

# An Analysis of Factors Affecting Growth and Operations of Brick Kilns in Haryana

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## ABSTRACT

As per the report provided by the director of Central Pollution Control Board no. of brick kilns in operation in India are approx. 140,000 which is more than China (Approx. 80000). From brick production point of view China is at first place with 800-1000 billion bricks per year whereas India is producing near about 240-260 billion bricks per year and providing employment to nearly 10-23 million workers. India is contributing more than 10 percent of total brick production at global level. The present study analyses the factors affecting growth and operations of brick kilns in Haryana. In these study estimations, the legal, financial, technological, and input factors in context of the brick industry were explored through interviews and questionnaires from 135 employers of brick kiln firms. Exploratory factor analysis has helped the researcher to identify the requisite factors whereas the regression analysis evaluated the highest and least impactful factor for financial factor. This research work discusses some of the underlying results that financial factor is mostly influenced by legal factor followed by technological and input factors in brick industry. The regression equation representing the relationship between dependent and independent variable is also derived.

## 1. Introduction

**Background of brick production in India:** Brick has become indispensable component in construction sector in India. For making clay bricks a pre-determined process is being followed which started from procurement or extraction of clay then preparing of mud or mixture, molding, drying, firing and at last distribution of the bricks.<sup>1</sup> There are two types of brick kilns in India continuous and intermittent. Continuous bricks kilns are more energy efficient than intermittent because they are based on either moving fire or moving ware principle. Clamps, downdraft, and scotch are the example of intermittent brick kilns and Bull's Trench Kilns, Zig-Zag based brick kilns, Hoffman and Vertical Shaft Brick kilns are the example of continuous brick kilns (Heierly & Maithel, 2008). India gains second position in clay fired bricks production approximately producing 140 billion bricks per year (Khan, 2008). Brick making in India is a manual process as technology has negligible role in the production of bricks whereas majority of the production depends upon labour only.

**Growth and development of brick sector in Haryana:** There were 2959 Brick kilns in operation in Haryana as on 31.01.2014.<sup>2</sup> As per the policy issued by state govt. of Haryana on dated 28.07.2017 every brick kiln in Haryana must be based on zigzag technology. There are near about 78 percent of brick kiln in Haryana are converted or under progress to be converted to zigzag based technology or other improved

emission technique<sup>3</sup>. A report has been submitted by CPCB on dated 04.03.2020 before the Hon'ble National Green Tribunal as per the information provided by SPCB's there are total 3278 brick kilns in Haryana and with regard to NCR region out of 2187 only 1504 has been converted to zigzag technology<sup>4</sup>. There are only 319 new brick kiln units has been established in last 5 years which shows a declining growth rate of brick sector in Haryana. The relationship factors affecting migration in some states like Haryana where the cost of raw material is lesser than many other areas affects the growth and operations of the brick kiln industry a lot. The construction work in developed cities has been almost over and now it's expanded to the outskirts of the cities or rural areas, so many of the employers find it a profitable business, if invested in rural areas (Nair, 1993).

**Factors of concern with regard to operate a brick kiln unit and its growth:** The brick industry of Tripura is going to be adversely impacted by various constraints such as institutional, input, financial, technological, land, environmental and socio-economic etc. (Ghoshal, 2008). Laws pertaining to social security of firms in unorganized sector should be incorporated. Government should revise the tax system and legal formalities for starting the brick kiln firms in any area. In addition to this, government should provide financial assistance to brick kiln firms to safeguards the future of small-scale industry in India. These firms are not in position to generate stable income because of its seasonal nature (Reena, 1998). Financial and technological condition of brick kiln firms is not sound as most of the brick kiln units in

<sup>1</sup>Asian Institute of Technology. (2003). *Small and medium scale industries in Asia: Energy and environment brick and ceramic sectors*. Pathumthani, Thailand: Regional Energy Resources Information Center (RER).  
[http://www.faculty.ait.ac.th/visu/Data/Publications/Chapters%20&%20books/BRICK\\_AND\\_CERAMIC.pdf](http://www.faculty.ait.ac.th/visu/Data/Publications/Chapters%20&%20books/BRICK_AND_CERAMIC.pdf)

<sup>2</sup>Economic survey of Haryana 2014-15,  
<http://web1.hry.nic.in/budget/Esurvey.pdf>

<sup>3</sup> Economic survey of Haryana 2019-20,  
<http://web1.hry.nic.in/budget/Esurvey.pdf>

<sup>4</sup>[https://greentribunal.gov.in/sites/default/files/news\\_updates/Report%20by%20CPCB%20in%20O.A.%20No.%201016%20of%202019.pdf](https://greentribunal.gov.in/sites/default/files/news_updates/Report%20by%20CPCB%20in%20O.A.%20No.%201016%20of%202019.pdf)

Muzaffarnagar and Meerut are converting into sick units due to expensive raw material and non availability of labour for production. Maximum firms has not upgraded the machinery parts and they are running in a traditional way so has not witnessed any technological advancements and firms were not giving any incentives to the labour. Permanent employees are few in numbers which shows that firms are not earning a huge profit to retain their employees by providing financial incentives or benefits. Brick kiln industry in U.P. is facing economic slowdown (Chopra, 1998).

The inability to expand the firms, non willingness to convert this industry into organized one, financial hurdles or parameters are not letting this small scale sector into medium enterprises. Informal way of paying wages (in cash on daily basis) makes the labour most non reliable input factor. It is one of the reasons that they are considered as unorganized labour. A large no. of female worker is working in informal sector. They work as a unit so that most of them are unpaid workers which make their condition worse (Neetha, 2007). The condition of brick kiln industry in Kerala state that lower level of regular employment, less remuneration and absence of legal and medical facilities such as provident funds or medical aid, made this industry as seasonal industry. They are not reaping full benefits of being a permanent production sector in the country (Eapen, 2001). Gupta (2003) examined the same conditions and factors of brick kiln industry in North India. Absence of laws and cash transactions makes this industry as informal sector providing employment to maximum workers. Labour is one of the major input factors of brick kilns. Brick production almost depends upon migrant workers which also consist of women and child. Migration to brick kiln industries for instance lack of employment opportunities; women’s working conditions at native place and low standard of living, these factors

collectively highlight the fact that life of the workers working at brick kiln is very hard (Singh, 2005). There are so many factors responsible for labour migration at brick kilns such as, political, education, social, economic, environment, health etc. Most dominant factors such as better opportunities for work and high wages rate in comparison of income at native place attracts workers to become migrants (Kainth, 2009). Although, government has formulated many laws pertaining to unorganized sector and for workers associated to those activities. But despite of government laws governing bodies and timely inspection, there is no equal distribution of fringed benefits in brick sector (Dharmalingam, 1995).

**2. Objective of the study**

- i. To identify the various factors affecting growth and operations of brick kilns in Haryana
- ii. To study the impact of legal, technological and input factors on financial factor in brick kiln industry in Haryana

**3. Research Methodology**

The current study deals with Brick Kiln firms in Haryana. The data is collected form owners of brick kilns operating in Haryana. Simple random and convenience sampling is used to collect the responses from the respondents. Factor analysis is used to extract the factors. Descriptive and frequency statistics is used to interpret the demographics of the study. Simple linear regression is applied to the extracted factors to identify the highest influential factor for financial aspects.

**4. Analysis and Interpretation**

**Table 1: Demographics of Brick Kiln Owners**

<b>Location of Brick kiln</b>			
	Frequency	Percent	Cumulative Percent
Rural	122	90.4	90.4
Urban	13	9.6	100.0
Total	135	100.0	
<b>Annual turnover of the Brick kiln:</b>			
	Frequency	Percent	Cumulative Percent
Below Rs 25 lakhs	30	22.2	22.2
Between Rs 25-50 lakhs	54	40.0	62.2
Between Rs 50-75 lakhs	18	13.3	75.6
Between Rs 75-100 lakhs	25	18.5	94.1
Above Rs 100 Lakhs	8	5.9	100.0
Total	135	100.0	
<b>Number of employees</b>			
	Frequency	Percent	Cumulative Percent
less than 50 employees	28	20.7	20.7
50-100 employees	51	37.8	58.5
100-150 employees	18	13.3	71.9
150-200 employees	25	18.5	90.4
more than 200 employees	13	9.6	100.0
Total	135	100.0	

Source: Primary data

Table 1 represents that majority of the firms are placed in rural area and few are in urban areas. In case of turnover of firms, 40 percent of the firms have turnover in between Rs 25 to 50 lakhs and 22 percent of firms have turnover less than 25 percent. Whereas few firms are there which are having

turnover more than Rs. 100 lakhs. Table further explain that 21 percent of firms belong to small-scale category having employees less than 50 and about 80 percent of the firms fall in medium scale category based on the number of employees.

**Table 2: Rotated Component Matrix for Items Affecting Growth and Operations of Brick Kilns in Haryana**

	Components			
	i	ii	iii	iv
<b>Financial Factor</b>	<b>Cronbach Alpha (0.885)</b>			
High cost of labourers because of advance payment to the migrant labourers effects the growth and operations of your brick kiln	.842			
Cost of fuel effects the growth and operations of your brick kiln.	.829			
High rate of interest charged by financial institutions against loan effects the growth and operations of your brick kiln.	.826			
Time gap between selling of bricks and receiving of money against brick sold effects the growth and operations of your brick kiln.	.793			
Commission to the agents for recruiting skilled labourer effects the growth and operations of your brick kiln	.790			
Requirement of large amount of money as working capital effects the growth and operations of your brick kiln.	.769			
Cost of raw material effects the growth and operations of your brick kiln.	.758			
<b>Legal Factor</b>	<b>Cronbach Alpha (0.905)</b>			
Maintenance of large no. of financial records effects the growth and operations of your brick kiln.		.878		
Government Tax system effects the growth and operations of your brick kiln.		.851		
Use of leasehold land effects the growth and operations of your brick kiln.		.821		
Huge Legal formalities in starting a brick kiln unit effects the growth and operations of your brick kiln.		.786		
Brick kilns are considered to be responsible for environment pollution effects the growth and operations of your brick kiln		.775		
<b>Technology and Competitive Factor</b>	<b>Cronbach Alpha (0.820)</b>			
Requirement of huge size plain land area to run the activities effects the growth and operations of your brick kiln.			.937	
Lack of availability of skilled labourers locally effects the growth and operations of your brick kiln.			.934	
Availability of fuel effects the growth and operations of your brick kiln.			.882	
Availability of quality of soil which is appropriate for bricks effects the growth and operations of your brick kiln.			.855	
<b>Input Factor</b>	<b>Cronbach Alpha (0.938)</b>			
Barriers in adopting mechanized technology effects the growth and operations of your brick kiln.				.910
In respect of status, non-recognition of brick kilns as an industry effects the growth and operations of your brick kiln.				.903
Lack of practical knowledge to adopt energy efficient methods effects the growth and operations of your brick kiln.				.869
Competition from other type of bricks effects the growth and operations of your brick kiln.				.787

Source: Primary Data

**Table 3 Model summary of regression model of financial factor**

Model Summary				
R	R Square	Adjusted R Square	R Square Change	Durbin-Watson
.496 <sup>a</sup>	.246	.229	.246	1.941

a. Predictors: (Constant), Input Factors, Technological and Competitive Factor, Legal Factor  
 b. Dependent Variable: Financial Factor

Source: Primary Data

Table 3 shows that regression have been applied to the all the factors extracted by applying EFA. Financial factor is considered as dependent factor and other factors as independent factors and simple linear regression is applied thereof. The result indicates that the value of R is 0.496, which signifies that the model explains the 49.6 percent of the variance and found significant for the model. This further

achieves the standardized benchmarks for Durbin-Watson value, which is less than 3 and highlights the fact the Values from 0 to less than 2 indicate positive autocorrelation. This further explains that model is found to be good model fit for the financial factor. This concludes that all the independent factors have significantly impact on the dependent factor.

**Table 4 Beta coefficients and VIF value for all the factors**

Terms	β Coefficient	Standard Error Coefficient	T- Stat.	Sig.	Tolerance	Variance Inflation Factor
Constant	10.025	2.768	3.622	.000		
Legal Factor	.517	.111	4.675	.000	.826	1.211
Technological and Competitive Factor	.148	.141	1.045	.009	.853	1.173
Input Factors	.255	.105	2.432	.016	.924	1.083
a. Predictors: (Constant), Input Factors, Technological and Competitive Factor, Legal Factor						
b. Dependent Variable: Financial Factor						

Source Primary Data

(Regression equation:  $P = x + y Q + e$ , where  $P =$  dependent variable,  $Q =$  independent variable,  $y =$  coefficient of  $Q$ ,  $x =$   $Q$ -intercept/ constant and  $e =$  error term)

The Linear Regression Equation for the impact of legal, technological and input factors for the financial factor in brick kiln industry will be as based on the regression equation  $P = x + y Q + e$ . In the current study, financial factor (P) is considered as dependent factors whereas other factors such as legal (Q<sub>1</sub>), technological (Q<sub>2</sub>) and input factors (Q<sub>3</sub>) are independent factors. The value of beta coefficient for respective factors is represented in table 4. Based on the information obtained in the table 4, the regression equation can be derived as

$$P = a + b_1Q_1 + b_2Q_2 + b_3Q_3 + e$$

$$\text{Financial Factor} = 10.025 + .517 (\text{legal factor}) + .255 (\text{input factor}) + .148 (\text{Technological and Competitive Factor}) + e$$

Table 4 reveals the fact that the VIF values are under the threshold values and are less than 2, which depicts that there is no multicollinearity in the data. This also explains that there is low correlation among the factors. Table 4 further explains the impact of legal, technological, and input factors on financial factor in brick kiln sector. It is found that legal factor or legal environment have the highest influence on financial parameters followed by technological and competitive factors, the input factor has the least impact on financial aspects in brick kiln industry (Neetha, 2007). The similar findings can be traced in the work of Kainth (2009), where the author has given emphasis on legal and technological factors for the improvement of brick kilns firms. In other words, in brick kiln firms, technology and competitors remains constant throughout the decades. Whereas, with the change in any legal parameters have huge impact on financial aspects. Now, law regarding conversion of existing brick kiln units into zigzag based technology bound all the brick kiln owners but due to the requirement of large amount of money they don't want to

convert their units (Roy, 2012). This govt. policy has adverse impact on their financial position. Heierli (2008) has also proposed that government should formulate some major and strategic policies for the overall economic development of labour working in brick kiln industry along with brick kilns industry as a whole.

**5. Conclusion**

The brick kiln industry in Haryana has been witnessed declined growth rate in the last decade. Majority of the brick kiln firms have turnover less than Rs 50 lakhs and few firms have turnover more than Rs1crore. The laborers immigrate to Haryana for job purpose only and their interest have been shifted from brick kiln industry to other fruitful areas. The legal factor has the highest impact on financial aspects for instance minor change in labour law acts as stimulating agents for labours and financial burden on the employers and vice versa (Sinha, 1994). In addition to this, technology up-gradation and innovations would likely to affect the production of bricks a lot, therefore government should push the employer to replace their traditional methods of production with modern equipments or should focus on zig zag technology, which is not only energy efficient but will help to improve productivity. Singh (2005) has also investigated that brick kiln firms should upgrade their technology and government should introduce some legal amendments to safeguard the rights of labour in brick kiln firms (Heierli, 2008). Thus may contribute significantly in improving the turnover of the firms and eventually will become the vital element for the firm. Further research in future may reveal many other dimensions such as government intervention, role of NGOs, government policies and fluctuations in demand, which may significantly influence the financial aspects of brick firms (Naik, 2009).

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