing the data during pilot testing and final survey. Majority of the respondents acquired a "Very High" perception in terms of impact in Health, Odor, and Water Resources. Through One-Way Analysis of Variance (ANOVA), the result revealed that there was no significant difference between residents' profile and to their perception. Thus, the null hypothesis has been failed to be rejected. Except between Highest educational attainment and Health because the result showed that in that area, there is a significant difference when the two categories are compared. Therefore, estimated monthly income, occupation and purok address are factors that do not affect the perception of the residents, apart from the highest educational attainment, which can be a significant factor in influencing residents' perception when it comes to the extensive swine and poultry production.

Keywords: residents' perception, swine, poultry farm, exploratory factor

1. INTRODUCTION

The global surge in meat consumption has led to a significant boom in swine and poultry farming. The agricultural practice involves raising domesticated pigs (swine) and various fowl (poultry) to meet the growing demand for meat, eggs, and other animal products. While these operations play a vital role in providing mass-produced food. It is crucial to acknowledge and address the challenges associated with extensive swine and poultry production [1]. Globally, the adverse impacts of swine and poultry farming have become a prevalent concern addressed by residents. In Nigeria, pig farming is a significant agricultural activity, primarily in the southern and north-central regions, but inadequate pig waste management poses challenges to the industry's sustainability [2]. Unregulated disposal of pig waste,

highlighted in reports by [3] and [4], leads to the release of harmful gases, degrading air quality and affecting human and animal health [5]. In Philippines, residents of barangay San Juan de Mata and Sto. Domingo, Tarlac, have voiced out their serious concerns about the harmful effects of three large commercial hog farms, including poultry farms, in their health and the environment. Each housing has 30,000 pigs, and is situated in densely populated rural areas and discharge their waste directly into the Being River, rendering it biologically dead and unsuitable for irrigation. Improper waste management has led to unchecked insect and disease vector proliferation, affecting the environment and human health, as outlined in the study of [6]. In barangay Untaga, Alicia, Bohol, residents near a swine and poultry production is facing with adverse effects such as persistent odor, water pollution, and health concerns. In fact, it has already been a controversial topic on social media where residents aired their frustration and rants online about the problem relating to the swine and poultry farm. The pervasive stench from these facilities compromised the quality of life for those living in proximity. Water pollution is also a significant issue as concentrated waste contaminates nearby water sources, imposing threats to both aquatic ecosystems and residents relying on these water supplies [7]. The emissions from the facility contaminate the air and water, leading to health issues, intensifying pre-existing health conditions, and present long-term health risks. Overall, the detrimental effects extend beyond inconvenience, encompassing a range of environmental and health challenges for the residents. In light of the various implications coming from the extensive swine and poultry farm, the objective of the study was to undertake a rigorous local study endeavor. The investigation aimed to assess and examine resident's perceptions concerning the facility with their perceived effects on public health, air quality, and water resources. The transition from conventional farming practices to intensified swine and poultry production over recent decades has brought about numerous harmful effects on the environment and human health. In order to fulfill the rising demand of meat products, the transformation has been motivated by a number of issues, including the need for efficient of swine and poultry production. The intensity has, however, affects the public health and also the environment [8]. In the context of swine and poultry production, several key theories offer insights into the environmental and societal implications of these practices. The Risk Society Approach, as articulated by [9], asserts that the risks associated with modernization can lead to irreparable harm to the environment. The perspective underscores the potential consequences of intensive animal agriculture on ecological well-being. In their respective studies, [10] and [11] documented widespread instances of unregulated open dumping of pig waste within these regions. The careless disposal of pig waste has given rise to environmental pollution and a surge in public grievances. Consequently, the environmental and human health issues tied to pig production in these states can be attributed to subpar waste management practices in farms, as noted by [12], [13], and [14]. Complementing that, the Theory of Waste Management, as proposed by [15], emphasizes the importance of waste management in preventing harm to both human health and the environment, while simultaneously advocating for the optimization of resource used. In swine and poultry production context, the theory highlights the important role of responsible waste management to mitigate damaging effects. Lastly, the Environmentally Responsible Behaviour Theory, as articulated by [16], emphasizes the significance of intention as a pivotal factor influencing responsible behaviour toward environmental management. In the context of animal agriculture, the theory underscores the role of individual and collective intentions in fostering environmentally responsible practices, such as sustainable and ethical production methods. Together, these theories offer a comprehensive framework for understanding the complex interplay between swine and poultry production and their environmental and societal consequences. Multiple credible sources highlight the alarming consequences of intensifying swine and poultry production, which have led to a range of significant environmental issues. These pressing concerns encompass public health along with air and water pollution. In terms of health, livestock farms are known to emit microorganisms, some of which are animal-transmitted pathogens or carriers of resistance to

antimicrobials. A series of epidemiological studies identified associations between residential area to livestock farms and risk of animal-borne infections and suggest that environmental transmission might play a role. While poultry production is one of the most efficient forms of livestock management with regards to natural resource use and protein gain, it can still have a significant impact on human health and the environment [17]. Swine production is prone to the detrimental influence of infectious diseases including *Mycoplasma hyopneumoniae*, *Actinobacillus pleuropneumonia*, Porcine Reproductive and Respiratory Syndrome Virus, *Trichinella* spp., *Toxoplasma gondii*, *Salmonella* spp., *Campylobacter*, and *Leptospira*. Poultry farms emit toxic odors containing various compounds, including dimethylamine, ammonia, ketones, aldehydes, and organic acids. These odors can detrimentally affect the well-being of both farm workers and nearby communities [18]. Intensive poultry production generates dust comprised of feather and skin fragments, feces, feed particles, microorganisms, and pollutants, negatively affecting both poultry health and the health of those living and working around and nearby the farms [19]. Poultry house dust, which includes particulate matter (PM) of varying sizes (PM₁₀, PM_{2.5}, PM_{0.1}), poses a risk of inflammation and respiratory diseases when inhaled. The study determined the perception of the barangay residents with regard to the swine and poultry production of a swine and poultry farm located in Untaga, Alicia, Bohol.

2. MATERIALS AND METHODS

The study utilized descriptive study design with the aid of survey-questioning method that will be used to get the sufficient data and information. The use of itemized questions, calculated frequencies, tabulated data, and curated tables is suited in achieving the needed results needed for the study. The investigation aimed to examine residents' perception and assessing their perceived effects concerning public health, air quality, and water resources. The locale of the study is at Untaga, Alicia, Bohol. The study is particularly conducted at the barangay where the swine and poultry farm is situated and the residents are primarily exposed to the impact of the said facility. A stratified sampling is used to identify and gather the needed one-hundred fifty (150) respondents coming from each household and purok address of barangay Untaga as the representative of the total population. In order to gather the data of the study, the study used survey-questionnaires (checklist and rating scale) to determine the residents' perception about the swine and poultry farm in Untaga. A printed survey containing information about the study and a table which the respondents can check the well-curated questions given. The study utilized a survey questionnaire with two parts; (1) respondents' demographic profile (estimated monthly income, highest educational attainment, occupation, and purok address) and (2) the perceived impact in terms of health, odor, and water resources. The respondents are required to select the options which best matched their perception. The questionnaires were scored on a Likert scale from strongly agree to strongly disagree. The frequency of the residents' responses to the items of the questionnaire was counted for ranking. The original questionnaire has a total of thirty (30) items: ten (12) items for the health section, ten (8) items for odor section, and ten (10) items for water resources. The questionnaire systematically underwent pilot testing using Exploratory Factor Analysis and some items were statistically omitted, Thus, leaving the twenty-four (24) items retained. In the health section, the eleven (11) remaining items have good indicators of reliability with an acceptable factor loading of ($0.614 \geq 0.6$) and Cronbach $\alpha = 0.86$. In odor section, the three (3) remaining items have good indicators of reliability with an acceptable factor loading of ($0.860 \geq 0.6$) and Cronbach ($\alpha = 0.93$). Lastly, in the water resources section there are ten (10) unchanged items which all have good indicators of reliability with an acceptable factor loading of ($0.659 \geq 0.6$) and Cronbach $\alpha = 0.95$. The result reveals the reliability and validity of the instrument which implies that it is ready for final survey distribution. Before final survey, a preliminary pilot testing was conducted in barangay La Hacienda, Alicia, Bohol where residents are also exposed to a poultry farm. That is to test the validity and reliability of the questionnaire before using it on the final survey. The study then asked for the

approval from the study adviser of the group and to the barangay captain of barangay La Hacienda to conduct the pilot testing survey in Sitio Tawid and Sitio Dagohoy. For final testing, the study asked for the permission from the department dean and the study committee of College of Teacher Education in Bohol Island State University-Cogtong, Candijay Campus to conduct the final survey. After the approval, the study also asked permission to the barangay captain of barangay Untaga to conduct the final testing survey to the four (4) respective purok of Untaga with their corresponding number of participants. After the gathering of data, the results are tabulated, analysed and interpreted. To determine the significant difference between the residents' perception and their profile in terms of educational attainment, estimated monthly income, occupation, and purok address, One-Way Analysis of Variance (ANOVA) was used.

3. RESULTS AND DISCUSSION

Table 01: Profile of Residents in Terms of Highest Educational Attainment, Estimated Monthly Income, Occupation, and Purok Address

Estimated Monthly Income	F	%
Poor (less than 9,100)	116	77.33
Low Income (9,101-18,200)	15	10
Lower Middle (18,201-36,400)	15	10
Middle (36,401-63,700)	4	2.67
Upper Middle Class (63,701-109,200)	0	0
Highest Educational Attainment		
Elementary Level	31	20.67
Elementary Graduate	18	12
High School Level	22	14.67
High School Graduate	24	16
College Level	15	10
College Graduate	40	26.67
Occupation		
Blue Collar Jobs	28	18.67
Gray Collar Jobs	21	14
Green Collar Jobs	31	20.67
No Collar Jobs	41	27.33
Pink Collar Jobs	6	4
Red Collar Jobs	6	4
White Collar Jobs	17	11.33
Purok address		
Purok 1 (500 meters)	51	34
Purok 2 (1 kilometer)	48	32
Purok 3 (300 meter)	27	18
Purok 5 (1.5 kilometer)	24	16

Table 01 reveals that college graduates formed the largest group among respondents, indicating a strong preference for higher education compared to those with basic education. That suggests a potential influence from the readily available options provided by public and private colleges, along with state universities, which offer a diverse range of educational programs and degrees. However, most of the respondents belong to poor families, with an estimated monthly income of below 9,100, and as a matter of fact even with the individuals who attained tertiary education has low estimated

monthly income especially to those individuals who are no collar jobs such as students, senior citizens, and housewives. Majority of the respondents are from a Green Collar Jobs, Blue Collar Jobs, Gray Collar Jobs while No Collar Jobs got the highest number of respondents as compared to other types of jobs. Furthermore, Purok 1 and Purok 2 comprise the greatest number of available respondents compared to Purok 3 and Purok 5 who has the least number of respondents available.

Table 02: Respondents' Perceived Impact of the Swine and Poultry Farm to their Health

The swine and poultry farm contribute ...	SA	A	D	SD	Mean	Description
1. Cough	75	54	20	1	3.35	SA
2. Cold	75	54	21	0	3.36	SA
3. Pneumonia	33	32	38	47	2.34	D
4. Stomachache	43	47	52	8	2.83	A
5. Loss of food appetite	58	56	33	3	3.12	A
6. Gastroenteritis	15	21	50	64	1.91	D
7. Allergies	50	53	35	12	2.94	A
8. Headache	68	62	20	0	3.32	SA
9. Fever	19	42	44	45	2.23	D
10. Stress and anxiety	100	45	2	3	3.61	SA
11. Bacterial, viral and other easily-transmittable diseases (e.g. Hand, Foot, and Mouth Disease)	39	57	30	24	2.74	A
Level of Perceived Impact on Swine and Poultry Farm	F			%		
Very High	62			41.33		
High	52			34.67		
Low	31			20.67		
Very Low	5			3.33		

Based on the results in Table 02 the items "Cough, Cold, Headache, and Stress and anxiety" got a remark of Strongly Agree while the other four items got a remark of Agree. The outcome implies that most respondents are strongly agreed with most of the items with regard to the negative health risks associated with the swine and poultry farm. However, there are items that the respondents deemed uncertain as they think some sicknesses are not entirely associated with swine and poultry farm but are influenced by other various factors. Nonetheless, overall, the respondents possess a strong level of negative perception when it comes to the health risk associated with the swine and poultry farm thus perceiving the health category as Very High. The finding aligns with [20] study, which the study affirms that livestock odors could potentially induce adverse physiological responses, such as nausea, vomiting, headaches, coughing, and irritations of the eyes, nose, and throat. Moreover, literature in health science demonstrated that odor exposure could worsen preexisting conditions, such as asthma [21]. That means that swine and poultry farms in general can have a profound impact on the well-being of nearby residents specifically on their psychological and physiological aspect.

Table 03: Respondents' Perceived Impact on the Swine and Poultry Farm in terms of Odor

Odor	SA	A	D	SD	MODE	RANK
I...						

12. Often smell bad odors coming from the swine and poultry farm.	99	50	1	0	SA	3
13. Feel uncomfortable due to the chicken dung, pig stool, and other waste odor from the facility.	106	42	2	0	SA	2
14. Notice how the air quality in our barangay has become bad.	128	21	0	1	SA	1
Level of Perceived Impact on Swine and Poultry Farm	F			%		
Very High	114			76		
High	36			24		
Low	0			0		
Very Low	0			0		
SA = Strongly Agree; A = Agree; D = Disagree; SD = Strongly Disagree						

Table 03 shows that item no. 14 which states that “Notice how the air quality in our barangay has become bad” got the highest frequency. Majority of respondents strongly agreed with all the items. It suggests that respondents perceived the odor as a noticeable and concerning issue, potentially affecting their daily lives and overall well-being. Overall, the results indicate that the odor from swine and poultry production is generally perceived by the respondents as Very High. The result is similar to the study entitled “The Air Quality Assessment of Swine and Poultry Farms in the Province of Laguna, Philippines by the University of the Philippines Los Baños (UPLB, 2016) which states that “Swine and poultry farms in Laguna emit significant amounts of air pollutants, particularly ammonia and particulate matter (PM)” which the study also found out that people living near swine and poultry farms are at an increased risk of exposure to these air pollutants. In addition, a study of [22] states that, “In areas dominated by livestock farming, air quality experiences significant deterioration due to the release of various pollutants”. The outcome and the support of various studies mentioned means that residents living near the swine and poultry farm are exposed to risk due to bad air quality that swine and poultry farm emits.

Table 04: Respondents’ Perceived Impact on the Swine and Poultry Farm in terms of Water Resources

Water Resources	SA	A	D	SD	MODE	RANK
I have observed that due to the swine and poultry farm...						
15. There is build-up of algae in the waterways.	86	47	14	3	SA	9
16. The waste run-off has contaminated nearby river.	130	19	1	0	SA	3
17. The waste run-off has caused fish kill in the river.	123	20	7	0	SA	5
18. The waste run-off has changed the color of nearby river.	137	11	2	0	SA	1
19. The waste has harmed the local waterways.	114	33	3	0	SA	6
20. The water emits foul odor.	78	59	10	3	SA	10
21. The water is not safe for consumption.	98	48	4	0	SA	7
22. The creek in our barangay is contaminated due to poor sewage system from the facility.	125	22	1	2	SA	4
23. The water is no longer fit for activities such as bathing, fetching water, and laundry washing.	133	15	1	1	SA	2
24. The polluted stagnant water has become a breeding-ground for mosquitos and other disease-carrying insects.	80	63	5	2	SA	8
Level of Perceived Impact on Swine and Poultry Farm	F			%		
Very High	126			84		

High	21	14	
Low	3	2	
Very Low	0	0	
SA = Strongly Agree; A = Agree; D = Disagree; SD = Strongly Disagree			

In Table 04, it is evident that most of the respondents strongly agreed with all statements presented. Among these items, item no. 18 which addresses the change in color of the river due to waste run-off, garnered the highest frequency. The finding suggests that among the various types of water resources, the river of barangay Untaga have been affected by a substantial impact from the swine and poultry farm, particularly in terms of discoloration. Overall, these findings point to a Very High perception among residents regarding the state of water resources, highlighting the farm's potential impact on barangay Untaga's water quality. That is grounded by the study that implied, "The primary elements of animal waste that impact surface water are organic matter, nutrients, and fecal bacteria. Animal waste may also increase the amount of suspended material in the water and affect the color either directly by the waste itself or indirectly through the production of algae. Indirect effects on surface water can also occur when sediment enters streams from feedlots or overgrazed pastures and from eroded stream banks at unprotected cattle crossings," [23]. Another study by the Philippine Council for Agriculture, Forestry and Natural Resources (PCARRD, 2013) implied that the Philippines swine and poultry industries heavily polluted the water and that it produces over 100 million liters of nutrient-rich wastewater daily, often discharged untreated into rivers and lakes, causing algae blooms and eutrophication, deteriorating water quality and causing fish kills. The result showed that extensive swine and poultry operation can really affect the water bodies by contaminating it with harmful waste chemicals and bacteria which can damage the ecosystem and the well-being of residents.

Table 05: Difference on Residents' Perception on Swine and Poultry Farm across Profile Categories

Profile	Variable		
	Health	Odor	Water Resources
Highest educational attainment	0.0128*	0.116	0.1480
Estimated monthly income	0.6403	0.197	0.4662
Occupation	0.2097	0.060	0.0838
Purok address (distance)	0.1197	0.451	0.2092
*P-values significant at 0.05 level of significance			

The Table 05 indicates that regardless of estimated monthly income, occupation, and purok address, all respondents convey the same negative perception. And among all the respondents' profile categories; there is only one (1) significant difference in all of the data set mainly in the health category in relation to highest educational attainment as shown in the table. It implies that the higher educational attainment, the more knowledge is accumulated and therefore wider and deeper understanding of environmental issues. These respondents also likely believed that the higher the exposure, the greater the risk when it comes from the swine and poultry farm. The result is supported by the study of [24], which brings forth compelling evidence of a strong connection between educational attainment and heightened pro-environmental attitudes and behaviours. Which means that the higher educational attainment, the more environmentally aware a person can be on environment issues specifically when it comes to health hazard? The extensive swine and poultry

production has brought a widespread negative consequence. Thus, addressing the challenges posed by extensive swine and poultry production necessitates a comprehensive action plan that considers the multifaceted impacts on public health and the environment. Establish partnerships between LGU Alicia and the swine and poultry farm to promote dialogue, innovation, and collective action towards addressing the negative impacts of the swine and poultry farm on health, odor, and water resources.

Table 06: Action Plan

Objectives	Activities	Success Indicator	Responsible Person/s	Date of Implementation	Estimated Budget
Establish partnerships between LGU, BISU, and the swine and poultry farm to promote dialogue, innovation, and collective action towards addressing the negative impacts of extensive swine and poultry production on health, odor, and water resources.	1. Present the study to the LGU of Alicia and to the swine and poultry farm.	Attendance/ Documentations	Municipal Mayor, Barangay Captain, Swine and Poultry Farm Personnel	June 05, 2024	5,000 Php
	2. Approval of the establishment of the wastewater treatment plan.	Receipt of purchase for a water treatment supply and product	Municipal Mayor, Swine and Poultry Farm Personnel	November 05, 2024	5,000,000 Php
	3. Surveying of the waterways and river.	Water is treated and the biodiversity is thriving.	DENR Personnel and Environmental Science Specialist	December 05, 2025	10,000 Php

The main purpose of the study was to determine the residents' perception about the swine and poultry farm in the barangay of Untaga, Alicia, Bohol during the year of 2023 and 2024. Specifically, the study aimed to answer the following questions: 1. What are the respondent's profile in terms of: estimated monthly income; highest educational attainment; occupation; and purok address?, 2. What are the perceived impact of the respondents on the swine and poultry farm in terms of: health; odor; and water resources?, 3. Is there a significant difference between the respondents' profile and their perceived impact when they are grouped according to: health; odor; and water resources?, and 4. What action plan to propose? The null hypotheses states that there is no significant difference between the residents' profile in terms of estimated monthly income, highest educational attainment, occupation, and purok address as to their perceived impact of swine and poultry production in terms of health, odor, and water resources. The study utilized descriptive study design with the aid of survey-questioning method that was used to get the sufficient data and information with the objective to examine residents' perception and assessing their perceived effects concerning public health, air quality, and water resources. A pilot testing was conducted in barangay La Hacienda, Alicia, Bohol where there is also a poultry farm in nearby houses and the final testing was done in Untaga, Alicia, Bohol where a large-scale swine and poultry farm is established within the vicinity of the community. To determine the profile of the respondents, the percentage formula was used. To ascertain the significant

difference between the residents' perception and their profile in terms of educational attainment, estimated monthly income, occupation, and purok address, One-Way Analysis of Variance (ANOVA) was used.

4. CONCLUSION

After a thorough analysis and interpretation of the study and the data gathered, the study arrived at the following valuable findings: The demographic profile of the respondents in terms of educational attainment was majority of the respondents are more inclined to attend higher education than attending on basic education. In occupation, most of the respondents are green collar jobs, blue collar jobs, gray collar jobs, and no collar jobs compared to the number of respondents who are in different field of occupation. In estimated monthly income, majority of the respondents are Poor who have a minimum income of less than 9,100 Php contrary to the respondents who are Middle-Middle who have an income bracket of 36,401 Php to 3,700 Php. With regard to purok address, Purok 1 and Purok 2 comprise the greatest number of available respondents compared to Purok 3 and Purok 5 who has the least number of respondents available. In contrast, majority of the respondents acquired a "Very High" perception in terms of the impact on swine and poultry farm when it comes to health risk. Additionally, most of the respondents acquired a "Very High" perception in terms of the impact on swine and poultry farm when it comes to air quality. At the same time, most of the respondents acquired a "Very High" attitude in terms of the impact on swine and poultry farm when it comes to water resources. There is no significant difference between the residents' perception and their profile as to highest educational attainment, estimated monthly income, occupation, and purok address in terms of health, odor and water resources. However, there is a significant difference between the profiles of highest educational attainment when compared to the health category. Based on the following findings presented, the studies conclude that there is no significant difference between the residents' profile and their perception. However, there is a significant difference between the profiles of highest educational attainment when compared to the health category. Thus, the null hypothesis has been failed to be rejected.

5. RECOMMENDATIONS

In light of the abovementioned findings and conclusions of the study, it is suggested that the following recommendations be taken into consideration:

- Present the study and the action plan to the Local Government Unit (LGU) of Alicia in formulating a responsive action towards the mitigation of the negative impact of extensive swine and poultry farm.
- Future study may conduct further study that includes a larger number of sample sizes and multiple settings in order to maximize the results and findings.

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