Exploring Critical Success Factors for Stakeholder Management in Small Ruminant Farming

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Abstract—The aim of this study was to determine the Critical Success Factor (CSF) in small ruminant farming. A total 600 respondents were surveyed in the field. Face to face interviewed used as a method of this study. The results from factor analysis revealed that the small ruminant farming ranchers' perspectives, thirteen (13) factors were extracted namely family support, government support and policies, labour, extension services, production system, farm management, feed sources, farm operation, neighborhood relationship, marketing, disease and prevention management, feed strategies and technical skill. All these factors family support, government support and policies, labour, extension services, production system and farm management were identified as critical successful factors among the respondents to perform success in small ruminant farming.

Index Terms—critical success factor, goat, livestock industry, management, sheep

I. INTRODUCTION

Malaysia is a country that has an equatorial climate with temperature ranging from 21 to 32 ℃ daily and very rich in biodiversity in terms of flora and fauna. Malaysia is a unique country due to its ethnic, racial and language diversity [1]. The Malaysian population is now almost 31.13 million in 2015 and is increasing drastically year by year [2]. The growth in population is very significant to increase the rate of food sufficiency. Ironically, food supplies must be available from the present agricultural sector. Malaysia is now categorized as an emerging country in the agricultural sector. A country can be affected when the economic growth and security for the supply of foodstuffs is lacking [3].

In Malaysia, small ruminant industry is small compared to other livestock commodities. The total ex-farm output value of beef and milk is estimated to be about RM1, 247.71 million and RM 150.54 million respectively and mutton about RM149.94 million in 2014. In term of self-sufficiency comparison, chicken industry lead with (104.87%), followed by eggs (120.55%), pork (93.87%) and beef (24.84%). However, local mutton currently only able to accommodate 13.35 percent of the market and the remaining 86.65 percent is imported meat

from countries such as Australia, Thailand, Indonesia and Vietnam [4].

In Malaysia, there are several problems facing by ranchers which are lack of high quality breed which can adapt with our climate, lack of grazing area, high cost of feed, and lack of knowledge and skill among ranchers. Traditionally small ruminant are farmed as a side activity of small holder farmers. Total 21,600 people are small ruminant ranchers in Malaysia [5]. Almost 12,566 of the ranchers used traditional farming to rear their small ruminant and only 47 ranchers are doing commercial farming. Otherwise, 127 used semi traditional farming to rearing their small ruminant. Hence this study encourage rancher to shift their farming into commercial farming. Therefore, they can boost up their production [6].

Small ruminant farming is a part of livestock industry in Malaysia. Factors that influence on small ruminant farming are business planning, management and prevention of disease, neighborhood relations, support family members and friends, labour, feed sources, facilities, infrastructure, and livestock area, stock and breed, veterinary services, price and market, government support and policy, and production system. Therefore, this research was purposely done to determine the Critical Success Factor (CSF) in small ruminant farming.

II. MATERIAL AND METHOD

In this study, quantitative method is applied to gain necessary information about ranchers and farming. There are a number of advantages of implementing quantitative methods in this research. Qualitative research allowed taking high in depth information regarding rancher and their farm. It helps to interpret and better understand the complex situation about small ruminant farming. On the other hand, quantitative method enables to quantify variation and describe the characteristics of a population. This method ensured high levels of gathered data. Fundamentally, the secondary data were collected from journals, text books, conference papers, and proceeding papers. Most of the information was obtained via internet and data browser. While, primary data were obtained from face to face interview and survey questionnaire.

The data for this study was collected through a survey of 600 ranchers in the Peninsular Malaysia, which are Kelantan, Terengganu, Pahang, Johor, Negeri Sembilan,

Melaka, Selangor, Perak, Kedah, Perlis and Pulau Pinang (Fig. 1). Ranchers were invited by officials DVS district office for the interview at the DVS district office. However, not all ranchers who were invited attended the session for various reasons and excuses. To overcome these problems, researchers went to the farm and did interview there. The list of ranchers in every state in Peninsular Malaysia was obtained from DVS. Ranchers are categorized according to the number of parents that are owned by ranchers such as small-scale (below 50), medium-scale (51-100), large-scale (100-150) and extra large-scale (150 and above). There were constraints in the process of discovering and obtaining the cooperation of the respondents identified.

Figure 1.   Map of Peninsular Malaysia showing the study areas

The study was conducted in the districts which were ranked with highest number of rancher in Peninsular Malaysia. From each district; ranchers were randomly selected from a sampling frame obtained from the DVS offices. This was done due to equally cover the survey of small ruminant farming through Peninsular Malaysia. Similarly, earlier researcher were also conducted this type sampling [7]. Furthermore, for this study we identified categories of ranchers that we focused on during the field survey. The main reason for the categories is in order to capture all categories of rancher available and operated in Malaysia. A total of twenty ranchers were selected from each district.

In building each item and question, researchers ensure that all items and questions according to what is to be measured. This is done by examining the concepts to be measured. In addition, officials from the DVS are also referred to when developing the research instrument. The questionnaire was pre-tested prior to the actual study conducted in Hulu Langat district. Based on the pre-test feedback, questions have been modified, particularly for the language and accuracy questions or items, format and suitability of questionnaire design questions posed by educational background of the respondents.

A few statistical models were used to assist in analyzing the factors that affect the critical success factors of small ruminant farming in the livestock industry of Malaysia. The SPSS (Statistical Package Social Sciences) program version 21.0 used to analyze quantitative data that was collected from respondent at the field survey. After all the data had been entered, a frequency output, mean and standard deviation for all variable was undertaken to check that the data had been correctly entered and to identify any missing data and outliers. Additional calculation and graph generation was done by using Microsoft Excel 2010. Few statistical analyses were obtained to analyses the data like descriptive analysis, Pearson's correlation, reliability analysis, chi-square analysis, factor analysis and multiple regressions. The descriptive analysis was used to analyses socio-demographics and farm profile of ranchers. Mean ranking analysis used to transform ranchers' perception into a form that is easier to understand and interpret and gather critical success factors. Cornbach's alpha score was used to determined reliability of data. Chi-square analysis used to describe a set of relationship between two variables. Finally, the factor analysis was piloted to analyses which factor is the critical factor in the success of small ruminant farming.

III.   RESULT AND DISCUSSION

In the present section, outcomes on the socio-economic status are presented. Socio-economic profile of the ranchers were presented such as age, gender, race, material status, education level, family involve in farm, experiences and year started. Table I shows the distribution percentage of respondents which are involved in this program by age category were highest between the ages of 41 to 50 years i.e. a total of 141 respondents (23.5%), followed by the age category 51 to 60 years with 135 respondents (22.5%). The next category of age are $\geq$ 31 years of 103 respondents (17.2%), 31 to 40 years of 129 respondents (21.5%).

The lowest recorded number of categories is the age category over 61 years were 92 respondents (15.3%). Hence, from the ages it was clear that mostly the mean age of the respondents from 30 to 60 years old were involved in this farming, whereas the average age of respondents was 45.32 years old. From the study, out of the 600 respondents, 92.8% were male and 7.2% female. Relatively elderly men were more engaged in the small ruminant farming and vice-versa (Table I). This farming is more laborious and it is more suitable for the male to adopt. Similar finding were reported earlier that mostly (68.3%) of the respondents were males involved in the small ruminants farming [8].

The number and percent of respondents by people involved in the rearing of the study showed that the respondents were Muslim in majority 549 respondents (91.5%), followed by Hindus 38 respondents (6.3%). Mostly consumers in Malaysia are Muslims and they use

small ruminants for the ritual such as Qurban and Akikah due to their halal feed concept. About 502 (86.7%) of the respondents were married, 89 respondents (14.8%) were singles and only 9 respondents (1.5%) were widowed. It seems that mostly business is run by the married people might be due to the family support. Many of the ranchers involved in the food and tree crop production are married and their women involved in food processing and marketing [8].

TABLE I.   DEMOGRAPHICS OF THE RESPONDENTS

Variables	Parameter	Frequency	(%)
Age	≥ 30 years	103	17.2
	31-40 years	129	21.5
	41-50 years	141	23.5
	51-60 years	135	22.5
	≥ 61 years	92	15.3
	Means	45.32	
Gender	Male	557	92.8
	Female	43	7.2
Religion	Muslim	549	91.5
	Christian	5	0.8
	Buddhist	13	2.2
	Hindus	33	5.5
Marital status	Single	89	14.8
	Married	502	86.7
	Widow/widower	9	1.5
Education qualification	Not attending school	7	1.2
	Primary	107	17.8
	Secondary	353	58.8
	Higher Education	133	22.2
Number of family involved	0	77	12.9
	1-2 members	407	67.8
	3-4 members	93	15.5
	5-6 members	18	3.0
	7-8 members	3	0.5
	≥ 9 members	2	0.3
Experiences	4- 5 years	216	36.0
	6-10 years	226	37.7
	11-15 years	73	12.2
	16-20 years	54	9.0
	21-25 years	7	1.2
	≥ 26 years	24	4.0
	Means	9.60	

The number and percentage of respondents by level of education showed that the 7 respondents (1.2%), were not attending school while 107 respondents (17.8%) were attended primary school, the highest number 353 (58.8%) of the people who have completed their education till secondary education. The next level of education of the respondents was higher education 133 (22.2%). Majority of the respondents (99.3%) had received formal education (Table I), which suggested that communication of technical knowledge for the small ruminant farming would be easier to the ranchers. Furthermore, their education level may have limited opportunities to other forms of employment. Early marriages or deliberate focus on educating males were possible factors influencing education beyond primary school. In contrast, most of the respondents have enough knowledge to understand this farming and handle the problems like disease and other related issues [8]. In terms of number and percent of respondents who have family members involved in the small ruminant farm, the findings show that respondents who have family members 1 to 2 members were involved

in farm which is 407 respondents (67.8%), followed by the family members involved in the rearing of small ruminant by 3 to 4 members were 93 respondents (15.5%). The involvement of the family holder respondents was higher than the others; it was due to the family support for the income generation [8].

Table I also shows the distribution of respondents by years of experience acquired in small ruminant farming. The findings from the current study indicated that most of the respondents have spent past 6 to 10 years of the experience is about 226 respondents (37.7%), followed 216 respondents (36.0%) had less than or 5 years experiences but not less than 4 years. According to DVS, researcher needs to collect data from respondents those have more than 4 years' experience that will show the success of farming. A few respondents 7 (1.2%) were found with the experience of between 21 to 25 years involved in this industry. The small ruminant farming is a new industry and having less experienced person which opens a door for the further involvement to boost the income generation of the poor or low income people.

The result of factor analysis showed in Table II. From the result analysis, thirteen (13) latent factors influencing respondents' perception of success factors had been identified which account for about 68.449% of the total variance. The factors were labeled as family support, government support and policies, labour, production system, farm management, extension services, disease and prevention management, technical skill, farm operation, marketing tool and strategies, neighborhood relationship, feeding strategies and feed sources. The factor loadings from the principal component factor analysis were obtained after a varimax rotation of respondent' responses to 60 statements respectively related to the factors that influence in critical success factor.

TABLE II.   SUMMARY OF FACTOR ANALYSIS RESULT

Items	Factor Loading
Family Support	**F1**
Family should consent about current industry	0.903
Family members should be involved in the management of farms to ensure a smooth operation and successful project	0.893
Family members should be given knowledge and understanding of the current methods of rearing	0.885
Project need heir to replace when rancher not around	0.862
Family members help manage farm	0.849
Project successful if family support	0.784
Eigenvalues	12.552
Percentage (%) of Variance	20.921
Total of % of variance	20.921
Government Support and Policies	**F2**
Agricultural policies that focus on improving the small ruminant industry has helped the successful of project	0.806
Continuing government support give advantages for small ruminant industry	0.798
Giving the area for grazing and rearing help the industry	0.783
Capital and breed given by government help ranchers	0.782
Incentives and subsidies given to ensure ranchers success	0.745
Effective integration system should be introduced to help the livestock sector and other sectors optimum used of land	0.705
Eigenvalues	4.331
Percentage (%) of Variance	7.219
Total of % of variance	28.140

Labour	F3
Skilled labours need to assigned in the farm operation	0.864
Labours need to be care about changes and needs of small ruminant	0.863
High labour discipline	0.842
Labours know the minimum level of disease and infection	0.831
Sufficient labour to handle the project	0.822
Eigenvalues	4.187
Percentage (%) of Variance	6.978
Total of % of variance	35.118
Production system	**F4**
Good production system should be introduce to interested ranchers	0.791
Small ruminant breeding system need to be improve	0.787
The most eeffective production systems is essential for small ruminant	0.756
A good production system form overseas should brought and transform accordingly in Malaysia	0.747
DVS needs to consider the entry of foreign breeds to ensure they tolerate with Malaysia conditions	0.746
Economic production system help ranchers	0.691
Eigenvalues	3.169
Percentage (%) of Variance	5.282
Total of % of variance	40.400
Farm management	**F5**
Make improvements if there is any weakness in terms of financial management, labour and operations	0.840
Continuous monitoring for financial (incoming and outgoing money) and project operational aspects	0.834
A good business plan have been used	0.783
Have good farm records	0.765
Farm managers and workers need to understand the objectives of the farm	0.713
Managers need to search new information for improvement of project	0.630
Eigenvalues	2.779
Percentage (%) of Variance	4.632
Total of % of variance	45.032
Extension Services	**F6**
Schedule of DVS visits and treatment should be consistently	0.812
Monitoring and control of medicine prices by the DVS	0.770
DVS officer should have high expertise in farming	0.764
Enough fund	0.749
Equipment , free advice and cheap help implementation of project	0.699
Officers and Veterinary Centre should be added to help livestock sector	0.694
Eigenvalues	2.605
Percentage (%) of Variance	4.341
Total of % of variance	49.373
Disease and Prevention Management	**F7**
Small ruminant are also given treatment against parasite	0.772
Small ruminant kept away from other animals that attacked by diseases	0.748
Immediate action would be taken if found abnormalities in goats	0.709
Small ruminant given a vaccine to prevent foot and mouth disease (FMD)	0.639
Ranches need to know how to avoid small ruminant from disease include methods of feeding, cages care etc.	0.576
Eigenvalues	2.166
% of variance	3.609
Total of % of variance	52.982
Technical Skill	**F8**
Workers need to understand the technical methods	0.727
Managers need to be aware of the latest techniques and methods in farming	0.719
Project managers need to have skill in the intricacies of farm operations	0.705
Technical knowledge needed for successful of small ruminant farming	0.571
Eigenvalues	2.001
Percentage (%) of Variance	3.335
Cumulative Percentage of Variance	56.317
Farm Operation	**F9**

Managers need to change the technical regarding the location, type of breed, farming system and not just follow other rancher's methods	0.769
Technical of small ruminant needs to be changed regarding scale of projects	0.731
Managers should refer to and learn from many sources for improving technical skills	0.658
Eigenvalues	1.767
Percentage (%) of Variance	2.946
Total of % of variance	59.263
Marketing tool and strategies	**F10**
Stable small ruminant price in the market to encourage ranchers to rear	0.797
High potential of small ruminant helping the success of the project	0.794
Broad market and promote the small ruminant inspire	0.720
Eigenvalues	1.657
Percentage (%) of Variance	2.761
Total of % of variance	62.024
Neighborhood relationship	**F11**
The objective of the need to explain to your neighbors and to get understanding from them	0.830
Social responsibility should be given to communities to maintain neighborhood relations in small ruminant project area	0.753
Small ruminant should be prevented from entering the neighborhood area	0.732
Eigenvalues	1.436
Percentage (%) of Variance	2.394
Total of % of variance	64.418
Feeding strategies	**F12**
Feeding strategies should be planned nicely	0.849
The most economical method of feeding and nourishment	0.750
Mineral salt are essential for small ruminant	0.737
Eigenvalues	1.249
Percentage (%) of Variance	2.082
Total of % of variance	66.500
Feed Source	**F13**
Well fomulation of small ruminant feedmill needed to keeping growth of small ruminant	0.682
Various innovations have to do to make their own feed	0.646
If small ruminant cannot graze , sources like the leaves and grass should be given to small ruminant	0.618
Eigenvalues	1.169
Percentage (%) of Variance	1.949
Total of % of variance	68.449

A. Factor 1: Family Support

The third factor is family support. This factor consists of six (6) sub-variables and has a total variance of 9.316%. The highest factor loading is "family should consent about current industry" (0.897), followed by "family members should also be involved in the management of farms" (0.885), "family members help to manage farm" (0.867), "family members should be given knowledge and understanding of current methods of rearing small ruminant" (0.867), "project need heir to replace when rancher not around" (0.852) and "project successful if family member support" (0.749). Family support is very important in achieving success in small ruminant farming. Therefore, ranchers should emphasize this point to make farm operation success. In Turkey, most of the women help their men to generate income by rearing and managing their farms and somehow want to receive information about small ruminant production especially from extension agents [9].

B. Factor 2: Government Support and Policies

The forth factor is government support and policies. This factor consists of eight (8) sub-variables and has a

total variance of 5.812%. The highest factor loading is "continuing government support for small ruminant industry" (0.811), "agricultural policies need to focus on improving the small ruminant industry has helped the successful of project" (0.819), "capital and breed given by government help ranchers" (0.813), and incentives and subsidies given to ensure successful of ranchers (0.822). Similar finding were in line, government have responsible to support ranchers for the survival of small ruminant farming especially to give them subsidies and capital [10].

C. Factor 3: Labour

The first factor that recognized has a greater influence on respondents' perception towards success factor is the Labour. This factor consists of eight (8) sub-variables and has a total variance of 22.707%. "Workers need to be careful about changes and needs of small ruminant" has the highest factor loading (0.895). This is followed by "workers should be given training to become proficient" (0.891), "good distribution of job among workers" (0.893), "skilled workers" (0.874), worker welfare" (0.864), "high labour discipline" (0.859) "workers know the minimum level of disease and infection" (0.860), "and "sufficient labour" (0.811). The result of this factor explains that with the availability of labour, ranchers will get success in small ruminant farming.

D. Factor 4: Production System

Production system is fifth factor in small ruminant farming. This factor consists of six (6) sub-variables and has a total variance of 7.858%. The highest factor loading is "small ruminant breeding system need to be improve (0.804), good production system should be introduce (0.788), effective production systems is essential for small ruminant (0.777), a good production system form overseas should brought and transform accordingly in Malaysia (0.760) and DVS needs to consider the entry of foreign breeds to ensure they tolerate with Malaysia conditions (0.767). Results showed that more successful farmers use production systems that are diverse, adopt measures to control cost, and use marketing strategies that seek the highest level of profit [11].

E. Factor 5: Farm Management

Farm management is recognized as the four (4) factors that influences respondents' success factor in small ruminant farming. The issues that were loaded most heavily on this factor, which explained 4.434% of the variation, were "continuous monitoring for financial (incoming and outgoing money) and project operational" has the highest factor loading (0.825) and followed by "make improvements if there is any weakness in terms of financial management, labour and operations" (0.813), "a good business plan have been used" (0.786) and "Have good farm records" (0.775). The result indicates that with the good management, the ranchers are more success in small ruminant farming.

F. Factor 6: Extension Service

The sixth factor is extension service. The issues that were loaded most heavily on this factor, which explained 5.029% of the variation, were "veterinary services officer accessible for services when needed" (0.861), followed by "simple procedures of veterinary services" (0.859), "less bureaucracy" (0.814), "equipment , free and cheap advice and affordable help implementation of project" has the highest factor loading (0.746). The results show that the ranchers want the extension services to play important roles in providing the facilities, financial support, special advice, veterinary services and less bureaucracy in extension agencies to support ranchers to be success in small ruminant farming. Participatory agricultural extension in terms of specified needs of small farmers the empowerment process should be encouraged and strengthened. Therefore, extension services must plan and deliver more useful educational courses to increase small farmers' knowledge and awareness regarding the most important needs [12]. Most farmers required veterinary help, mainly from the government veterinary service for disease and prevention management [13]. Extension and veterinary services are given demonstrations and training courses free of charge [9]. Service delivery by extension personnel demands availability of adequate financial, capital and physical resources which were said to be missing in most districts visited. Additionally, insufficient extension staff was a hindrance to dissemination of technologies and service delivery [14].

G. Factor 7: Disease and Prevention Management

Disease and prevention management is a seventh factor that influencing ranchers to critical success factors of small ruminant farming. This factor is divided into three (3) variables and has a number of variance of 2.845. Highest factor loading in this factor is "small ruminant kept away from other animals that attacked by diseases (0.773), followed by "small ruminant are also given treatment against parasite (0.749), "immediate action would be taken if found abnormalities in small ruminant (0.773). Management of the diseases was through regular de-worming and use of antibiotic drugs. Inaccessibility of vaccines for immunization of small ruminant against common viral diseases was said to contribute to high mortalities across the sampled districts [7].

H. Factor 8: Technical Skill

Technical skills is eighth factor that influencing ranchers to critical success factors of small ruminant farming. This factor is divided into three (3) variables and has % of variance of 3.188. "Workers need to understand the technical methods", have the highest factor loading (0.761). Follow by "managers need to be aware of the latest techniques and methods" (0.761) and "project managers need to have skill in the intricacies of small ruminant operations" (0.727). This decision requires ranchers to improve technical skills in small ruminant farming. With technical skill ranchers will be able to reduce operating costs and improve the quality of livestock and fulfill customer requirements. Training or educating the farmers in small ruminant production and related practices such as marketing and the utilization of

manure for composting and fertilizing are the critical success factor in farming [15].

I. Factor 9: Farm Operation

Farm operation is an eighth factor that influencing in critical success factors on small ruminant farming. This factor is divided into three (3) variables and has a number of variance of 3.948. The highest factor loading in this factor is "managers need to change the technical regarding condition of the location, type of breed and farming system and not just follow other people's methods of rearing" (0.866), "technical of small ruminant needs to be changed regarding scale of projects" (0.766) and "manager should refer to and learn from many quarters to increase technical skills (0.746).

J. Factor 10: Marketing Tool and Strategies

Marketing tool and strategies is a tenth factors that influencing in critical success factors on small ruminant farming. This factor is divided into three (3) variables and has a number of variance of 3.686. The highest factor loading in this factor is "stable small ruminant price in the market to encourage ranchers to rear" (0.812), "broad market and promote the small ruminant inspire" (0.734) and "high potential of small ruminant helping the success of the project" (0.807). According to [12], ranchers needed markets and strategies such as market advisors and marketing cooperatives facilitate better trades for small farmers and enabling them to access higher levels of income and to avoid those being taking advantage by middle man [7]. Stable price contribute in potential domestic markets [16]. Similar finding were reported by "ref. [17]" that the small ruminant have the potential according to the local potentialities and the growing interest in small ruminant dairy products world-wide

K. Factor 11: Neighborhood Relationship

Neighborhood relationship is a ninth factor that influencing in critical success factors on small ruminant farming. This factor is divided into three (3) variables and has a number of variance of 1.032. The highest factor loading in this factor is "small ruminant project successful if not give bad smell to neighbors" (0.737), "small ruminant should be prevented from entering the neighborhood area" (0.825) and "the objective of the need to explain to your neighbors and to get understanding from them" (0.759).

L. Factor 12: Feeding Strategies

Feeding strategy is a twelve factor that influencing in successful factor on small ruminant farming. This factor is divided into three (3) variables and has number of variance of 2.082. The highest factor loading in this factor is "feeding strategies should be planned nicely" (0.849), followed by "the most economical method of feeding and nourishment" (0.750) and "mineral salt are essential for small ruminant" (0.737). According to Salem and Smith (2008), ranchers should have feeding strategies to reduce cost of farming by giving cheapest alternative supplement to small ruminant at actual time. Good feed management to reduce feed cost without decreasing lamb growth [18]. In addition, many ranchers from different countries are used profitable feed to reduce feed cost [19] [20]-[22]. Similarly, ranchers at Kenya "ref. [13]" and Eutophia "ref. [23]" were given mineral to their small ruminant during both the dry and wet seasons.

M. Factor 13: Feed Source

Feed source is a thirteenth factor that influencing in critical success factors on small ruminant farming. This factor consists of three (3) sub-variables and has a total variance of 2.759%. The highest factor loading in this factor is "well formulation of small ruminant feed needed to keeping growth of small ruminant (0.682), followed by "various innovations have to do to make their own feed (0.646) and "if small ruminant cannot graze , sources like the leaves and grass should be given to small ruminant" (0.618). Food processing generates large amounts of by-products are successfully integrated in livestock feeding with balanced and appropriate formulation of nutrients and innovation in small ruminant feed. In addition, alternative feed given when small ruminant cannot go out for grazing [24], [18]. Tree leaves have been successfully used as alternate for grass in small ruminant diet [25]. Similar finding indicate that leaves of Green chirayta (*Andrographis paniculata*) and palm oil (*Elaeis guineensis* Jacq.) has significantly improved small ruminant growth performance and meat yield [26], [27].

IV. CONCLUSION AND RECOMMENDATION

The importance of the small ruminant farming has been recognized well in Malaysia and it has a great potential to participate more to the livelihoods of people and fulfill their demand. The critical success factors were measured for the development of small ruminant farming and from the study it was observed that ranchers have positive perceptions on the idea of critical success factors. These factors performed a major role for the industry to boost the rancher's income and enhance the self-sufficiency level of the small ruminants. Age, gender, level of education, years of experience, income and scale of farming significantly affected the respondent's perception towards critical success factor in small ruminant farming.

In the small ruminant industry; labour, extension services, family support, government support and policies, production system, farm management, feed sources, farm operation, neighborhood relationship, price and marketing, disease and prevention management, feed strategies and technical skill played an important role to ensure the success of farming. All these factors family support, government support and policies, labour, extension services, production system and farm management were identified as critical successful factors among the respondents to perform success in small ruminant farming. The study should be taken into consideration to develop this industry by providing trainings and skills to small ruminant farmers and sort out the cheaper and appropriate feed sources. The identified needs and findings must be addressed by the Government

(DVS), livestock extension agents and other all stakeholders.

Government support and policies play an important role in small ruminant farming industry. Government through DVS with help from another agency must empower the small ruminant ranchers to generate more income and increase self-sufficient level of small ruminant. The various types of the trainings, education, guidance and assistance from experts could be helpful and make empower to the ranchers. This is to make sure that ranchers who involved in small ruminant farming well survive in this industry. Government agencies especially Veterinary Services Department should teach and expose them on how to do business particularly, marketing besides relying on profit from small ruminant farming due to the high level of consumptions. Ranchers need knowledge and technical skills in terms of management, feed sources and strategies to improve small ruminant farming. As ranchers, they should be skilled to handle the farm by their own with the help of extension agencies. Empowerment can be developed by Veterinary extension services through training programs and ensure the success for the improvement of farm development. In addition the main constraints are feed, capital and knowledge.

Government already formulated policies for the livestock to ensure the industry remains significant as it is one of the vital sectors in national economic growth. However, government must continue to provide support and be consistent with the rules and policies related to small ruminant industry. On the other hand, government need to allocate more budget particularly R&D activities to improve small ruminant industry. Besides, government should find ways to overcome the land size, deforestation and land ownership problems. Government should take part to introduce DVS bare lands that could be used as a grazing area of small ruminants. In addition, farmers could get loan facilities and increase investment to develop and strengthen this industry. Most of the ranchers expected that veterinary services must have high expertise in small ruminant farming. Hence, DVS should do more focus to this farming by updating them on the latest knowledge, implementation of project, funds, control medicinal prices, regular visits to farms, and identify some more rancher's needs and perceptions that could be very useful to develop and make more attractive this industry.

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