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Motivation and Performance of Beef Cattle Smallholder Farmers in Central Java Indonesia

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Abstract: This research was conducted to describe the kind of motives as components of farmer's motivation which related to farmer's motivation to analyze the farmer's performance, i.e., the level of technology adoption and income and to determine the relationship between motivation and performance. The research was conducted by survey method. A fifty six beef cattle farmers in Manis Renggo, Klaten, Central Java as respondents, selected by multi stage method which combined by purposive sampling and simple random sampling methods. The data were collected using interview and questionaire as interview schedule and analized by descriptive statistics and Spearman's Rank Correlation. The results showed that 64.29% of total farmers had high motivation. There were positive correlation between farmers experience in cattle farming (r = 0.366), number of cattle raised (r = 0.462) and number of labors (0.265) with the level of motivation, respectively. The average of technology adoption rate of the farmers was 24.93%. It was concluded that motivation of cattle farming is physiological needs, safety needs, love and belonging, esteem and self actualization. There were positive correlation between farmers experience in cattle farming, number of cattle raised, time alocation in cattle farming and number of labors. There were positive correlation between level of motivation and performance that is innovation adoption and income (r = 0.802 and 0.798, respectively).

Key words: Adoption, innovation, livestock, Klaten, cattle

INTRODUCTION

In Indonesia, 90% of beef cattle is handle by farmers in the rural areas with ownership 2-5 cattle per farmer. Beef cattle is developed by cattle farmer through a farmland business integrated with his agricultural crops. Beef cattle raising pattern is still traditional and simple. A good raising way is key factor in success of beef cattle development. There are some beef cattle raising purposes that is: raising method to produce calves to be sold later, fattening up method to be sold as beef cattle and cattle raising method to produce calves or add its quantities. In Java, beef cattle in general is raised traditionally by farmers, it doesn't aim at market orientation yet. The reason is cattle are not only raised as beef cattle, they also function to produce manure, help to plow farmland and to be savings that can be sold at any time. That cattle business condition is attributable to cattle farmers' capital limitation. According to Guntoro *et al*. (2000), beef cattle area use a raising model by farmers in a certain location separated from human settlement. Group animal housing system maintenance is a cattle and stall grouping of some owners who live in same village at a certain location that is relatively far from human settlement.

Adoption in (agricultural) extension process in essence, means one's behavior change process, either knowledge (cognitive), attitude (affective) or skill (psycho-motoric), after he adopted innovation extended by an extension worker toward a targeted community. Adoption, in this context means that he can really apply or carry it out correctly and fully comprehend it in his farmland business (Mardikanto, 1993).

Cattle farming sector concentration in Indonesia now a days is low production and productivity because of business feature that is still traditional. This condition exists because cattle in general is raised as family business or small-scale cattle farming with small capital and production method which generally is still traditional.

Technology transformation application in a community has to seek, select and develop a kind of rural-specific technology that is an effective technology. It has to be understood technically by farmers, it can increase obviously cattle farming productivity and minimize farmers' social and economical loss. Technology that research system gives is expected can increase productivity. Although, productivity increases, gap between real condition and research laboratory is very still wide. This gap needs to be minimized although,

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researchers didn't expect that technology presentation in research place (laboratory) can be compared with its real condition. Therefore, technology assessment study has to be conducted to bridge the gap by analyzing factors that affect to adoption, setting up technology efficiency and developing/constructing more appropriate approach for technology development to be adopted (Guntoro *et al*., 2000). In extending recommendation to farmers, an extension worker has a decisive responsibility. He can communicate with them by advices and suggestions on effective technology application either for prosperity objective or farmers' producing target.

One's motivation in doing action is various, it is based on needs that form the background of it. The needs are physiological needs, safety needs, love and belonging, esteem and self-actualization. Handoko argued, motivation is individual needs and wants impetus that is directed towards purpose of getting satisfaction. Motivation in raising cattle which is an impetus to fulfill physiological or safety needs creates a behavior type that is different from an impetus just to fulfill esteem need, either in business development or its management.

From problem background above this research needs to be more focus on specific problems that is by answering following research questions: What are kinds of motives that encourage cattle farmers to raise beef cattle? What are social demographic factors that have correlation with motivation in beef cattle farming? How is beef cattle farmers' performance which composed by innovation adoption and income? How is correlation between farmer's motivation in cattle farming and his performance?

Research objectives: This research aimed to find out the level of motivation of beef cattle smallholder farmer to analyze how social demographic characteristics of the farmers correlated with level of motivation in cattle farming and to determine the relationship between farmer's motivation in cattle farming and his performance.

MATERIALS AND METHODS

Research methods: This research was carried out at four cattle farmers groups in Klaten Regency, Central Java that cattle farmers groups has been existing for >2 years. Researchers expect by 2 years since they were established, farmers have gotten many information about cattle farming technology/innovation and they can decide to apply or not apply that introduced technology with consideration of its advantage and disadvantage.

This research used survey method. In preliminary stage, researchers tested questionnaire before using it as data collection tool and in implementation stage, researchers collected primary and secondary data. Questionnaire test was conducted by validity and reliability test on 30 respondents, it was conducted on members of beef cattle farmers groups that have similar characteristic to group members that will be research respondents. Validity and reliability gave description about overall data collection process quality in a research.

Table 1: Correlation strength category according to Cramer's V-analysis

Correlation category	Correlation level
Very strong	0.70-1.00
Strong	0.50-0.69
Medium	0.30-0.49
Weak	0.10-0.29
Very weak	0.00-0.09

Data collection was conducted towards respondents from Klaten Regency. Subdistricts in Klaten Regency were chosen by Purposive Random Sampling Method that is it has at least four cattle farmers groups (Manis Renggo and Tulung Subdistricts). Of two subdistricts above, researchers chose one subdistrict by simple random sampling (Manis Renggo Subdistrict). Of Manis Renggo, researchers chose villages by Purposive Random Sampling Method that is it has cattle farmers groups and then researchers chose four cattle farmers groups by Purposive Random Sampling Method that is they are still active. Researchers chose respondents by taking all members of four selected groups. Andini Makmur is as 21 persons, Rukun Makmur is as 17 persons, Tani Bhakti is as 12 persons and Sari Andhini is as 6 persons so total respondent is as 56 persons.

Data analysis used statistical descriptive in the form of mean, standard deviation and percentage for social demographic data, motivation in cattle farming and technology adoption rate and income while to find correlation between motivation level and performance used Spearman Rank correlation analysis (Sugiyono, 2006). Correlation between social demographic factors (age, education, experience in cattle farming number of beef cattle, number of labor) and motivation level can be founded by Spearman Rank correlation analysis and correlation between social demographic factors (cattle breed that they have and cattle ownership status) and motivation analyzed by chi-square, the significant relationship then continued by Cramer's V test (Cohen, 1988). Coefficient value from Cramer's V then refer to correlation strength category in Table 1.

RESULTS AND DISCUSSION

Geographic condition: Geographically, Klaten Regency lies between 110°30'-110°45' East longitude and 7°30'-7°45' South latitude. Klaten Regency is 665.56 km^2. It adjacents

to Sukoharjo Regency in East, Gunungkidul Regency in South, Sleman Regency in West and Boyolali Regency in North. Topographically, Klaten Regency lies between Mount Merapi and a Thousand Mountainous with altitude 75-160 m mean sea level and it is divided into Mount Merapi slope in northern slanted area, plain area and hills area in south. Based on its altitude, Klaten Regency consists of plain and mountain with various altitude that is 9.72% at 0-100 m above sea level, 77.52% at 100-500 m above sea level and 12.76% at 500-1,000 m above sea level.

Klaten Regency has tropical climate with rainy and dry season in turns all year long, average temperature is 28-30 Celsius and monthly average wind velocity is 153 mm, highest rainfall is in January (350 mm) and lowest rainfall is in July (8 mm).

Social demographic characteristics of the respondents: The average of farmer's age was 45.09±12.29 years old. Most of them still in productive age (92.86%). Most of the had low education (29%) while graduated from college was only 3.57%. The average of farmer's experience in raising cattle farming was (16.23±8.06). While number of cattle ownership was 1.71±0.93 unit animal.

The farmer raising cattle only two kind of breeds that were Ongole Cross (PO) and Simmental Crossed with PO (Simpo). Most of them maintaining only their own cattle (51.79) while 39.29% was lent out (gaduhan) and 8.93% maintaining both their cattle and gaduhan. Table 2 shows the social demographic characteristics of the respondents.

Table 2: Social demographic characteristics of the respondents

Social demographic characteristics	No. (person)	Percentage
Age (years)		
24-35	17	30.37
36-45	15	26.78
46-55	16	28.57
56-65	4	7.14
>65	4	7.14
Average (45.09±12.29)	-	-
Formal education		
Not graduated from elementery school	8	14.29
Elementery school	21	37.50
Junior high school	6	10.71
Senior high school	19	33.93
College/University	2	3.57
Cattle farming experience (tahun)		
1-10	15	26.78
11-20	24	42.87
>20	17	30.35
Average (16.23±8.06)	-	-
Number of labor (person)		
1	29	51.79
2	25	44.64
≥3	2	3.57
Average (1.52±0.57)	-	-
Number of cattle ownership (animal unit)		
0.05-1	25	44.64
1.05-2	21	37.50
2.05-3	4	7.15
>3	6	10.71
Breed		
PO	13	23.21
Simpo	32	57.14
PO dan Simpo	11	19.64
Animal ownership status		
Own cattle	29	51.79
Lent out (gaduhan)	22	39.29
Own catle and lent out	5	8.93

Motivation in beef cattle farming: Motivation category is obtained from five motives that is physiological needs, safety needs, love and belonging, esteem and self-actualization. Percentage value of farmers' motives category distribution is shown in Table 3.

From Table 3, it can be understood that high motivation in cattle farming is physiological motive (60.71%), safety motive (73.21%), social and belonging motive (69.64%), esteem motive (58.93%) and self-actualization motive (53.57%). Highest motive is safety motive because farmers feel safe with their cattle ownership that can be used to overcome unpredictable needs.

Motivation distribution value is obtained from average amount of physiological motive, safety motive, love and belonging motive, esteem motive and self-actualization motive.

Total average score of motives is motivation level that is divided into three categories that is low motivation, medium motivation and high motivation. Table 4 showed most cattle farmers had high motivation in cattle farming as 82.14% while cattle farmer who had medium motivation was as 17.86%.

Table 3: Percentage of farmers' motivation

	Category (%)		
Motives	High	Medium	Low
Physiological motive	60.71	39.29	0.00
Safety motive	73.21	26.79	0.00
Love and belonging motive	69.64	30.36	0.00
Esteem motive	58.93	41.07	0.00
Self-actualization motive	53.57	46.43	0.00

Table 4: Farmers' motivation level

Motivation value	Total (person)	Percentage
High	46	82.14
Medium	10	17.86
Low	0	0.00
Total	56	100.00

Respondents' performance: Performance of the farmers was determined by two component variables, i.e., innovation adoption rate and income.

Innovation adoption rate: Study results indicated that farmer had average innovation adoption rate as 31.17±19% thus average farmers had low rate in cattle farming innovation adoption. Low adoption rate was as 58.93% and medium rate was as 41.07% (Table 5).

Table 5: Cattle farmers' technology adoption level

Adoption level	Total (person)	Percentage
Low	33	58.93
Medium	23	41.07
High	0	0.00
Total	56	100.00

Kinds of innovation: Several innovations that introduced by extension worker or outsider people were compost, rice straw fermentation, artificial insemination, superior (high varieties) grass, vitamin/minerals, medicine/vaccine, concentrate, bran/mixture of rice and bran, cassava waste, tofu waste and hay (peanut leaves). Table 6 shows the rate of innovation adoption based on feed stuff that introduced and or adopted by respondents.

Farmers' innovation adoption rate: Average technology adoption rate on each cattle farmers group was various. Table 7 shows that average lowest innovation adoption rate was at Tani Bhakti cattle farmers group as 12.88% while highest rate was at Andini Makmur cattle farmers group as 45.80% (Table 7) because there were routinely extensions and cattle monitoring at Sari Andini cattle farmers group that encouraged farmers to raise their cattle more seriously.

Farmer's income: Average of beef cattle farmer's income was Rp. 3,531,858/year/animal unit. Table 8 shows the average of production cost, revenue and income of beef cattle farmers in 1 year.

Relationship between farmer's social demographic factors and motivation in cattle farming: Farmer's social demographic factors include age, education level, experience in cattle farming, number of cattle ownership, number of labor, cattle breed and cattle ownership status. Study results indicated that experience in cattle farming variable had positive correlation with motivation ($p<0.01$) that was longer experience in cattle farming, higher motivation level in cattle farming. This indicated that by long enough experience level, farmers had gotten many advantages from beef cattle farming therefore they would always increase their cattle productivity. Soekartawi (1995) argued that experience in cattle farming affects to innovation adoption if new technology was continuity from prior technology that farmers apply.

Cattle ownership quantity had positive correlation with motivation level ($p<0.01$) that was greater number of cattle that farmer had, higher motivation level in cattle farming. This indicated that by greater cow quantity, farmers will tend to take care of their cattle seriously and try to increase their productivity.

Table 6: Total cattle farming innovation that introduced and or adopted by respondents

Kinds of innovation	Total user respondents (person)	Percentage
Compost	0	0.00
Rice straw fermentation	3	5.36
Artificial insemination	21	72.41
Superior (high varieties) grass	50	89.29
Vitamin/minerals	5	8.93
Medicine/vaccine	20	35.71
Concentrate	39	69.64
Bran/mixture of rice and bran	21	37.50
Cassava waste	5	8.93
Tofu waste	2	3.57
Hay (peanut leaves)	17	30.36

Table 7: Average percentage of cattle farmers group technology adoption score

Cattle farmers group	Average of innovation adoption rate (%)
Rukun Makmur	25.72
Tani Bhakti	27.58
Andini Makmur	39.94
Sari Andini	40.61

Table 8: Average of production cost, revenue and income of beef cattle farmers in 1 year (Rp/year/Animal unit)

Cost and revenue	Rupiah
Costs (Fixed costs)	
Depletion of cattle housing	31,234
Depletion of meterials	6,054
Total (a)	37,288
Variable costs	
Feed	3,305,365
Medical treatment	4,782
Insemination	62,555
Fee	2,445
Total (b)	3,375,147
Total cost (a+b)	3.412,434
Revenue	
Selling cattle	890,510
Benefit value	6,053,649
Total	6,944,159
Income	3,531,858

Labor quantity had positive correlation with motivation level in cattle farming ($p<0.01$) that was greater labor quantity in cattle farming, higher motivation level in cattle farming. The reason was farmers wanted to get more advantage from their cattle farming so they employed more labor to take care of cattle while age and education level had no correlation with motivation level because each farmer either old or young who had various education background had same expectation to increase his cattle business.

Study result (Table 9) indicated that number of respondent who had PO with high motivation was as 6 persons (10.71%) and with medium motivation was 4 persons (7.14%). Respondent who had Simpo cattle with high motivation was as 23 persons (41.07%) and with medium motivation was 4 persons (7.14%) while respondent who had PO and Simpo cattle with high

Table 9: Correlation between cattle breed and motivation

	Motivation		
Breed	High (person)	Medium (person)	Total
PO (Ongole X local cattle)	6 (10.71%)	4 (7.14%)	10
Simpo (Simmental X PO)	23 (41.07%)	4 (7.14%)	27
PO, (Simpo)	17 (30.36%)	2 (3.57%)	19
Total	46 (82.14%)	10 (17.86%)	56

Chi-square = 34.331** (Significant at p<0.01); Cramer's V = 0.220

Table 10: Correlation between farmer's social demographic characteristics and motivation level

Motives	Correlation coefficient	Significance
Age	0.056	0.683
Education level	0.194	0.151
Experience in cattle farming	0.366	0.006**
Number of cattle ownership	0.462	0.000**
Number of labor	0.561	0.000**

**Significant at level p<0.01

Table 11: Correlation between cattle ownership status and motivation level

	Motivation		
Ownership	High (person)	Medium (person)	Total
Own cattle	20 (35.71%)	7 (12.50%)	29
Lent out cattle	17 (30.36%)	3 (5.36%)	22
Own cattle and lent out cattle	9 (16.07%)	0 (0.00%)	5
Total	46 (82.14%)	10 (17.86%)	56

Chi-square = 8.821* (Significant at p<0,05); Cramer's V = 0.242

motivation was as 17 persons (30.36%) and with medium motivation was 2 persons (3.57%). Calculation results by using chi-square indicated that there was correlation between cattle breed that farmer had and motivation level($p<0.01$) while on Cramer's V test, Cramer value was 0.220 (Table 10). This indicated that there was low strength level of correlation between cattle breed that farmer had and motivation level.

Study result indicated that respondent who had own cattle with high motivation was as 20 persons (35.71%) and with medium motivation was 7 persons (12.50%). Respondent who had lent out cow with high motivation was as 17 persons (30.36%) and with medium motivation was 3 persons (5.36%). Respondent who had own and lent out cows with high motivation was as 9 persons (16.07%). Statistical analysis result by using chi-square indicated that there was correlation between cattle ownership status and motivation level ($p<0.05$) while on Cramer's v-test, Cramer value is 0.242 (Table 11) that indicated there was low strength level of correlation between cattle ownership status and motivation level.

Relationship between motivation and performance: This study found a statistically significant relationship ($p<0.01$) between farmer's motivation in cattle faring and all of components of performance, i.e., innovation adoption rate and farmer's income with coefficient correlation of 0.802 and 0.798. It means that the higher motivation level, the higher farmer's innovation adoption rate and the higher farmer's income. Farmer who had high motivation would try in many ways to make his cattle better and increase his income as well.

Cattle farming development business could be more developed by support of any parties through capital loan and extension services to add knowledge and skills in beef cattle business sector. These actions are necessary in order that information about cattle farming is easy to be accepted by farmers so, it's easy to be applied and farmers, researchers expect can increase their cattle farming production and productivity.

CONCLUSION

Motivation that encourages farmers to raise beef cattle was based on physiological needs, safety needs, love and belonging, esteem and self-actualization. Of five needs above, safety needs was highest need. That motivation level was positively correlated with social demographic factors that included experience in cattle farming, number of cattle ownership, number of labor, time allocation, cattle breed and cattle ownership status. Motivation level was also positively correlated with technology adoption rate that is higher motivation level, higher adoption rate.

Any efforts to increase technology adoption to beef cattle farmers can be conducted by executing routinely extension service and conveying technology application advantage thus, existing technology can be applied by cattle farmers and also paying attention to motives in cattle farming so that extension worker will emphasize on points related with farmers' safety motive like as savings which can be sold at any time.

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