



Extension Needs of Farmers Engaged in Buffalo Raising around Kaeng Lawa Reservoir Wetland, Ban Phai District, Khon Kaen Province, Thailand

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Received 9 Nov 2023 Accepted 10 June 2024 (*Corresponding Author)

Abstract Buffalo raised by smallholder farmers play important roles for agricultural production, including providing draught power and fertilizer. Buffalo are suited to poor feeding management and adapt to hot-humid tropical climate conditions. Recently the swamp buffalo population of Thailand has been declining. The objectives of the current study are to examine the socio-economic background of Thai farmers engaged in buffalo raising, buffalo raising practices, and farmer needs in terms of extension work focused on buffalo raising. Data collection for the study consisted of questionnaires submitted to 45 farmers in May – October 2020 by convenience sampling. SPSS for Windows was used for analysis to determine the percentage, mean, minimum, and maximum values. In-depth interviews were conducted with farmers who were members of a buffalo-raising group, and with several village headmen and local staff in communities around the Kaeng Lawa Reservoir wetland, in Ban Phai District, Khon Kaen Province, Thailand. The results indicated that members of the buffalo-raising group had an average of 23.9 years' experience in buffalo raising, with an average of 8-9 heads of buffalo per household. The majority of farmers (92.1%) sold their buffalo per head to local merchants, while the average annual income from buffalo sales was 63,233.71 baht per household. Additionally, farmers sold buffalo manure by 20 kg bag for 20-25 baht, earning 2,000 – 3,000 baht a year. The extension work on buffalo raising showed that farmers needed the following: 1) knowledge, in particular on selecting and buying female breeders, breeding improvements, keeping buffalo manure and added value of buffalo manure; 2) training; 82.22% of farmers wanted training provided at the village level, while 75.56 % requested livestock officers as training facilitators; and 3) support, in particular with buying high-quality breeders from government organizations, services on injections for animal health, provision of vaccinations and prevention of disease.

Keywords buffalo raising, agriculture extension, buffalo raising extension

INTRODUCTION

Thai people's livelihood in the past depended on buffalo labor for agriculture. Historically, buffalo are part of Thai people's lives. Currently, the role of buffalo is changing and being replaced by modern technology arising from farm mechanization. As a result, the significance of the past role of buffalo is being lost, and the buffalo population, as a critical part of the rice farming industry has declined rapidly. The value and price of buffalo has also declined (Bangkok Post, 2019). The Provincial Livestock Office and Office of Agriculture Economics (2021) reported that statistics of buffalo in Thailand has decreased from 1.70 million in 2000 to 1.26 million in 2020. In some areas

buffalo raising is still a valued agricultural animal activity for small householders, but the production has unfortunately declined in recent decades (Pineda et al., 2021). Moreover, buffalo have become a niche market, conservation activity and hobby.

The Kaeng Lawa Reservoir wetland, located in Ban Phai District, Khon Kaen Province, Thailand currently has about 2,000 buffalo around the reservoir, and is the biggest group of buffalo in Northeast Thailand (Department of Livestock, 2022). About 120 farmers in a community enterprise there may help to drive the agriculture in the region sustainably as well as providing socio-economic outputs farmers and their practices on buffalo raising. Thus, the study on needs for agriculture extension on buffalo raising of farmers in Kaeng Lawa reservoir wetland, Khon Kaen was needed.

OBJECTIVE

The objective of this research was to study some selected social and socio-economic backgrounds of Thai buffalo raising farmers, practices on buffalo raising and needs for extension on buffalo raising of farmers around Kaeng Lawa reservoir wetland, located in Ban Phai District, Khon Kaen Province, Thailand.

METHODOLOGY

The study was conducted by individual interviews to 45 buffalo raising farmers around Kaeng Lawa reservoir wetland in Ban Phai District, Khon Kaen Province, Northeastern Thailand (Figures 1 and 2). The population details were collected by questionnaire in May - October 2020 by convenience sampling. A questionnaire was created by generating from the literature review. The instrument consisted of three parts. The first part was related to the farmers' background (education background, experience, and number of buffalo). The second part was focused on practices on buffalo raising. The third part was related to the needs for extension on buffalo raising of farmers. All parts of the questionnaire contained multiple choices, fill in the blank, and choose all were used. The answers were from individual farms. SPSS for Windows was used for analysis of data to determine percentage, mean, minimum and maximum. An in-depth interview was done with 5 village headmen who live near the Kaeng Lawa reservoir and the local staff.



Fig. 1 Kaeng Lawa reservoir wetland



Fig. 2 Herd of buffalo in the wetland

RESULTS AND DISCUSSION

Socio-economic Background of Surveyed Farmers

The results indicated that farmers were a mean of 56.40 years old. Most farmers (82.22%) had finished primary school level, 15.56% of them had finished high school, and 2.22% of them had no education. Kudting and Wongsaman (2010) stated that farmers with low education level had no

problems and dissents for raising the buffaloes, and the main things were the experiences and the knowledge passing from earlier generations. The main career of farmers was rice farming (66.67%). Farmers in the region received revenue mainly from rice production (71.11%), livestock production (17.78%), and other sources (11.11%). The majority of farmers raised buffalo as the second career (74.61%) more than the first career (25.39%). The land for raising buffalo was free areas around Kaeng Lawa Reservoir wetland (80.00%) and their own land (20.00%) and 23.90 years' experience on buffalo raising (Table 1).

Table 1 Socio-economic background of buffalo raising farmers around Kaeng Lawa Reservoir, Khon Kaen Province, Thailand

Personal information	Number (n=45)	Percent (%)
1. Age (year)		
- ≤ 50	7	15.56
- 51-60	31	68.88
- >60	7	15.56
Mean 56.40, Maximum 73, Minimum 39		
2. Education level		
- No education level	1	2.22
- Primary school	37	82.22
- High school	7	15.56
3. Main career		
- Rice farming	30	66.67
- Buffalo rising	6	13.33
- Fisherman	5	11.11
- Employment	4	8.89
4. Main income		
- Rice production	32	71.11
- livestock production	8	17.77
- Other sources	5	11.11
5. Buffalo rising land		
- free areas around Kaeng Lawa Reservoir wetland	36	80.00
- their own land	9	20.00
6. The experience on buffalo raising (year)		
- ≤ 10	3	6.97
- 11-30	33	73.33
- > 30	9	20.00
Mean 23.90, Maximum 63, Minimum 33		

Buffalo Raising Practices

Farmers had buffalo for the average of 8-9 heads per household. Most farmers did not use any feed concentrate, and no feed that was used with another to improve the nutritive balance (92.16%). Only 7.84% of farmers sometimes used concentrate to feed their buffaloes because source of roughage was from natural grassland (89.47%), grown by themselves (10.53%). The primarily farmers raised buffalo by natural pasture (100%). About 71.33% of farmers gave supplemental minerals to their buffaloes, those supplemental minerals from department of livestock support. Some farmers preferred to breed their buffaloes by natural matching (60.38%), more than artificial insemination (39.62%) because most of the buffaloes were in the field. Almost all buffaloes got vaccination (97.78%) and all buffaloes were treated against parasites. The majority of them (92.1%) sold their buffaloes per head to local merchants and earned the annual income of 63,233.71 baht per household. Farmers dried some buffaloes manure from the pen and sold it for 20-25 baht a bag (Figs. 3 and 4), earning 2,000 – 3,000 baht a year (Table 2).

Table 2 Buffalo-raising practices of farmers around Kaeng Lawa Reservoir, Khon Kaen Province, Thailand

Practices	Number (n=45)	Percent (%)
Number of buffaloes (head)		
- <5	6	13.33
- 5-20	30	66.67
- >20	9	20.00
Mean 8.56, Maximum 47, Minimum 2		
Feeding the concentrate food		
- Yes	4	7.84
- No, feeding only roughage	41	92.16
- free natural grassland	(37)	(89.47)
- grow grassland	(4)	(10.53)
Giving supplemental minerals		
- Yes	33	73.33
- No	12	26.67
Breeding		
- Matching by natural	27	60.38
- Artificial insemination	18	39.62
Vaccination		
- Yes	44	97.78
- No	1	2.22
Market place		
- Local merchant	41	92.16
- Meat selling	4	7.84
Buffalo annual income (baht)		
- ≤20,000	11	24.44
- 20,000-50,000	29	64.44
- >50,000	5	11.11
Mean 63,233.71, Maximum 800,00 Minimum 15,000		



Fig. 3 Buffaloes in the pen with their manure



Fig. 4 Bags of buffalo manure for sale

Farmer Extension Needs with Regard to Buffalo-Raising

Regarding the extension on buffalo raising, it was found that farmers had needs in the following: 1) Knowledge aspect; having the high level (>70%) of needs in the topics; selecting and buying female breeder (95.56), breeding improvement (100%) for reducing genetic disorder and also improving the productivity related to Na-Chiangmai (2000) who stated that development of buffalo breeding schemes in Thailand have shown higher performance of calves after breeding program by the National Buffalo Breeding and Research Program, keeping buffalo manure and added values of buffalo manure (100%); 2) Training course aspect; 82.22% of farmers needed training provided at the village, 75.56% would like have livestock officers to be resource person of training; and 3) Support aspect; the farmers had high level of needs in the items; 71.11% of buying good breeder

from government organization, 82.22% of service on injection for animal health, 82.22% of providing vaccination and prevention of disease (Table 3).

The in-depth interview found reproduction of buffalo under intensive farm management conditions, farmers raised buffalo by natural pasture which less feeding in flooding rainy season, buffaloes breeding were in their herds with closed blood and buffalo manure was released to the environment; water and air pollutions, because numbers of buffaloes around Kaeng Lawa reservoir was clumped in small upper areas. The situation was different than that indicated in the report of Food and Agriculture Organization (FAO, 2022) on buffalo in Thale Noi wetland, wide area in the southern Thailand found essential part of wetland ecology, maintaining water quality.

Table 3 Needs for extension on buffalo raising of farmers around Kaeng Lawa Reservoir, Khon Kaen Province, Thailand

Needs	Number (n=45)	Percent (%)
Knowledge aspect		
- selecting and buying female breeder	43	95.56
- breeding improvement	45	100.00
- keeping buffalo manure and added values of buffalo manure	45	100.00
Training course aspect		
- training provide at the village	37	82.22
- livestock officers to be resource person of training	34	75.56
Support aspect		
- buying good breeder from government organization	32	71.11
- service on injection for animal health	37	82.22
- providing vaccination and prevention of disease	37	82.22

CONCLUSION

Most farmers who raise buffalo have a high level of needs with regard to breeders and breeding improvement. Although the National Buffalo Breeding and Research Program in Thailand was established in 1981, a program suitable for free-range buffalo as well as for intensive buffalo raising by smallholder farmers is still needed, particularly due to the aging of the farming population. Moreover, storage of buffalo manure and added value of buffalo manure is a major aspect of the Bio-Circular-Green' Economy Model (BCG Model), which aims to develop high-value products and services that are eco-friendly and require less resource input, while conserving natural and biological resources. One way of creating added-value organic fertilizer from buffalo manure is via vermiculture, i.e., by utilizing earthworms for composting organic material. This can reduce waste and increase the income of buffalo-raising farmers.

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