

Perception Study of Success Factors – Green Energy Sector of Uttarakhand

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ABSTRACT

This study aims to find out the key factors responsible for the success of small-scale entrepreneurs in the nascent green energy industry of India. A sample size of 22 was taken under observation which included 14 small scale entrepreneurs and 8 industry experts from the region of Dehradun, Uttarakhand. Considering the importance of access to energy, aspiration for economic development across emerging markets, along with the urgency to lower global carbon emissions, this research seeks to investigate the convergence of all three of these topics through the lens of energy entrepreneurship in Dehradun, India. At present, around 20% or more of global population is deprived of access to electricity, most commonly grid electricity. In addition to this, nearly 40% of world’s population is still surviving on biomass fuel such as charcoal or wood primarily for the purpose of cooking, out of which 800 million people are in India. Cooking using the traditional cookstoves by burning wood have its own hazardous consequences such as serious health issues and decline in forest cover areas. Burning wood or charcoal is a global warming threat, as they emit black carbon as residue, which is a highly potent short-lived climate pollutant (Ellen Abrams, 2018). In states such as Uttarakhand, where there is large rural population who extensively use traditional cookstoves and burn wood to generate heat energy, green or renewable energy can potentially transform the lifestyle of rural population, especially women. The study explains the perception of people working in this field i.e. the green energy sector. The most important discovery would be to know if the industry is keen on making profits or if they are more inclined towards creating awareness.

Keywords: Green Energy, Green-energy markets, Solar Energy, Solar Products, Entrepreneur, Entrepreneurship development, Success factors, Perceptions, Uttarakhand, Rural Areas, Off-Grid Solutions, Rural Markets

1. Introduction

In the last few decades, India has been able to generate interest of many venture capitalists and angel investors. These investments have spurred the development of local enterprises. The entrepreneurs are navigating a developing market shaped by policy implementation, rapidly changing cost structures, and expanding market size.

In the past decade, India has progressed steadily in renewable energy power generation. The country’s installed capacity has risen six-fold to nearly 83 gigawatts (1 GW = 1,000 MW). According to the Central Electricity Authority (CEA), capacity of solar energy in past five years has grown 12 times (i.e. present capacity of 31 GW), which could make solar energy bigger and better than wind energy (Seetharaman, 2019). Share of total power generation is given below in figure 1.

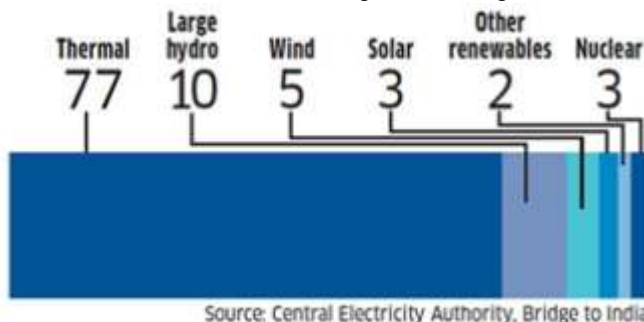


Figure 1

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While Rajasthan has the highest potential for green energy production at 15%, Uttarakhand is not even 10%. However, there are individuals innovating off grid solutions for this hilly state. Renewable energy enterprises are promoting clean technological solutions which have the potential to slow down ever growing GHG emissions. In developing countries such as India, there is ample of demand for fossil fuel and machines run by fossil fuels. For example, water pump motors which are run by diesel are extensively used in agricultural practices in developing countries & under-developed countries and these types of equipment & machinery form substantial market share, even in emerging markets. Machinery running on fossil fuel extensively contribute to climate change. Moreover, providing heavy machinery such as diesel generators which are centralized units running on fossil fuel are neither long term nor economic solutions to fulfill energy needs in under-developed or developing countries. "For countries trying to increase electricity access, the lower capital costs of small-scale, distributed renewable energy generation is a better option than compared to larger, centralized energy infrastructure" (Ellen Abrams, 2018).

Low cost, off grid distributed renewable energy is a sustainable option for rural areas or areas of low population density, as it is difficult to justify investment in centralized grid connected to central powerhouses. To enhance the reach of emerging markets in green energy sector, private sector enterprising is more feasible than public sector enterprising. Private sector can facilitate the process by making it faster and more evenly distributed. Moreover, private companies provide better customer and technical support in rural areas.

2. Literature Review

The study is based on primary research but has substantial secondary literature support. Initially informed by existing literature, then by primary data collection through interviews, the aim of the study is to understand factors responsible for success as perceived by industry people. A thematic approach and semi-structured interview plan were developed to address the key research questions for this project. Various business model design to generate better revenue collection were frequently mentioned by entrepreneurs and industry experts during personal interviews. Interviews with entrepreneurs led us to discover various ways through which business are sustained when the market conditions are unfavorable. Information about market positioning and company structuring to survive in competitive markets was also discussed by a few.

3. Objectives

The aim is to find out

1. What factors do entrepreneurs define as "success factors" for their ventures?

2. How do industry experts define "success" in terms of the market and green energy sector?

4. Research Methodology

In order to understand the factors that influence the success of renewable energy entrepreneurs in developing economies, an extensive study was conducted. Concepts of entrepreneurship and renewable energy in developing markets is a topic which has been researched and explored independently time to time. The existing literature was examined in detail in three distinct areas: economic, social, and policy related considerations. An independent questionnaire was developed as exploratory method of research has been selected for this study. The research methodology approach implemented for analyzing the data is "Thematic Analysis". Under this research methodology approach, we have utilized the process of 'Template Analysis'. Under this process, we have identified sixteen-word templates (codes) or common themes (pattern of meaning) which are derived from the data analysis (by analyzing interviews) such as 'accessibility of private investments' for all information concerning loans, micro-finances, and angel investors etc. This word template moreover covers the government schemes valid at private banks and other finance institutions. Other word templates are developed in similar manner i.e. by analyzing the interviews. This is purely inductive in nature and there have been no preconceived common themes. All word templates/ common themes are derived out of the data i.e. from the interviews conducted.

Interview method

Personal interviews – telephonic, face to face and via-online tools (skype, WhatsApp video call) were conducted. Each interview lasted for 35 minutes to 45 minutes. The interviewer followed natural course of conversation by asking the five structured questions in random order. A few unstructured questions were also asked, to deep dive into any specific perceived factor. Following natural course of conversation made the interviewees comfortable and they were able to express themselves more, thus giving us detailed answers. The interview was divided into three parts- Introduction, open-end questions & responses (based on success factors), advice & closing.

Brief example of interview conducted-

Introduction

(Same questions were asked to entrepreneurs and industry experts)

Greetings! Thank you for finding time to speak with us and making this interview possible. This interview should last for 40-45 minutes. The goal of this interview is to find out what you think or perceive as important factors of success in the context of entrepreneurs in the field of green energy. Our research is focused on finding out the perceived

success factors as this can lead us to identify what an entrepreneur thinks is important for the success of his/her enterprise. We would prefer recording the interview but if you are not comfortable, we can make notes as we go on. So, we would like to start with the question

Q1. What do you think about the scope of the green energy sector?

..... (followed by questions based on the responses)

Open End Questions and Responses

Q2. How is the financial condition of your business and is it easy getting loans sanctioned from private institutions? (Entrepreneurs)

Or

How is the financial condition of green energy sector and is it easy getting loans sanctioned from private institutions to expand your shops and trading outlets? (Industry experts)

.....(followed by questions based on the responses)

Q3. What is your perception of the domestic policies regarding entrepreneurship and current market situation in the green energy sector? (Entrepreneur)

Or

What is your perception of the domestic policies for traders & manufactures as of the current market situation in the green energy sector? (Industry experts)

..... (followed by questions based on the responses)

Q4. How do you recruit and retain your employees? Please elaborate. (same for both)

..... (followed by questions based on the responses)

Q5. How important do you think researching on products, improving quality and market positioning is? (Entrepreneur)

Or

How important do you think it is for the entrepreneur to research on products, improve quality and be conscious about their market positioning? (Industry experts)

..... (followed by questions based on the responses)

Q6. What is more important for you to make your company grow- improving company structure or strategic partnership or future strategic plans or revenue generation? (Entrepreneur)

Or

What should be more important for an/a entrepreneur/trader to make their

company/organization grow- improving company structure or strategic partnership or future strategic plans or revenue generation? (Industry experts)

..... (followed by questions based on the responses)

Advice & Closing

(Same questions were asked to entrepreneurs and industry experts)

Q7. Is there anything important that we have missed that you think is essential to shed light on?

Q8. Would you like to elaborate or give opinions on any topic discussed?

Q9. What is your final thought and what would-be your advice for the improvement of this sector?

5. Analysis

Coding

All interviews were analyzed to form codes based on the data received. The codes are positive responses which are perceived as important success factor. The frequency of positive occurrence is the percentage, or the referral count of the success factor identifies. We have applied thematic analysis on the responses/ answers receives from the responders. We identified sixteen codes as the major perceived success factors based on template analysis. These are-

- Accessibility of private investment
- Market positioning
- Domestic energy policy (net energy metering, feed-in tariffs, etc.)
- Competitive landscape
- Consumer awareness & adaptation
- Talent acquisition
- Customer financial resources
- Strategic planning
- Profitability/financial sustainability
- Long term growth
- Company Structure
- Ability to collect revenue
- Domestic skilled labor supply (installation, electrician, etc.)
- Distribution infrastructure
- Research & Development
- Product Quality

Sample Design

The first sample is of entrepreneurs, who in some way have presented an innovative idea, machine or equipment in the market. This sample includes innovative manufactures. Sample group of entrepreneurs represent various companies within the renewable energy and clean technology industries which includes solar energy solutions (primarily), wind power, energy efficient biofuels. Industry experts is a smaller sample group. This sample includes wholesalers, traders, technicians etc.

Observation

The main purpose of the research is to gather insights about the business environment, company structures, manpower availability, markets, customer orientation which is deep diving into the top factors over which entrepreneurs have influence. Identifying these factors helps inform what entrepreneurs might prioritize in order to achieve success when operating their business. The analysis of the content gathered from the literature review and research interviews help shape ideas around what entrepreneurs may be able to change or influence for the success of their business. According to the entrepreneurs interviewed, the important factors of success included revenue generation, domestic labour supply, financial stability etc. Along with the determined success factor, one has to keep in mind that an entrepreneur's ability to operate in the marketplace successfully is also dependent on factors such as stakeholders and their interference, govt. rules & regulations etc. (Ellen Abrams, 2018)

Entrepreneurs in India focus on providing the most cost-efficient pricing, but low margins don't make business successful. To keep up with the market, various other crucial factors should be prioritized and developed such as manpower. In this study, we have observed that 'revenue generation' and 'domestic labour supply' were closely tied success factors while 'access to private investments' lacked behind. This proves that a business should be able to bring in the revenues despite less investments and we can say that this process of revenue collection is facilitated by a good trained team, justifying the importance of 'domestic labour supply.'

There is a certain degree of decentralization when it comes to rules, regulation and policy framework in India. Due to which, Indian entrepreneurs do not focus on macro environment as such. Only important or essential documentation is done. However, we need to know that factors affecting internal environment of green energy companies in emerging markets are impacted by the larger ecosystem in which they operate. The ability to make profits or revenue generation is a prominent factor for startups in developing nations, but it can be a crucial differentiating factor in emerging and price sensitive markets such as India. It is necessary to achieve success within the factors that entrepreneurs can control as these internal factors can positively impact factors that are

external to their companies. While talent acquisition and retention of skilled workers present a problem in many emerging markets, startups can compete by having a unique employment structure that makes employee retention better.

A questionnaire containing five questions was developed which focused on gathering information about the success factors that an entrepreneur may consider vital for their organization. The questions are as follows-

Q1. How is the financial condition of your business and is it easy getting loans sanctioned from private institutions? (Entrepreneur)

Or

How is the financial condition of green energy sector and is it easy getting loans sanctioned from private institutions to expand your shops and trading outlets? (Industry experts)

Q2. What is your perception of the domestic policies regarding entrepreneurship and current market situation in the green energy sector? (Entrepreneur)

Or

What is your perception of the domestic policies for traders & manufactures as of the current market situation in the green energy sector? (Industry experts)

Q3. How do you recruit and retain your employees? Please elaborate. (same for both)

Q4. How important do you think researching on products, improving quality and market positioning is? (Entrepreneur)

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Q5. What is more important for you to make your company grow- improving company structure or strategic partnership or future strategic plans or revenue generation? (Entrepreneur)

Or

What should be more important for an/a entrepreneur/trader to make their company/organization grow- improving company structure or strategic partnership or future strategic plans or revenue generation? (Industry experts)

Our sample size of 22 individuals, gave in depth answers for each question which led us to identify sixteen major common success factors that the entrepreneurs and industry experts see as crucial for the development of any enterprise in the green energy sector.

Top Success factors and their referral count(referral count occurrence i.e. 'mentions' during the interview.) is the percentage count of the success factor based on its

Table: 1

Success factors	Entrepreneur (14)	Industry Experts (8)	Total Count (22)
Accessibility of private investment	19.5%	40%	26.95%
Market Positioning	8.91%	46%	22.4%
Domestic energy policy (net energy metering, feed-in tariffs, etc.)	8.5%	13.7%	2.29%
Competitive landscape	15.1%	35.8%	4.98%
Consumer awareness& adaptation	16.78%	19.7%	17.84%
Talent acquisition	25.57%	40.8%	31.1%
Customer financial resources	20.67%	50%	31.3%
Strategic planning	13.89%	40%	5.14%
Profitability/financial sustainability	30.78%	45%	35.95%
Long term growth	12.7%	60%	29.9%
Company Structure	3.67%	55%	22.35%
Ability to collect revenue	60.7%	62%	61.17%
Domestic skilled labor supply (installation, electrician, etc.)	55.7%	65%	58.08%
Distribution infrastructure	17.98%	54%	31.08%
Research & Development	12.3%	35%	20.55%
Product Quality	20%	65%	36.36%

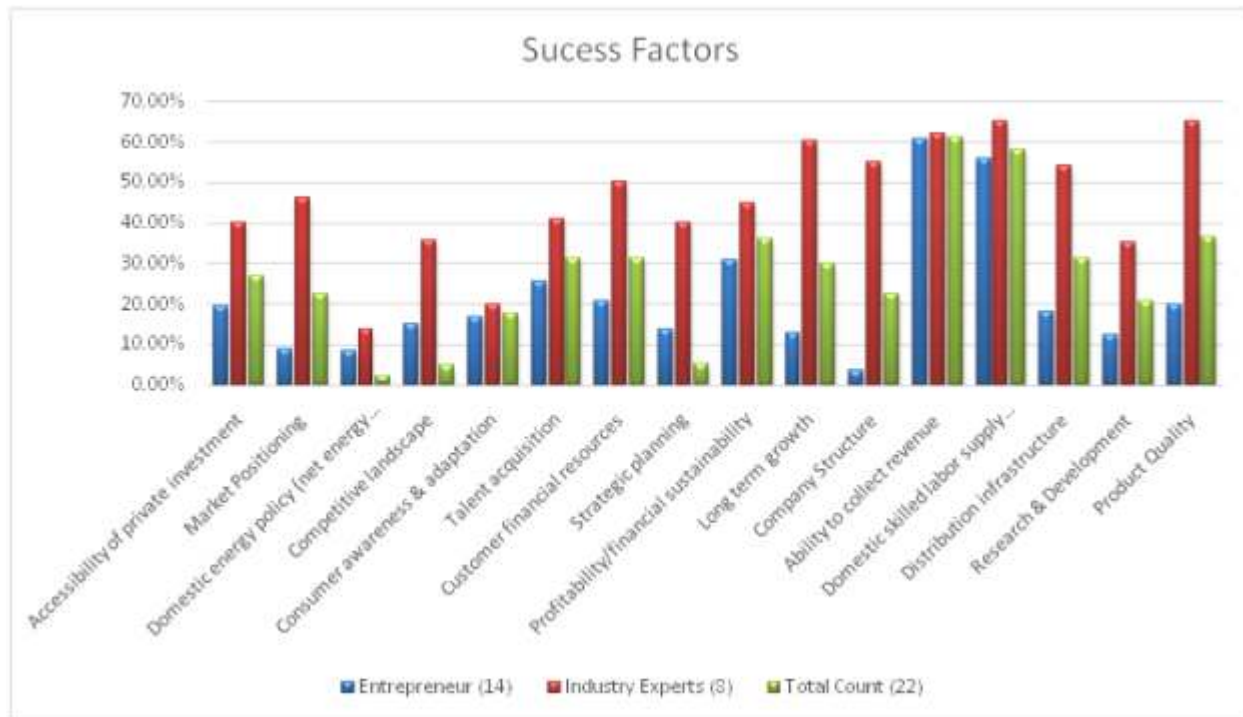


Figure 2: Data Interpretation of Success Factors

6. Discussion

The success factors 'Ability to collect revenue' and 'Domestic skilled labour supply' were the most prominent mentions by entrepreneurs during the interviews. More

than 50% of entrepreneurs believe that these two factors are not only success factors but necessary factors for the survival of the firm.

On the other hand, industry experts believe more on

providing 'Quality Products' over 'Revenue generation' but agree on the fact that 'Domestic skilled labour Supply' is a crucial success factor if any green energy enterprise wants to become successful in the domestic market. Entrepreneurs tend to believe that the product should be cost efficient even if it meant compromising on quality as India is a very price sensitive market and people tend to choose average quality low price products over high quality high price products.

Research and development are not a front runner amongst the success factors. One major reason for this is the rural customer base. Most of the client are based in villages and far off places and these people do not expect new products to launch after every six months. This leads to low to no pressure to innovate. The entrepreneurs sell the same technology for a year and sometimes for years. For example, small, portable solar lanterns. The solar lanterns being sold today are similar to the solar lantern sold two years ago. However, research and development are a high priority success factor for industry experts.

Success factors such as 'long term growth' and 'strategic planning' should be prioritized as per the industry experts but the entrepreneurs see them as important not crucial. Additionally, not all entrepreneurs think about the long-term growth of their enterprise. Their answers regarding strategic planning and long-term growth were confusing as they talked about the benefit of doubt stating, 'what if innovation or technological advancements creates a new product, maybe we will shift to some other kind of business.'

'Consumer awareness & adaptation' was a factor on which both groups agreed to a similar extent. Both sample groups had a similar take on the importance of this factor. They perceive that the customers see green energy solutions as a need; customers don't buy solar panels because they desire or fancy them but because they need them. A solar panel is a solar panel for the consumer, and the panel should be able to produce electricity. The consumers don't deep dive into the technicalities of the product as they only ask for basic information. One industry expert was quoted stating, "At times while buying low cost equipment such as solar torch or solar lantern, the customers doesn't even ask a single question. They simply look at a few models and buy what looks good to them".

Factors such as 'Domestic energy policy', 'Market Positioning' & 'Company structure' are least prominent ones among the top sixteen success factors as per the energy entrepreneurs. For industry experts 'Consumer awareness and adaptation' was the least prominent one after 'Domestic energy policy'.

7. Conclusion

On analyzing the data, we can conclude that there is already an existing need and demand for the green energy

products such as solar heaters, solar plants etc. 'Consumer awareness & adaptation' is not being considered vital because entrepreneurs and industry experts know that consumers already trust and need the product but are least interested in knowing the know-how of the technology. This suggests that consumers are already aware of the presence and importance of green energy and there is a good demand for products based on green energy solutions. To support this suggestion, we can also see that not all mentioned 'competitive landscape', which solidifies the assumption that there is enough demand for the products and there is a lot of scope for growth. Consumers want to utilize the benefits of green energy but are not deep diving into the technical area which makes it easier to sell products. This information has led to the realization that perceptions of entrepreneurs and industry experts are largely based on the feedback received from customers or consumers. Internal factors such as company structure are least discussed as perceived factors contributing to success.

The success factors 'Ability to collect revenue' and 'Domestic skilled labour supply' dominated the result and proved to be vital factors which are perceived to be deciding factors for the success of any green energy enterprise. To conclude, we can state that this industry is somewhat inclined to create awareness about environment but is more focused on generating and collecting revenues.

8. Limitations

The study focuses on what the entrepreneur and industry experts think. This study in no way suggests that the success factors discovered are the only crucial and important ones. The result is based on the opinions which are analyzed to find out which factors do entrepreneurs and industry experts think are crucial for the success of the enterprise.

Though there is always a divergence between what is perceived to be critical and what is proven to be critical for entrepreneurial success. This study focusses on the former which is 'what is perceived to be critical for entrepreneurial success'. The benefit of the research is that we can understand the thought process of small-scale entrepreneurs and industry experts when the industry is in its nascent stage.

Ultimately, we sought to better understand which factors enterprises should focus on and how they can leverage such factors to become successful.

While the clean energy entrepreneurial landscape is filled with several stakeholders ranging from political leaders to investors, it seems that the focus is not around the corner in small town such as Dehradun. Here the industry experts often comprise of middlemen, wholesalers and potential financiers. This sector needs to attract more capital to stabilize the growth of the emerging market's in energy

sector. If entrepreneurs can internalize and capitalize on the industry stakeholders' expertise, the entrepreneurs can better plug into the support network that is available.

9. Implications

This research can open doors for understanding the perceptions of budding & experienced entrepreneurs / industry experts (traders/wholesalers) working in rural areas, who are dealing in green energy sector.

On observing the impact of perceived factors in a longer run, we could find the relatability between perceptions, thoughts and their practical outcomes, specifically on how these factors help in shaping the business decisions.

If we successfully discover the impact of perceptions and their practical outcomes, we can mentor entrepreneurs in framing their thoughts about the business and minimize the confusion of prioritizing tasks and activities, thus optimizing resources to full use. Knowing what kind of perception could make a business successful can be an addition to future research.

This study is intended to be purely exploratory research that could be used as a starting off point for deeper research. Potential questions for future research could include:

Q1. Are these success factors applicable to achieving long term goals and developing a small-scale green energy enterprise into a medium or large enterprise?

Q2. How do differing opinions between entrepreneurs and industry experts inform how they define success?

Q3. Do consumers share the same thought process with respect to their buying decision?

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