International Academic Institute for Science and Technology

International Academic Journal of Business Management
Vol. 3, No. 2, 2016, pp. 144-161.

ISSN 2454-2768

International Academic Journal of Business Management

www.iaiest.com

Impact of the firm and the owner/managers characteristics on the growth of renewable energy enterprises

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Abstract

Several researches is devoted to the influence of the characteristics of the owner/managers and the firm on the growth of the firm. Nevertheless, the majority of such research tends to focus in developed countries and very limited studies have provided such research in developing countries, and even less in Nepal. This study contributes to fill the gap. The paper aims at determining impact of the owner/managers and the firm characteristics on the firm growth of renewable energy enterprises in Nepal. The growth of the firm comprises as a dependent variable while the firm characteristics such as sector, legal status, firm age and firm size as well as the characteristics of the owner/managers such as age, gender, education and experience are included as predictors. The necessary data is collected through a primary survey using structure questionnaire from 118 renewable energy enterprises having 264 observations. The empirical results are estimated through cross-tabulation, chi-square test and Cramer's V using IBM SPSS statistics 20. The study reveals that all the firm characteristics except firm size have a significant effect on the growth of the firm. In case of the owner/managers characteristics, the level of education and experience of the owner/managers have significant influences on the growth of the firm. The owner/managers characteristics such as age and gender do not have a significant influence on the firm growth. This paper can be further extended by developing resources based entrepreneurship models in renewable energy sector to get a greater insight into the results.

Keywords*:* Firm characteristics, firm growth, characteristics of the owner/manager.

1. **Introduction**

Entrepreneurship in general is the phenomena to capitalize on identified opportunities or creation of new opportunities through innovation (Jennifer, Carr, & Rasheed, 2009). Entrepreneurship is a way of thinking that emphasizes opportunities over threats (Krueger, Reilly, & Carsrud, 2000). Previous studies show entrepreneurial success is determined by multiple factors. The growth of small and medium enterprises (SME) is influenced by the owner/manager characteristics and the firm characteristics (Woldie, Leighton, & Adesua, 2008).

Moreover, entrepreneurial success is attributed to personal characteristics and managerial characteristics. Thapa, Thulaseedharan, Joshi, & Goswami, (2008) conducted study on determinants of street entrepreneurial success in India and finds that among many socio-economic and motivational factors, size of initial investment, number of workers, family business and promising demand of product/services are some of the major determinants of entrepreneurial success.

In addition, limited liability firms and sole proprietorships were associated with growth; larger and older firms have higher propensity for growth than smaller or newer firms; the industrial sector a firm operates in has an association with the level of growth the firm attains (Woldie, Leighton, & Adesua, 2008, p. 12). Entrepreneurial success is determined by multiple factors of the firm and the owner/managers characteristics.

Mead (1994) finds from his study of five African countries most of the firms started with 1 to 4 employees and will never expanded as well as less than one percent grew to about 10 employees. Contrary, the study of 116 Nigerian firms over a 30 years period by Kilby (1993) shows that only 2 out of the 21 firms that had fewer than 10 employees. Likewise, the Friedman (1988) study comprising 214 micro enterprises finds only 4 enterprises had graduated to small and medium firms within an eight year period. A study by Oshahbemi (1983) finds five out of twenty enterprises survive in their first year of operation. Onyeiwu (1992) conducted a study over thirty years on small and medium enterprises (SMEs) states one out of two firms does not survive beyond half a century.

There are few studies conducted on the area of entrepreneurship in Nepal. Pokharel (2006) concluded, among others, that creation of enterprises on renewable energy technologies in Nepal is vital. K.C. (2003) concluded that economic development cannot be initiated without the pioneering efforts of entrepreneurs. Entrepreneurs have key role to play in the process of industrial development in particular and economic development in general however, entrepreneurs in Nepal are very shy to invest capital in industrial sector.

Several studies is revealed to the influence of the characteristics of the owner/managers and the firm on the firm growth. Nevertheless, the bulk of such studies tends to focus in developed countries and very limited studies have focused such research in developing countries, and even less in Nepal. This study contributes to fill the gap.

Furthermore, Nepalese renewable energy sector has two categories of enterprises: some of them are successful and others are only surviving. The patient question arises that do successful entrepreneurs have something special? Among others, this study is important attempts to get answers of this question.

Despite all these facts and empirical evidences, no such study on the firm and the owner/managers characteristics and their influences on growth of the firm in renewable energy enterprises has yet been conducted in Nepal. In this circumstance, the study deals with: Do the firm characteristics such as sector of enterprises, legal status, firm age, and firm size have significant effect on the growth of the firm? What kind of relationship does there exist between the characteristics of owners/managers such as age, gender, education, and experience and the firm growth?

With the above backcloth, this study aims at determining impact of the owner/managers and the firm characteristics on the firm growth of renewable energy enterprises in Nepal. The remainder of the paper is organized as follows. Section 2 describes objective of the study while section 3 comprises research hypothesis. The materials and methods have employed in section 4 while section 5 analyzes results and discussion of this study. Section 6 summarizes the results and offers some implications and directions for future research. Finally, section 7 comprises acknowledgements of the study.

2. Objectives of the Study

The main aim of this study is to examine the entrepreneurial characteristics and their influence on the firm growth. The specific objectives are:

1) To assess the firm characteristics and their influence on firm growth in the context of Nepalese renewable energy enterprises.
2) To analyze the characteristics of the owners/managers of renewable energy enterprises and their influence on the firm growth.

3. Research Hypothesis

The main aim of this study is to examine the entrepreneurial characteristics and their influence on the firm growth. After theoretical and literature review, the study considered two objectives and each objective has distinct hypothesis.

Hypothesis for Objective 1:

Hypothesis 1.1: There is significant relationship between a sector of enterprises and the level of growth attained.

Hypothesis 1.2: There is significant relationship between the legal status of the firm and the level of growth attained.

Hypothesis 1.3: There is significant relationship between the age of the firm and the level of growth attained; firm growth decreases with firm age.

Hypothesis 1.4: There is significant relationship between firm size and the level of growth attained; firm growth increases with firm size.

Hypothesis for Objective 2:

Hypothesis 2.1: There is significant relationship between the age of the owner/managers and the level of growth attained; consequently, firms run by younger owner/managers tend to have a higher growth possibility than those run by older one.

Hypothesis 2.2: There is significant relationship between the gender of the owner/managers and the level of growth attained; Male owned/managed firms reveal higher growth than female owned/managed firms.

Hypothesis 2.3: There is significant relationship between the level of education of the owner/managers and the level of growth attained; growth is higher in the firms where the owner/managers have college or university degree.

Hypothesis 2.4: There is significant relationship between the experience of the owner/managers and the level of growth attained; growth of the firm increases with the experience of the owner/managers.

4. Materials and Methods

Descriptive cum analytical research design is adopted in this study. Descriptive research design is utilized mainly for conceptualization of the problem. Analytical research design is followed mainly to analyze the results. Moreover, deductive research approach is employed in this study. Hypothesis is derived from the review of theory and literature. The necessary data to test hypothesis are collected from primary sources of data. Accordingly, the data are analyzed in order to confirm or disconfirm the hypothesis.

The study is carried out by applying stratified random sampling method. The necessary primary data was collected from three major components of Nepalese renewable energy sector: biogas, solar and micro-hydro using structured questionnaire. Furthermore, there are 260 pre-qualified Nepalese renewable energy enterprises (REEs) to involve in renewable energy programme by Alternative Energy Promotion Centre (AEPC). The region-wise number of REEs in Nepal is presented in Table 1.

Table 1: Region-wise Number of Renewable Energy Enterprises (REEs) in Nepal

SN	**REEs**	**Development Regions**					**Total**
		Eastern	***Central***	***Western***	***Mid-Western***	***For-Western***	
1	BCs	21	*46*	25	15	6	**113**
2	SCs	1	*61*	2	4	1	**69**
3	MHCCs	2	*55*	19	1	1	**78**

Total	**24**	**162**	**46**	**20**	**8**	**260**
%	**9.23%**	**62.31%**	**17.69%**	**7.69%**	**3.08%**	**100%**

Sources*: Web Page of AEPC as of 5th August 2014: www.aepc.gov.np.*

Notes: *BCs stand for biogas companies for domestic biogas plants, SCs stands for solar companies for solar home systems, and MHCCs stands for micro hydro construction companies.*

Table 1 shows that the highest penetration of REEs i.e., 62.31 percent in central development region of Nepal. Based on the penetration of REEs, the central development region is selected as study area. A total of 162 REEs of the central development region is taken as population of the study. The study is determined its sample by using Yamane (1967) simplified formula for proportions for finite population. The study assumes 95 percent level of confidence and 5 percent level of significance (margin of error). Based on these assumptions, the study is sampled by using the formula as given in equation 1.

$$= \frac{N}{1 + N(e)^2} \quad \ldots (1)$$

Where, n is the sample size; N is the population size; and e is the level of precision.

Given that, n =? N = 162 renewable energy enterprises; e = 5 percent

$$= \frac{162}{1 + 162\ (0.05)^2} \quad = 115.30 \cong 116\ REEs$$

Thus, the sample size of the study is 116 REEs. These enterprises selected for the study are representative of biogas companies, solar companies, and micro-hydro construction companies as shown in Table 2.

Table 2: Number of Enterprises Selected for the Study

SN	Renewable Energy Enterprises (REEs)	N	Weightage (%)	n	n/N (%)
1	PQ Biogas Companies (BCs) for Domestic Biogas	46	28.40%	33	71.60%
2	Qualified Solar Companies (SCs)	61	37.65%	44	71.60%
3	PQ Installation/Construction Companies for Micro Hydropower (MHCCs)	55	33.95%	39	71.60%
Total		**162**	**100.00%**	**116**	71.60%

Sources*: Web Page of AEPC as of 5th August 2014: www.aepc.gov.np.*

Note: N *indicates the total number of Nepalese REEs that were pre-qualified by AEPC for renewable energy program and* n *indicates the number of REEs selected for the study.*

Out of 162 REEs, the study comprises 116 REEs i.e., 71.60 percent that seems to be good representative of the Nepalese renewable energy sector as a whole. The sample of biogas, solar and

micro-hydro sector consist of 33, 44 and 39 REEs respectively. The owners/managers of renewable energy enterprises are taken as the study unit of the study.

In order to get required data, 130 REEs was selected randomly out of 162 REEs. For each sector, random sampling is used. The survey process aimed at a minimum response rate of 90 percent. The details of questionnaires distributed and collected are presented in Table 3.

Table 3: Number of Questionnaires Distributed and Collected for the Study

SN	REEs	Number of Renewable Energy Enterprises (REEs)			Number of questionnaires	
		Sampled	Questionnaires distributed	Filled questionnaires collected	Distributed	Collected
1	BCs	33	38	33	114	63
2	SCs	44	48	45	144	102
3	MHCCs	39	44	40	132	99
Total		**116**	**130**	**118**	**390**	**264**

Sources*: Web Page of AEPC as of 5th August 2014: www.aepc.gov.np.*

The participants of this study included 390 owners/managers from 130 REEs in Nepal. Out of 390 questionnaires distributed, a total of 273 questionnaires were returned, yielding a response rate of 70 percent. Out of 273 questionnaires received, nine questionnaires were discarded as the respondents did not respond to more than 25 percent of the items. Remaining 264 questionnaires had no missing responses on the scale items from 118 REEs.

Furthermore, the greater the degree of consistency and stability in an instrument represents the greater its reliability. Cronbach's alpha coefficient, the most popular test to measure reliability for the factors are used. The results are given in Table 4.

Table 4: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
.799	.916	133

Source: Field Survey 2015-2016.

The Cronbach's alpha values are greater than 0.70 that show a very strong reliability that reveals internal consistency and the data are reliable. Hence further test can be done from these data. The analysis is made through cross-tabulation, chi-square test and Cramer's V using IBM SPSS statistics 20.

5. Results and Discussion

In this section, an attempt is made to determine impact of the owner/managers and the firm characteristics on the firm growth of renewable energy enterprises in Nepal. This section is divided into four sub-sections comprising demographic profile, firm characteristics, owner/managers characteristics, and concluding remarks.

5.1. Demographic profile of the sample firms

In order to study the effect of firm characteristics and the characteristics of the owners/managers on performance of renewable energy enterprises, a primary survey was conducted using structured questionnaires. The questionnaire was constructed by incorporating resources-based theories and a review of previous survey instruments. Demographic characteristics play a vital role in understanding the entrepreneurial characteristics and their reliability in the renewable energy sector. This section therefore describes the demographic characteristics of the respondents of renewable energy enterprises in Nepal. It includes firm characteristics such as sector of enterprises, legal status, firm age, and firm size on the one hand. The characteristics of owners/managers contains respondent's status, gender, marital status and age of respondents on the other hand.

Table 5 shows the demographic characteristics of the respondents in frequency and percentage of firm characteristics and the characteristics of owners/managers. 264 filled questionnaires (63 from biogas companies, 102 from solar companies and 99 from micro hydro construction companies) having no missing responses on the scale items from 118 renewable energy enterprises (REEs) collected for this study. The 118 REEs comprises 33 biogas companies, 45 solar companies and 40 micro hydro construction companies.

Moreover, the firm age is ranged from 3 to 57 years having average age of 10.41 years. The frim age classifies into four categories. The 24.24 percent of the enterprises fall under the age of 3-5 years while 43.94 percent of the enterprises fall under the age 6-20 years. The age group of 11-15 years and 16 years or above have 18.18 percent and 13.64 percent of REEs respectively.

The firm size is ranged from 3 to 110 employees having average firm size of 19.81. The frim size classifies into four categories. The 14.39 percent of the enterprises fall under the size of 1-6 employees while 21.21 percent of the enterprises fall under the firm size of 7-10 employees. The firm size of 11-20 employees and 21 employees or above have 30.68 percent and 33.71 percent of REEs respectively. Similarly, the REEs have two categories of business form or legal status- sole proprietorship and partnership. There are 79.55 percent of partnership firm while 20.45 percent of sole proprietorship firm in the sampled firms.

Table 5: Demographic Profile of Sample Firms

This table shows the firm characteristics such as sector of enterprises, firm age, firm size and business form of enterprises as well as the characteristics of owners/managers such as respondent's status, gender, marital status and age of respondents.

Demographic Profile	**Characteristics**	**Frequency**	**Percent**	**Min**	**Max**	**Mean**
Renewable energy enterprises (118)	Biogas companies	33	27.97%			
	Solar companies	45	38.14%			
	Micro-hydro construction companies	40	33.90%			
Firm age	3-5 years	64	24.24%	3.00	57.00	10.41
	6-10 years	116	43.94%			
	11-15 years	48	18.18%			
	16 years or above	36	13.64%			
Firm Size	1-6 employees	38	14.39%	3.00	110.00	19.81
	7-10 employees	56	21.21%			
	11-20 employees	81	30.68%			
	21 employees or above	89	33.71%			
Form of enterprises	Sole proprietorship	54	20.45%			
	Partnership	210	79.55%			
Respondents from the sector of enterprises (264)	Biogas	63	23.86%			
	Solar	102	38.64%			
	Micro-hydro	99	37.50%			
Respondents' status (264)	Owners	131	49.62%			
	Managers	133	50.38%			
Gender of respondents	Male	230	87.12%			
	Female	34	12.88%			
Marital status of respondents	Single	85	32.20%			
	Married	179	67.80%			
Respondents' age	25 years and under	38	14.39%	20.00	62.00	35.02
	26-35 years	108	40.91%			
	36-45 years	80	30.30%			
	46 years and above	38	14.39%			

Source: Field Survey 2015-2016.

Altogether 131 respondents out of 264 are owners while 133 respondents are managers of REEs. Out of the total 264 respondents, 87.12 percent is male and 12.88 percent is female respondents. Moreover, 67.80 percent respondents are married while rest 32.20 percent are single category of marital status. Similarly, the minimum age of the respondent is 20 years while the maximum age is 62 years. It have 35.02 years of average age of the respondents. The age group of the respondent is divided into four categories. The 40.91 percent of the respondents fall under the age of 26-35 years while the 30.30 percent of the respondents fall under the age group of 36-45 years. The 14.39 percent of the respondents fall under the age group of 25 years or below. Likewise, the 14.39 percent of the respondents fall under the age group of 46 years or above.

*5.2. **Firm characteristics and their influence on the firm growth***

Firm characteristics comprises sector of enterprises, legal status, i.e., business form, firm age and firm size while the sale turnover growth has taken as the growth of the firm in this study. All the variables except firm size in this section is found to have a statistical significant association with growth of the firm as discussed in the following pages.

5.2.1. Sector of enterprises and its influence on the growth of the firm

Table 6 shows that the sector of the enterprises and its influence on the firm growth. Firms from the biogas, solar and micro-hydro sectors have seen to have the highest representation in the "increased slightly" category while the lowest in the "decreased/remained the same**"** category.

Table 6: Sector of enterprises and its influence on the firm growth

Sector	**decreased/remained the same**	**increased slightly**	**increased greatly**	**Total**
Biogas	13 (20.6%)	26 (41.3%)	24 (38.1%)	63 (100.0%)
Solar	8 (7.8%)	52 (51.0%)	42 (41.2%)	102 (100.0%)
Micro-hydro	20 (20.2%)	53 (53.5%)	26 (26.3%)	99 (100.0%)
Total	**41 (15.5%)**	**131 (49.6%)**	**92 (34.8%)**	**264 (100.0%)**
Hypothesis testing	**Chi-square**	**d.f.**	**Cramer's V**	**P**
Sector	11.015	4	0.144	0.026

Source: Field Survey 2015-2016.

The larger number of solar companies (41.2%) than biogas and micro-hydro construction companies are in "increased greatly" category while the larger number of micro-hydro construction companies (53.5%) fall into "increased slightly" category than others. The statistical test shows an association between firm's sector and growth, with a Cramer's V value of 0.144. *Hence, the hypothesis 1.1 is accepted that reveals the significant relationship between a sector of enterprises and the level of growth attained.*

The finding of this study is consistent with the various empirical results on firm sector and firm growth by Westhead and Birley (1993) and Storey (1994). This finding however contradicts empirical results of other researchers who found no significant association between firm sector and firm growth by Barkham (1992); Storey et. al. (1987); and Macrea (1991).

5.2.2. Firm legal status/business form and its influence on the firm growth

The result shows that firms with sole proprietorship status have seen to be more likely to grow than the partnership as given in Table 7. Firm in this group represent a high proportion in the increased category.

Table 7: Firm legal status/business form and its influence on the firm growth

Business form	**decreased/remained the same**	**increased slightly**	**increased greatly**	**Total**
Partnership	40 (19.0%)	98 (46.7%)	72 (34.3%)	210 (100.0%)
Sole Proprietorship	1 (1.9%)	33 (61.1%)	20 (37.0%)	54 (100.0%)
Total	41 (15.5%)	131 (49.6%)	92 (34.8%)	264 (100.0%)
Hypothesis testing	**Chi-square**	**d.f.**	**Cramer's V**	**P**
Business form/legal status	10.078	2	0.195	0.006

Source: Field Survey 2015-2016.

The larger proportion of the partnership firm (19%) fall into "decreased/remained the same" category than that of the sole proprietorship firms (1.9%). The statistical test shows an association between legal status and growth of the firm, with a Cramer's V value of 0.195. *Therefore, hypothesis 1.2 accepted that comprises* the *significant relationship between the legal status of the firm and the level of growth attained.*

The finding shows that firms with sole proprietorship status have seen to be more likely to grow than the partnership. The finding of this study is consistent with the finding of the study by Woldie, Leighton, & Adesua (2008).

5.2.3. Firm age and its influence on the firm growth

Firm age and its influence on the firm growth is depicted in Table 8. The larger number of the firms from the all categories fall into the firm age group of 6-10 years than that of other categories. The lower number of the firms fall into in the age group of 16 years of above than others.

Table 8: Firm age and its influence on the firm growth

Firm age	**decreased/remained the same**	**increased slightly**	**increased greatly**	**Total**
3-5 years	7 (10.9%)	26 (40.6%)	31 (48.4%)	64 (100.0%)
6-10 years	18 (15.5%)	62 (53.4%)	36 (31.0%)	116 (100.0%)
11-15 years	7 (14.6%)	32 (66.7%)	9 (18.8%)	48 (100.0%)
16 years or above	9 (25.0%)	11 (30.6%)	16 (44.4%)	36 (100.0%)
Total	41 (15.5%)	131 (49.6%)	92 (34.8%)	264 (100.0%)
Hypothesis testing	**Chi-square**	**d.f.**	**Cramer's V**	**P**
Firm age	18.206	6	0.186	0.006

Source: Field Survey 2015-2016.

The statistical test shows an association between firm age and growth of the firm, with a Cramer's V value of 0.186. *Hence, hypothesis 1.3 is accepted that represents the significant relationship between the age of the firm and the level of growth attained; firm growth decreases with firm age.*

The result of this study reveals that the younger firms have a higher propensity for growth than that of the older ones and consistent with the finding of the study by Storey (1994), and Stokes (1995). However, the finding of this study contradicts that of other researchers who have postulated that older firms grow faster than younger firms by Birley & Westhead (1990); Birch (1987); and Woldie, Leighton, & Adesua (2008).

5.2.4. Firm size and its influence on the firm growth

The size of the REEs in the survey is measured by total number of employees that includes the owner/managers of the firms. Firms employing 1-6 employees have seen to have a high representation in "increased greatly" category while lower representation in "decreased/remained the same" category as given in Table 9. However, all the firms employing 7 or more employees have seen to have a high representation in "increased slightly" category.

Table 9: Firm size and its influence on the firm growth

Firm size	**decreased/remained the same**	**increased slightly**	**increased greatly**	**Total**
1-6 employees	5 (13.2%)	15 (39.5%)	18 (47.4%)	38 (100.0%)
7-10 employees	13 (23.2%)	30 (53.6%)	13 (23.2%)	56 (100.0%)
11-20 employees	11 (13.6%)	42 (51.9%)	28 (34.6%)	81 (100.0%)
21 employees or above	12 (13.5%)	44 (49.4%)	33 (37.1%)	89 (100.0%)
Total	41 (15.5%)	131 (49.6%)	92 (34.8%)	264 (100.0%)
Hypothesis testing	**Chi-square**	**d.f.**	**Cramer's V**	**P**

Firm size	7.765	6	0.121	0.256

Source: Field Survey 2015-2016.

Furthermore the results reveal that the firms employing higher the number of employees have not more likely to grow. The statistical test shows that the size of the firm has not a significant association with the growth of the firm. *Hypothesis 1.4 is rejected which shows the insignificant relationship between firm size and the level of growth attained; firm growth does not increase with firm size.*

The statistical test shows that the size of the firm has not a significant association with growth of the firm as well as the second part of hypothesis 4 is also not confirmed as shown in the results of the cross tabulation that the firms with larger number of employees have not more representation in the increased category as expected. This finding is contradicts with the finding of the study by Woldie, Leighton, & Adesua (2008).

5.3. ***Characteristics of owners/managers and their influence on the firm growth***

The results on the owner/managers characteristics is discussed in this section. The owner/managers characteristics having the highest association with growth are education of the owner/managers with a Cramer's V value of 0.197 and experience with a Cramer's V value of 0.159. Moreover, the results show that the coefficient of age and gender of the owner/managers are not statistically significant.

5.3.1. Age of the owner/managers and its influence on the growth of the firm

The results on age of the owner/managers and its influence on the turnover growth of the firm is depicted in Table 10. The owner/managers having age group of 46 years or above (57.9%) have a high representation in the "increased slightly" category. Similarly, the age group of 26-35 years have the highest representation in "increased greatly" category. However, the age group of 25 year and under have the highest representation in "decreased/remained the same" category.

Table 10: Age of the owner/managers and their influence on the firm growth

Age	**decreased/remained the same**	**increased slightly**	**increased greatly**	**Total**
25 years and under	8 (21.1%)	19 (50.0%)	11 (28.9%)	38 (100.0%)
26-35 years	12 (11.1%)	53 (49.1%)	43 (39.8%)	108 (100.0%)
36-45 years	14 (17.5%)	37 (46.2%)	29 (36.2%)	80 (100.0%)
46 and above	7 (18.4%)	22 (57.9%)	9 (23.7%)	38 (100.0%)
Total	41 (15.5%)	131 (49.6%)	92 (34.8%)	264 (100.0%)
Hypothesis testing	**Chi-square**	**d.f.**	**Cramer's V**	**P**
Age of the owner/managers	5.772	6	0.105	0.449

Source: Field Survey 2015-2016.

The statistical test shows that the age of the owners/managers has not a significant association with the growth of the firm. *Hypothesis 2.1 is rejected.*

The statistical test does not show a significant association between age of the owner/managers and growth of the firm. The second part of the hypothesis is also not confirmed. The result of the cross tabulation does not reveal clear representation of the firm for different categories. Age does not influence on the growth of the firm. This finding is supported to the finding of the study by Storey (1994) however, this finding contradicts with the finding of other study by Woldie, Leighton, & Adesua (2008).

5.3.2. Gender of the owner/managers and its influence on the firm growth

Gender of the owner/managers and its influence on the firm has summarized in Table 11. The results show that there does not appear to be any significant difference between the growth of the firms run by men and women. Both men and women have the ability to run renewable energy business even though the male proportion in the owners/managers is higher (87.1%).

Table 11: Gender of the owner/managers and its influence on the firm growth

Gender	**decreased/remained the same**	**increased slightly**	**increased greatly**	**Total**
Male	34 (14.8%)	113 (49.1%)	83 (36.1%)	230 (100.0%)
Female	7 (20.6%)	18 (52.9%)	9 (26.5%)	34 (100.0%)
Total	41 (15.5%)	131 (49.6%)	92 (34.8%)	264 (100.0%)
Hypothesis testing	**Chi-square**	**d.f.**	**Cramer's V**	**P**
Gender	1.516	2	0.076	0.469

Source: Field Survey 2015-2016.

In addition, the size of the firms run by female owner/managers in not as small as was expected, considering the initial representation of the firm (12.9%). Six out of 34 female owner/managers in the sample are in 1-6 employees group of size of the firms while rest of the firms have employed more than 6 employees as shown in Table 12.

This finding consistent with the findings of Woldie, Leighton, & Adesua (2008) however this finding contradicts many studies who have often cited that firms run by female owner/managers tend to be smaller and are likely to grow than those run by male owner/managers ((Cooper, Gimeno-Gascon, & Woo , 1994); Cliff, 1998).

Table 12: Relationship of gender of the owner/managers and firm size

Firm size in term of the number of employees	**Gender of respondent**		**Total**
	Male	**Female**	
1-6 employees	32 (13.9%)	6 (17.6%)	38 (14.4%)
7-10 employees	46 (20.0%)	10 (29.4%)	56 (21.2%)
11-20 employees	72 (31.3%)	9 (26.5%)	81 (30.7%)
21 employees or above	80 (34.8%)	9 (26.5%)	89 (33.7%)
Total	**230 (100.0%)**	**34 (100.0%)**	**264 (100.0%)**

Source: Field Survey 2015-2016.

Hypothesis 2.2 is rejected. The statistical test shows the relationship of gender with the growth of the firms is not statistically significant. This indicates that gender does not have an effect on business performance. Gender is not among the factors influencing the growth of the firms that supported to the finding of the study by Woldie, Leighton, & Adesua (2008), Barkham (1992), and Storey (1994). However, this finding rejects earlier empirical result by Cooper, Gimeno-Gascon, & Woo (1994) and Cliff (1998).

5.3.3. **Level of education of the owner/managers and its influence on the firm growth**

The level of education of the owner/managers and its influence on the firm growth has summarized in Table 13. The results show that the firms run by the owner/managers having higher level of education have high propensity for growth compared to the run by the owner/managers having lower level of education.

Table 13: Level of education of respondents and their influence on the firm growth

Education	**decreased/remained the same**	**increased slightly**	**increased greatly**	**Total**
SLC (Class 10)	6 (28.6%)	8 (38.1%)	7 (33.3%)	21 (100.0%)
Intermediate degree or 10+2	16 (17.8%)	31 (34.4%)	43 (47.8%)	90 (100.0%)
Bachelor degree	17 (14.2%)	73 (60.8%)	30 (25.0%)	120 (100.0%)
Master degree or above	2 (6.1%)	19 (57.6%)	12 (36.4%)	33 (100.0%)
Total	41 (15.5%)	131 (49.6%)	92 (34.8%)	264 (100.0%)
Hypothesis testing	**Chi-square**	**d.f.**	**Cramer's V**	**P**
Level of education	20.535	6	0.197	0.002

Source: Field Survey 2015-2016.

The statistical test of the level of education of the owner/mangers shows an association between level of education and growth of the firm, with a Cramer's V value of 0.197. *Hypothesis 2.3 is accepted that consists of the significant relationship between the level of education of the owner/managers and the*

level of growth attained; growth is higher in the firms where the owner/managers have college or university degree.

The result shows that there is significant relationship of level of educational qualification of the owner/managers with the growth of the firm. In addition, the results of the cross tabulation shows that the higher the educational qualification of the owner/manager is, the higher the level of growth of the firm attained. This finding supports to the finding of the study by Watkins et. al. (2003), Cooper, Gimeno-Gascon, & Woo (1994), Storey (1994), and Woldie, Leighton, & Adesua (2008).

5.3.4. Experience of the owner/managers and its influence on the firm growth

The experience of the owner/managers and its influence on the firm growth has been mentioned in Table 14.

Table 14: Experience of the owner/managers and its influence on the firm growth

Experience	**decreased/remained the same**	**increased slightly**	**increased greatly**	**Total**
3 years or under	9 (25.7%)	12 (34.3%)	14 (40.0%)	**35 (100.0%)**
4-6 years	8 (12.9%)	27 (43.5%)	27 (43.5%)	**62 (100.0%)**
7-9 years	11 (22.9%)	27 (56.2%)	10 (20.8%)	**48 (100.0%)**
10 years or above	13 (10.9%)	65 (54.6%)	41 (34.5%)	**119 (100.0%)**
Total	**41 (15.5%)**	**131 (49.6%)**	**92 (34.8%)**	**264 (100.0%)**
Hypothesis testing	**Chi-square**	**d.f.**	**Cramer's V**	**P**
Experience	13.393	6	0.159	0.037

Source: Field Survey 2015-2016.

The statistical test of the experience of the owner/mangers shows a significant association between experience and growth of the firm, with a Cramer's V value of 0.159. *Hypothesis 2.4 is accepted. There is significant relationship of experience of the owner/managers with the growth of the firm.* This finding contradicts that of Brush and Changati (1998) who found no association between experience and the growth. It however supports the findings of the study by Storey (1998) and Woldie, Leighton, & Adesua (2008).

6. Conclusions, Implications and Future Avenues

The study suggests that all the firm variables except firm size have an effect on the growth of the firm while in case of the owner/managers characteristics, the level of education and experience of the owner/managers influences on the growth of the firm. The owner/managers characteristics such as age and gender do not have an influence on the firm growth. The pattern which emerges from this finding is that sole proprietorship firms is associated with growth; younger firms have the high propensity than that

of middle-aged and older firms. The renewable energy sector a firm operates in has a significant association with the level of growth firm attains. Another important pattern which emerges from this finding is that men and women have the same propensity to run growth oriented firms. Age of the owner/managers is not associated with the level of growth attained. In addition, the higher level of education and longer experience attained by the owner/managers, the higher the likelihood of growth is.

The findings can have significant implications for academia, renewable energy enterprises (REEs), development actors in the sector, and policy makers. This research is first of its kind in Nepal. This study is a new undertaking for the renewable energy sector of Nepal. It is most likely to be useful for the researchers because such information on this sector is being made available for the first time. This finding can have significant implications as the scholars interested in conducting research in entrepreneurship and renewable energy sector of Nepal. Likewise, this study is constructive for academia by acquiring new knowledge in the literature of entrepreneurship and recommendation for future research. The study is valuable for renewable energy enterprises to grow their business through focusing on the important factors relating to the growth of the firm. It is also useful for development actors of the renewable energy sector for more commercialization of the sector. Finally, the study is also useful for policy makers. This may be guide map to formulate entrepreneur-friendly policies to facilitate the existing and potential renewable energy entrepreneurs.

This paper can be extended by conducting a case study of renewable energy enterprises to get possibly more concrete results. A second research avenue is to make the study more fruitful by adding additional variables that are related with growth of the firm to get a greater understanding into the results. The paper can also be extended by developing resources based entrepreneurship models in renewable energy sector to get a greater insight into the results.

7. **Acknowledgements**

We heartily acknowledge the cooperation received in collecting data from the owner/managers of the sample renewable energy enterprises. We are indebted to all writers and researchers whose write ups has been used as references for this study. We would also like to express our sincere thanks to Dr. Tatwa P. Timsina, Professor, Tribhuvan University, Nepal, Dr. Anant Lal Karn, Professor, Tribhuvan University, Nepal and Dr. Tej Bahadur Karki for expected encouragement and valuable comments and suggestions to enrich this paper. We would also like to express sincere gratitude to the anonymous reviewers for their valuable comments. In this limited space, it is simply impossible to give the names of a large number of friends and well-wishers who helped us in this work in one way or another. We wish to express the sincerest thanks to them all. Last but not least, we are also indebted to the International Academic Institute for Science and Technology for providing an opportunity to publish this article in its International Academic Journal of Business Management.

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