| Research Article |

Economic life of North Sindh Kiln Labour

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Abstract: *Brick making is a process which involves different types of labour.* ***Munshi*** *deals with Jamaadars. Jamaadars are operating hands of the Munshi of the kiln. Jamaadars and distribute work quotas. North Sindh kiln labour education profile is very serious. Only 47 are educated (23%). 78 % of the educated have five years of education. 33.5% (67) of the participants has told about following six problem prevalent in the kiln labour. There is 18.5% wage gap for 23 kilns where women work. It means on average male labourers are paid 18.5% more than female labourers. Each labourer has to work 6.5% more hours than ideal hours by government. 80 % kiln labour is bonded labour. gini is 0.36, 0.38 and 0.52 for small , medium and large kilns. Bigger the kiln size higher the income inequality.*

Kiln labour, on the average, work 200-250 days of year. They don t work on Fridays. 88 % of the labour falls in the age bracket of 19-50 years. Only 19 out of 200 have no any sort of training. Training in this industry is imparted on the job. 33.5% (67) of the participants has told about six health problems prevalent at kiln i.e. heat stroke, stomach pain, kidney stone, digestive system heat, fever and head chakars. Mostly fever and heat stroke are reported. Except for labour union and health insurance all the facilities of shelter, latrine and drinking water were provided. Labour at kiln has been living a pathetic life under heavy burden of peshgi/ advance loan given to them.

Relevant labour (without trolley and cleaning labour) are the ones who make product directly. are 13,33,82 for small, medium and large kilns. Total actual hours the relavant labour put to make final product at kilns is 9771 hours, 48164 and 128657 hours for small, medium and large kilns respectively. Labour works more than sanctioned standard government time by 8.3%, 6.6% and 1.4% at large , medium and small kilns respectively. The largest annual hours required for production is given by molders i.e. 41567 hours. On the average molders process 825 bricks daily.

On the average 8.5 more males are there per 1 woman working at each of 23 kilns. No any small kiln employ woman as kiln labour. Only 5 medium sized kilns did so. 10.721% of labour force, on average, of the 23 kilns consists of women labour. There will be 4 % loss, on average, if women labour at kiln is not employed.

Highest annual income is that of Jamadaar because he earns commission from other kiln labour(2.28lakhs), second largest income is that of Mistri (1.77 lakhs). Least income is that of chokidaar (1.025 lakhs), then trolley labour (1.021 lakhs). Per brick rupees rate is 1.05, 0.147, 0.144,0.142,0.131, 0.057,0.0518, 0.04,0.04, 0.03, 0.01 and 0.01 rupees for moulder, carrier, stacker, jamadar, nikasi, carrywara, munshi, trolley driver, chokidaar, safaiwara, Jalaiwara and Mistri. Rate per 1000 bricks processed is 10, 10.2, 30, 57, 131, 142, 144, 147 and 1045 rupees for Mistri, Jalaiwara, safaiwara, carry wara, nikasiwara, jamaadar, stackers, carriers, and moulders. Largest amount is given to moulders

Keywords: *Economic life, North Sindh, Kiln labour, peshgi, Munshi, Jamaadars*

Introduction

Brick making is a process which involves different types of labour. Moulders mould bricks. Stackers stack bricks in particular design and shape inside chimni for baking like a pizza is put in oven. Mistri fire bricks with help of Jalaiwara. And Nikasiwara get bricks out of fire when finally baked. Bricks are made manually in North Sindh. This creates job opportunities for the local labour. The most important cost is fuel cost which is Labour cost for large kilns. The most important cost is fuel cost which is Labour cost for large kilns.

Role of *Jamadar* is vital for the betterment of labour. Jamadar controls the labour at kiln for this he gets 20 to 30 rupees commission from daily income of the labour.

Usually kilns depend on intangible assets in the form of labour. Kilns are labour intensive in nature. Labour is required in greater proportion as compared to capital. Unlike banking and other financial sectors the brick industry is a labour intensive industry. Operation is heavily dependent on the working of the labour on the manufacturing field / site.

Kiln management has to deal with labour/ humans and provide them with shelter, drinking water, latrine facility, and children safety, etc. For this government has dedicated department of labour that keeps check on kilns. This is corporate social responsibility.

Munshis work with mistri and labour. They are all locally peer trained. Labour learn during work. Management is skilful in due time.

Labour at kiln live pathetic life under the burden of ***peshgi*** (advance loan) given to them by kiln management. They usually earn below minimum wage set by government.

Labour quantity at kiln ranges between 20-150 depending on the operating capability and size of kiln. Labour at kiln is divided into different categories based on skill set. i.e., Munhsi, stackers, Nikasiwala, cleaners, jalaiwala, and tractor trolley mazdoors.

Kiln labour spend their income on peshgi payment, healthcare, utilities, child education, transport , food consumption, etc. Saving or investing is not an option as they live from hand to mouth. Their due rights at kilns are ignored. Their rights including health insurance, protective gears, masks, proper latrine, shelter from sun heat, etc. are missing in their work life. They work long duration and their payment is insufficient.

Indicators that tell us about living standards of kiln labour are .Gender wage gap, Working poverty rate, Labour productivity, Labour efficiency, Bonded Labour Rate, Child Labour rate

There is not a formal mechanism about labour promotion at kiln. It all starts with ordinary labour

than goes to Jamadar (group leader) and finally Munshi. Mistri controls Jalaiwala labour only.

Labour on duty to remove burnt bricks from oven / khuro / chimney have to arrange for their own animals. Kiln don t provide them with loading animals. Anaimals used are donkeys and horses.

Payment done to all labour (except Munshi) is based on work quantity completed on kiln. It may be daily or weekly or chakar based. Wwhole family work here but payment is only for the elder. This is discrepancy and injustice for the labour. Families have to live there to complete their quotas. Even kiln managers give them social loans for marriages etc to further enslave them. This is sometimes beneficial for the labour too. Labour is paid differently if they work with Qisti or Roof. Roofi bricks are costly to make.

Theses mazdoors are not normal labourers. They start work at kiln from their age. They are generational mazdoors. Generation of a specific village work solely at kiln. There are many such special kiln labour villages. There is one at taluka Gambat, i.e. Faizal Mahar Village where Mahar community resides. This is ideal kiln village for labour. They go on job early in the morning collectively.

Socially there is not any specific caste associated with brick making other than Odh or Menghwar .

Kiln labour feel headaches and stomach aches and lung suffocation due to constant burning of the bricks and fuel. They become week due excess of the work load. They work 10 to 15 hours daily for just 300-700 Rs daily. The kiln owners threaten them,

"If you don't work here just pay us back our Peshgi"

And most of them have not any other source of income. They are bonded labour.

Following research techniques are employed for this article.

- Labour income analysis
- Labour brick processing capacity
- Labour productivity
- Labour efficiency
- Gini coefficient

- Duncan Index
- Lorenz curve
- Male female ratio
- Poverty rate
- Wage gap
- Bonded labour
- Child labour
- Labour allocative efficiency
- Labour cost at kilns

Literature review

Child labour: There is no proof of child labour in Sindh Kilns as explained in government ILO report, adopted in 2020, published in ILC 109th session, 2021. There is Sindh Child Act 2017 dealing with child labour. There is no proof of child labour in Sindh Kilns as explained in government report. There is Sindh Child Act 2017 dealing with child labour. And in two districts of KPK 5% is child labour. Punjab Government has helped children working at kilns with free uniforms, shoes and books along with financial package for their families. Punjab Prohibition of Child Labour at Brick Kilns Act, 2016 has prohibited children less than 14 years to work at kilns and it is further explained in section 5 and 7 that their parents / guardians will be liable of such violations. UNICEF has helped Sindh and Punjab governments NFE (Non Formal Education) policy formulation to enrol 6 lakh out of school children into schools in next five years. PWF (Pakistan Workers Federation) has told that Sindh and Punjab follow the policy of not inspecting a new business for at least one year, for this prior permission is required.

Child labour is also present at kilns of Pursana block, Bengal, India. Female children ratio is higher.(Palash Patra et al., 2015)

Children become blind at kilns due to work conditions. According to HRCP one in twenty family has blind children. (HRCP, 2011). Children personality changed with maltreatment at kilns.

50 % children work at kilns have chronic chest infections as compared to normal kids. (Children Working on Brick Kilns in Sindh , Institute of Social Research and Development, Karachi, 1990)

Bonded Labour: In ILO report, adopted in 2020, published in ILC 109th session, 2021 it is told that There is bonded labour at Sindh Kilns. Sindh government has registered 740 kilns to counter bonded labour. Sindh government has improved inspection capacity and institutional mechanism for better implementation of acts and laws. Sindh has prohibited child labour at carpet weaving, glass bangle and tanneries industry. In 2010 ILO started project Strengthening law enforcement responses and action against internal trafficking and bonded labour in Sindh and Punjab to bound kiln owners to end all forms of bonded labour and provide a social safety system to all kiln workers.

Bonded labour is equated with debt bondage (ILO). Process of Debt Bondage starts when The labour takes loan from owner of agriculture farm or kiln owner. He is bound to provide services to owner until debt is paid off. He cant move to another location for better pay. His rights are violated. (Nadeem Malik, 2019)

Bonded labour is banned under Boneded Labour System (Abolition) Act 1992.There are 1.8-8.6 million families work under debt bondage in Pakistan(Muhammad & Aly, 2000), or 5% of poor living below poverty line are under debt bondage (Zaidi , 2010, page 14)

Kiln Bonded labour according to Nadeem Malik, 2019 are landless families with children , women and belong to ethnic minority section of society. They work as family unit at kilns and payment is only for head of unit. Sometimes children inherit the debt of their parents!They are trapped in debt bondage due to their inability to pay debt back. Also they keep on taking debt further. Higher rate of interest is charged on that loan / debt. e (Hussain, 1997). Advance loan system is called Peshgi system. Generations pay these loans. They become prisoners at kilns. Their right are violated, i.e. maternity leave , leave on death of family member, free permission to leave kiln site, and sexual abuse etc.

Bonded labourers at kiln are same like sharecroppers at agriculture land/farms. . (Nadeem Malik, 2019)

Muhammad Javed Iqbal, 2006, has researched on the bonded labour prevalent in the form of loan system of *Peshgi.* According to him it is poverty which cause *Peshgisystem* to flourish. It is not

sufficient for labour to work hard and get out of this trap. Advances (Peshgi) are difficult to pay back because of high interest rate, book manipulation and small wages. This system is not just in kiln industry but also in fisheries, mining , agriculture, weaving of carpet and bangle manufacturing industries too. ILO survey (1998) has told that 93% of kiln labour is under bonded debt. These are disguised as friendly loans. The guarantor for the advance loan to labour is *Jamadaar.* (MuhammadJaved Iqbal, 2006)

This bonded labour system is dominant feature of labour Intensive Industries of Pakistan. (MuhammadJaved Iqbal, 2006)

Contracts are the cause of slavery (Bales 1998)

Table: Patheras minimum wages fixed by Punjab Minimum Wages Board (MuhammadJaved Iqbal, 2006)

Year	Minimum wage
1995	Rs. 125/- Per Thousand Bricks
1998	Rs. 143/- Per Thousand Bricks
2002	Rs. 184/- Per Thousand Bricks

According to Muhammad Javed Iqbal, 2006, 90% of the kilns work in the rural areas. On the average 6-8 family members work at a kiln. kilns are usually located in the form of the clusters. It is migratory nature business. 20-25 kilns must be treated as industrial estate. The researcher has provided a new model to get kiln labour out of bonded labour. (MuhammadJaved Iqbal, 2006) *Pathera* labour is usually Christian in Punjab. (MuhammadJaved Iqbal, 2006).

MuhammadJaved Iqbal, 2006 gave suggestions for the elimination of bonded labour,

- Agencies which work in this area work in isolation. They must coordinate.
- NGOs must be involved
- Role of the trade unions should not be negligible.

- Government departments i.e. Labour, Old Age , Police, Social security , Home department, Banks, EOBI, TEVTA must coordinate with each other.
- A better strategy must involve economic recovery, educational breakthrough and social uplift.
- There should be an authority which should be one window operation based and where all related matters of the kilns are discussed and solved, and Peshgi problem also.

Labour work conditions : there are four labour types working at kiln, i.e. moulders/dressers, Reja-Benki, loaders/beldars and firing labourers(Palash Patra et al., 2015)

Table: Work Profile of Labour in Brick Kilns of Pursura Block, India(Palash Patra et al 2015)

Type of labourers	Work Duration(Hours/Day)	No. of Days in a week
Moulder labourer	8	6
Reja-Banki	07-8	6
Beldar Labourer	07-8	6
Firing Labourer	24	7

In the research conducted by Mayuree Das et al, Assam, India, 2018, it is concluded that labour start working form 5 am till 5 pm with approximately 2 hours rest. Firemen work even after 5 pm, if so. So, working hours at kilns are very long. Long exposure to kiln harsh and dusty environment has caused many physical and psychological health issues with labour. And it was observed that migrant workers live on site in makeshift huts with no any drinking water, electricity, bath room etc. facility and unhygienic food. In the conclusion they said that labour industry is positively associated with employment generation with a health loss. (Mayuree Das et al, Assam, India, 2018)

Muhammad Sohail et al., 2020, concludes that ILO decent work standards are not followed in Pakistan kiln industry. It is generally considered that labour laws are not applicable to kilns as those are not considered as factories and their owners are not industrialists. (Muhammad Sohail et al., 2020)
Hyderabad kiln labourers (Siriman Naveen et al, 2016) have following problems / issues,

- Violation of labour laws
- Advance loan system

- Labour bondage contracts
- Network of exploitive contractors,
- Not payment of minimum daily wage (387Rs) (paid only 200Rs for 1000 bricks)
- Long Working hours (4 a.m. to 8 p.m)
- Child labour
- Sexual and physical harassment

No Fundamental rights at work (social security, dignity, assemble, union, and protection from violence) (Siriman Naveen et al, 2016)

Stress of heat at kilns includes external and internal heat, light, fire, cold , vibrations and noise. There are no safe levels of these constituents in BK industry. Usually kiln temperature lies between 900C to 1200C. heat related disorders are seen at labour at kilns heat stroke,heat exhaustion, dehydration, heat syncope, heat cramps, and heat rash. Sweating rate increased to 623.6 (plus minus 105.4 g/h) and sweat loss increased to 1137.4 (plus minus 238.6 ml) (SeshanandaSanjel et all, 2016)

Table: Heat diseases in labour of Nepal, KhatmanduValley(SeshanandaSanjel et all, 2016)

Heat related Disease	headache	insomnia	heat cramps	skin rashes
% of labour	34.30%	25.70%	20%	14.20%

As temperature increased above 34.9C their productivity decreased specially for women. They coped with this by reducing walking speed thus earning less income. musculoskeletal disorders include back (50% of labour) , neck (38%) and shoulder (29%)pain. Allowed weight that a labourer can carry is 12-40 kg. Labourers with highest level of contact risk with pollutants at kiln are ash handlers, brick unloaders, fire masters, etc. Respiratory diseases include pneumoconiosis and silicosis due to inhaling of siliceous dust at kilns. GIT infections in labour at kilns are frequently present. (SeshanandaSanjel et all, 2016)

Vulnerable employees included poor, children , women, undocumented migrants and bonded labourer. (Shilpa Shrestha et al, 2019)

Following were the results Shilpa Shrestha et al, 2019, got.

- Children worked as carriers.
- There were no fixed hours of work.
- The labour was paid based on the bricks they carried or processed.
- The labourers wore no foot protection as they used flip flop.
- Naike (middlemen) were not involved in the hiring process at kilns.
- Citizenship documents were not allowed to kiln to be kept.
- Mechanical process eliminates the injuries to the labour.

Bhat Mohed Sikander et al , India, 2013 have analysed kiln emissions. They found that kiln emissions is the third largest contributor to the air pollution after vehicle emissions and *road re suspended dust* at Dhaka. Annually 3.5 billion bricks are made in Dhaka (2013) with emissions of particulate matter (PM2.5) of diameter of < 2.5 μm (23300 tons), sulfur dioxide (15500 tons), carbon monoxide (302000 tons), black carbon(6000 tons) and Carbon Dioxide(1.8 million tons). Emission rates changed during kiln firing (operational) time (7 days) and in between two such Cycles. Following emission levels achieved with production of 1000 bricks at a kiln

- 6.35 to 12.3 kg of CO,
- 0.52 to 5.9 kg of SO2 and
- 0.64 to 1.4 kg of PM.

SO2 is the main pollutant in the kiln emissions. (Bhat Mohed Sikander et al, 2013)

Rights of Kiln Labour:

Workman or Worker *is person who is defined to be employed at some place (kiln) where 10 or more are employed to manufacture some product (bricks)* ,as in section 2 (g) of the Factories Act, 1934. According to definition of workman the labourers at kiln are entitled to receive insurance from kiln owner in case any accident according to Sindh Workers Compensation Act(2015). (Muhammad Sohail et al., 2020)

Factory is defined, The Factories Act(1934), as place where 10 or more workmen / workwomen

are employed to manufacture a product having aid of power or not. In case of Syed Shabbir Husain Kazmi versus Government of Pakistan it is established that kilns are factories and labour inspectors are entitled to inspect all kilns so as to implement all labour laws. (Muhammad Sohail et al., 2020)

The industrial establishment is defined as place or workshop where articles are made for selling , transporting or using purpose. Bricks at kilns are made for selling purpose. It means that kilns are not only factories but also industrial establishment. It is obligatory for Kiln employers to pay wages to kiln labourers as kilns are also industrial establishments. According to Payment of Wages Act(1936) wage period and no wage period is decided for workers at kiln. (Muhammad Sohail et al., 2020)

Minimum wage is lowest wage, fixed by government from time to time, that owner of kiln, etc is bound to pay to workers either skilled or unskilled. Currently Sindh government has fixed minimum wage at 17000 rupees via Minimum Wages Ordinance(1961). (Muhammad Sohail et al., 2020)

The Industrial and Commercial Employment (Standing Orders) Ordinance (1968) In case of Syed Shabbir Hussain supra the Federal Shari at Court, it is established that kiln falls under this law. This law applied to factories/firms with minimum number of 10 employees.(Muhammad Sohail et al., 2020)

Sindh Workers welfare Fund Act (2014)It provides support to kiln workers with respect to building low cost houses, health insurance, financing education, death and marriage grants. It is applicable to industrial establishment which earns more than 500000 Rupees annually. (Muhammad Sohail et al., 2020)

The Industrial Relations Act (2012): deals with trade unions, any disputes between kiln owner and labour. (Muhammad Sohail et al., 2020)

Following eight fundamental conventions by ILO, are binding on every nation whether they have ratified those or not. *Pakistan has ratified all of these.*

1. Forced LaborConvention(1930)
2. Freedom of Association and Protection of the Rights to Organize Convention(1948)
3. Right to Organize and Collective Bargaining Convention (1949)
4. Abolition of Forced LaborConvention(1957)

5. Minimum Age Convention (1973)
6. Worst Forms of Child LaborConvention(1999)
7. Equal Remuneration Convention (1951)
8. Discrimination (Employment and Occupation Convention)(1958)

Female labour: Mostly labour is male dominant, young (60%) temporary, seasonal and nomadic. (Palash Patra et al., 2015) In both Rangia and Hajo 37% labour is female. (Mayuree Das et al, Assam, India, 2018)

Dr.Inam Rubab et al, 2020 tried to measure / check applicability of Islamic and Legal women rights at kilns in Kasur area. Qualitative methods were used only. They got help from 15 recruited women labourers of the area. They conducted interviews and surveys. They used narrative analysis technique for results. They found there were malpractices at kilns and suggested an awareness program for kiln labour women. (Dr. Inam Rubab et al, 2020)

After giving introduction on the women s Islamic and Legal Rights background Dr. Inam Rubab et al, 2020 , have provided following results.

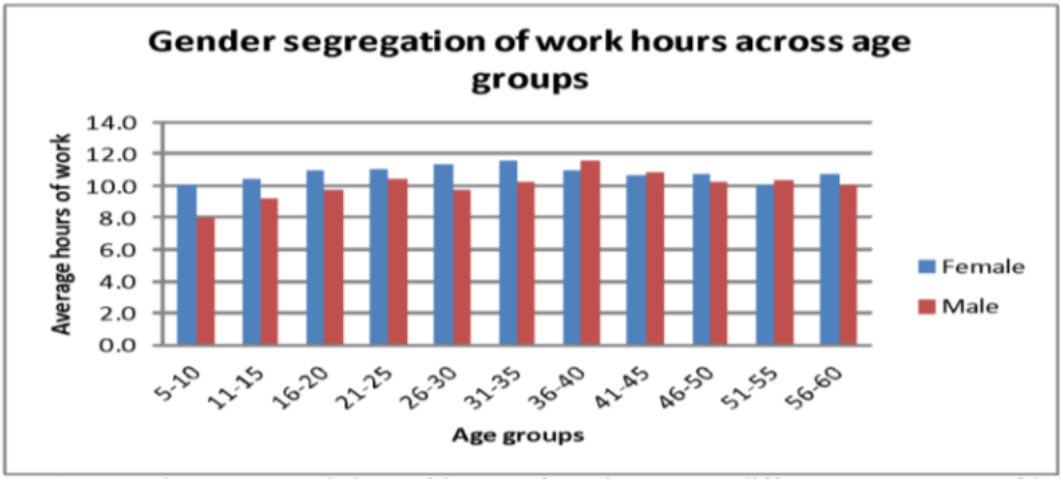

Figure: Gender data segregated with respect to hours worked and ages.

Women had to perform house chores and kiln duties. Women labour at kiln complained that they had to go through long tiring hours of work at kilns. They complained also about sexual harassment at kilns and spousal violence at houses. In the end they told that the lives of women labour at Kasur kilns were miserable and against Islamic and Legal rules and regulations for such work. (Dr. Inam Rubab et

al, 2020).

Labour income: Economically all the labour groups have been shown in diagram.

Figure: Monthly Income of Labourers in Brick Kilns of Pursura Block (Palash Patra et al., 2015)

In the research conducted by Mayuree Das et al, Assam, India, 2018, it is concluded that women are not specially treated , they are combined with male partners while paying labour. Patheras were paid per 1000 bricks made at the rate of 500Rs. Kessarejas were paid too similarly at the rate of 175 Rs per 1000 bricks. 11000 Rs were paid monthly to loadmistrys. Rabbishman were paid 9500 on monthly basis. Coylamen and firemen were paid 9000 and 13500 per month respectively. Pakkareja were paid 135 Rs per 1000 bricks processed. (Mayuree Das et al, Assam, India, 2018)

Muhammad Sohail et al., 2020 , have concluded that on the average there are 50 labourers at a kiln who are hired by Jamadars also called agents/ contractors. Jamadars get commission on the wages of labourers. Ordinary labour is paid according to their capacity and quantity of work, i.e. per 1000 bricks made. They are also called blue collar workers performing manual work. While white collar workers are Munshi, Accountant, Driver, etc. Owner gets usually 3 lakhs profit in a month. The unskilled worker at kiln is one who performs unskilled labour without any training. (Muhammad Sohail et al., 2020)

Kilns generate low income for the labour. Kiln owners cut cost without seeing the costs of doing this. (SeshanandaSanjel et all, 2016)

Kiln labour Quantity in Pakistan: Total labour in 18000 kilns is more than 1 million plus 115000 animals. (Business recorder, 15/01/2020).

Gini coefficient : Mr. Xu (2003) has calculated Gini coefficient and Lorenz curve to show income

inequality at kilns and Abdella et al, 2012, have used Xu s approach in this research.

Migrant labour: Kiln industry is labour intensive and is place where unskilled; semi skilled and migrant labour is employed. This industry has generated a lot of job opportunities for locals and migrant labour. Potential of kiln industry to generate jobs stands at 3 million for rural seasonal labour. Every season 3 million people are employed by kilns. But there is shortage of skilled labour. (Mayuree Das et al, Assam, India, 2018)

There are 4 lakh labourers at Hyderabad kilns. Most of the labour is migrant from state of Odhisha. Kilns are located at the outskirts of Hyderabad city(Siriman Naveen et al, 2016)

Gursharan Singh Kainth, 2009 , has tried to find reasons behind industrial migration of labour from lower opportunity area of Bihar to higher opportunity area of Utter Pardesh at individual level. He wanted to form a socio political profile of kiln labour in Punjab state. His main role was to find factors that contribute to the propensity to migrate. The most of migrating kiln labour was illiterate, livening unhygienic life, hailing from very big families, and they did not know about Inter-State Migrant Workmen Act, 1979. The biggest influencing migration factor was better economic opportunity for the most of the labour. Factors which cause labour to migrate are economic (push, pull factors), demographic, socio-cultural, political, etc Low income is push factor as it compels a person to migrate while better opportunity is pull factor which attracts a person to migrate towards. Sometimes family conflicts (socio-cultural factor) cause to migrate. Quota system is political factor. In India sons of soil policy cause labour migration too. (Gursharan Singh Kainth, 2009)

Research questions :Their (Siriman Naveen et al, 2016)) research questions are

- Who are the different players involved in along the brick making chain?
- What is the connection among those players?
- Who impacts this chain from inside or outside?
- Who has control over the productivity of the kilns?
- What is the level of risk involved along the chain for different players?
- What are the government and NGO programmes offered to the kilns for their development?

The focus is on chain level not on the producer or labour level. Real estate sector is resorting to new techniques to get light weight, durable, capital intensive brick making. In developing countries bricks are made by using old traditional labour intensive ways. (Siriman Naveen et al, 2016)

Research methodology

Information for this article is taken from two questionnaire forms. This primary data is collected from kiln sites and kiln labour villages. Sampling is non random purposive.

Duncan Index of Dissimilarity or Segregation: This indicator tells about segregation of sexes at the work place kiln. Following data will be asked in the form and later Duncan Index will be calculated

Total (Relevant)Labour Quantity	Female Labour	Male Labour	Fi Female Fraction	Mi Male Fraction	|Fi - Mi| Absolute Value

Formula for Index will be

$D = 1/2\sum |fi-mi|$

It is ½ of the sum of absolute values for all kilns

If the value is 23.5 % it means that 23.5% fraction of women has to change occupation to be equal with males .

Male Female Ratio: It is related to labour sex identity. Men die earlier in the overall population thus their presence is required in majority even in workforce. It should be at the rate of 105-100. In Pakistan out of all population only 48.5% is women i.e. there are 106.2 males per 100 female

MF Ratio = Males /Females

Gender Wage Gap Index: in Pakistan women earn 34% less than men on average.(Global Report 2018/19). Pakistan ranks the second lowest country in world for gender equality.

Total Labour	Male	%	Mean income	Female	%	Mean income

Mean income (Male) = Total male income/ Quantity of males

Gender Wage Gap Index = (Mean male income – mean female income)/Mean male income

If the answer is 13.6% it means on average men labourers are paid 13.6% more than female labourers.

For further analysis all the labour at kiln will be arranged in the sequence of highest to lowest payment irrespective of gender and will be divided into 4 quarters. There should be equal employees in each

quarter.

Labour Efficiency: it can be calculated as

Kiln L.E. = (RADLIH/Actual amount of hours worked)*100

It will be kiln wise and individual labour type based

Bonded Labour Ratio: It will be based on the data about Peshgi given by participants

BL Ratio = Q of labour that has taken Peshgi/Total labour sample

Child Labour Ratio: It will be based on the ages of labour participant. There is a working age or minimum age that is required to work at a factory. **Kiln is a** factory.

Gini Coefficient (or Gini ratio or Gini Index): it tell about income distribution in a population. It shows income inequality at kiln and at brick kiln industry as whole. Higher the value higher will be the income inequality/gap.

Following data will be used in Gini Coefficient calculation

Total income	Total population	Type of Labour	Quantity	% of Total Population	% of Total Income

Following types of labour (total 11) are included

Owner , Munshi, Mistri, Jalaiwala, Moulders, Stackers, Carrywala, Nikasiwala, Safaeewala (cleaners),Trolley driver, Trolley mazdoors,

Table will be generated based on the higher level of income. Highest income group will be put first , and so on until least income group is reached. Table will be generated

Table: sample Gini coefficient generating table

Labour Group	Income %	Population %	population % richer	Score
1st group (highest income group)				
2nd group				
3rd group				
4th group				
5th group				
6th group				
7th group				
8th group				
9th group				

10th group				
11th group (Least income group)				

Following formulas will be used to calculate Gini Coefficient.

Population % richer will be calculated separately for all group except for last one which is zero.

1st Group= (1-Population % of that group)

2nd Group=(1- (sum of all fractions of population except that of 1st group))

3rd Group= (1- (sum of all fractions of population except that of 1st and 2nd groups))

Score will be calculated separately for all groups except for last one group which is zero.

Score for 1st group = % income of 1st group *(% of popu of 1st group+2*% of population richer)

Score for 2nd group = %income of 2nd group (% of popu of 2nd group+2 * % of population richer)

Sum of scores = add all scores

Gini Coefficient = (1- Sum of scores)

Lorenz Curve: It tells about income distribution in all groups of population. Scatter diagram in MS Excel will be used to create this curve. Cumulative income/population will be calculated.

Results

Participant Labour Types: following types of kiln labour were surveyed at their villages not at kilns.

Table: Types of kiln participant labour interviewed/surveyed

Type	munshi	Jamaadar	moulder	Doaewala	Stackers	carrywala	Mistri	Jalaiwala	Nikasiwala	Safaiwala	Chokidaar	trolley driver	trolley labour
Participants	25	13	32	18	35	10	2	14	15	6	4	7	19

Munshi: he is also part of kiln labour. He is manager of all labour types. He deals with Jamaadars. Jamaadars are operating hands of the Munshi of the kiln. He make negotiations with nikasi, stacking, carrier and moulding. Jamaadars and distribute work quotas. Jamaadars are responsible for the quantity of the work done.

Jamaadars: they are responsible for the work of the labour at kiln. Jamadaars are usually contractors belonging to specific labour type. They work at kiln too. Usually Jamaadars belong to moulders, stackers, Nikasi, carriers and firemen who work at kilns. Jamaadars are responsible for the ups and downs

of that labour type which they are Jamaadars of.

Moulders: They mould bricks at kiln site. They are paid at the rate of 1000 bricks made

Doaeewala (carriers): They carry raw/unburnt bricks to chimney place to stackers.Mostly they use animals. 80 unbaked bricks per donkey (but 100 baked)are carried. 65 donkeys equal 1 trolley. Small wheelbarrow carries 50 bricks. At large more than 300 times one donkey carries bricks to be equal to 1 big trolley load. There are 3-6 trolley carried bricks per day at large kilns. Donkey cart carry 300-400 bricks. Also they carry back baked bricks to place of storage. Tractor trolleys than load bricks and delivers to consumers.

Stackers: they stack unbaked bricks inside chimney (place of fire) to be burnt. They prepare bricks and place at specific place. One stacker has the capacity to stack bricks between 12k-13k. They earn on average 50-70 Rs per 1000 bricks stacked. If they have taken advance loan management gets 20Rs out of 1000Rs earned. Other than that 10-20 Rs are paid by them to Stacking Jamadaar as commission.

Carrywala: They put *carry(ash of the burnt fuel)*on and under thge raw bricks before start of fire. It very important job at the kiln.

Mistri: He is the one who supervise the quality and the quantity of the fire at kilns. Fire determines quality of the bricks too.

Jalaiwala (Firemen): They work more as compare to other kiln labour. Their work is time sensitive. They fire stacked bricks at the chimney or at the *Da as(*Medium sized kiln*).*

Nikasiwala: they pull out baked red bricks out of place of fire. They unstuck bricks and put at safe place where trolley mazdoors load these to trolleys and dumpers. They use donkeys. One donkey can get 80 bricks once. One Nikasiwala get between 70-80 donkey trips. Usually 6k-8k bricks are pulled out by one Nikasiwala with an average donkey. Donkeys they use for this purpose are of different capacities. They are paid between 100-120 Rs per 1000 bricks. They pay usually 10 Rs per 110Rs for loan repayment.

They have to take care of the donkey/horse themselves. Munshi is not responsible even for the death of the animals. Fodder or donkey food can range between 200-300 Rs per day. They have to pay out of their income.

Safaiwala: they are hired at the end of production cycle. They clean inside and around the place where bricks are burnt. They are usually not regular kiln labourers. They are hired.

Chokidaar: He is responsible for protection of assets of the kiln. He takes care of the fuel and brick inventory.

Trolley driver: He drives the loaded bricks to the consumer site of construction.

Trolley labour: He loads and unloads bricks at the kiln and construction site. there are two trolley labourers per on edriver at kiln.

Sequence of work at kiln: following was the sequence of work at kiln to complete the brick production cycle.

Table: Sequence of labour work at kiln

Labour type	Munshi	Jamadaar	Moulders	Carry Wara	Stackers	Fire Mistri	Jalaiwara (Firemen)	Nikasi Wara	Trolley Driver	Trolley Labour	Chokidaar	Careers (Doaeewara)	Safaeewara (Cleaners)
Rank	0	I-6	I	4	3	5	5	6	8	8		2	7

Labour work environment data: it includes,

Employment status: labour at kiln has been living a pathetic life under heavy burden of peshgi/ advance loan given to them. They earn below minimum wage level set by Sindh Government. It is miserable nature of their profession that inspite of all that they were protective of their kiln masters. They tried to hide information about their health conditions and kiln facilities provided to them. They work in very dangerous environment.

Employment status at kilns is of temporary or ad hoc nature. Labour is paid at end of the day and only after work is completed. Labour is paid by quantity of the work done not by time spent on work place. Labour is paid usually per 1000 bricks completed for each category of the kiln labour.

Education: North Sindh kiln labour education profile is very serious. Only 47 are educated (23%). 78 % of the educated have five years of education.

Table: North Sindh kiln labour education profile

	Kiln Labour education profile
No education	153
class four	1
class five	37
class eight	3
class ten	6

Training: Only 19 out of 200 have no any sort of training. Rest has training experience. Training in this industry is imparted on the job. There is no any mentioned training period. They learn everything on the job.

Experience: Results achieved are

Table4.49: North Sindh kiln labour work experience profile

Age	Experience	% of life at kiln	job started at age of
17	4	23.5	13
18	2	11.11	16
20	5	25	15
23	6	26	17
24	10	41	14
25	10.5	42	14.5
27	15	55	12
28	6.5	23	21.5
30	7.7	25.6	22.3
31	12.5	40	18.5
32	9.25	28.9	22.75
33	6.25	18.75	26.8
34	11	32.35	23
35	15.15	43.3	19.84
36	16.5	45.8	19.5
40	17	44	21
45	16	37	27
50	19	40	28
55	25	46	29
65	30	49	30
75	35	46	40

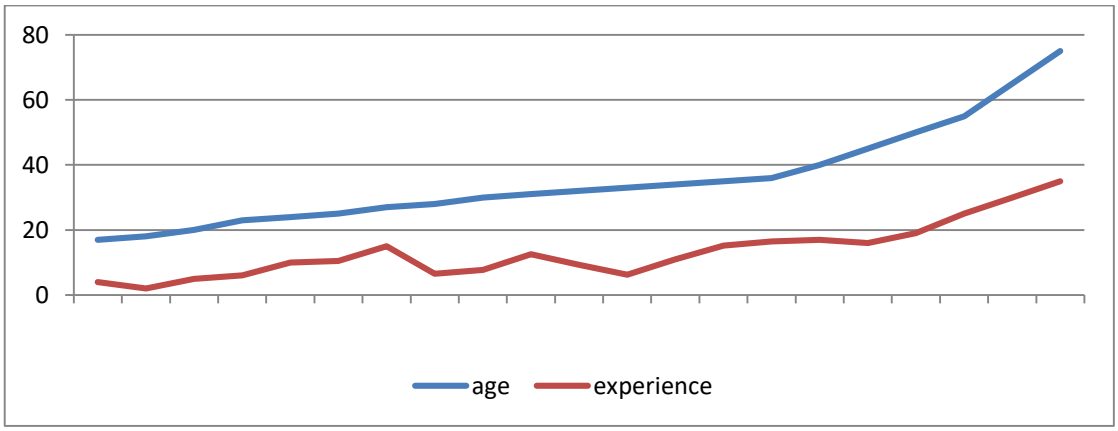

Figure4.48: Relationship between kiln labour age and kiln labour experience at kiln

Health problem due to work at kiln: 33.5% (67) of the participants has told about following six problem prevalent in the kiln labour.

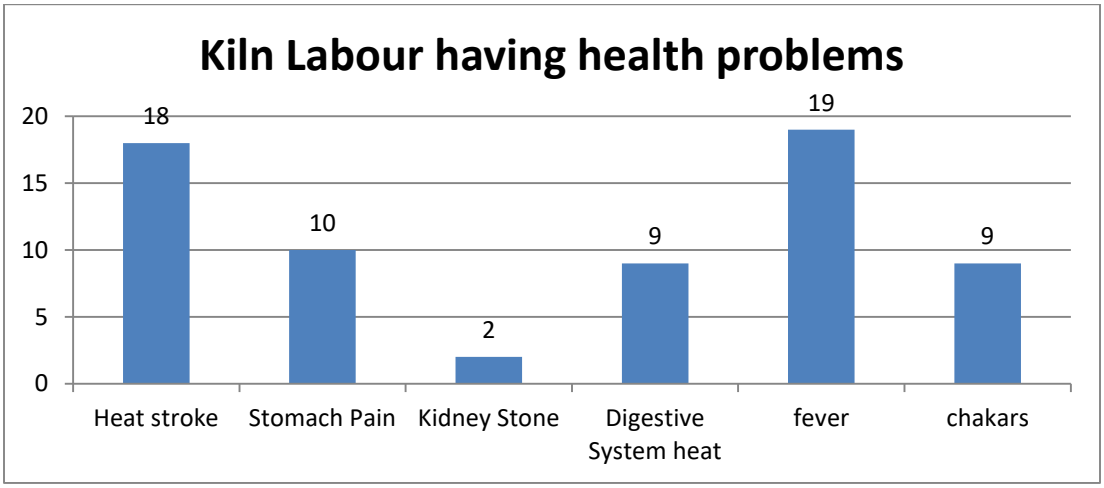

Figure 4.49: Kiln Health Problem chart

Kiln income: it is main income of the kiln labour got by working at kiln.

Table: Kiln labour income

Labour Type	Rate Per 1000 bricks	daily income	per brick	days work	annual income
Carrywala	57	643	0.057	234	150980
Chokidaar	33.75	427.5	0.03375	240	102525
Carriers	147.7778	641.1111	0.147778	236.6667	151863.9
Jalaiwara	10.14286	727.1429	0.010143	240	174678.6
Mistri	10	725	0.01	245	177500
Moulder	1045.313	573.2031	1.045313	235.625	134386.7
Munshi	51.8	616.9	0.0518	238.4	147167
Nikasi	131.3333	653.3333	0.131333	242.6667	158500

Safiwara	30	450	0.03	246.6667	110750
Stackers	144.4286	515.4286	0.144429	236.5714	122147.1
trolley driver	42.85714	457.8571	0.042857	228.5714	104071.4
trolley mazdoor	42.36842	437.8947	0.042368	233.6842	102168.4
Jamadar	142.6923	1089.615	0.142692	218.4615	228438.5

Family income: it is income of the family of the kiln participant that work at kiln too.

Off kiln Income: it is secondary income which is earned by the kiln labour usually via farming, BISP, goat herding, etc.

Mode of payment: usually labour is paid at the end of the daily or weekly or production cycle at the kiln. Labour is paid for their work in following way.

Table: Kiln labour mode of payment

Types	Munshi (1)	Jamadaar (2)	Moulders (3)	Carry Wara(4)	Stackers (5)	Fire Mistri(6)	Jalaiwara (Firemen) (7)	Nikasi Wara (8)	Trolley Driver (9)	Trolley Labour (10)	Chokidaar (11)	Careers (Doaeewara) (12)	Safae wara (Cleaners) (13)
mode	monthly	daily	daily	daily	daily	Chakar wise	Chakar wise	daily	daily	daily	monthly	daily	Chakar wise

Gender wage gap: Data of only those kilns were important where women worked. Following was the average gap of income between these two segments of the kiln population. There is 18.5% wage gap for 23 kilns where women work. It means on average male labourers are paid 18.5% more than female labourers.

Type of job done by women labour at kiln:Women are not employed as firemen squad. They usually perform the duties of moulders and stackers.

Women are not employed as firemen squad. They usually perform the duties of moulders and stackers. **Duncan Index of dissimilarity** is 42.3% . It means that 42.3% fraction of women has to change occupation to be equal with males. 83(ouof 90) kilns employ only local labour. Government basic labor wage is 17000Rs for year2021-22. 174 live beowl basic annual income oc 204000 Rs. It is 87% poverty rate. Poverty line is 204000Rupees. On the average a labour at kiln earn 175008 rupees annually.

His average total family size is 7.6 with only 30500 rupees annually for each member. Per month it becomes 2550 rupees per family member.

Comparing male, female and children labour: children that work as labour were asked in Questionnaire form I and no kiln has reported any such labour at the work site. But while observing it was noted that kilns with on site housing units had both female and children in the vicinity.

Duncan Index of dissimilarity: Overall it is 42.3% . It means that 42.3% fraction of women has to change occupation to be equal with males.

Local vs non local labour: Kilns were asked to provide data if they employ non local labour at the kilns and 7 kilns said yes. 83 kilns employ only local labour.

The Most significant labour at kiln: Each labour type working at kiln is important because of nature of job. But when asked from kiln managers they provided following data. Only 12 kilns consider carrywara as most significant, 22 consider Jalaiwara and 56 kilns consider the most significant labour is Moulders.All small and medium kilns consider moulders significant while large kilns consider jalaiwara and carrywara significant labour having bigger impact on the output.

Working poverty rate: It tells ratio or percentage of labour whose income falls below poverty line due to low income job. They work properly but get less income.

WPR= (poor employed/total labour)*100

Government basic labor wage is 17000Rs for year2021-22. 174 live beowl basic annual income oc 204000 Rs. It is 87% poverty rate. Poverty line is 204000Rupees. On the average a kiln earn 175008 rupees annually.

Table: Kiln Labour Poverty analysis

Tot Income	Months worked	Time unemployed	Standard Basic wage	annual due	Average Difference
175007.8	9.322853	2.677147	17000	204000	28992.25

His average total family size is 7.6 with only 30500 rupees annually for each member. Per month it becomes 2550 rupees per family member.

Figure: Relation of earned and minimum wages

On the average each labour has to earn 2537 rupees per month more to reach minimum pay. It is 29% more pay with respect to current monthly income. And why would a munshi pay 29 % more to a kiln labour?

Following linear line tells about more or less a labour has to earn

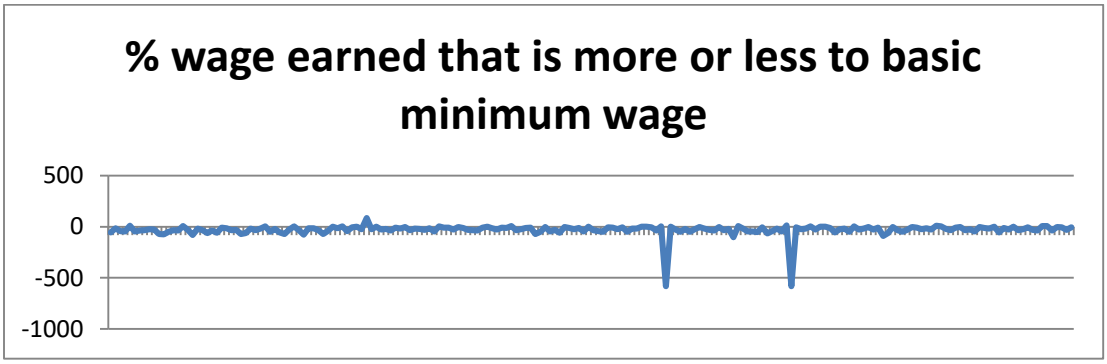

Figure4.50: Kiln labour poverty line

Only 26 kiln labourers (13%) have earned more than basic pay of 17000 per month. On average they earn 7 rupees more than 17000 per month.

Work day duration: Work duration at kilns depends on type of job. Fire masters work longer time than moulders , stackers. Nature of job decides work duration. In summer work day is longer. Following data analysis was performed.

Table4.15: Working capacity of the kiln labour

		Labour	Work days	annual hours required for

		Quantity							production			
Labour Type	Brick processing power	large	medium	small	Average	Large	medium	small	Average	large	medium	small
Moulders	825	40	14	3	207.4914	243.9436	225.3337	65.43804	41567	77168.18	25843.47	2280.373
Doaee	5000	6	3	1	123.723	151.8702	132.483	29.08571	6826	12661.76	4254.524	373.2571
Stackers	11000	15	8	3	44.40658	57.17364	44.01927	14.56277	3103	5755.348	1933.874	169.6623
Carrywala	12000	5	3	1	85.42041	107.7444	90.16204	16.98016	2844	5275.735	1772.718	155.5238
Jalaiwala	70000	12	4	2	8.837358	10.84787	9.463071	2.077551	487	904.4118	303.8946	26.66122
Nikasiwala	6000	12	4	3	91.05578	107.1851	102.3467	18.0119	5690	10551.47	3545.437	311.0476
Munshi	12000	1	1	1	228	276	217	144	1990	2452.846	1888.188	1176
Mistri	75000	1	1	1	8.837358	10.8	9.4	2.077551	76	95.62537	80.36079	16.78367
Chokidar	15000	1	1	1	301.6667	338.8235	304	203	2622	3000	2635.714	1662.857
safai labour	15000	2	2	1	18.66667	31.35294	12.33333	6.857143	560	888.3529	242	70.85714
trolley mazdoor	10000	2	2	2	228	276	217	144	4622	6602.568	3776.376	2352
trolley driver	10000	1	1	1	228	276	217	144	2311	3301.284	1888.188	1176

Further it is analysed as,

Table 4.16: Actual vs standard Hours of labour consumed at kiln

	ideal hours	per day hour	actual hours	per day	more work (%)	largest	Smallest
Large	116169.377	8	128657.5853	8.86	0.083193	10	7
Medium	45331.5227	8	48164.74285	8.5	0.066289	10	7
Small	9532.70593	8	9771.023575	8.2	0.014286	10	8

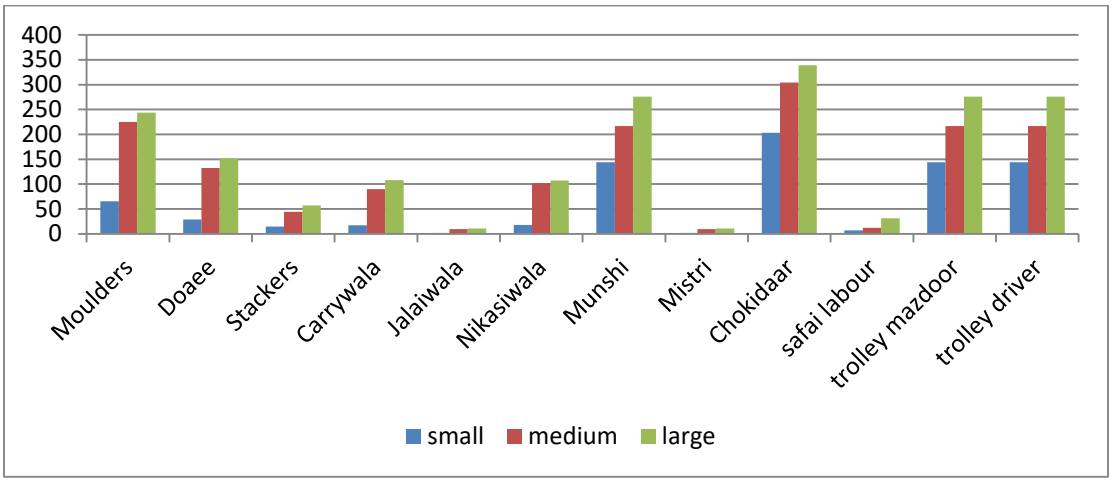

Figure 4.19: Time contribution of different labour types at kiln

Labour productivity and efficiency for different kiln types is as,

Table 4.17: labour productivity and efficiency for different kiln types

Size	Large	medium	Small
Production	7147059	2465476.19	230428.6
Labour relevant	82.58824	33.85714286	13.5
Ideal/standard hours	116028.1	44637.27482	9611.63
per day	8.852941	8.666666667	8.142857
actual hours	128657.6	48164.74285	9771.024
More %	0.083193	0.066288738	0.014286
productivity per employee (Bricks)	89817.25	76759.34508	17588.64
productivity per hour (Bricks)	56.12718	51.16197422	22.94333
Efficiency (work hours)	91.68067	93.37112623	98.57143

Each labourer has to work 6.5% more hours than ideal hours by government. Following table is generated to check productivity and efficiency of each labour category.

Table: Labour productivity and efficiency for different kiln labour types

	actual hours worked	ideal hours	work more /less	productivity per hour	efficiency

Moulders	41567.43	37833.88	more	96.2728	0.910181
Doaee	6826.84	6218.24	more	584.634	0.910852
Stackers	3103.109	2826.473	more	3103.109	0.910852
Carrywala	2844.517	2590.933	more	1403.122	0.910852
Jalaiwala	487.6314	444.16	more	8184.877	0.910852
Nikasiwala	5689.033	5181.867	more	701.5608	0.910852
Munshi	1990.718	1828.85	more	1776.295	0.918688
Mistri	76.23764	70.69887	more	48535.49	0.927349
Chokidaar	2622	2413.333	more	1376.152	0.920417
safai labour	459.5556	415.8222	more	10860.52	0.904836
trolley mazdoor	4622.479	4222.981	more	785.7256	0.913575
trolley driver	2311.24	2111.491	more	1571.451	0.913575

Child labour : During survey and observation it was found that children are employed at kilns specially at moulding and carrying phase of brick making. In the record only four labourers are under the age of 18.

Bonded Labour: 40 out of 200 haven t taken Peshgi from kiln management. On average they have taken 55800Rs each. Small kiln labour has taken on average 12000Rs, medium sized kiln labour has taken on average 33000Rs and large kiln labour has taken on average 56000Rs

Bonded labour rate is 160/200= 0.8

80 % kiln labour is bonded labour.

Gini Coefficient /Index/ Ratio: In the research methodology section process of its calculation is given. It tells about income distribution in a population. It shows income inequality at kiln and at brick kiln industry as whole. Higher the value higher will be the income inequality/gap. There are 13 types of

labour who work at kiln. Following average tables were generated. Labour type was sequenced with respect to amount of income at kiln.

Gini for large kilns is as

Table4.41: Large Kiln Gini coefficient calculation table

Large kiln						
			income %	pop %	population % richer	Score
Owner	1	14900000	0.488765	0.009259	0.990740741	0
Moulders	40	7000000	0.229621	0.37037	0.009259259	0.089297104
Jalai	12	1900000	0.062326	0.111111	0.37962963	0.054246472
Nikasi	12	1600000	0.052485	0.111111	0.490740741	0.057344535
Stackers	15	1400000	0.045924	0.138889	0.601851852	0.061657524
Jamadars	9	1000000	0.032803	0.083333	0.740740741	0.051330648
Doaeewara	6	800000	0.026242	0.055556	0.824074074	0.044709298
Carrywala	5	700000	0.022962	0.046296	0.87962963	0.04145937
trolley mazdoor	2	370000	0.012137	0.018519	0.925925926	0.022700903
Mistri	1	220000	0.007217	0.009259	0.944444444	0.013698297
trolley driver	1	220000	0.007217	0.009259	0.953703704	0.013831939
Munshi	1	200000	0.006561	0.009259	0.962962963	0.012695983
Chokidaar	1	150000	0.00492	0.009259	0.972222222	0.009613107
safaimazdor	2	25000	0.00082	0.018519	0	1.51866E-05
Total	108	30485000	1	1		0.472600368
Gini						0.527399632

Gini for medium kilns is as

Table4.42: Large Kiln Gini coefficient calculation table

Medium Kiln						
Labor type	Quantity	Annual Income	income %	pop %	population % richer	Score
Owner	1	3647000	0.374474	0.020408	0.979591837	0
Moulders	14	1800000	0.184824	0.285714	0.020408163	0.060350662
Stackers	8	1000000	0.10268	0.163265	0.306122449	0.079629346
Jamadars	4	600000	0.061608	0.081633	0.469387755	0.062865273
Jalai	4	600000	0.06160	0.08163	0.551020408	0.0729237I

			8	3		7
Nikasi	4	500000	0.05134	0.081633	0.632653061	0.069151801
Doaeewara	3	400000	0.041072	0.061224	0.714285714	0.061188866
Carrywara	3	400000	0.041072	0.061224	0.775510204	0.066218088
trolley mazdoor	2	200000	0.020536	0.040816	0.836734694	0.035204553
Mistri	1	180000	0.018482	0.020408	0.87755102	0.032815673
Munshi	1	140000	0.014375	0.020408	0.897959184	0.026110044
trolley driver	1	135000	0.013862	0.020408	0.918367347	0.025743329
Chokidaar	1	130000	0.013348	0.020408	0.93877551	0.025334705
safaimazdor	2	7000	0.000719	0.040816	0	2.93371E-05
Sum	49	9739000	1	1		0.617565396
Gini Coefficient						0.382434604

Gini for small kilns is as

Table4.43: Large Kiln Gini coefficient calculation table

Small Kiln						
Labor type	Quantity	Annual Income	income %	pop %	population % richer	Score
Stackers	3	700000	0.290336	0.130435	0.869565217	0
Moulders	3	350000	0.145168	0.130435	0.130434783	0.056804862
Jamadars	2	300000	0.12443	0.086957	0.260869565	0.075739816
Owner	1	282000	0.116964	0.043478	0.347826087	0.08645159
Nikasi	3	150000	0.062215	0.130435	0.391304348	0.056804862

trolley mazdoor	2	130000	0.05392	0.086957	0.52173913	0.060952518
Doaeewara	1	100000	0.04147	0.04347 8	0.608695652	0.052296539
carrywara	1	100000	0.04147	0.04347 8	0.652173913	0.055903197
trolley driver	1	90000	0.03732 9	0.04347 8	0.695652174	0.05355887
Chokidaar	1	78000	0.03235 2	0.04347 8	0.739130435	0.04923088
Munshi	1	74000	0.03069 3	0.04347 8	0.782608696	0.049375147
Jalai	2	35000	0.01451 7	0.086957	0.826086957	0.025246605
Mistri	1	20000	0.00829 5	0.04347 8	0.913043478	0.015508629
safaimazdor	1	2000	0.00083	0.04347 8	0	3.60666E-05
Sum	23	2411000	1	1		0.637909581
Gini Coefficient						0.362090419

It is 0.36, 0.38 and 0.52 for small , medium and large kilns. Bigger the kiln size higher the income inequality.

LorenzCurve: It tells about income distribution in all groups of population. It is a graph. It was developed by Max O. Lorenz int he year of 1905. On the x axis population is shown and on the y axis cumulative income. It ranges from 0 to 1. 0 means all have equal income. It will be a straight diagonal line with a slope of 1.

Table: Cumulative income and population data for Lorenz curve

Large kiln		Medium kiln		Small kiln	
cumulative income	Cumulative population	cum income	cum pop	cum income	cum pop
0.488765	0.009259	0.374474	0.020408	0.290336	0.130435
0.718386	0.379629	0.559298	0.306122	0.435504	0.26087
0.780712	0.49074	0.661978	0.469387	0.559934	0.347827
0.833197	0.601851	0.723586	0.55102	0.676898	0.391305
0.879121	0.74074	0.785194	0.632653	0.739113	0.52174

0.911924	0.824073	0.836534	0.714286	0.793033	0.608697
0.938166	0.879629	0.877606	0.77551	0.83451	0.652175
0.961128	0.925925	0.918678	0.836734	0.875987	0.695653
0.973265	0.944444	0.939214	0.87755	0.913316	0.739131
0.980482	0.953703	0.957696	0.897958	0.945668	0.782609
0.987699	0.962962	0.972071	0.918366	0.976361	0.826087
0.99426	0.972221	0.985933	0.938774	0.990878	0.913044
0.99918	0.98148	0.999281	0.959182	0.999173	0.956522
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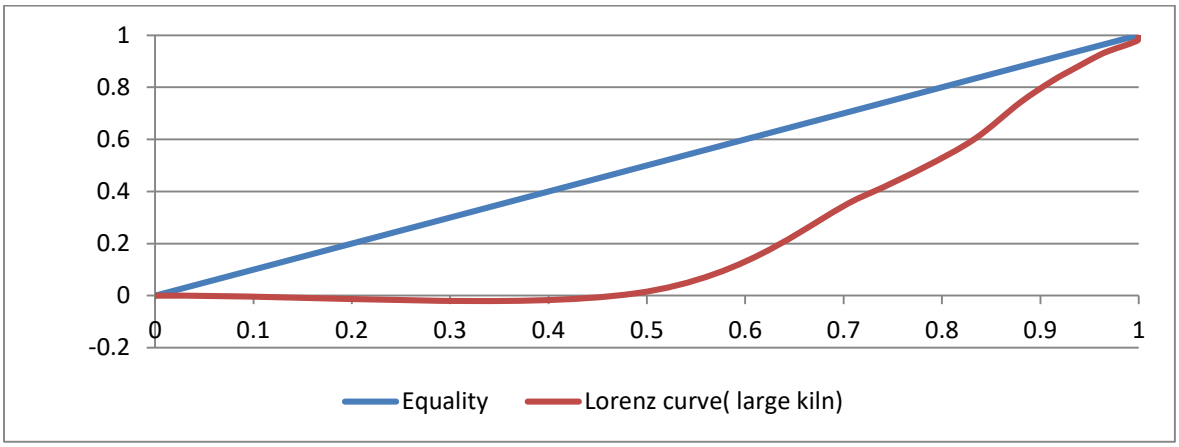
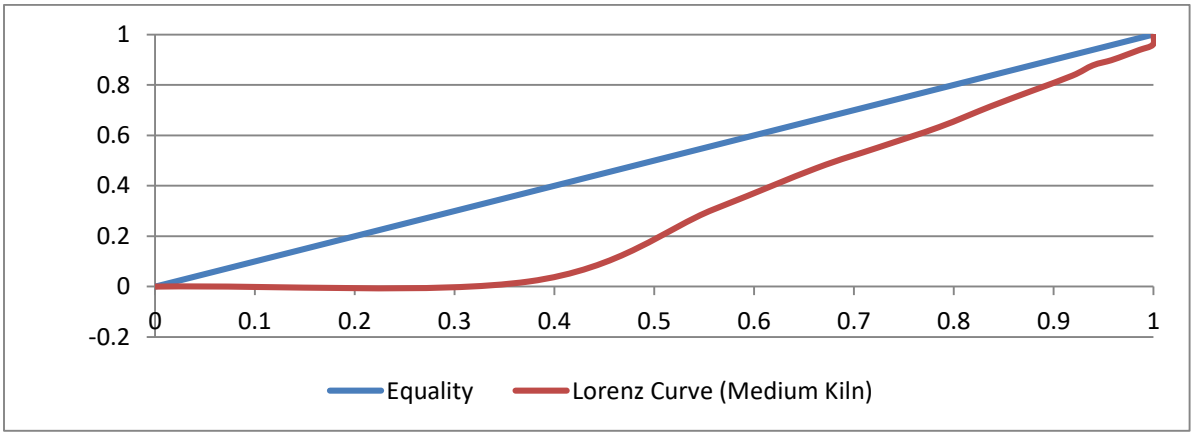
And so Lorenz Curves for kilns is calculated,





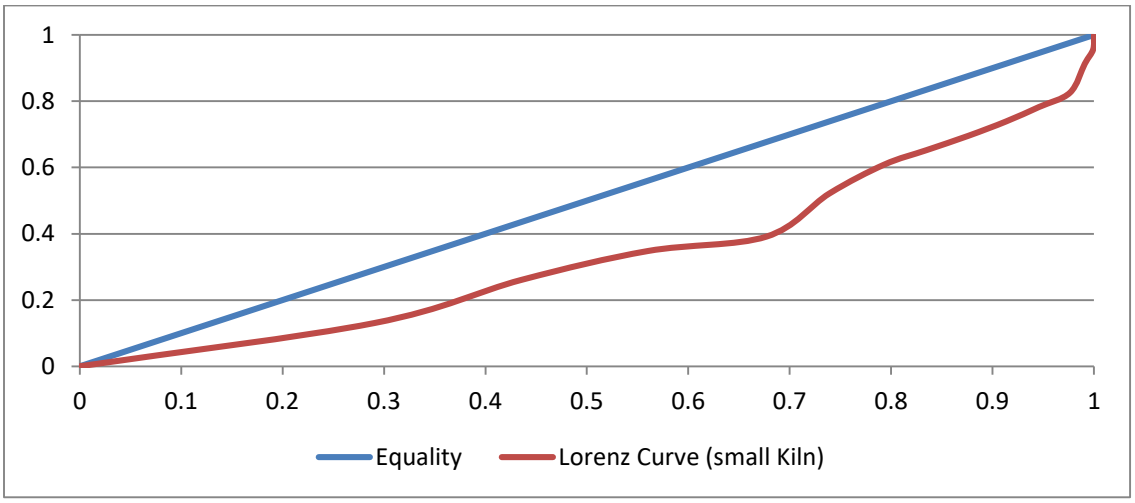


Figure4.47: Lorenz Curevs of labour working at kilns

Conclusion and suggestions

Kiln labour was surveyed without going to kiln. Asking questions from labour in presence of kiln owner made data biased. The labour was surveyed at kiln residence or model kiln labour villages. In khairpur model kiln labour village is near Gambat town i.e. Faizal Mahar. Sample size is 200 labourers. Kiln labourers selected were110, 54 and 46 from khairpur, sukkur and Larkana respectively. There are 35 stackers, 32 moulders, 25 munshis, 19 trolley labour, 18 carriers, 15 Nikasiwara, 14 jalaiwara, 13 jamadars, 7 trolley drivers, 6 cleaners, 4 chokidaars and 2 mistris. Only 70 of them gave permission to share their private data. Kiln labour that work at small, medium and large kiln are 61, 56 and 83 respectively.

Kiln labour, on the average, work 200-250 days of year. They don t work on Fridays. 88 % of the labour falls in the age bracket of 19-50 years. Only 4 are under 18 years age. Only 8 are non Muslims. There is positive relationship between labour age and labour experience. Some have spent their 50 % of life working at kiln.

North Sindh kiln labour education profile is very serious. Only 47 are educated (23%). 78 % of the educated have five years of education. Only 10 participants are class 10 pass.

Only 19 out of 200 have no any sort of training. Training in this industry is imparted on the job. There is no any mentioned training period. They learn everything on the job.

33.5% (67) of the participants has told about six health problems prevalent at kiln i.e.

heat stroke, stomach pain, kidney stone, digestive system heat, fever and head *chakars*. Mostly fever and heat stroke are reported.

Only 150 of the participants have married. 50 have no self family/children but have dependants. Nuclear family includes self, wife and children. Other Dependants includemother, sister, brother father etc who are living with the participant. Total/full Familyis the sum of nuclear family and other dependants. Total actual dependants is total family minus members working at kiln minus self. Only 6 participants have family members who work at kilns along with participant.

40 labourers did not avail the facility to advance / *peshgi* loan. Health problem does not affect peshgi amount taken by kiln labour. On the average they have taken 55800Rs each. Small kiln labour has taken on average 12000Rs, medium sized kiln labour has taken on average 33000Rs and large kiln labour has taken on average 56000Rs. 80 % kiln labour is bonded labour.

Except for labour union and health insurance all the facilities of shelter, latrine and drinking water were provided. Labour at kiln has been living a pathetic life under heavy burden of peshgi/ advance loan given to them. They earn below minimum wage level set by Sindh Government. It is miserable nature of their profession that inspite of all that they were protective of their kiln masters. They tried to hide information about their health conditions and kiln facilities provided to them. They work in very dangerous environment. Employment status at kilns is of temporary or ad hoc nature. Labour is paid at end of the day and only after work is completed. Labour is paid by quantity of the work done not by time spent on work place. Labour is paid usually per 1000 bricks completed for each category of the kiln labour. Each labourerhas to work 6.5% more hours than standard hours by government.

During survey and observation it was found that children are employed at kilns specially at moulding and carrying phase of brick making. In the record only four labourers are under the age of 18.

Labour income data includes kiln income , family income and off kiln income. Kiln income is main income of the kiln labour got by working at kiln. Highest annual income is that of Jamadaar because he earns commission from other kiln labour(2.28lakhs), second largest income is that of Mistri

(1.77 lakhs). Least income is that of chokidaar (1.025 lakhs), then trolley labour (1.021 lakhs). Per brick rupees rate is 1.05, 0.147, 0.144,0.142,0.131, 0.057,0.0518, 0.04,0.04, 0.03, 0.01 and 0.01 rupees for moulder, carrier, stacker, jamadar, nikasi, carrywara, munshi, trolley driver, chokidaar, safaiwara, Jalaiwara and Mistri. Rate per 1000 bricks processed is 10, 10.2, 30, 57, 131, 142, 144, 147 and 1045 rupees for Mistri, Jalaiwara, safaiwara, *carry* wara, nikasiwara, jamaadar, stackers, carriers, and moulders. Largest amount is given to moulders. Family income is income of family members living with participants. Off kiln Income is secondary income which is earned by the kiln labour usually via farming, BISP, goat herding, etc. all kiln labour has other income source too. Annually other income is approximately 32000Rupees. Gross income is sum of all incomes for a kiln labour including family income and off kiln income. Government basic labor wage is 17000Rs for year2021-22. 174 live below basic annual income of 204000 Rs. It is 87% poverty rate. Poverty line is 204000Rupees. On the average a labour at kiln earn 175008 rupees annually. His average total family size is 7.6 with only 30500 rupees annually for each member. Per month it becomes 2550 rupees per family member. On the average each labour has to earn 2537 rupees per month more to reach minimum pay. It is 29% more pay with respect to current monthly income. And why would a munshi pay 29 % more to a kiln labour? Only 26 kiln labourers (13%) have earned more than basic pay of 17000 per month. On average they earn 7 rupees more than 17000 per month.

Income or *peshgi* loan taken is spent on daily life heads of transport, utilities, rent, food, children education, self health, family health, jamaadar commission and loan repayment. Kiln managers also retain their daily dues as security against loan taken. At the end of contract, if there is, the retained amount is not given back to labour. Sometimes interest is also charged at the peshgi loan taken.

Labour is the most vital intangible asset of the kilns. It is vital for the product manufacturing and value addition. Quality of facilities provided to the labour depends on the operation and size of the kiln. 57 participants said there is a school in kiln s vicinity, 7 said no. 94% of the large kilns, 87% of the medium sized kilns and 35% of the small kilns have first aid facility at the kilns. 70 participants said that they had a dispensary /hospital facility available near/around kiln. All the kilns provide drinking water facility to the labour. No any kiln provides facility of the insurance to all labour types. 100% of the

large kilns, 76% of the medium sized and 28% of the small kilns have provided shelter facility to labour. . 76% of the large kilns, 66% of the medium sized and 50% of the small kilns have provided laterine facility to labour. All kilns have given peshgi to their labour. On the average large kiln provides 56617Rs, medium kilns provide 33095Rs and small kilns provide 12071Rs advance loan to the labour.

There are 13 types of labour types at kilns (+1 owner). On the average there are 21, 49 and 108 labourers at small, medium and large kilns respectively. *Munshi* is the manager of the kiln, *Jamadaar* is the one who deals with essential labour at the kiln, Mouldermoulds bricks at kiln site, *carry* man sprinkles *carry* on the land and inside*Mooris,(* Carry is the burnt char / ash of the wood / fuel used at the kiln site previously), Stackers place / stack bricks upon each other inside Chimney (FCTBK) or on the land embankments (*Daas kilns*), *Mistri*is head of all *Jalaiwalas*who help him burn/bake bricks at kiln*Nikasiwara*works to get / take bricks out when completely baked / prepared, Trolley Driver and trolley labour transport an order at a certain location, *Chokidaar* is responsible for the security of the bricks, unused fuel, other inventory items and the protection of the *Munshi* office, *Safaiwara*operates /cleans in the cycles /*chakars*at kilns. Largest quantity of the labour is moulder for all type of the kilns. Capacity to process daily Qisti bricks at a kiln is 825, 5000, 6000, 11000, 12000 bricks for one moulder, carrier, nikasiwara, stackers and carrywara.it is same for all kilns. Chokidar is the labour type with most time of year given for kiln and then Munshi. Least time is given by Mistri and jalaiwara. Largest part of the total kiln income ,for large and medium kilns ,belongs to owner who is sometimes Munshi too, but for small kiln it goes to stackers. Least income goes to Safaiwara for all types of the kiln. most labour at kilns is paid daily except for munshi and chokidar who are paid monthly. Mistri and jalaiwara are paid at the end of a chakar (production cycle) at kiln.

Women labour at kilns is required specially for certain jobs at kilns. Women labour does not perform fire job at kilns. Their main job is to mould bricks. Following data analysis was performed. 23 kilns employed females. On the average 8.5 more males are there per 1 woman working at each of 23 kilns. No any small kiln employ woman as kiln labour. Only 5 medium sized kilns did so. 10.721% of labour force, on average, of the 23 kilns consists of women labour. There will be 4 % loss, on average, if women labour at kiln is not employed. There is 18.5% wage gap for 23 kilns where women work. It

means on average male labourers are paid 18.5% more than female labourers.Duncan Index of dissimilarity is 42.3% meaning that 42.3% fraction of women has to change occupation to be equal with males.

If families reside at a kiln there are children also at kilns. They officially don t work at kiln yet they work at kiln with many other workers without any pay. Officially they are not part of kiln labour force. 69 participants said that there are no any children residing with kiln families. There are 11-15 children at 3 kilns, 6-10 children at 8 kilns and 1-5 children at 10 kilns.

Relevant labour (without trolley and cleaning labour) are the ones who make product directly. are 13,33,82 for small, medium and large kilns. Total actual hours the relavant labour put to make final product at kilns is 9771 hours, 48164 and 128657 hours for small, medium and large kilns respectively. Labour works more than sanctioned standard government time by 8.3%, 6.6% and 1.4% at large , medium and small kilns respectively. The largest annual hours required for production is given by molders i.e. 41567 hours. On the average molders process 825 bricks daily. Second slot goes to Carriers (6826 anuual hours), as they process 5000 bricks per day. Third slot goes to Nikasiwala (5690 annual hours), as they process 6000 bricks per day. Fourth slot goes to trolley mazdoor (4622 annual hours), then stackers (3103 annual hours) and so on. Productivity per employee is 17588 bricks, 76760 bricks and 89817 bricks for small , medium and large kilns. Per hour it is 22 bricks, 51, and 56 bricks for small , medium and large kilns. Kilns efficiency rate is 98%, 93% and 91 percentage for small , medium and large kilns. All small and medium kilns consider moulders significant while large kilns consider jalaiwara and carrywara significant labour having bigger impact on the output. 83 kilns employ only local labour.

Labour at kilns is paid by their work not by the time they utilize on daily basis. Sometimes they complete their work early and sometimes they don t. Labour usually doesn t work at night except jalaiwala labour. There is no any shifts just one shift.

Resource use and Allocative efficiency of brick production in North Sindh is about kiln s ability to effectively use resources to maximize profits at available technology and fixed factor level. Returns to scale tells elasticity of production at a kiln i.e. if it produces higher level of output from same level of inputs as compared to other kilns. Kilns are going through IRS (Increasing returns to scale) as elasticity

of production (sum of all nine coefficients of production function) is greater than 1 i.e. 1.09. kilns are technically efficient. Labour clay and water are underutilized while all other inputs are over utilized for an average North Sindh kiln. For small kiln clay, fuel and water are underutilized and rest are over utilized. For medium kiln clay, labour and water are underutilized and rest are over utilized. For large kiln clay, labour, maintenance and water are underutilized and rest are over utilized. Clay and water are underutilized throughout all kilns. Labour is over utilized only at small kilns. Land is underutilized only at large kilns. Fuel is over utilized only at small kilns. Transport, capital, FOH/Inventory are over utilized at all kiln types. Maintenance is underutilized only at large kilns.

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