

Swine Farm Pollution Management Based on Hora Subdistrict Local Ordinance of Businesses Detrimental to Health, B.E. 2542

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Abstract

The purpose of this research was to study and propose guidelines for swine farm pollution management based on Hora Subdistrict Local Ordinance of Businesses Detrimental to Health, B.E. 1999. An in-depth interview conducted among eight informants purposively sampled. They were authorities with legal power in and responsibilities for the swine farm pollution management and villagers affected by the pollution. The study area covered two villages in Hora Subdistrict, At Samat District, Roi Et.

The research found that a state agricultural extension organization promoted livestock and controlled swine farm pollutions. It was also found that the community leaders reconciled the complaints made by villagers affected by the farm pollution by negotiating with and proposing guidelines to the entrepreneurs for swine farm pollution and impact mitigation. There was an integrated mission among Hora Subdistrict Administrative Organization, the district agricultural extension office, and swine farm entrepreneurs who had experience in pollution management and farming knowledge promotion. However, Hora Subdistrict Administrative Organization did not have its own *local ordinance of swine farm entrepreneurship and control* which should contain regulations for swine farm pollution management in all aspects. For this reason, legislating a local ordinance of swine farm entrepreneurship was proposed in this research. It should include swine farm-community distance, swine farm locations, sanitary housing, wastewater treatment system, manure management, hygienic workers, infectious disease management, and nuisance prevention. Another guideline was setting up an official committee consisting of local organization administrators, community leaders, and academic experts to collaboratively reconcile complaints and find suitable solutions.

Keywords : people's participation, swine farm pollution management, Hora Subdistrict Local Ordinance of Businesses Detrimental to Health, B.E. 1999

Introduction

Hora Subdistrict Administrative Organization, At Samat District, Roi Et Province has 14 villages. It has a total population of more than 10,000 people. The majority of the people do swine farming for living. There are more than 20 swine farms with over 1,000 swine. Swine farming is one of their needs to make and sell products to provincial and overseas markets. Hora Subdistrict Administrative Organization has its own *Local Ordinance of Businesses Detrimental to Health, B.E. 2542 (1999)* as a law to control businesses that are harmful to health. Item 3 of this local ordinance states that swine farming which is detrimental to health shall be under special control (Department of Local Administration, 2003). Concepts and Operation Manual for Subdistrict Councils and Subdistrict Administrative Organizations. Bangkok. Swine farm areas shall follow the conditions concerning sanitation, wastewater treatment system, dung management, and

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dung odor prevention (Paraksa, N,1988: 69-75). Thus, swine farm entrepreneurs shall follow such conditions which were made by the local authorities in order to prevent harms to the public health (Rattanapatsakorn, Somchai 2007: 13)

Nevertheless, the swine farms still produce pollutions in their neighborhood such as offensive odor and wastewater. Odor pollution results from poor management of a vast amount of swine dung (Sonchareonzup, P,2001: 13 -16) Likewise, wastewater is generated from pigpen cleaning. Swine farms without a proper wastewater treatment system drain wastewater into public watercourses and private agricultural areas. This brings internal conflicts between villagers and swine entrepreneurs. The case study of this research is the swine farm management at Moo 10 (a part or section of a village or community) of Ban Non Had, Hora Subdistrict, At Samat District, Roi Et Province. The research focused on studying the swine farm pollution management as well as proposing guidelines for pollution management based on Hora Subdistrict Local Ordinance of Businesses Detrimental to Health, B.E. 2542.

Research Objectives

1. To study the swine farm pollution management based on Hora Subdistrict Local Ordinance of Businesses Detrimental to Health, B.E. 2542.
2. To propose guidelines for pollution management based on Hora Subdistrict Local Ordinance of Businesses Detrimental to Health, B.E. 2542.

Research Methodology

This is a *research and development* project with a qualitative design. The scope of the research is as follows:

1. Population

The research was conducted by means of an in-depth interview among eight key informants who were purposively sampled. The eight informants were authorities with official legal power in and responsibilities for the swine farm pollution management and villagers directly affected by the swine farm pollution. The eight key informants are as follows:

- 1) 4 entrepreneurs whose swine farms were located in the area under the authority of Hora Subdistrict Administrative Organization, At Samat District, Roi Et Province
- 2) 2 local authorities (an administrator and an officer) with official legal power in and responsibilities for the swine farm pollution management
- 3) 2 headmen from the villages where swine farms of over 50 swine were located
- 4) 2 villagers who were directly affected by the swine farm pollution management in the area of Hora Subdistrict Administrative Organization, At Samat District, Roi Et Province.

2. Research instrument

The researcher conducted the in-depth interview (semi-structured interview) with the key informants. The interview was designed to be flexible and open so that the researcher could freely adapt questions to elicit data to meet the specific purposes of the research. The in-depth interview gathered fundamental data from the administrator and the officer, the entrepreneurs, the headmen, and the villagers who were directly affected by the swine farm pollution management in the area of Hora Subdistrict Administrative Organization, At Samat District, Roi Et Province.

1) Data collection

Data was collected through a *documentary research* section and a *fact research* section. Then the data was well organized for data analysis.

2) Data analysis

Data from the documentary research section was analyzed through *content analysis*. Data from the interview was analyzed through *analytic induction* based on the observation and interview notes taken from concrete data in the study area.

Research Results

1. Context of Hora Subdistrict Administrative Organization

The Office of the Chief Administrator, Hora Subdistrict Administrative Organization, has official legal power in and responsibilities for subdistrict development plans, legal affairs and litigation, dispute compromising, and agricultural extension. Subject matter specialists from a state agricultural extension organization were in charge of promoting livestock and controlling swine farm pollutions such as wastewater, manure odor, diseases, and insect pests. There was a project to provide the swine farm entrepreneurs with academic knowledge on swine farm pollution management which included fermenting bio-extracts for swine farm wastewater and odor treatment. In addition, the project trained the swine farm entrepreneurs to build septic tanks to sundry swine dung for sale and other uses. The project also advised them to mix swine dung with rice husks for deodorization and insect pest prevention. There are no public health organizations in the area of Hora Subdistrict Administrative Organization. However, Hora Subdistrict Administrative Organization has certain essentials in the swine farm pollution management. They set up a specific division and officers whose responsibilities are controlling, looking after, advising, and providing knowledge on swine farming, and pollution prevention and solution. Moreover, the organization funds a budget to run a pollution prevention and management program that is integrated with the community development and problem solution.

2. Swine farm pollution management in the area of Hora Subdistrict Administrative Organization.

The interview with the villagers at Moo 10, Hora Subdistrict, revealed that the villagers who were affected by the pollutions made complaints to the subdistrict headman or the village headman. These community leaders directly involved with swine farm pollution management. They worked closely with swine farm entrepreneurs and experienced specialists on making guidelines that led to agreements among the entrepreneurs. This was aimed at preventing the entrepreneurs from causing pollutions. The community leaders, after receiving complaints from the affected villagers, negotiated with and recommended some appropriate solutions to the pollution management. This could lower damages to the neighborhood. Moreover, the community leaders requested cooperation from the entrepreneurs to build new swine farms, if any, further away from the community. As a result, there were fewer problems from the complaints. This was due to the fact that the community leaders worked closely with the entrepreneurs on the pollution management. The entrepreneurs were also villagers who paid respect to the community leaders. This great cooperation benefited deodorizing swine dung which is usually stronger in the evenings of the rainy season.

In addition to Moo 10, the interview with the informants from Moo 5 showed that the discussion between the community leaders and the entrepreneurs on the complaints satisfied the affected villagers. This allowed the affected villagers to realize the facts about the pollution-solution process of the entrepreneurs. It enabled the affected villagers to understand the pollution from an academic perspective. It also helped the villagers accept some reasons arising in the pollution-solution process. The villagers were allowed to co-inspect the pollution management. In the discussions, the entrepreneurs directly learned the troubles from the villagers. They took this opportunity to clarify the causes of the pollutions and the processes taken in the pollution management. Also, the entrepreneurs updated the progress of the pollution management process. For this reason, the two parties perceived the sincere actions of each other. This cooperation in the pollution management created great satisfaction. In contrast, Moo 10 had a different swine farm pollution management system. In their system, they set a committee consisting of subdistrict/village headmen and volunteers. The committee acted as core leaders in the inspection and follow-up of the pollution management system. The committee gained willing cooperation from the entrepreneurs. This system resulted in fewer effects from the swine farms.

Additionally, the Moo 10 headmen revealed some information on the management of conflicts on offensive odor. This problem affected the villagers most in the rainy reason. The rainwater spilled out the wastewater from the treatment tanks. When this problem occurred, the headman led a discussion among the affected villagers. Then, the headman made a complaint to the entrepreneurs. The affected villagers required the entrepreneurs to raise the ridges, to add the fermented bio-extracts, and to move farms further from the village.

The interview with the Hora Subdistrict Administrative Organization officers showed that the organization had received complaints from the villages. Most of the complaints were concerned with dung odor. Another case was the location of a farm. It was located near the rice field of a village. The wastewater was drained into the rice field. It left an exceeding amount of swine dung in the rice field. As a consequence, the rice was not as fruitful as it should be. In this case, the local administrators had the headman arrange reconciliation between the complaint makers and the entrepreneur. The solution from this reconciliation was that the entrepreneur had to deodorize the wastewater and dung by applying the knowledge gained through the specialists from the district offices such as the district livestock office and the public health office. The entrepreneurs also benefited from other entrepreneurs who had earlier succeeded in solving smell from swine wastewater and dung. Besides, the entrepreneurs were suggested to reduce the number of swine or to move the farms further from the village.

In addition to the above findings, the swine farm entrepreneurs at Moo 4 unveiled that in some complaints the villagers needed the farms to be moved out of the community. The villagers expressed an idea that in the future the community area could be expended to get close to the swine farms. In that case, the farms shall again be moved further from the community neighborhood. The community-farm distance must always meet the standard. The building of a new farm shall follow the local ordinance on the location for building a new swine farm. The entrepreneurs regarded that this was unfair to them because the expansion of the community was uncontrollable. However, the swine farm building was controllable. The Moo 4 entrepreneurs were well aware of the effects of the odor pollution on the villagers nearby. Due to the awareness, the farm workers deodorized by adding fermented bio-extracts to the swine dung tanks and to the pigpens in order to prevent the odor from spreading to the residence.

3. Pollution management based on Hora Subdistrict Local Ordinance of Businesses Detrimental to Health, B.E. 2542

Hora Subdistrict Administrative Organization has its own *Local Ordinance of Businesses Detrimental to Health, B.E. 2542* (1999) as a law to control businesses that are harmful to health. This law covered 125 businesses. A rising number of problems from risks and pollutions generated by those businesses were found. There have been more and more problems, nuisances, and complaints reported by the villagers who were affected by risks and pollutions. Such risks and pollutions would become fewer provided that the swine farm entrepreneurs paid attention to the procedures or standards in the local ordinance. Moreover, local organization officials had to collaborate with other relevant offices to warn entrepreneurs and control businesses detrimental to health. According to this local ordinance, swine farming which is detrimental to health shall be under special control. Swine farm areas shall follow the conditions concerning sanitation, wastewater treatment system, dung management, and dung odor prevention. Thus, swine farm entrepreneurs shall follow such conditions which were made by the local authorities in order to prevent harms to the public health.

Swine farming is a business which is detrimental to health. This business must be under special control. Swine farm entrepreneurs have to maintain close care of the sanitation of their farms. They have to control swine farm pollutions and prevent them from harming the public health. Any swine farms; which neither have proper pollution prevention and control and treatment, nor appropriate treatment, bring serious troubles to surrounding residents. Consequently, complaints on offensive odor, air, and wastewater are made. It could be concluded that there were four main causes of pollutions as follows:

1. The entrepreneurs were not aware of consequent impacts of the swine farms on the environment. They started the farms without a long term plan that should focus on locations, building structures, environmental problem control and prevention as well as waste treatment area and technology.

2. The entrepreneurs and the workers of some swine farms at Hora Subdistrict lacked knowledge and understanding of harms generated in this business. They had zero plans for farm management. This lack of awareness eventually led to harms to people's health and environment.

3. Some swine farms at Moo 10 were adapted from houses. This type of farms gave even worse problems to the neighborhood and made it harder to solve.

4. Due to the fact that control, inspection, and supervision from the government sector did not cover all the aspects of swine farm businesses, swine farm pollution management was not as efficient as expected. There have still been longtime and continual impacts from the swine farm pollution.

In the control of businesses that are detrimental to health, Hora Subdistrict Administrative Organization has set out general rules and conditions for the swine farm entrepreneurs to practice to protect the people's health or the farm sanitation. Hora Subdistrict Administrative Organization has collected and managed the data of all the farms in the subdistrict. The organization incorporates this data into the control of the swine farm businesses and the collection of local taxes. With this basic data, the organization can be aware of the situations of the farm pollution.

Discussions

1. Context of Hora Subdistrict Administrative Organization

According to the interview with the local administrators, they provided activities to promote and support the academic knowledge for the swine farm entrepreneurs. They had the subject matter specialists train the entrepreneurs and inspect the farms throughout the year. Also, the entrepreneurs were invited to attend trainings organized by relevant agencies on appropriate occasions all year round. This finding was consistent with the interview with the Moo 10 community leaders who revealed the provision of information on swine farm pollution management for the entrepreneurs to prevent and solve the pollutions. Solutions to mitigate the pollutions included using fermented bio-extracts in swine farm wastewater treatment, adding the fermented bio-extracts and sun drying swine dung to deodorize its odor, locating new farms at an appropriate distance away from the nearest community, and cleaning the pigpens and cages on a regular basis. The finding was also in accordance with the Moo 10 swine farm entrepreneurs. They revealed that the swine farm workers gained and utilized the knowledge to degrade the spread of germs from the farms. The farm workers were well trained on a regular basis by livestock offices in At Samat District, Roi Et Province. For more than 30 years, spread of germs from the swine farms to the communities has not been found. At present, the average distance between a farm and a community is 1 km.

2. Swine farm pollution management in the area of Hora Subdistrict Administrative Organization

According to the interview with the subject matter specialists, Hora Subdistrict Administrative Organization cooperated with the district agricultural extension office and experienced entrepreneurs in managing swine farm pollution such as wastewater, odor, dung, and diseases and insect pests. They provided the swine farm entrepreneurs with academic knowledge on fermenting bio-extracts for swine farm wastewater and odor treatment. They trained the swine farm entrepreneurs to build septic tanks to sundry swine dung for sale and other uses. They also advised them to mix swine dung with rice husks for deodorization and insect pest prevention. They were responsible for controlling, supervising, and providing knowledge on swine farming, and pollution prevention and solution. Moreover, the subdistrict administrative organization funds a budget to run a pollution prevention and management program. The amount of the funded budget depended on the annual budget from the government which was limited and may cause obstacles in conducting training projects. For this reason, the subdistrict administrative organization had to change training projects into sending the subject matter specialists to train the entrepreneurs and inspect the farms throughout the year. Also, the entrepreneurs were invited to attend trainings organized by relevant agencies on appropriate occasions all year round.

3. Pollution management based on Hora Subdistrict Local Ordinance of Businesses Detrimental to Health, B.E. 2542

Hora Subdistrict Local Ordinance of Businesses Detrimental to Health, B.E. 2542 (1999) is a law to control businesses that are harmful to health. In item 3 of this local ordinance, a swine farming business is regarded detrimental to health and shall be under special control and supervision. Swine farm areas shall follow the conditions concerning sanitation, wastewater treatment system, dung management, and dung odor prevention. Thus, swine farm entrepreneurs shall follow such conditions which were made by the local authorities in order to prevent harms to the public health. However, the objective of the local ordinance was to collect a fee from giving a license to do the swine farming business. This local ordinance did not state detailed and clear regulations of swine farm pollution management as practices for

entrepreneurs to maintain sanitation and prevent damages to the community nearby. In the local ordinance, the rules for requesting for a license to do the swine farming business still lack the following aspects.

- 3.1 Distance between a farm and a community nearby
- 3.2 Sanitation of the farm buildings and components
- 3.3 Wastewater treatment system and dung management system
- 3.4 Sanitation of farm workers
- 3.5 Infectious disease management and nuisance prevention

Therefore, the existing process in the pollution standards control not only lacked efficiency and effectiveness, but also sometimes failed in preventing swine farm pollutions from causing a public nuisance in the community. As a consequence, the public made continual complaints and requests for solutions. This finding accorded with Pichet Sonchareonzup (2001) who did research on “People’s Attitude towards Environmental Problems from Pig Farms at Pasak Sub-district, Mueang District, Lamphun Province.” In that research, it was found that the people showed a high degree of agreement that the pig farms brought about environmental problems. The people’s proposed solutions included zoning pig farms, cleaning farms on a regular basis, setting and observing standards of pig farm management, and carrying out inspection by the government sector.

Recommendations

1. Application of the Research Results

For swine farm pollution management, Hora Subdistrict Administrative Organization should provide opportunities for the public to participate in consideration before giving a license to an entrepreneur to start a swine farming business. The entrepreneur of the new farm has to present a process of swine farm pollution management. Both the villagers and the entrepreneurs should discuss advantages and disadvantages that may arise in the future. They should also raise environmental impact prevention measures. The villages should listen to the entrepreneurs in case the community has been expanded to the farm area.

For byproducts of swine farms, Hora Subdistrict Administrative Organization should promote knowledge on benefiting swine dung. The swine farm entrepreneurs are recommended to install a system to produce biogas from the swine manure for different purposes such as household cooking, lighting, and electrical generation. The farm manure can be utilized to produce energy and fuel. They can deodorize the swine manure in a biogas pond. The amount of the biogas in this pond can produce enough electrical supply for the whole farm. Moreover, exceeding solid from the fermented manure can be turned into income and distributed to the local people.

For conflict management, the villagers should be allowed to reconcile any conflicts by means of formal and informal participation. In case a swine farm is built with the people’s acceptance in the area, the entrepreneur and the villagers should cooperate in preventing and controlling any pollution from the farm. They should sincerely understand and admit the factual problems that may occur. The entrepreneur has to build good relationship with the local people as well as make contributions to local activities. This will generate greater cooperation between the entrepreneur and the villagers. The participation in the swine farm pollution management will be stronger. Finally, there will be peaceful livelihood and interdependence.

For legislation, Hora Subdistrict Administrative Organization should issue its own *local ordinance of swine farm entrepreneurship and control* which should contain detailed and clear regulations of swine farm pollution management in all aspects. This local ordinance will be helpful in making a comparison between positive impacts and negative impacts of building a swine farm in the community environment. Hora Subdistrict Administrative Organization can refer to this local ordinance before making a decision to give a license to any swine farm entrepreneur to begin the business. The local ordinance is also a plan to control, prevent, and solve problems from swine farms. The local ordinance should incorporate the following preventive measures against harm to health.

1.1 Location - Any swine farm should be located at an appropriate distance from the community area, buildings, houses, schools, or public water sources. Effects from the location of a swine farm on wind directions should also be considered.

1.2 Space size – A swine farm needs enough space for its business activities. Space zoning is important in this kind of business. Space must be partitioned into different zones such as purchase and sale, material transfer, machinery, production, product processing, waste store, waste treatment, and household. Space zoning and designing has to follow academic principles.

1.3 General management – A farm should be well managed to facilitate the atmosphere. There should be enough ventilation, light, temperature, space per person, bathrooms, restrooms, and working safety.

1.4 Waste treatment – A farm shall provide a waste treatment system as well as a pollution control and prevention system. These systems shall meet the standards determined by related laws.

1.5 The above items 1.1 – 1.4 shall be conducted by a committee consisting of local officials, public health administration officers, and academics of other related fields.

1.6 Dissemination of local ordinance - Hora Subdistrict Administrative Organization should disseminate the above items 1.1 – 1.4 together with penalties for not observing or violating. This dissemination is aimed at building perception among entrepreneurs and the general public.

2. Further Research

Future research should study *local ordinances of swine farm entrepreneurship and control* of other local administrative organizations. Findings from future research can be applied to the local ordinance of Hora Subdistrict Administrative Organization, At Samat District, Roi Et Province. Findings from future research can lead to amendments in and implementation of the Hora Subdistrict Local Ordinance.

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