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## Success Factors in Greenhouses of Guanajuato, México

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**GJMBR - A Classification :** *JELCode : M19*



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# Success Factors in Greenhouses of Guanajuato, México

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## I. INTRODUCTION

Small and Medium Enterprises (SMEs) in Mexico are important, according to data provided by the Secretaría de Economía (2011), because they represent 99% of the companies, they generate 72% of employment, and they contribute 52% of the Gross National Product (GNP). SMEs in the State of Guanajuato represent 54.58% of the companies and contribute 3.9% of GNP as part of the national total (Secretaría de Economía, 2014).

The agricultural sector is important to the economy of Mexico, agricultural Industry produce most of the food, they contribute to the cost of living, and to the real income of the population. They also contribute to industrial and commercial activities. Globally, there is concern for climate change and the conservation of our natural resources, and the ability to feed the world's growing population (FAO, 2009). Although agriculture is essential, there are problems in Mexico, particularly in the Guanajuato state, including climate-change, the high cost of supplies and services, the loss of soil fertility, difficult access to credit, and major infrastructure problems (INEGI, 2007). Another problem is the fact that many agricultural SMEs are not profitable and the failure rate is high, like in other sectors of the economy. These survival rates recorded by the Secretaría de Economía (2011) reported that 70% of businesses do not survive for more than 24 months. With such a high failure rate, clearly research is needed to help improve the survival rate.

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Entrepreneurs can do well by doing better in helping with sustainability (Parhankangas, McWilliams, & Sharder, 2014) through developing green goals and environmentally friendly strategies (Becherer & Helms, 2014). Thus, in order to protect crops, preserve natural resources, make an efficient use of water and supplies, and meet the food needs of an increasing population, it is necessary, especially those in Guanajuato, to use new agriculture production systems. Mexican farmers need to better manage their SMEs to improve the chances of success for long-term survival (FAO, 2002). To improve the success rate, it is important to understand the factors that contribute to success vs. failure. Although there have been prior success factor studies (Aragón, Ballina, Calvo-Flores, García, & Madrid, 2004; Aragón & Rubio, 2005; Lussier et al. 2000, 2001, 2010; Mahmood, Asif, Imran, Aziz, & I-Azam, 2011), none of the prior research found in the literature search studied agricultural success factors.

The contribution of SMEs in the development of a country is very important. However, there are few studies involving agriculture SMEs, mostly focusing on technical aspects of production in irrigation systems (Gallardo, 2005; Ortega, et al., 2010) and on pepper plants (Gómez, Rodríguez, Enrique, Miranda, & González, 2009; Urrestarazu, Castillo, & Salas, 2002). Sustained, productivity-enhancing research, and favorable market incentives for farmers and agribusiness (Haggbblade & Hazell 2010). This is the first study to focus on success factors in agriculture, and more specifically greenhouses.

The greenhouse is an efficient technology to avoid the restrictions imposed environmentally for the best plant growth (Bastida, 2006). Thus, the focus of this study is on greenhouse farming. The purpose of this article was to analyze the success factors of greenhouses in the state of Guanajuato, Mexico. This research had implications as it can benefit current and would be agricultural entrepreneurs, as well as a variety of other stakeholders including: parties who assist and advise them, investors and institutions who provide them with capital, communities and society by and large (Dennis & Fernald, 2001).

## II. LITERATURE REVIEW

In this study, a greenhouse is an agricultural building used for cultivation and protection of plants. The greenhouse has a steel structure, a translucent

plastic film covering that does not permit the passage of rain inside, and which aims to reproduce or simulate the most suitable climatic conditions for the growth and development of plants established inside, with some independence from the external environment and whose dimensions allow employees to work indoor. Greenhouses can have a plastic total enclosure at the top and mesh on the sides (Asociación Mexicana de Constructores de Invernaderos AC, 2008).

As suggested above, is necessary that Mexican farmers identify those factors that will improve their chances of success, for which Rockart (1982: 2) defined success factors as "those few key areas of activity in which positive results are absolutely necessary for owners' manager to reach his or her goals". The success factors are means to achieve success, which can be conceptualized in different forms such as survival, growth, profitability, as well as customer satisfaction and personal satisfaction (Gorgievski, Ascalon, & Stephan, 2011).

However, survival is considered as the most essential measure for the success of a company measure (Cowling, 2007, quoted in Toledo, Jiménez, & Sánchez, 2012) measure. In México, the survival of SMEs depends on a 24 months period (Gómez & Fernández, 2007).

González, Correa & Acosta (2002) suggests improving profitability and anticipating the insolvency to better predict business success. This depends of external finance, inability to pay debts with the resources generated by operating, having a low profit margin, among others (González, Correa & Acosta, 2002). Thus, from an economic and financial perspective, profitability is necessary, but not sufficient, for the success of the company, as one that does not get a return at least equally to that of their competitors may not attract the necessary funds to finance its expansion. Brown (2013) suggested preferentially to promote economic growth in the agricultural and rural sectors instead of the non-agricultural sectors to effectively reduce poverty in developing countries.

In the present study, and in order to obtain a more appropriate measure, three elements that support business success were considered: 1) years of the return of investment ROI, 2) growth C and 3) permanence or survival in Markets.

To better understand success factors that contribute to the success of SMEs in Pakistan, Mahmood, Asif, Imran, Aziz, & I-Azam, (2011) found that the financial, technological, government support, market strategies and business skills such as leadership and decision make resources have a positive and significant impact on business success, financial resources being the most important. In the USA, Nadim and Lussier (2012) also studied SMEs success factors related to sustainability.

Additionally, Lussier and Halabi (2010) studied success versus failure prediction in three countries in different parts of the world: United States, Croatia and Chile. The model included 15 variables determinants of success or failure. Small businesses that start with adequate capital in good economic times, that keep updated and accurate records and adequate financial controls, develop specific plans, received professional advice, can attract and retain quality employees, select good products or services and also with owners that have a higher level of education, age, marketing skills, the parents that owned a business, and the number of years of management experience and industry are factors that increase their chances of success.

Estrada, García and Sánchez (2009) analyzed the relationship among five success factors from the internal environment of Mexican SMEs: human resources, strategic planning, innovation, technology, and quality certification. Haggblade and Hazell (2010) suggested two key determinants for outstanding performance for farmers and agribusinesses: the agricultural research to increment productivity and to provide incentives for favorable markets, are required. Also, these authors say that the credit systems help farmers to access supplies and to get enough infrastructure to access markets.

Also, for accelerating agricultural growth in Africa, Noble (et al., 2004) identified a number of opportunities into four major categories: to harmonize trade regulations (export – import bans, safety standards, customs procedures), an agricultural market information system, to invest on domestic horticulture and to expand the productivity of dairy cattle, including feed systems.

The Secretaría de Agricultura, Ganadería, Pescay Alimentación (2002) (Department of Animal Farming, Rural Development, Fishing, and Food) quoted by Food and Agriculture Organization of the United Nations [FAO] (2002), they identified as success factors in agriculture, financial support, technical support and consultancy academic, organization and the interests of the producers through partnerships, capacity to innovation and improvement of existing proposals, constant communication, continuity and commitment to the project, commercialization and agriculture climate conditions as factors that have a positive influence in the success of agriculture SMEs.

The previous studies, reveal a number of factors that positively influence the success of SMEs. Among the key success factors identified in Mexico and other countries, there is the importance of good management of financial resources (Aragón, et al, 2004; FAO, 2002; Lussier & Halabi, 2010; Mahmood et al., 2011) staff training (Aragón et al, 2004; Estrada, et al., 2009; Lussier & Halabi, 2010); technological resources (Aragón, et al., 2004; Estrada, et al., 2009; Haggblade & Hazell, 2010; Mahmood et al., 2011) and quality of

products and services (Aragón et al., 2004; Estrada, et al., 2009) and the importance of the profile associated with the employer (Lussier & Halabi, 2010; Mahmood et al., 2011). However, there are specific complexities related to agriculture, which has to do with the problems associated with weather conditions, making it necessary to rethink whether these factors are aligned to the specific problems of agricultural SMEs.

### III. PREPOSITIONS

Having reviewed the literature, with further references and in order to have a more comprehensive characterization of the success factors, seven factors that determine greenhouses success were selected for this study: 1) Business person profile, 2) Human Resource Management, 3) Quality Certification, 4) Technology, 5) Financial Resources, 6) Subsidies, and 7) Channel of Distribution.

#### a) Business Person Profile

The first success factor is related to the identification of the characteristics or skills that owner/managers must possess to achieve their goals. According to studies conducted, the level of education and training (Lussier & Halabi, 2010; Lussier & Pfeifer, 2001; Simpson, Tuck, & Bellamy, 2004), dedication and perseverance at work (García, Crespo, Marti, & Crecente, 2007; Islam, Aktaruzzaman, Muhammad, & Alam, 2011) and those owned by men SMEs positively influence success.

*P1: A positive business profile is a contributing factor to greenhouses success.*

#### b) Human Resource Management

The second success factor refers to the efficient management of human resources, mainly having the ability to recruit and retain skilled labor (Chiavenato, 2007; Lussier et al., 1996, 2000, 2001, 2010). Effective human resource management has been found to decrease absenteeism and turnover, reduce the level stress, and increase commitment to the company, which results in increased productivity (Carnicer, Martínez, Pérez & Vela, 2002; Cervantes, 2005; Mañas & Garrido, 2013; Devyani, 2015). Having flexible work hours is important to Mexican workers, and thus, helps in the attraction and retention of employees (Cervantes, 2005). Companies that can attract and retain quality employees have a greater chance of success.

*P2: Positive human resource management is a contributing factor to greenhouses success.*

#### c) Quality Certification

The third success factor is the feature set and attributes that a product must possess to meet the buyer's needs and expectations (Ivancevich, Lorenzi, Skinner, & Crosby, 1997). These features are enhanced through the use of quality systems, as Irechukwu (2010) found that three out of four companies in Nigeria were

successful with the implementation of quality management systems. Also, SMEs must engage in continuous quality improvements (Harris, Gibson, McDowell & Simpson, 2012), and improve their quality processes and food safety, in order to be competitive in domestic and foreign markets. Thus, quality management improves production process and increases the level of customer satisfaction (Agus & Hassan, 2011), which contribute to entrepreneurial success. Although quality is important, it is measured by the greenhouse getting a quality certification like ISO but specifically for agriculture including the Global Good Agricultural Practices (GAP) and Primus Lab certification.

*P3: Having quality certification is a positive contributing factor to greenhouses success.*

#### d) Technology

The fourth success factor refers to technology, that is a package of techniques whose elements cannot be separated or used individually, but together they can lead to optimum performance (Stewart, 1977). Adopting one technology or another depends on the employer's own economic conditions, the evolution of markets and consumer behavior, as well as the gradual introduction of various innovations that allows acquiring sufficient knowledge about managing different equipment (Hernández & Castilla, 2000). The use and the adoption of new technologies have a positive relationship with the development of the enterprises (Bressler, Bressler & Edward, 2011; Mahmood, et al., 2011).

*P4: Technology is a contributing factor to greenhouses success.*

#### e) Financial Resources

The fifth factor of success is to maintain solvency function to meet the obligations of the company. Lussier & Halabi (2010) and Liao, Welsch, and Moutray (2008/2009) found an important factor of success is to start with adequate capital. Entrepreneurs should also avoid excessive debt and generate sufficient internal resources to pay debts (Aragón & Rubio, 2005; Silva & Santos, 2012; Vivanco, Aguilera, & González, 2011), while maximizing profitability and growth, thus contributing positively to the success of SMEs.

*P5: Having financial resources is a contributing factor to greenhouses success.*

#### f) Subsidies

The sixth factor of success is constituted by incentives or subsidies that reduce the effective cost of investment (Danielova & Sarkar, 2011). The government exemptions play an important role in the economies of developed and developing countries where the political support includes a firm positive growth because it stimulates the investment in infrastructure and the technological development (Cotti & Skidmore, 2010;



Resvani, Gilaninia, Mousavian, & Shahraki, 2011; Manikonda, 2015) that allows the enterprises to be more productive and generate regional development.

*P6: Getting subsidies is a contributing factor to greenhouses success.*

#### g) Chanel of Distribution

The seventh factor of success is the channel of distribution. The selection of the channel the greenhouse owners use to distribute their produce affects their success. Channels of distribution can include exporting, as companies can seek to expand their activities beyond national markets (Chelliah, Sulaiman, & Mohd, 2010). Companies that export increase their knowledge of foreign markets that can contribute to their success as the enterprises are able to gain market position to survive and grow (Islam, et al., 2011; Ojeda, 2009; Spence, 2003).

*P7: Channel of distribution is a contributing factor to greenhouses success.*

### IV. METHOD

The objective of this research was to explore the success factors of greenhouses based on seven factors: 1) Businessperson Profile, 2) Human Resource Management, 3) Quality Certification, 4) Technology, 5) Financial Resources, 6) Subsidies, and 7) Channel of Distribution. The methodology was survey research with personal interviews.

#### a) Sampling and Data Collection

The population was defined as all greenhouses of Guanajuato state and sampling was used for exploring relationships between success and seven success factors. There is no list of greenhouse owners and managers to use as a sample frame. Therefore, owners or managers of greenhouses were selected by interviewing known owner/managers and through professional references to greenhouse owner/managers. To increase the sample size, snowball sampling was used to recruit more general managers or owners of greenhouses by asking interviewed owner/managers for additional contact information. The total sample size consisted of 88 questionnaires completed by the owner/managers of greenhouses

operating in the municipalities of Apaseo el Alto, Acámbaro and San Felipe, plus 12 other municipalities in the State of Guanajuato, Mexico.

#### b) Instrument

The questionnaire included seven success factors: (1) the businessperson profile, (2) human resource management, (3) quality certification, (4) technology, (5) financial resources, (6) subsidies, (7) channel of distribution/exporting. This questionnaire incorporates 39 items: seven items measured (1) the profile of the entrepreneur, recording career at the company, training, education and demographics; eight items measured (2) humans resources, as employment practices including temporary staff, permanent and flexitime; six items measured (3) quality certification; four items measured (4) innovation and technology; five items measured (5) financial aspects, such as initial investment, budgeting, finance and controls; two items measured (6) subsidies and VAT returns; and seven items measured (7) channel of distribution. Each of the variables and their measures are discussed with the results. Success was measured with one item for years of survival, one to identify number of years to return the investment (ROI), and one item to measure growth.

#### c) Statistical Analysis

SPSS software was used for data analysis, descriptive statistics were run for each of the seven variables measuring the success factors of the 88 agricultural greenhouses.

### V. RESULTS AND DISCUSSION

#### a) Overall Success in Greenhouses

The results showed overall that the 88 greenhouses are successful, because more than 80% (83.9%) survived 4 years or more and have a mean of almost 9 years (8.9) in business. Also, 45 (51.1%) of the 88 already recovered their initial investment in a little more than one (1.39) year. Also, all of them reported having growth in production capacity, only 9.1% had very low growth, the rest had low to very high growth (see Table 1 and 2). These survival rates are far greater than that recorded by the Secretaria de Economía (2014), where 70% of businesses do not survive for more than 24 months.

*Table 1 : Survival and years for ROI*

	Years in Business- Survival	Years to recover ROI
Mean	8.8506	1.3929
Standard Deviation	8.32659	1.88857

Table 2 : Growth in production capacity

	Frequency	Percent
Very Low	8	9.1
Under	18	20.5
Regular	25	28.4
High	27	30.7
Very High	10	11.4

b) *Business Person Profile*

Results of Proposition 1, A positive business person profile is a contributing factor to greenhouses success, has partial support. Age and education are not contributing factors, but commitment of the owner/manager is a contributing factor to success.

The educational level of the general manager or the owner of the greenhouse is a bimodal distribution

(34.1%) with educational level of "Primary" and Bachelor," so the educational level did not imply that it is a success factor of greenhouses (see Table 3). Age, also, does not seem to be a success factor with the mean age of 48.27 years. In the sample, the majority of owner/managers 57 (64.8 %) are male (see Table 4).

Table 3 : Education

	Frequency	Percent	Percent Acumulative
Elementary	30	34.1	34.1
Secondary	12	13.6	47.7
High School	11	12.5	60.2
Bachelor	30	34.1	94.3
Master	5	5.7	100.0

Table 4 : Age, gender work commitment of the agricultural manager

	Age	Dedication Hours	Dedication Days
Mean	48.26	7.41	5.85

  

Gender	Frequency	Percentage
Female	31	35%
Male	57	65%

However, the dedication of working in the business does imply that it is a success factor. Owner/managers worked more than 43 hours per week, averaging 7.41 hours per day for almost 6 days (m =5.85) a week. This complements the findings of Islam, et al. (2011) and García et. al. (2007) who found the importance of constant willingness to personally participate in the work, but does not mean that the amount of hours worked must be excessive, as suggested in this present investigation.

c) *Human Resource Management*

Results of Proposition 2: Positive human resource management is a contributing factor to greenhouses success, was supported. Participating successful companies managed their human resources effectively indicating that HRM is a success factor (see Table 5). Permanent work and flexible working hours are important to employees. Permanent workers have

agricultural activities that are not just vegetable harvesting. By contrast, temporary workers are hired just for the vegetable harvest. Flexible working hours refers to employees' ability to select the time they work and they can change their day off.

Table 5 : Human Resources

	Permanent	Permanfe male	Perman male
Mean	13.95	6.51	7.49
Standard deviation	38.91	17.42	23.39

The mean results are the followings: 14 permanent employees by 7 temporary, a 2:1 ratio, proportionally distributed among both genders and counted with flexible working hours in most companies (50/88). The scheduling flexibility benefits mainly the females to combine household activities, so they contribute to family income and are recognized by their social activities (Rodríguez, 2012; Shmite, 2009). This reinforces the findings of Manzano & García (2009), who consider that the maintenance of the agricultural sector depends largely on labor.

#### d) Quality Certification

Results of Proposition 3, Having quality certification is a contributing factor to greenhouses success, was not supported. In the sample, 90% of the 88 companies did not have any quality certification, Global Good Agricultural Practices (GAP) and Primus Lab, implying that certification is not a success factor of greenhouses (see Table 6). The results coincide with those found by Aragon et al., (2004), where quality was not a factor for success of SMEs in the state of Veracruz, Mexico.

Table 6 : Quality Certification

	N= 88	Percentage
Neither	79	90%
Global GAP	5	6%
Primus LAB	4	4%

#### e) Technology

Results of Proposition 4, Technology is a contributing factor to greenhouses success, was supported. The greenhouses use technology but most regular farms do not. The successful agricultural enterprises involved technological innovations, the mean results show more than 2 innovations, the majority

(56/88), with some improvement in irrigation system (see Table 7) and 39 had more for two general innovations. The results are consistent with Hernández & Castilla (2000), where the introduction of various innovations is gradual, allowing the owner/manager to acquire sufficient knowledge about the management of the different equipment.

Table 7 : Mean of improvements and innovations in irrigation

	Technological improvements	Amount of irrigation improvements	
Mean	2.1705	Zero	32
Standard deviation	6.41518	One	56

#### f) Financial Resources

Results of Proposition 5, Having financial resources is a contributing factor to greenhouses success, was supported. Starting with adequate capital is necessary for success—it takes money to make money. The greenhouses were successful because the majority (76.1%) started with capital enough or more than enough to begin their business, the 20 greenhouses with little and almost zero of their own capital were practically financed by external funding (see Table 8). In addition, 28 did not require external resources, 43 had funding between 20% and 50%, and only 17 companies financed more than 50% of their initial investment. The results are consistent with of the Lussier & Halabi (2010) findings that a business must start with adequate capital.

Table 8 : Starting Capital

	Frequency	Percentage
Almost zero	10	11.4
Little	10	11.4
Regular	30	34.1
Enough	32	36.4
More than enough	5	5.7

g) *Subsidies*

Results of Proposition 6, Getting subsidies is a contributing factor to greenhouses success, (subsidies with VAT returns) was not supported as a success factor for greenhouses because more than 70% (n = 63,72%) of the business did not receive any government support in the past five. The results contradict the findings of Hall & Jorgenson (1967) that indicated that tax cuts encourage more frequent use of this resource.

h) *Channel de Distribution*

Results of Proposition 7, Channel of distribution is a contributing factor to greenhouses success was

partially supported as a success factor in greenhouses because 59 (67%) of the participating companies did not export. But almost all of them sell their production (80 of 88) via a trader (wholesale), become their own trader or directly sell retail to customers (see Table 10). The lack of participation in other markets may not require quality certification that allows them access to premium markets and a lack of connection with other agricultural enterprises and internationalization strategy (Islam, et al., 2011; Ojeda, 2009; Spence, 2003).

Table 10 : Exporting and Channel of Distribution

Exporting			
No exporting		10 to 100% of products exported	
59		29	
Channel of Distribution			
Neither	Direct/ Retail	Trader/ wholesale	Own trader
8	45	30	5

i) *Discusión*

The results indicate that five of the seven variables do contribute to greenhouses success. Greenhouses with owner/managers that are dedicated to working in the business, effectively manage their human resources, are innovative and use technology, start with adequate capital, and have effective channels of distribution are generally more successful than those that do not. Regarding human resources, owner/managers can have effective interpersonal relations with their employees, which is an important feature for organizational success. It is possible to consider the organizational purpose and profits while at the same time to be socially responsible to others in the community through equitably distribution of work and benefits (Giraldo, 2010).

Two of the variables were no supported. The majority of greenhouses do not have quality certification and owner/managers do not get subsidies and VAT returns. However, this doesn't mean that greenhouses owner/managers should not get certified, because if they want to grow and sell in other areas, certification would

help enter new markets. Also, greenhouse owner/managers could benefit from getting subsidies and VAT returns. The government could make this information available to potential entrepreneurs who may not be aware of these benefits.

## VI. IMPLICATIONS

According to the Mexican government, with the importance of small business, there is a need for better education of entrepreneurs (Secretaria de Economía, 2011). This study found the need for training of entrepreneurs in SMEs as many entrepreneurs do not have any kind of certification, lack a business education, there is a lack of a quality culture, only a few engage in exporting, many lack technology to compete, and they are not aware of government programs that can help them run a successful SME.

This study has various implications for public policy. In Mexico, the government does not provide much assistance for agricultural SMEs. The Support Fund for Micro, Small and Medium Enterprises (SME FUND), Secretary of Economy, does not provide



enough support, as a low percentage of small business owners receive any help. Similarly, the support of the Secretaría de Agricultura, Ganadería, Pesca y Alimentación (2002) (Department of Animal Farming, Rural Development, Fishing, and Food) is also inadequate. Thus, it is suggested that its role should be enhanced by providing more resources. Moreover, there is no stated government policy on entrepreneurship. The provision of such a policy should be the starting point to coordinate efforts to enhance an entrepreneurial environment in Mexico. Mexican officials should seek help and support from the U.S. Small Business Administration (SBA) and implement some of its policies and programs that could help Mexican SMEs, the government could also consider hiring SBA executives to work for Mexico to develop a new agency to support SMEs

With the importance of economic growth coming from small businesses, understanding business success is a critical issue in Mexico, and globally. With the high failure rate, research is needed to increase the odds of SMEs success. The results of this study can help government agencies and institutions to do a better job of understanding why some business succeed and others fail, and teach this to new entrepreneurs. More importantly, these institutes can help entrepreneurs get the proper training and resources they need to succeed and avoid failure. Thus, this study can be used to help formulate strategies to increase business success and economic development in Mexico.

## VII. CONCLUSION

This research contributes to the body of literature because, a set of seven success factors was discussed and it is the first study to focus on success in greenhouses in Mexico. We agree with Reij and Smaling's (2007) suggestion that establishes the success is a combination of useful indicators to support the development projects, the investment in agriculture and agricultural gestion. It also has implications as it can benefit current and would be agricultural entrepreneurs, as well as a variety of other stakeholders including parties who assist and advise them, investors and institutions who provide them with capital, communities and society by and large.

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