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INFLUENCE OF PROVISIONS OF SOCIAL SECURITY ON BRICK PRODUCTIVITY AMONG WOMEN MIGRANT WORKERS - EVIDENCE FROM BRICK KILNS OF JORHAT DISTRICT OF ASSAM

Dr. Bharati Gogoi[1]

[1]Assistant Professor, Department of Geography, Bhattadev University, Bajali (Assam)

ABSTRACT

This research study attempts to investigate the impact of provisions of key social security facilities on production of bricks at two distict levels – women migrant workers' level and brick klin level by collecting primary data from 156 women brick kiln migrant workers in the age group of 18 to 60 years through multistage judgement sampling method from 15 sample brick kilns of Jorhat district of Assam. Out of the key social security services, status of health facilities (p value = .013, <0.05); status of social security facilities (p value = .040, <0.05); provision of drinking water (p value = .015, <0.05) and maternity benefits (p value = .021, <0.05); are the very significant predictors of brick production at women migrant workers' as well as brick kiln level. This study recommends that brick kiln entrepreneurs with greater investment and deep focus on social security amenities to women migrant workers can increase the quality and quantity of their brick productivity.

Keywords: Brick Productivity, Provisions, Social Security, Women, Workers

Corresponding Author

Dr. Bharati Gogoi,
bharatigogoi85@gmail.com

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1. INTRODUCTION

In urban areas of India, approximately one-third of population are living is likely to rise steadily in coming years. Accelerating demand of housing constructions in urban areas leads to a boost in the number of brick kilns to more than 100,000 brick kilns in the country. These brick kilns are recruiting about 10 million workers, producing about 200 billion bricks and firing approximately 30 million tons of coal annually (Kumar, R. & Sharma, A., 2021). According to the 2011 census, out of the 48.58 per cent women population, 25.67 per cent constitute working women and 6.83 percent working women were working in brick kilns (Nanjunda, D. C. & Venugopal, P. N., 2021).

Another research study finds that about 76 per cent of working population works in the informal industries and out of which almost 118 million are women workers in India (Nandal, S. & Kumar P., 2016). The Brick Kilns units being informal industries employs workers from marginalised caste, rural backward regions, poverty driven areas, lacking education, poor social status, and security (Gupta, J., 2003). Women workers in brick kilns encountered working discrimination and

exploitation due to their intersectional identities (Monisha, S. & Rani, P. L., 2016). There are other serious social security issues experienced by women workers such as lack of drinking water, amenities of living, sanitation, health care etc. (Robertson, R., Di, H., Brown, D. et al., 2016). In a hierarchical structure of work, women workers are exploited in such a way that they are either under the dominance of brick kiln owner or their partner, or by both (Nandal, S. & Kumar P., 2016). Addressing the provisions of social security facilities to women workers is also vital in brick kilns as these are the basic needs and contribute a lot towards production of bricks by workers. A study conducted on the manufacturing industrial units in South Africa establishes relationship between existing work conditions and workers ability to work (Abrey M, Smallwood J. J., 2014). Women workers of brick kilns are treated as family workers rather merely counted as individual workers (Sundari, S., 2020).

It has long been in brick kilns of India, the provisions of social securities are not regarded as a factor of productivity and typically neglected. In brick kilns, women workers usually not granted the social protection, basic welfare and health facilities and they are forced to work in a working place capable of unhealthful and hazardous (Mitra D, Valette D., 2017). Informal workers mainly faced prolong rampant problems in brick kilns like poor housekeeping, poor lighting, excessive heat, lack of ventilation, insufficient workspace and operational tools, unhiegenic working and living conditions, lack of protective apparatus, exposure to dangerous pollutants, lack of drinking water and sanitary facilities and long hours of work (Ghosheh N., 2013). In the case of brick kilns in India, a directive in occupational safety and health care provisions to workers with minimum social securities in brick kilns such as temporary living shelters, drinking water access, rest areas, toilet facilities, primary health care, and child care centres stimulate economic growth of brick kiln industries (Kumar R., Sharma A., 2021). Generally the brick kiln owners do not give main concern to investing in working and living conditions for workers at brick kilns (Shyamsundar, K. R., and Sapkal R., 2020). It is significant to acknowledge the major contribution of women workers in the mechanization at brick kilns, and their well-being is equally important. There is a deficiency of reserch studies on the role of social security provisions to women workers in improving workers' productivity at brick kilns.

2. OBJECTIVES

The main objectives of the current research study are: to investigate the influence of provisions of key social security facilities on production of bricks at two levels - women migrant workers' level and brick klin level and to find out the significant social security predictors of brick production at brick kiln level.

STUDY AREA

The district of Jorhat, named after it's headquarter town, i. e. Jorhat is located at the eastern part of Assam and stretches from 25^0 49/ to 27^0 17/ North latitudes and 93^0 18/ to 95^0 26/ East longitudes. Located at the central part of Brahmaputra valley Jorhat is an administrative district of Assam. At the north, Jorhat district is bounded by Lakhimpur and Majuli, Nagaland state on the south, Sivasagar on the east and Golaghat on the west. In the north of the district, the Brahmaputra River forms the largest riverine island of the world, Majuli, which spreads over 924.6 square km. It has an average elevation of 116 metres (381 feet). The district covers an area of 2851 sq. km. The district comprises 3 sub – division, 11 towns, 848 villages, 8 Community Development Blocks, 110 Gaon Panchayats and 6 revenue circles.

Figure 1: Location of Brick Kilns at Jorhat District

3. METHODOLOGY

In this research study, primary data have being collected from 40 % brick kiln units selected through multistage judgment sampling techniques from Jorhat district, one of the industrialized district of Assam. Jorhat district have a total 72 brick kiln units unevenly distributed in 5 revenue circles. Most interested brick kilns for current study are the kilns where women migrant workers constitute 30 % or more than the total workfore. Only 38 brick kilns of study area satisfied the criterion of sample selection. Out of the 38 brick kilns, 15 brick kilns were chosen for primary data collection. Thus, 2 brick kilns selected from Teok circle, 4 from Titabor circle, 2 from west Jorhat circle, 1 from East Jorhat circle and 6 brick kilns from Mariani circle have been selected on the basis of judgement random sample techniques. Altimately primary data pertaining to various social security parameters and brick production was carefully collected from 156 women migrant workers in the age group of 18 to 60 years.

4. RESULTS AND DISCUSSION

PRODUCTION OF BRICKS AT WOMEN MIGRANT WORKERS' LEVEL

Table 1: Percent distribution of women pathera workers by average production of brick per day according to total brick production

Average brick production per day per worker	Total production of bricks (in numbers) per workers									Total (in %)
	Less than 20000	20001 to 35000	35001 to 50000	50001 to 65000	65001 to 80000	80001 to 95000	95001 to 110000	110001 to 125000	125000 to 140000	
less than 100	2.4%									2.1%
151 to 200	1.0%	1.0%								2.4%
201 to 250	1.4%	3.1%								4.5%
251 to 300		3.4%	1.7%							5.2%
301 to 350		0.7%	8.6%							9.3%
351 to 400			5.9%	2.8%						8.6%
401 to 450			1.0%	6.2%	1.4%					8.6%
451 to 500			0.7%	7.9%	4.5%	3.1%				16.2%
501 to 550					6.6%	1.0%	0.7%			8.3%
551 to 600					2.4%	7.9%	0.7%			11.0%
601 to 650					0.4%	3.1%	4.5%	4.8%		12.9%
651 to 700					0.2%		5.9%	1.4%	0.7%	8.2%
701 to 750								1.0%	1.7%	2.8%
Total	4.8	8.3	17.9	16.9	15.5	15.2	11.7	7.2	2.4 %	100%

Table 1 shows a positive association between average production of katchha bricks and total katchha brick production by pathera women migrant worker. The highest of all pathera women migrant workers (17.9 percent) produced 35001 to 50000 bricks on an average. Out of the total respondents the lowest average bricks of less than 100 bricks were produced by the lowest 2.1 percent women pathera workers. On the other hand, the highest bricks between 701 to 750 bricks were produced by only 2.8 percent workers. The highest respondents (16.2 percent) produced 451 to 500 bricks on an average per day.

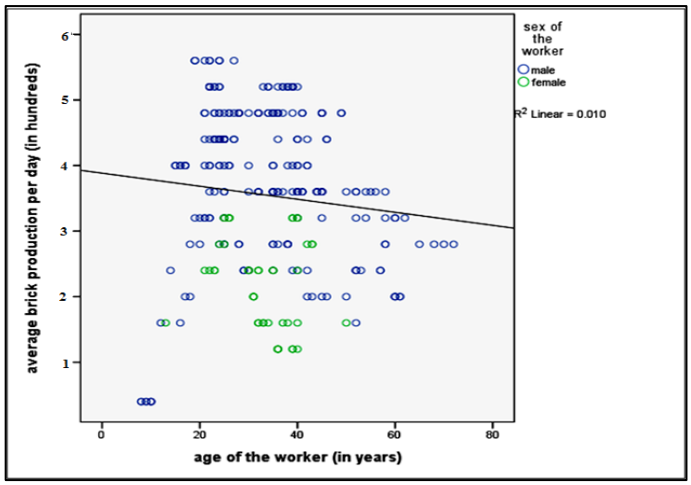

Figure 2: Scatter plots with fit line showing association between age and average production of bricks according to sex of the pathera migrant workers

Figure 2 shows association between age and average production of bricks according to sex of the pathera migrant workers. It is obvious that the average production of bricks by women brick moulding migrant workers per day was much lower than that of male pathera migrant workers of brick kilns. Fit line direction indicates that there was a negative relationship between age and brick productivity of women migrant workers per day. With an increase in the age of brick moulding women migrant workers working in brick kilns, the daily productivity of bricks by themselves decreases. The coefficient of determination, R^2 *(0.010)* is the proportion of the variability in brick productivity that could be analysed by age of women migrant workers. R^2 *(0.010)* indicates that age of the women workers could influence only 1 % of the variability in average brick production per day per women worker.

INFLUENCE OF KEY PROVISIONS OF SOCIAL SECURITY ON BRICK PRODUCTIVITY AT WOMEN WORKERS LEVEL

The coefficient of correlation statistics in (Table 2) were computed in SPSS 20. Some of the variables selected for regression analysis were excluded for computing correlation statistics. The results of multiple correlation statistics (Table 2) indicate very strong positive correlations between size of the kiln and production of bricks (.878); work injury benifits and bricks production (.863); child day care centers and bricks production (.916); maternity benifits and production of bricks (.989); status of health facilities provided and production of bricks (.910); status of social security facilities provided by owner and production of bricks (.857); status of housing condition and production of bricks (.824) and status of drinking water facilities and production of bricks (.746).

Table 2: Multiple Correlations statistics between brick production and selected key variables of social security

Multiple Correlations Statistics between Production of Bricks and Selected Variables

Variables		Production of bricks	Size of kiln	Provision of electricity	Work injury benefit	Quality of bricks produced	Child day care centres	Maternity benefits	Health facilities provided	Social security facilities	Status of housing condition	Status of sanitation condition	Status of drinking water provided	Equipments for risk work	Bonus given	Provision of school
Production of bricks	P. C.	1	.878**	.592*	.863**	-.855**	.916**	.989**	.910**	.857**	.824**	.568*	.746**	.646**	.503*	.425
	Sig.		.000	.012	.000	.000	.000	.000	.000	.000	.000	.017	.001	.005	.039	.089
	N	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Size of kiln	P. C.	.878**	1	-.661**	-.910**	-.874**	-.877**	-.85**	-.904**	-.88**	-.845**	-.60*	.609**	.417	.532*	.359
	Sig.	.000		.004	.000	.000	.000	.000	.000	.000	.000	.011	.010	.096	.028	.157
	N	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Provision of electricity	P. C	.592*	-.661**	1	.583*	.608**	.627**	.563*	.554*	.519*	.592*	.294	-.197	-.184	-.299	-.302
	Sig.	.012	.004		.014	.010	.007	.019	.021	.033	.012	.252	.449	.481	.244	.239
	N	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Work injury benefit	P. C.	.863**	-.910**	.583*	1	.872**	.858**	.849**	.891**	.831**	.767**	.465	-.607**	-.416	-.310	-.250
	Sig.	.000	.000	.014		.000	.000	.000	.000	.000	.000	.060	.010	.097	.226	.334
	N	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Quality of bricks produced	P. C.	-.855**	-.874**	.608**	.872**	1	.750**	.857**	.891**	.919**	.835**	.564*	-.696**	-.477	-.496*	-.411
	Sig.	.000	.000	.010	.000		.001	.000	.000	.000	.000	.018	.002	.053	.043	.101
	N	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Child day care centres	P. C.	.916**	-.877**	.627**	.858**	.750**	1	.886**	.808**	.773**	.722**	.489*	-.513*	-.422	-.383	-.358
	Sig.	.000	.000	.007	.000	.001		.000	.000	.000	.001	.046	.035	.091	.129	.158
	N	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Maternity benefits	P. C.	.989**	-.850**	.563*	.849**	.857**	.886**	1	.900**	.856**	.842**	.602*	-.795**	-.697**	-.547*	-.485*
	Sig.	.000	.000	.019	.000	.000	.000		.000	.000	.000	.011	.000	.002	.023	.049
	N	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Health facilities provided	P. C.	.910**	-.904**	.554*	.891**	.891**	.808**	.900**	1	.896**	.869**	.648**	-.753**	-.516*	-.588*	-.413
	Sig.	.000	.000	.021	.000	.000	.000	.000		.000	.000	.005	.000	.034	.013	.099
	N	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Social security facilities provided	P. C	.857**	-.882**	.519*	.831**	.919**	.773**	.856**	.896**	1	.925**	.680**	-.672**	-.460	-.495*	-.425
	Sig.	.000	.000	.033	.000	.000	.000	.000	.000		.000	.003	.003	.063	.044	.089
	N	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Status of housing condition provided	P. C.	.824**	-.845**	.592*	.767**	.835**	.722**	.842**	.869**	.925**	1	.769**	-.673**	-.461	-.639**	-.567*
	Sig.	.000	.000	.012	.000	.000	.001	.000	.000	.000		.000	.003	.063	.006	.018
	N	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Status of sanitation condition	P. C	.568*	-.600*	.294	.465	.564*	.489*	.602*	.648**	.680**	.769**	1	-.692**	-.152	-.694**	-.607**
	Sig.	.017	.011	.252	.060	.018	.046	.011	.005	.003	.000		.002	.561	.002	.010
	N	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Status of drinking water	P. C.	-.746**	.609**	-.197	-.607**	-.696**	-.513*	-.795**	-.753**	-.672**	-.673**	-.69**	1	.685**	.658**	.494*
	Sig.	.001	.010	.449	.010	.002	.035	.000	.000	.003	.003	.002		.002	.004	.044
	N	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Equipments for risk work	P. C.	.646**	.417	-.184	-.416	-.477	-.422	-.697**	-.516*	-.460	-.461	-.152	.685**	1	.451	.339
	Sig.	.005	.096	.481	.097	.053	.091	.002	.034	.063	.063	.561	.002		.069	.184
	N	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Bonus given	P. C.	.503*	.532*	-.299	-.310	-.496*	-.383	-.547*	-.588*	-.495*	-.639**	-.694**	.658**	.451	1	.751**
	Sig.	.039	.028	.244	.226	.043	.129	.023	.013	.044	.006	.002	.004	.069		.001
	N	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Provision of school	P. C.	.425	.359	-.302	-.250	-.411	-.358	-.485*	-.413	-.425	-.567*	-.607**	.494*	.339	.751**	1
	Sig.	.089	.157	.239	.334	.101	.158	.049	.099	.089	.018	.010	.044	.184	.001	
	N	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Very strong positive correlations highlight that increase in quantity, quality and magnitude of size of brick kiln, work injury benefit, child day care centers, maternity benifits, status of health facilities, status of social security facilities, and status of housing conditions and drinking water facilities provided to women workers would tend to highly increase the number of bricks production by women workers.

It is found that moderate positive correlations existed between provisions of electricity and bricks production (.592); status of sanitation condition and production of bricks (.568); number of equipments provided for risk work and production of bricks (.646); amount of bonus given and production of bricks (.503). Moderate positive correlations highlight that increase in quantity, quality and magnitude of provision of electricity, status of sanitation condition,

number of equipments provided to risk work and amount of bonus given to women workers would tend to moderatly increase the number of bricks production by women workers.

Weak positive correlation found to exist between provision of schooling facility to workers children and production of bricks by women workers (.425).

Again, it is found that strong negative association exist between quality of bricks produced and bricks production (-.855). Strong negative correlation indicates that with increase in quality of bricks produced, number of bricks produced by women workers tend to decrease.

5. INFLUENCE OF KEY PROVISIONS OF SOCIAL SECURITY ON BRICK PRODUCTIVITY AT BRICK KILN LEVEL

Multiple regression analysis model is used to predict the variability between 25 independent variables (size of kiln, year of start, no. of women workers, quality of bricks produced, day care centers for child, toilet facility, status of health facilities, status of social security facilities provided, status of housing condition, status of sanitation condition provided, status of medical facilities provided, bonus given, provision of drinking water, accidental insurance for workers, povision of school, maternity benefits, rest room provided, essential equipments for risk work, provision of electricity, employment injury benefit, compensation provided, first aid facility, providing amenities for living, food staff provided sometimes, incentives provided by brick-kiln owners) and dependent variable (total brick production at the brick kilns) (Table 3).

In Table 3, the *B* value for unstandardized coefficient (236555.367) of size of the kiln indicats that on average, the predicted brick production for brick kilns would be decreased by 236555 numbers of bricks if size of brick kilns decreases if all other variables remain constant. The *B* value for unstandardized coefficient of number of women workers is -21131.748. It indicats that on average, for every 1 percent increase in number of women workers, the predicted brick production in numbers would be decrease by 21131 bricks after assumming all variables remain as constant.

Table 3: Multiple Regression Model showing relationship of provisions of social security to productivity in brick-kilns

Coefficients Statistics of Multiple Regression Model							
Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Co Linearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	248879.448	1014398.994		.245	.822		
Size of kiln	-236555.367	158492.791	-.312	1.493	.232	.024	42.458
Year of start	9074.670	19055.853	-043	.476	.666	.123	8.098
No. of women workers	-21131.748	89721.858	-.447	-2.355	.710	.029	34.960
Quality of bricks produced	-7424.754	73144.490	-.171	-1.015	.585	.036	27.631
Day care centers for child	3671.319	3248.973	.180	1.130	.634	.040	24.736
Toilet facility	345.914	.133	.841	6.855	.806	.068	14.635
Status of health facilities provided	69196.080	39264.245	.132	1.762	.013	.164	6.085
Status of social security facilities provided	16640.429	34634.772	.033	.480	.040	.198	5.048
Status of housing condition	43160.399	86117.997	.087	.501	.451	.034	29.597
Status of sanitation condition provided	15253.076	44317.248	.022	.344	.753	.249	4.011
Provision of women's health services	55922.680	169063.599	.025	.331	.444	.186	5.368
Bonus given	28343.346	156461.109	.225	1.812	.168	.067	14.941
Provision of drinking water	213743.528	53097.778	.199	4.025	.015	.143	6.979
Accidental insurance for workers	57203.534	13962.412	.209	4.097	.152	.135	7.413
Provision of school	204272.395	65889.804	.174	3.100	.599	.112	8.955
Maternity benefits	774395.877	270780.558	.340	2.860	.021	.025	40.332
Rest room provided	13797.018	55660.461	.008	.248	.845	.313	3.195
Essential equipments for risk work	26054.368	59129.156	.011	.441	.436	.520	1.923
Provision of electricity	121598.095	46944.141	.113	2.590	.235	.183	5.455
Employment injury benefit	571429.473	186387.512	.344	3.066	.044	.028	35.830
Compensation provided	458532.526	174299.212	.276	2.631	.231	.032	31.333
First aid facility	89828.129	59452.050	.064	1.511	.372	.196	5.104
Providing amenities for living	167180.627	48535.371	.132	3.445	.018	.237	4.211
Food staff provided sometimes	15987.543	63210.967	.010	.253	.842	.243	4.121
Incentives provided by brick-kiln owners	24281.747	79503.740	.022	.305	.780	.204	4.89
a. Dependent Variable: Production of bricks at brick kiln level							

The *B* value for unstandardized coefficient for quality of bricks produced is -7424.754. It indicats that on average, the predicted brick production for brick kilns would be decreased by 7424 numbers of bricks if quality of produced decreased by 1 percent after controlling all other variables as constant. The *B* value for unstandardized coefficient of day care center for child is 3671.319. It highlights that on average, for every 1 percent increase in number of day care center for child, the predicted brick production in numbers would be increase by 3671 bricks after assumming all variables remain as constant. The *B* value for unstandardized coefficient (345.91) of toilet facility indicating that predicted brick production of brick kilns would be increased by 345 numbers of bricks if quality of toilet facility increased by 1 percent after controlling all other variables as constant. The *B* value for unstandardized coefficient of health facilities provided is 69196.080. It highlights that on average, for every 1 percent increase in status of health facilities, the predicted brick production in numbers would be increase by 69196 bricks after assumming all variables remain as constant. The *B* value for unstandardized coefficient (16640.429) of social security facilities indicates that for every 1 percent increase in social security facilities, the predicted brick production in numbers would be increase by 16640 bricks after assumming all variables remain as constant. The *B* value for unstandardized coefficient (43160.399) of status of housing condition indicates that the predicted brick production would be increase by 43160 numbers of bricks for every 1 percent increase in the status of housing condition if all other controlling variables remain constant. The *B* value for unstandardized coefficient (15253.076) of status of sanitation condition highlights that the predicted brick production for brick kilns would be increase by 15253 numbers of bricks if status of sanitation condition improved by 1

percent. The *B* value for unstandardized coefficient (55922.680) of status of provision of women's health services indicates that for every 1 percent increase in status of medical facilities, the predicted brick production in numbers would be increase by 55922 bricks if all other controlling variables remain constant.

The *B* value for unstandardized coefficient (28343.346) of bonus given to women workers highlights that for every 1 percent increase in amount of bonus given to women workers, the predicted brick production in numbers would be increase by 283438 bricks after assumming all variables remain as constant. The *B* value for unstandardized coefficient (213743.528) of provision of drinking water facility highlights that the predicted brick production for brick kilns would be increase by 213743 numbers of bricks if provision of drinking water facility improved by 1 percent after controlling all variables. The *B* value for unstandardized coefficient (57203.534) of accidental insurance for women workers highlights that for every increase in one case in accidental insurance to women workers, the projected brick production in numbers would be increase by 57203 bricks after assumming all variables remain as constant. The *B* value for unstandardized coefficient (204272.395) of provision of school indicates that for an increase in number of schools, the predicted brick production in numbers would be increase by 204272 bricks if all other controlling variables remain constant. The *B* value for unstandardized coefficient (774395.877) of maternity benefits for women workers highlights that for every increase in one case in maternity benefits to women workers, the projected brick production in numbers would be increase by 774395 bricks after assumming all variables remain as constant. The *B* value for unstandardized coefficient (13797.018) of provision of rest room indicates that for an increase in number of rest rooms, the predicted brick production in numbers would be increase by 13797 bricks if all other controlling variables remain constant. The *B* value for unstandardized coefficient (26054.368) of essential equipments for risk work to women workers highlights that for every 1 percent increase in essential equipments for risk work given to women workers, the predicted brick production in numbers would be increase by 26054 bricks after assumming all variables remain as constant. The *B* value for unstandardized coefficient (121598.095) of provision of electricity indicates that for every 1 percent increase in electrification, the predicted brick production in numbers would be increase by 121598 bricks if all other controlling variables remain constant. The *B* value for unstandardized coefficient (571429.473) of employment injury benefit to women workers highlights that for every increase in one case in employment injury benefit to women workers, the projected brick production in numbers would be increase by 571429 bricks after assumming all variables remain as constant. The *B* value for unstandardized coefficient (458532.526) of compensation provided to women workers reveals that for every increase in one case in compensation provided, the predicted brick production in numbers would be increased by 458532 bricks after assumming all variables remain as constant. The *B* value for unstandardized coefficient (89828.129) of first aid facility to women workers highlights that for every increase in one case in first aid facility provided to women workers, the projected brick production in numbers would be increased by 89828 bricks after assumming all variables remain as constant. The *B* value for unstandardized coefficient (167180.627) of providing amenities for living to women workers indicates that for every 1 percent increase in amenities providing to women workers, the predicted brick production in numbers would be increase by 167180 bricks after controlling all variables remain as constant.

P values in "Sig." column of Table 3 shows which variables are significant predictors of total production of bricks at brick kilns level. Year of start, no. of women workers, quality of bricks produced, day care centers for child, toilet facility, status of sanitation condition provided, provision of school, rest room provided, food staff provided sometimes, incentives provided by brick-kiln owners are not significant predictors of production of bricks at brick kiln level as the *P* values of these independent variable are > 0.05.

Size of kiln, status of health facilities, status of social security facilities provided, status of housing condition, Provision of women's health services, bonus given, provision of drinking water, accidental insurance for workers, maternity benefits, essential equipments for risk work, provision of electricity, employment injury benefit, compensation provided, first aid facility, providing amenities for living are significant predictors (*p* values are <0.05) of brick production at brick kiln level.

Out of these significant predictors of production of bricks, status of health facilities provided (*p value* = .013, <0.05), status of social security facilities provided (*p value* = .040, <0.05), provision of drinking water (*p value* = .015, <0.05), maternity benefits (*p value* = .021, <0.05), employment injury benefit (*p value* = .044, <0.05) and providing amenities for living (*p value* = .018, <0.05) are the very significant predictors of brick production at brick kiln level.

Table 4: Model Summary of Multiple Regression Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.998[a]	.997	.984	70792.531

Table 4 shows the model summary statistics of multiple regression model. R^2 of model summary statistic of multiple regression model is 0.998 reveals that all the 25 selected independent variables altogether could explain 99.8% of variation in total production of bricks at brick kilns. 99.8% of variability in bricks production is accounted by all of the independent variables together.

Table 5: Analysis of Variance (ANOVA[a])

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	4841262428709.884	11	440114766246.353	71.021	.000[b]
Residual	30984630113.647	5	6196926022.729		
Total	4872247058823.530	16			

Analysis of variance (ANOVA) is applied to interpret the impact of all selected factors on brick productivity at brick kiln level. The *p* value for the F statistic is 71.021 at <0.05 sig. level. This means that at least there is a statistically significant difference among the brick kilns as the brick productivity is concern. It can be summerzies that the brick kilns having better provisions of social security services could produce higher number of bricks than the kilns having poor social security provisions.

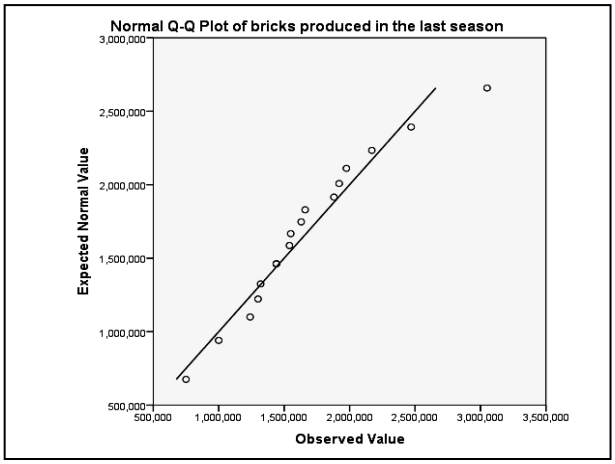

Figure 4: Q – Q plots showing normal distribution of predicted brick production at brick kilns

Points on the Normal QQ plots display univariate normality of the dataset. In Figure 4, the quantile values of total brick production by women are plotted on the x-axis and the corresponding projected quantile values of brick production at brick kilns are plotted on y axis. The points fall near to the 45-degree reference line. This indicates that the residuals are roughly normally distributed. The main deviation from this reference line exists at high values of bricks production.

6. CONCLUSION

In spite of being a workers intensive and informal sector, the significance of the brick kiln industries is growing in Jorhat due to increasing demand of bricks as a consequence of the rising population as well as fast rate of urbanization. Nevertheless, brick kiln industries is facing some serious issues on incompetent use of energy, considerable adding of air pollutants and unsafe working and living environment for women workers. Brick kiln owners have slowly on track to develop the working and living conditions, use machinery and implement comparatively cleaner and fuel saving technology. This research study mainly investigated the influence of status of social security provisions on brick productivity at women workers level and brick kiln levels. The results of the study revealed that an overwhelming bulk of brick kilns did not provide sufficient workplace and living amenities related to social security for their women workers. Most brick kilns did not offer necessary facilities such as facilties of women health and childcare services for women workers.

Women workers' level analysis revealed that key provisions of social security extensively influence the productivity of bricks among women brick moulding workers at brick kilns. Out of the significant predictors of production of bricks, status of health facilities provided (*p value* = .013, <0.05), status of social security facilities provided (*p value* = .040, <0.05), provision of drinking water (*p value* = .015, <0.05), maternity benefits (*p value* = .021, <0.05), employment injury benefit (*p value* = .044, <0.05) and providing amenities for living (*p value* = .018, <0.05) are the very significant predictors of brick production at brick kiln level. This signifies that brick kiln entrepreneurs with greater investment and deep focus on social security amenities to women workers can increase the quality and quantity of their brick productivity. In this

context, proper awareness programs should be organized by Department of Labour in Jorhat among brick kiln owners to encourage them to adopt and provide social security services to workers with special focus to women workers.

CONFLICT OF INTERESTS

None.

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