Brick Sector in Nepal
National Policy Framework

Prepared by MinErgy in collaboration with
Federation of Nepal Brick Industries

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Executive Summary

Brick, a commonly applied conventional construction material, is produced in about 1000 kilns in Nepal attracting approximately 37 million US$ investment in the sector. Brick kilns, mostly adopting the informal production management approach, have been confronting a number of inherent environmental and social issues. Absence or insufficiency of innovative policy reforms embracing a longer-term perspective coupled with weak enforcement of already existing sector-friendly policies have been a major factor for the slow and low-scale transformation of the brick sector. This “National Policy Framework” has been developed specifically for the brick sector with the aim to make the industry more energy-efficient, environment-friendly and socially responsive, thereby contributing to achieve reductions in black carbon and CO₂ emissions along with promoting their related co-benefits on development and health.

The Framework consists of a portfolio of policies relevant to brick industries, both existing and those in pipelines. Based on stakeholder consultations and the review of policies, the Framework identifies the policy gaps and issues, and provides recommendations. The policy recommendations corresponding to the identified issues are clustered around i) industry promotion, ii) technology and environment, iii) labor conditions, and iv) monitoring and enforcement. The policy actions have been recommended while assessing their efficiency, effectiveness and implementability.

The Study identifies investment insecurity as a major constraint for the industry promotion. Procedural delays for new registration as well as operational challenges posed by external factors for established kilns do not favor the promotion of industry. Legally registered and operating kilns come under the scrutiny of multiple taxes while non-registered kilns remain out of the tax and monitoring regime. Most policy incentives that exist to reward good practices is either inaccessible or not delivered due to the absence of feasible delivery mechanism. The Study has recommended the policy strategies that provide an enabling environment for industry promotion. Simplified registration procedures such as online registration provision, dedicated brick manufacturing zones/clusters, assurance of undisrupted operation and necessary legal arrangement to close down non-registered kilns are some of the recommendations made by the Study. Besides, integrated and consolidated taxation, development of by-laws and guidelines for the incentive delivery have also been recommended as strategic policies by the Study.

The Study has recommended for setting the emission standards putting in perspective the longer-term sector development along with the concern of environment-friendliness. It recommends for the technology-neutral emission standards with phase-wise, time-bound targets for emission reduction to avoid reactive moves and enable the sector to plan and choose technology and operational practices accordingly. The Study proposes to develop more stringent emission standards for sensitive locations such as urban areas, valleys and heritage and conservation sites. The Study recommends for phasing out polluting firing technologies while providing preferential schemes and incentive packages for the cleaner ones along with suggesting appropriate technology suitable to the rural areas. The Study brings forth
the ways to deal with the issues related to optimizing raw materials and standardizing the products.

The Study has identified the enforcement, implementation and compliance monitoring of the policies as the major concern with regard to workplace, employment conditions and child labor issues. The study has suggested reviewing and revising some of the proposed provisions in the Minimum Occupational Health Safety (OHS) Standards. The Study has recommended for expediting the process to approve the Regulations on Child Removal, Repatriation and Rehabilitation followed by preparation and approval of the Guideline for immediate implementation.

In conclusion, the Study recommends instituting a joint mechanism for compliance monitoring. The Study recommends incorporating the workplace, employment conditions and child protection measures into the joint compliance monitoring mechanism. The Study recommends preparing a standardized compliance monitoring protocol for the relevant aspects (emissions, child labor, workplace and employment conditions, etc.) as well as capacitating the relevant institutions for implementation. Preparation of the guideline to take actions against kilns not achieving the emission standards and labor compliance has also been proposed. In case of non-compliance, the Study also recommends to have a provision in the monitoring guideline to allow brick kilns to prepare and implement time-bound action plan for full compliance. Additionally, the Study suggests to incorporate a provision to utilize the compliance reports to access incentives, made available by the Government.

It is hoped that the Study will help streamline the brick sector through necessary policy intervention by heeding to the suggestions and recommendations stated above in a nutshell.
## List of Acronyms

- **CCAC** – Climate and Clean Air Coalition
- **CCWB** – Central Child Welfare Board
- **CDO** – Chief District Officer
- **CSIDB** – Cottage and Small Industries Development Board
- **DCSI** – Department of Cottage and Small Industries
- **DCWB** – District Child Welfare Board
- **DDC** – District Development Committee
- **DFO** – District Forest Office
- **DoE** – Department of Environment
- **DoI** – Department of Industry
- **DoL** – Department of Labor
- **EIA** – Environmental Impact Assessment
- **ESMP** – Environment and Social Management Plan
- **FC-BTK** – Fixed Chimney Bulls Trench Kiln
- **FNBI** – Federation of Nepal Brick Industries
- **HHK** – Hybrid Hoffmann Kiln
- **ICIMOD** – International Centre for Integrated Mountain Development
- **IEE** – Initial Environmental Examination
- **IIPB** – Industry and Investment Promotion Board
- **IPB** – Industrial Promotion Board
- **IRD** – Inland Revenue Department
- **LDO** – Local Development Officer
- **MoI** – Ministry of Industry
- **MoLRM** – Ministry of Land Reforms and Management
- **MoPE** – Ministry of Population and Environment
- **NLUP** – National Land Use Project
- **OCSI** – Office of Cottage and Small Industries
- **OHS** – Occupational Health and Safety
- **PM** – Particulate Matter
- **PPE** – Personal Protective Equipment
- **SPM** – Suspended Particulate Matter
- **VAT** – Value Added Tax
- **VDC** – Village Development Committee
- **VSBK** – Vertical Shaft Brick Kiln
- **WHO** – World Health Organization
1 Introduction

1.1 Background

Brick is one of the most common building materials in Nepal. There are about 1000 brick kilns in the country. The investment in the sector is estimated to be about 37 million USD. Despite huge investment, however, brick industries are still considered an informal sector and have been grappling with a number of inherent environmental and social issues. Transformation of the sector is gradually underway but in a very slow pace and also on a low scale. There is no clear policy and strategic guidance to transform and modernize the sector. Many existing policies are rudimentary and their enforcement is rather weak hence not instrumental enough to bring the holistic change in the sector. There is, therefore, a need for comprehensive strategic policy measures to make the industry more energy-efficient, environment-friendly and socially responsive.

The Climate and Clean Air Coalition (CCAC) is a global effort that unites governments, civil society and private sector, committed to improving air quality and protecting the climate in next few decades by reducing short-lived climate pollutants across sectors. Complementary to mitigating CO₂ emissions, the Coalition acts as a catalyst to create, implement and share immediate solutions addressing near-term climate change to improve people’s lives rapidly, and to ensure sustainable development for future generations. The CCAC brick kiln initiative is aimed at achieving substantial reductions of black carbon and other emissions from brick kilns through employing a range of technologies and policy approaches. The International Centre for Integrated Mountain Development (ICIMOD) is the implementing agency of CCAC brick initiative in the South Asian region. MinErgy and Federation of Nepal Brick Industries (FNBI) are assisting ICIMOD in implementation of the CCAC brick initiative in the region. Under the CCAC initiatives and funding support from CCAC/ICIMOD, MinErgy in collaboration with FNBI has developed these comprehensive strategic policy actions to improve brick kiln conditions and operations and reduce emissions emerging from brick production. The strategic policy actions will provide the basis for decision-makers, national governments and sub-national entities to make informed and evidence-based policy decisions to improve the operation of the brick sector.

1.2 Objectives and Expected Outputs

The main goal of this study is to achieve reductions in black carbon and CO₂ emissions with their related co-benefits on development and health. The objective is to develop a national policy framework to improve brick kiln conditions and operations, and reduce emissions related to brick production.

The expected outputs are:

- Portfolio of current policy measures
- National policy framework for Nepal with recommendations for policy actions
1.3 Methodology

In order to prepare the policy framework, two major steps have been followed.

- Identification of policy gaps, issues and problems associated with the sector
- Preparation of strategy and policy recommendations based on the issues

Identification of policy gaps, issues and problems was done through literature review and consultative meetings with relevant government stakeholders, sector experts and brick entrepreneurs. The existing policy documents (acts, rules, regulations, guidelines and standards) as well as the new proposed polices were studied and reviewed. In doing so, the major policies were documented and the gaps were identified and noted. Also, at this stage, policies from the countries such as India, Bangladesh, Vietnam and China were reviewed and the progressive measures taken to bring about positive changes in the sector were documented. The outcome of this process was a portfolio of current policy measures.

Simultaneously, bilateral consultation meetings were carried out with relevant government agencies such as Ministry of Industry (MoI), Ministry of Population and Environment (MoPE), Ministry of Land Reforms and Management (MoLRM), Department of Industry (DoI), Department of Cottage and Small Industries (DCSI), Cottage and Small Industries Development Board (CSIDB) and Department of Labor (DoL) to get better insights of existing and new policy measures, understand implementation challenges, document their concerns, and get suggestions for improvements.

Four consultation meetings were then organized with brick entrepreneurs and district level relevant government agencies in Kathmandu, Biratnagar, Chitwan and Nepalgunj to discuss and understand issues and collect suggestions for improvement. A consultation meeting with sector experts was also organized in Kathmandu to discuss on the way forward to improve the sector.

The gaps/problems identified and the issues collected from review and consultation meetings were then clustered into four themes, namely, Industry Promotion, Technology and Environment, Labor Conditions and Institutional Arrangement. The clustered issues were analyzed and possible strategies and policy recommendations were enlisted after the series of team meetings. While framing the strategies and policy recommendations, the team considered different policy alternatives that could have solved the problem. The preferred policy actions have been recommended while assessing their effectiveness, efficiency, implementability.

Draft policy framework was then circulated with relevant government agencies for their review and suggestions. Finally, a national consultation workshop was organized in Kathmandu engaging the government stakeholders, development partners, brick entrepreneurs and sector experts to discuss and refine the strategies and recommendations that were presented. The comments and feedback from the workshop have finally been integrated into the final policy framework.

It should be noted that while making the recommendations on strategies and policy actions, the new federal structures have not been considered.
2 Sector Background

Brick is one of the most traditional and common building materials in Nepal. It is not known exactly from when bricks have been produced and used as building material in Nepal. Bricks are found in the remnants unearthed at the Maya Devi Temple in Lumbini, which is venerated as the birthplace of Gautam Buddha and is considered almost 2600 years old (NBC NEWS, 2013).

It has been said that annually six billion bricks are produced in Nepal (Baum, 2012) from more than 1000 brick kilns. The investment in the sector is estimated to be US$ 37 million and more than 140,000 people are estimated to be employed in the sector (Premchander, Bloesch, Tuladhar, & Raghunandan, 2011). Brick kilns are seasonally operated in dry season (from November to May) and is considered informal sector. Fixed Chimney Bull’s Trench Kilns (FCBTKs) are the most common brick firing technologies. The recent figure from the Federation of Nepal Brick Industries (FNBI) shows that there are 950 FCBTKs in Nepal. Clamps, Vertical Shaft Brick Kiln (VSBK), Tunnel, Hoffman and Hybrid-Hoffman are some other brick firing technologies that exist and operate in Nepal.

FCBTKs based on its brick-setting pattern can be broadly categorized into two methods, namely, straight line and zigzag firing system. In straight line FCBTKs, the fire within the kiln moves in straight line whereas in zigzag FCBTKs, the fire moves in zigzag pattern thus making it more efficient than the former. There is increasing interest and uptake of zig-zag FCBTKs after 2015 earthquake. Clamps are the most traditional brick firing technology suited mainly for small-scale brick production. It is also the second most prevalent brick firing technology in Nepal. The exact number of clamps is difficult to estimate as most of them operate without registration. Government of Nepal has formally banned the operation of clamps since 2016 in Nepal. Though VSBK is the most efficient and environmental-friendly technology (Premchander, Bloesch, Tuladhar, & Raghunandan, 2011), its adoption has been rather low mainly because of the inferior quality of bricks and also because of higher investment. Currently, there are 38 VSBKs with 81 shafts in Nepal but currently only 28 VSBKs are in operation (VSBK Entrepreneurs Association, 2017). Hoffman, commonly known as Chinese brick factory, was introduced in Nepal in the 1970s. But till date, only five Hoffman kilns have been built. Tunnel and Hybrid-Hoffman are considered the modern brick firing technologies. Both technologies have been recently introduced in Nepal. Currently, there are one Tunnel and one Hybrid-Hoffman in operation.

Despite producing one of the most preferred building materials, brick kilns are notoriously known for their negative impacts on environment. Particulate matter (PM), black carbon (BC), sulphur di-oxide (SO\textsubscript{2}) and carbon di-oxide (CO\textsubscript{2}) are some of the most common emissions credited to brick kiln. Brick kilns have been identified as the fourth largest source of air pollution in Kathmandu Valley (Gautam, 2006). About 11% of the total PM emissions in Kathmandu Valley are from brick kilns (ibid). Similarly, the study carried out by the World Bank in 1996 showed that brick kilns are the number one emitter of sulfur-dioxide within Kathmandu Valley (Prajapati, 2009).
Brick production is also one of the major sources for BC and other short-lived climate pollutants (SLCP) emissions impacting both human health and climate change. Studies showed that 10-50% reduction of pollutants emissions could be achieved by improving the firing process (CCAC).

The inefficient technologies and excessive use of coal are one of the primary reasons for high emissions from brick industries. Coal, the main fuel for firing bricks, is mainly imported from India. About 70% of fuel used in brick kilns is estimated to be coal (Uprety & Lamichhane, 2016). The annual coal consumption by the brick sector in the country is estimated to be of 449,358 tons (Premchander, Bloesch, Tuladhar, & Raghunandan, 2011). With the current market price, import cost of coal for firing bricks accounts about US$ 110 million annually. In addition, firewood, rice husk, sawdust, charcoal and agriculture residue are also used for firing bricks.

The brick sector of Nepal is predominantly labor-intensive with its low level of mechanization in production process. A traditional brick kiln employs about 150 to 300 laborers, and a VSBK can have 70 to 200 laborers, depending upon the number of shafts (Premchander, Bloesch, Tuladhar, & Raghunandan, 2011). Generally, workers are grouped around based on their job nature such as green brick molders, green and red brick transporters, and those involved in loading, firing and unloading, etc. About 140,000 people are estimated to be employed in the sector (Premchander, Bloesch, Tuladhar, & Raghunandan, 2011). Along with the employment for mostly poorer population, brick sector is often blamed for the child labor, child trafficking, poor working conditions without basic workplace facilities, labor exploitations and other social issues.

### 3 Policy Portfolio

The policy portfolio is prepared as a part of the policy framework. It takes stock of various policy and legal measures including acts, regulations, guidelines and standards that govern the brick industry in Nepal. It also documents different policy measures that are being considered by Nepal government to promote the sector. In addition, some regional best practices to develop and transform the brick sector have also been documented.

#### 3.1 Existing Policies

There are no policies or regulations that are exclusively targeted to brick sector in Nepal. Policy that governs brick sector are interlinked with other policies and currently are scattered in the form of various acts, policies, rules and regulations enacted by the Parliament and Government of Nepal from time to time. Important acts, rules and regulations are enlisted and described briefly as follows.

**List of Reviewed Policies**

*Existing Policies*

- Industrial Enterprises Act, 2049 (1992)
- Industrial Enterprises Act, 2073 (2016)
- Land Use Policy, 2069 (2012)
• Environment Protection Act, 2053 (1996)
• Environment Protection Rules, 2054 (1997)
• Labor Act, 2048 (1992)
• Labor Rules, 2050 (1993)
• Child Labor (Prohibition and Regulation) Act, 2056 (2000)
• Child Labor (Prohibition and Regulation) Rules, 2062 (2006)
• National Ambient Air Quality Standards, 2069 (2012)
• Value Added Tax Act, 2052 (1995)
• Value Added Tax Rules, 2053 (1996)
• Standard on Chimney Height and Emission for Brick Kiln Industry, 2064 (2008)
• Animal Welfare Directive, 2073 (2016 A.D)
• Letter of Department of Cottage and Small Industries (2017)

In Pipeline

- Land Use Bill (Draft)
- Standard on Chimney Height and Emission for Brick Kiln Industry (Draft)
- Labor Act and Social Security Act (Draft)
- Minimum Occupational Health and Safety (OHS) Standards for Brick Industry Workers (Draft)
- Child Labour Inspection and Monitoring (CLIM) Guideline (Draft)

3.1.1 Industrial Enterprises Act, 2073

The Government of Nepal replacing its earlier version of 2049 (1992) has recently enacted the Industrial Enterprises Act, 2073 (2016). It aims to uplift the country’s industrial sector by making industrial climate conducive and investment-friendly. It also intends to increase the opportunities of national productivity enhancement and employment creation and build competent, dynamic, competitive and productive economy by fostering industrial development, optimizing the use of natural, physical and human resources and emphasizing on import substitution and export promotion. The Act mainly elucidates the classification of industries; permission and registration process of industry; and, facilities and concessions to be accorded to several industries.

As envisioned in the Act, the Industry and Investment Promotion Board (IIPB) is now functional under the chairpersonship of Minister of Industries with representations from relevant governmental bodies and private sector stakeholders. IIPB, formerly known as Industrial Promotion Board (IPB), is responsible for the establishment, expansion, promotion and development of industrial sector as well as for the coordination and facilitation of activities to be undertaken by different government agencies regarding industry and investment promotion. Most policy decisions and regulations for brick industry have so far been and continue to be made by IIPB. Government of Nepal, and MoI in particular, on the recommendation of the Board, enacts policies and regulations by publishing notifications in the Nepal Gazette.

The Act for the first time has incorporated ‘No Work No Pay’ system that has been a major demand of the country’s private sector. Similarly, the Act has made strikes a punishable offence if activities related to strikes obstruct the operations of industries.
It has also made mandatory for the industrial sector to fulfill the required human resources from Nepali citizens; however, it has exempted such condition if there is non-availability of special skills and capacity of Nepali citizens. Likewise, the Act has eased the registration process of industries. It has provisioned that Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) of industries can be done after the registration and before operation of the industrial production. It also has introduced the ‘One Window Policy’ to provide services of the Department of Industry in a more convenient and easier way by provisioning to establish ‘One Stop Service Center’. The Act has also incorporated a provision to register complaints directly with the Ministry if the concerned authorities delay in registering industries in stipulated time.

### Some provisions in the new Act that could be relevant to brick industries:

- The Act classifies industries into three categories based on the size of fixed assets in investment:
  - Small industries: below NRs 10 crore (NRs 100 million)
  - Medium industries: from NRs 10 to 25 crore (NRs 100 to 250 million)
  - Larges industries: above NRs 25 crore (NRs 250 million)
- Provision for tax incentives on Pollution Reduction and Control, Energy Efficiency Improvement and Entrepreneurship Development, Research & Development and Technology Innovation activities:
  - Permission shall be granted for a reduction of up to 50 percent from the taxable income for the investment on process or equipment, which has the objective of reducing or controlling pollution or which may have minimum effect on the environment through recycling of wastes, or reuse of recycled products. Such remission may be deducted on lump sum or installment basis within a period of three years.
  - Expenses on tools and equipment that helps on improving energy efficiency can be deducted from the taxable income.
- Permission shall be granted for a reduction of up to 50 percent from the taxable income for the investment on entrepreneurship development, research & development and technology innovation activities. Such remission may be deducted on lump sum or installment basis within a period of three years.

### 3.1.2 Land Use Policy, 2069

On 4th Baisakh of 2069, the Government of Nepal approved the National Land Use Policy, 2069 (2012). It has intended to manage land use according to land use zoning policy of the Government of Nepal and outlined six zones as Agriculture area, Residential area, Commercial area, Industrial area, Forest area and Public use area. The policy has defined the respective zones as per the land characteristics, capability and requirement of the lands. Further, for the effective implementation of land use zones in the country, the National Land Use Policy, 2069 has clearly directed for an institutional setup of Land Use Council at the top to the District level and Municipality/ VDC level at the bottom. It has added further importance to the National
Land Use Project (NLUP) on preparation of VDC level maps and database. However, based on the scenario developed after the major earthquake of 12th Baisak, 2072, the Government of Nepal has redirected for possible amendment on the existing Land Use Policy, 2069 which possibly may also emphasize the safe and secure settlement along with environmental protection and protection of food security.

Based on the Policy, a draft Land Use Bill has been developed by the Ministry of Land Reforms and Management and is now under discussion among the concerned government agencies. It has yet to receive the Cabinet approval before it will be submitted to the Parliament for its approval, which will likely take considerable time owing to the long procedural steps of legislation to be followed including a clause-wise deliberation in the Legislation Committee.

**National Land Use Project**

The Ministry of Land Reform and Management of Government of Nepal established the National Land Use Project (NLUP) in 2057/058 fiscal year to generate necessary databases on land resources of the country, in realization of importance of proper land management for balancing all-round development in the country.

The objectives of the National Land Use Project are as follows:

- Minimize the ratio amongst the different land use sectors for maintaining the balanced land use from the point of view of population, environment and sustainable development; and classify the land for agriculture, forest, pasture, settlement, urban development, industrial areas, etc.
- Identify and classify the sectors based on geographical characteristic, land capability and soil quality, which are comparatively more beneficial for arable land for agricultural crop production and the areas for income generation such as fruits, cash crops and herbs production areas.
- Identify and zoning the land for housing, urbanizing, industrialization and other non-agricultural purposes in the existing municipalities and urban oriented rural areas as well as balance the environment and sustain the system by preserving and developing water, forest and living treasure.
- Identify the main settlements, which are in transition zones and develop such areas in a planned and environmentally justifiable way.

The scope of the project involves works at District level and Municipality/ Village Development Committee Level.

The works at district level are carried out at the scale of 1:50,000 and include:

- Update of the existing Land Resources Maps
- Preparation of Land Zoning Data
- Preparation of Land Use Data Base
- Preparation of Profile

The works at the Municipality/ VDC level are carried out at the scale of 1:10,000 and include:

- Preparation of present Land Use Data
- Preparation of Land Zoning Data
- Preparation of Soil Map
- Preparation of Land Capability Data
- Preparation of Profile

In the first phase, the National Land Use Project had initiated several projects at district level and prepared Land Resources Maps and Databases at 1:50,000 scale for the whole Nepal. It had also prepared same kinds of maps and databases for Kirtipur, Lekhnath, Madhyapur Thimi and Bhaktapur municipalities at larger scales of 1:10,000. Finally, NLUP was mandated to prepare land resources maps of VDCs of Nepal for local level planning through outsourcing modality. Upto fiscal year 2070/071, NLUP has completed preparation of land resource maps and database for 28 VDCs of Chitwan district, 51 VDCs of Nawalparasi district, 96 VDCs of Bara district, 12 VDCs of Jhapa district, 7 VDCs of Banke district, 24 VDCs of Kailali district, 12 VDCs of Kathmandu district, 22 VDCs of Lalitpur district, and one VDC each for Kavre and Tanahu district. These digital databases includes VDC level present land use, soil, land capability, land use zoning, cadastral layers and VDC profile with bio-physical and socio-economic database.

3.1.3 Environment Protection Act, 2053 and Environment Protection Rules, 2054

The Environment Protection Act, 2053 (1996) was enacted to make legal provisions for maintaining clean and healthy environment by minimizing, as far as possible, adverse impacts likely to be caused from environmental degradation on human beings, wildlife, plants, nature and physical objects, and for protecting the environment with proper use and management of natural resources, taking into consideration the sustainable development that could be achieved from the inseparable inter-relationship between the economic development and environment protection.

The Environment Protection Rules, 2054 (1997) was formulated to exercise the power conferred on by Section 24 of the Environment Protection Act, 1996 in order to protect environment with proper use and management of natural resources, taking into consideration the sustainable development that could be achieved from the inseparable inter-relationship between the economic development and environment protection.

Provision for IEE and EIA are articulated in the Environment Protection Rules, 2054. The brick industries having annual production capacity of 20 million bricks are required to undergo IEE, and those with annual production capacity of more than 20 million bricks are required to undergo EIA during the registration process.

The scope for IEE and EIA including the Submission for Approval, Approval Process and Environmental examination and Maintenance are also articulated in the Rules. The Rules has also articulated provisions for obtaining provisional or permanent pollution control certificate. Brick industries are classified as an industry requiring the certificate of pollution control.

Provisions relating to provisional or permanent pollution control certificate:
All industries as referred to in Schedule-7 which are currently in operation, shall apply within 90 days from the date of commencement of these Rules and the industries which were registered prior to the commencement of these Rules but are not in operation or the industries which shall be registered after the commencement of these Rules shall apply within the 60 days from the date of beginning of production to the concerned body mentioning their detailed particular to obtain the provisional pollution control certificate.

### 3.1.4 Labor Act, 2048 and Labor Rules, 2050

The Labor Act, 2048 (1992) and the First Amendment 2054 was enacted by the Government of Nepal to make provisions for the rights, interests, facilities and safety of workers and employees working in enterprises of various sectors. The Act dictates about employment and security of service of workers, working hours, remuneration, health and safety, welfare provision, conduct and punishments, settlement of labor disputes, etc.

#### Provisions of Labor Act relevant to brick kilns:

- Minors and females may be engaged in the works normally between six o’clock in the morning till six o’clock in the evening, except in the prescribed conditions. *(Minor means a person who has attained the age of sixteen years but has not completed the age of eighteen years.)*
- The workers or employees of a seasonal enterprise shall not be deemed to be on reserve during off-season period. The beginning and closure of operation of seasonal enterprise shall be informed to the Labor Office.
- The permanent worker or employee shall have to be paid with at least twenty five percent of his/her remuneration as retaining allowance for the period of closure of a seasonal enterprise during off-season.
- Where any worker or employee is engaged to work for more than eight hours in a day or forty eight hours in a week, he/she shall be paid overtime wages at the rate of one and one-half time of his/her ordinary rate of wages. Provided that, no worker or employee shall be compelled to work overtime.
- No worker or employee shall be engaged in the works of lifting, loading or transporting any load likely to cause physical injury or harm to the health.
- Where fifty or more female workers and employees are engaged in the work, the Proprietor of the Enterprise shall have to make provisions of a healthy room for the use of children of such female workers and employees.

In exercise of the powers conferred on by Section 86 of the Labor Act, 2048 (1992), Government of Nepal framed Labor Rules, 2050 (1993). The Rules include provisions for the security of profession and service; remuneration and welfare provision; health, cleanliness and safety; and formation of Central Labor Advisory Committee and its authority.

#### Some provisions of Labor Rules applicable to brick kilns:
• In case a worker or employee is injured while doing a work assigned by the enterprise, the whole amount incurred on his/her treatment, shall be paid by the proprietor, as compensation, to such worker or employee on the recommendation of the medical practitioner recognized by the Government of Nepal.

• In case a worker or employee is grievously hurt leading to physical disability while doing the works designated by the enterprise, then such a worker or employee shall be paid by the proprietor a lump-sum amount equivalent to his/her five years’ remuneration at the rate of his/her current remuneration, if the disability of the worker or employee is of hundred percent, which is to be determined on the basis of percentage of disability.

• If any worker or employee dies immediately or during treatment as a result of an accident while doing the works designated by the enterprise, compensation equivalent to the amount of three years of remuneration of the deceased shall be provided by the proprietor, in lump to the nearest heir of the deceased worker or employee.

• Workers shall not be allowed to lift or move or carry load exceeding the following limit:
  - (a) Adult male - 55 kg
  - (b) Adult female - 45 kg
  - (c) Minor male (16-18 years) - 25 kg
  - (d) Minor female (16-18 years) - 20 kg.
  - (e) Minor male and female (14-16 years) - 15 kg

• No minor, who has not attained the age of sixteen years, shall be engaged in the works leading to adverse effect in health.

3.1.5 Child Labor (Prohibition and Regulation) Act, 2056, and Child Labor (Prohibition and Regulation) Rules, 2062

The Child Labour (Prohibition and Regulation) Act was enacted by the Government of Nepal in 2056 (2000) in order to prohibit engaging the children in factories, mines or similar risky activities and to make necessary provisions with regard to their health, security, services and facilities while engaging them in other activities.

The Child Labor Prohibition and Regulation Rules were formulated by the Government of Nepal in 2062 (2006) to exercise the powers conferred on by the Child Labor (Prohibition and Regulation) Act, 2056 (2000). These Rules dictate about certificate of eligibility for employing a child; remuneration, allowances and facilities given to child workers; provisions relating to health and security; and, formation of Child Labor Elimination Committee.

Some provisions of the Act relevant to brick kilns:
• No child having not attained the age of 14 years shall be engaged in works as a laborer.
• No child shall be engaged in works as a laborer against his/her will by way of persuasion, misrepresentation or by subjecting him/her to any influence or fear
or threat or coercion or by any other means. (Child means a minor not having completed the age of sixteen years.)

- While giving approval to engage a child in work, the labor office may impose appropriate conditions with the objective of developing skills and qualifications of the child or providing education to the child, and the enterprise shall have to follow it.
- The Labor Office may depute an employee from time to time to inspect an enterprise engaging children.
- Whoever engages any child having not attained the age of 14 years in any work as a laborer, shall be liable to a punishment of imprisonment of three months in maximum or a fine of NRs. 10,000/- in maximum or the both.
- Whoever engages a child in works as a laborer against his/her will, shall be liable to a punishment of an imprisonment of one year in maximum or a fine of fifty thousand rupees in maximum or the both.

### 3.1.6 National Ambient Air Quality Standards, 2069

Following parameters under the National Ambient Air Quality Standard, 2012 (the first amendment) have been promulgated by the Ministry of Environment using authority granted by the Rule 15 of Environment Protection Regulations (2054), through a notification in Nepal Gazette, section 62 published in 2069 (2012).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Units</th>
<th>Average Timing</th>
<th>National Standards</th>
<th>WHO Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSP (Total Suspended Particulates)</td>
<td>µg/m³</td>
<td>Annual</td>
<td>-</td>
<td>230</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24-hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PM₁₀</td>
<td>µg/m³</td>
<td>Annual</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24-hours</td>
<td>120</td>
<td>50</td>
</tr>
<tr>
<td>Sulphur Dioxide</td>
<td>µg/m³</td>
<td>Annual</td>
<td>70</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24-hours</td>
<td>80</td>
<td>-</td>
</tr>
<tr>
<td>Nitrogen Dioxide</td>
<td>µg/m³</td>
<td>Annual</td>
<td>40</td>
<td>39.48</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24-hours</td>
<td>80</td>
<td>-</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>µg/m³</td>
<td>8 hrs</td>
<td>10,000</td>
<td>10,305</td>
</tr>
<tr>
<td>Lead</td>
<td>µg/m³</td>
<td>Annual</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Benzene</td>
<td>µg/m³</td>
<td>Annual</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>PM₂·₅</td>
<td>µg/m³</td>
<td>24-hours</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>Ozone</td>
<td>µg/m³</td>
<td>8-hours</td>
<td>157</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Locations</th>
<th>Limitations (Decibels)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day</td>
</tr>
<tr>
<td>Industrial Area</td>
<td>75</td>
</tr>
<tr>
<td>Commercial Area</td>
<td>65</td>
</tr>
<tr>
<td>Rural Area</td>
<td>45</td>
</tr>
<tr>
<td>Urban Area</td>
<td>55</td>
</tr>
<tr>
<td>Mishrit Awas Chettra</td>
<td>63</td>
</tr>
<tr>
<td>Shanta Chettra</td>
<td>50</td>
</tr>
</tbody>
</table>

### 3.1.7 Value Added Tax Act, 2052, and Value Added Tax Rules, 2053

The Government of Nepal enacted the VAT Act, 2052 (1995) for increasing revenue mobilization by making effective the process of collecting revenues required for the economic development of the country, to impose a value added tax on all transactions including the sale, distribution, delivery, importation, exportation of goods or services and to collect revenues effectively by regulating the process of collection. The Act was later amended by Financial Act, 2068 (2011), and incorporates about imposition of value added tax on goods and services, rate of tax, registration, tax payment and collection, tax exemption, tax inspection and audit, interest and penalties, etc.

The Government of Nepal framed Value Added Tax Rules in 2053 (1996) in exercise of the powers conferred by Section 41 of the Value Added Tax Act, 2052. The VAT Rules have been amended since then and the latest amendment is made in 2062 (2005). The VAT Rules dictate about registration process, tax invoice and market price, tax return and collection, tax assessment, provisions for tax deduction and refund, provisions relating to import and export, and, provisions relating to withholding, auctioning off and searching of property.

### Some provisions of VAT Act relevant to brick kilns:
- The rate of tax to be levied pursuant to this Act shall be in single rate of 13 percent.
- Every person wishing to engage into a transaction shall apply to a tax office in the prescribed form for registration, before beginning to engage in such transactions.
- A taxpayer shall have to pay the tax for each month within twenty-five days of the close of the month.
- If a taxpayer does not pay the tax within the time limit, an extra charge of Ten percent per annum shall be imposed on the amount of tax due and outstanding.

### 3.1.8 Registration Process of Brick Industry

The detailed registration process as per the previous Industrial Enterprise Act, 2049 is discussed below (Refer Diagram 1 for details).
The detailed registration process based on new Industrial Enterprise Act, 2073 is not yet available.

The registration of brick kilns is done in the Department of Cottage and Small Industries or any district level office under the Department or any district office under the Cottage and Small Industries Development Board. Brick industries are not required to receive permission for their diversification and modernization. Registration includes nature of the industry, classification of the industry, physical location of the industry, machinery to be employed by the industry, raw materials, auxiliary raw materials, chemicals, packaging goods and name of the industrialist. The brick kilns having annual production capacity up to 20 million bricks are required to undergo IEE, and those with annual production capacity of more than 20 million bricks are required to undergo EIA, during the registration process.

For IEE, the entrepreneur needs to publish a notice in the concerned Office of the Village Development Committee or Municipality, Office of the District Development committee, schools, hospitals and health posts requesting the VDC or Municipality, District Development Committee and concerned individuals or institutions to offer their written opinions and suggestions within fifteen days with regard to the possible impact of the implementation of the proposal on the environment where the proposal is to be implemented. The 15 days’ public notice should also be published in a national level daily newspaper.

For registration of a brick kiln, the brick kiln entrepreneur has to submit an application to district office of the Department of Cottage and Small Scale Industries (DCSI). All the documents related to application, along with recommendations are sent from district offices to DCSI. The documents are sent to Industrial Promotion Section of DCSI for technical opinions for approval of work schedule (ToR). After approval of work schedule, the applicant is informed to submit IEE report, and the report is again sent to Industrial Promotion Section for technical opinions on the report. If positive opinions are received or after recommending some changes if necessary, the IEE Committee is made to decide on IEE report. After the IEE Committee gives approval to the IEE application or recommends some changes for approval, the notice of approval of IEE is given to the applicant and the documents are sent to the concerned district office of DCSI. The information of approval/ disapproval of IEE shall be given within 21 days from the date of submission of application.

Upon registration of a brick kiln, a license or registration certificate is provided to the entrepreneur. A registration certificate contains matters relating to the facilities and concessions to be enjoyed by the industry and the prescribed terms and conditions to be observed by the industry.

*Diagram 1 – Institutional Arrangement for a Brick Kiln Registration (based on previous Act)*
New Provision for Registration of Industries

The Department of Cottage and Small Industries has issued the letter on 29\textsuperscript{th} June 2017 that all the micro, small and cottage industries are now required to register with the Industry Development Section of the local government (Municipality and Gaon Palika).

This new provision has been effective in 27 districts and this replaces a need for industries to register earlier with respective office of OCSI and CSIDB. The sample TOR for the officials of the Industry Development Section (deputed officials from previous DCSI and OCSI offices) is also attached with the letter.

3.1.9 Standard on Chimney Height and Emission for Brick Kiln Industry, 2064

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Type of Kiln</th>
<th>Suspended Particulate Matter (maximum limit)</th>
<th>Height of Chimney (minimum limit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bull’s Trench Kiln, Forced Draught (Fixed Chimney)</td>
<td>600 mg/Nm³</td>
<td>17 meter</td>
</tr>
<tr>
<td>2.</td>
<td>Bull’s Trench Kiln, Natural Draught (Fixed Chimney)</td>
<td>700 mg/Nm³</td>
<td>30 meter</td>
</tr>
<tr>
<td>3.</td>
<td>Vertical Shaft Brick Kiln (VSBK)</td>
<td>400 mg/Nm³</td>
<td>15 meter</td>
</tr>
</tbody>
</table>

Notes:

i. Value of suspended particulate matter shall be calculated considering reference oxygen concentration as 10%.

ii. Chimney height shall be measured from ground level.


Ministry of Livestock Development has recently issued the Animal Welfare Directive, 2073 pursuant to Rule 22 (A) of the Animal Health and Livestock Services Regulation, 2056 and under authority of the Animal Health and Livestock Services Act, 2055 to ensure welfare and prevent cruelty of animals for management, development and quality purposes.

This directive is limited to pack animal and traction animals used as means of transportation or means of transporting goods, animals in commercial agricultural, industrial or occupation with a business and trade motive where weight is to be carried or pulled by the animals. It encompasses provision regarding working hours, weight of load, provision of minimum requirements regarding food, shelter, security, health and normal behaviors and prohibits cruel treatment towards working animals by ensuring welfare involved in labor works.

Some provisions of directive relevant to brick kilns:

- Animals shall be put to work only after due care.
- The working animals shall not be made to work in inclement climatic conditions and more than 8 hours per day.
- Workload shall be determined in accordance to body weight, working animal’s capacity, temperature or inclement weather, shows symptoms of inability to carry weight or work.
- Working animals should be provided appropriate shelter which should be clean and dry, it should have sufficient space to sit, stand and turn around. Female animals shall not be kept (or tied) next to male animals and should be protected from heat stress and cold stress.
- Working animals must be provided a balanced, nutritious and adequate diet.
- Animals should be properly handled during rest, should be provided proper treatment practices and disease and injuries must be properly managed.
- Animals incapable of working and old animals must be provided with necessary care by the animal owner.
- Defines behaviors that construct and non-construct cruelty towards animals.

### 3.2 In pipeline

Various policy measures are in pipeline or in consideration that will directly or indirectly affect registration and operation of brick industries in Nepal. Some key policies are described below:

#### 3.2.1 Land Use Bill

Based on the Policy, a draft Land Use Bill has been developed by the Ministry of Land Reforms and Management and is now under discussion among the concerned government agencies. It has yet to receive the Cabinet approval before it will be submitted to the Parliament for its approval, which will likely take considerable time owing to the long procedural steps of legislation to be followed including a clause-wise deliberation in the Legislation Committee.

#### 3.2.2 Standard on Chimney Height and Emission for Brick Kiln Industry

MoPE is considering updating and revising national standards to reduce emission load from brick kilns as well as to align with the emission standard from neighboring countries. In light of recent amendment of emission standards in India and China, and after monitoring ten brick kilns in Kathmandu valley, the consultant has recommended the following emission standards to the Ministry.

**Recommended New Brick Kiln Emission Standards**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Bull’s Trench Kilns (BTK) and Hoffmann Kilns</td>
<td></td>
</tr>
<tr>
<td>Particulate Matter (for natural draft kilns)</td>
<td>500mg/Nm3</td>
</tr>
<tr>
<td>Particulate Matter (for induced draft kilns)</td>
<td>250mg/Nm3</td>
</tr>
<tr>
<td>Stack Height (for natural draft kilns)</td>
<td>30 m</td>
</tr>
<tr>
<td>Stack Height (for induced draft kilns)</td>
<td>24 m</td>
</tr>
</tbody>
</table>

**Notes:**
1. Emission sample shall represent both charging and non-charging conditions
2. Particulate Matter (PM) results to be normalized at 4% CO₂ as below
   
   \[
   PM (normalized) = PM \times \frac{4\%}{measured \, CO₂\%}
   \]
3. The existing brick kilns shall increase the stack height according to these new standards within two years.
4. These emission standards shall be met by good fuel charging and operating practices/installing gravity setting chamber.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ii) Vertical Shaft Kilns (VSBK)</td>
<td></td>
</tr>
<tr>
<td>Particulate Matter (Sum of one Shaft)</td>
<td>250 mg/Nm3</td>
</tr>
<tr>
<td>Stack Height</td>
<td>11 m</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>(iii) Hybrid Hoffmann Kiln (HHK)</td>
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<tr>
<td>Particulate Matter</td>
<td>200 mg/Nm3</td>
</tr>
<tr>
<td>Stack Height</td>
<td>7 m</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>(iv) Tunnel Kiln</td>
<td></td>
</tr>
<tr>
<td>Particulate Matter</td>
<td>100 mg/Nm3</td>
</tr>
</tbody>
</table>

*FNBI and MinErgy*
3.2.3 Labor Act

The legislation committee of the Parliament has approved the new Draft Labor Act. Some of the clauses having the provisions that are specifically important and relevant to the brick sector in the new Labor Act are enlisted below.

- Prohibition for bonded labor (clause 4) – “No employee should be engaged in any form of bonded labor directly or indirectly”
- Specifying working hours (clause 32) – “The starting and ending time of work for a worker shall be as specified in the employment agreement and it shall be as determined by the employer”
- Payment of remuneration (clause 35) – “The employer should pay the worker as specified in the employment contract – the time-lapse of payment of remuneration shall not exceed more than one month.”
- Medical and life insurance (clause 54 & 55) – The employer should insure the worker for medical and accident with cost sharing for the premium by both parties.
- Supply of workers (chapter 11) – The provisions under this chapter regulates the company or individual that supply workers.
- Occupational safety and health (chapter 12) – The provisions under this chapter outlines the clauses on different OSH hazards (gas, chemical, physical, biological), roles and responsibilities of employer and worker.
- Provision relating to seasonal organization (clause 89) – The clause defines seasonal organization (operate below 180 days a year) and requires to pay 25% of worker’s salary during off-season.

3.2.4 Minimum Occupational Health and Safety (OHS) Standards for Brick Industry Workers

The Department of Labor is in the process of enacting minimum OHS standards for brick kiln workers in a bid to minimize adverse health effects and improve work safety of the workers. The standards are derived mainly based on Labour Act, 2048, Labour Rules, 2050, Child Labour (Prohibition and Regulation) Act, 2056 and Child Labour (Prohibition and Regulation) Rules, 2062. The various aspects covered by the OHS standards are:

- Standards for working hours of adult and child workers
- Standards for drinking water supply to the workers
- Standards for shelter management and toilets
- Standards for provision of first aid service- medicines, kits
- Standards for healthy rooms for care of children of workers
- Standards for toilets/ bathrooms and canteens for the workers
• Education and vocational training for children of workers and child workers
• Standards for health and safety - carry load limit, work safety, protection from dust, temperature regulation of workplace, sound control, protection from hazardous machines and equipment, safety from water sources such as ponds and wells, personal protective equipment (PPE), compensation in case of injury, etc.
• Abolishment of child labor and safety of child and young workers
• Standards for minimum remuneration for adult and child workers

3.2.5 Child Labor Inspection and Monitoring (CLIM) Guideline

Child labor inspection and monitoring guideline has been prepared with an objective to eliminate child labor and to make child labor inspection and monitoring process easy, simple and effective. Child labor Inspection and Monitoring Guideline is based on Good Governance Act 2064, Nepal’s Constitution 2072, Child Labour (Prohibition and Regulation) Act 2056, Child Labor Prohibition and Regulation Rules 2062 and international treaty signed by Nepal government to eliminate child labor. It includes provisions, mechanism and procedures for child labor inspection and monitoring. The Guideline also includes roles and responsibilities of different actors involved in the inspection and monitoring along with required forms and formats. It has also provisioned for ways to manage required resources.

4 Policy Issues and Recommendations

Issues related with policies were collected through bilateral discussions with government stakeholders, consultation meetings with brick entrepreneurs, consultation meetings with sector experts and review of existing policy documents. Based on the issues, the strategies and policy actions are being recommended. The issues, strategies and recommendations are clustered into four groups as follows:

• Industry Promotion
• Environment and Technology
• Labor Conditions
• Monitoring and Enforcement

4.1 Industry Promotion

4.1.1 Issues – Industry Promotion

4.1.1.1 Kiln Registration and Operation

Multiple government agencies (VDC, DFO, OCSI/CSIDB, DDC) are engaged during registration process. Engagement of different government agencies has contributed to procedural delays in issuing permission/recommendations from government authorities thereby making the registration process lengthy and cumbersome.

On the other hand, many established brick industries are facing challenges due to rapid and haphazard expansion of human settlements. Many brick entrepreneurs claim that human settlements are coming closer to brick industry not the vice versa. The expanding settlement is shrinking land availability for brick making and creating
other social disturbances in brick kiln operation. But in most cases, only brick industries are penalized if there is any conflict between industry and settlement.

4.1.1.2  Multiple Taxation
There is lack of clear and uniform taxation policy for brick kilns. Brick kilns have to pay multiple taxes to different government agencies. Some of those taxes include ‘itta nikasi kar’ (inter-district brick export), ‘sthaniya sanchalan kar’ (local administration), ‘mato nikasi kar’ (soil export), ‘samajik surkshya kar’ (social security), ‘itta bikri kar’ (brick sales), ‘ghar/jagga bhada kar’ (house/land rent) in addition to VAT and income tax. However, the taxation system is different in different districts. There is no clear provision or guideline for taxation. Also, the other issue is that many non-registered brick kilns are in operations that do not fall into tax regime.

4.1.1.3  Incentives for Change
Government has not been able to take actions against illegal kilns whereas kilns that are complying with policies are more scrutinized and are seldom rewarded. The government, in some cases, has provisioned incentives to reward/encourage good practices. However, in most of those cases, incentives are inaccessible or not delivered due to lack of incentive delivery mechanism.

4.1.2  Strategy and Policy Recommendation – Industry Promotion
Develop a brick sector-specific “Guideline” consolidating the provisions drawn from all relevant policies (Acts, Rules and Regulations). Institute a procedure to periodically review and refine the “Guideline” to be aligned with the practical context.

4.1.2.1  Kiln Registration and Operation
- Initiate online registration of brick kilns.
- Develop dedicated brick manufacturing zones/clusters all over Nepal. Include dedicated brick zones/clusters in land use maps through incorporation of provisions in land use act. Allow new brick industries to operate only within the dedicated brick zones/clusters, once the provision is in place. Make provision of simplified IEE/EIA through amendments of EPA and EPR for the brick zones and exclude requirement of IEE/EIA for individual kilns willing to operate within the zone. Instead, make provision of Environment, Social and Health Management Plan (ESHMP) for individual kiln.
- Make necessary legal arrangement to insert provisions to immediately close down non-registered brick kilns. Assure undisrupted operation of registered brick kilns, unless there will be a non-compliance to the provision of laws. If there is need for closing them down despite their compliance with law, they should be provided with the compensation that will be mutually agreed upon between investor and the government.

4.1.2.2  Multiple Taxation
- Collect VAT for central government and apply consolidated taxation at sub-national government. It will be appropriate to consult with concerned stakeholders
and reach a consensual understanding while determining consolidated taxation for brick industries.

### 4.1.2.3 Incentives for Change

- Develop bylaws and guidelines for delivery of incentive mechanism provisioned in Industrial Enterprise Act 2073. Implement the compliance monitoring and enforcement mechanism by allocating both fiscal and non-fiscal resources (such as budget and capacity building) for government institutions, and link the compliance report to the fiscal (e.g. tax rebate) and non-fiscal incentives (e.g. training) for industries.

### 4.2 Environment and Technology

#### 4.2.1 Issues – Environment and Technology

##### 4.2.1.1 Emission Standard

Emission of particulate matter and other harmful gaseous pollutants are one of the major concerns associated with brick kilns. To minimize the emission of Particulate Matter (PM) and its negative impact to locals residing close to brick industry, Nepal government promulgated standards for chimney height and emission for brick kilns in 2008. However, monitoring and enforcement of these standards have been very weak. Monitoring of brick kilns has been merely a routine activity, limited within Kathmandu Valley. Results of monitoring are neither shared with brick owners nor are a follow up action plan prepared for improvement.

Many environmentalists and brick experts claim that the existing standards are not stringent enough to curtail pollution from brick kilns. They have been pressing for stronger and greater protection measures. In line with this concern, Nepal government is considering new standards for brick firing technologies, which are tighter than the existing ones. However, many brick kiln entrepreneurs are demanding for proper baseline study before promulgating new standards. They claim that neither the capacity of brick industries has been assessed nor has the required support mechanism been placed to achieve proposed standards.

##### 4.2.1.2 Technology Roadmap and Incentives for Cleaner Technologies

There is neither long-term roadmap nor are there clear policy for technology promotion in Nepal. Clamps, the most traditional technology, are not required to register for establishment. So with the increasing brick demand, many new clamps (*Bhuse Bhatta*) were established in recent years. Since these kilns were not regularized, there was no legal and tax implications for them. So the mainstream brick entrepreneurs were facing challenges to compete with those non-registered kilns. Nepal government now has banned operation of these *Bhuse Bhatta* after a long deliberation. Similarly, there are rumors to ban the operation of brick kilns within Kathmandu Valley. The entrepreneurs are demanding a clear roadmap on operation of brick kilns within Kathmandu Valley. An ad hoc decision to ban brick kilns within the valley will risk millions of rupees invested in the sector.
The emission standard for brick industries is technology-specific. However, there are fiscal and non-fiscal incentives for technologies that emit low level of emissions. All brick industries, irrespective of better performing, need to follow the same registration process, pay same level of tax and operate under the same policy framework. This has discouraged entrepreneurs to adopt or invest in cleaner technologies.

4.2.1.3 Coal Quality

Coal for firing bricks is imported from India and other countries. There is no prescribed standard of coal for firing bricks. Hence, quality of coal is never officially checked before importing. Poor quality of imported coal can contribute in high sulfur and PM emissions.

4.2.1.4 Clay Availability and Brick Size

Rapid expansion of human settlement close to brick kilns is diminishing land availability for brick kilns. Limited availability of land and thus the shortage of good quality clay is one of the major challenges for brick kilns. On the other hand, use of topsoil for making bricks are degrading agricultural land and thus decreasing the productivity.

There is no uniformity of brick size in Nepal. Bricks in Terai are bigger in size where as those within Kathmandu Valley and hilly regions are smaller in size. A general perception among customers is that thicker bricks are stronger and cost-effective, and as a result, there is a growing tendency to produce thicker bricks to attract customers. This has direct implications on energy consumption and environment performance of brick kilns.

4.2.2 Strategy and Policy Recommendations – Environment and Technology

4.2.2.1 Emission Standard

- Prepare uniform emission standard for all brick firing technologies to replace technology specific emission standard. Define time bound emission targets for brick kilns such that it provides a direction as well as sufficient time for future improvement.
- Revise existing emission standard to reduce emission load from brick kilns. Ensure that the revised emission standard is implementable as well as achievable. It is recommended to revise emission (SPM) standard for brick kilns as follows:

<table>
<thead>
<tr>
<th>Proposed Standard</th>
<th>Time Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>450 mg/m³</td>
<td>With immediate effect (nation-wide)</td>
</tr>
<tr>
<td>350 mg/m³</td>
<td>With immediate effect for sensitive locations (Kathmandu Valley and Lumbini)</td>
</tr>
<tr>
<td>250 mg/m³</td>
<td>By 2022</td>
</tr>
<tr>
<td>100 mg/m³</td>
<td>By 2030</td>
</tr>
</tbody>
</table>
• Prepare a standardized monitoring protocol to measure emissions from brick kilns. The protocol should take into account factors such as monitoring methodology, standardization of equipment, duration of monitoring, appropriate timing, etc. Also, sensitize and capacitate the government, non-government and private monitoring institutes to enable them to take measurement as prescribed in the protocol.
• Prepare a guideline to take actions against those kilns that do not achieve the emission standard. The guideline should provide a clear timeframe for improvement. If the kiln does not meet the standard within the time frame, government should take stronger measures against them.

4.2.2.2 Technology Roadmap and Incentives for Cleaner Technologies

• Phase out energy inefficient and polluting technologies to reduce emission and improve energy efficiency of brick kilns. It is recommended to stop registration of fixed chimney BTKs with straight line firing with immediate effect. Also, all operating fixed chimney BTK with straight line firing should be converted to zigzag firing by 2022.
• For rural regions, operating bigger brick firing technologies may not be feasible. So the government should define the regions and provide permission to operate intermittent updraft or downdraft kilns in those areas. However, operation of those intermittent updraft or downdraft kilns should be regularized and only kilns with permanent structure and stack should be permitted for operation.
• Ban operation of non-registered brick kilns with immediate effect. Allow legally operating brick kilns to convert into cleaner technologies in the same location without administrative hassles.
• Provide preferential registration process and assist in accessing soft loan or revenue-based incentives to those entrepreneurs willing to adopt modern technologies (such as Hybrid-Hoffman and Tunnel Kiln) after assessing the performances in context of Nepal.
• Carry out periodic energy audit of different brick firing technologies and recommend policy measures to improve the performance.
• Link with educational institutes to carry out research activities that is necessary for brick industry. This will benefit industry, students and educational sector.

4.2.2.3 Coal Quality

• Identify alternative resources and promote production of alternative fuel to promote as substitute in brick industry.
• Encourage brick entrepreneurs to apply alternative fuel by providing financial incentives (tax subsidy) to entrepreneurs applying more than 25% of alternative fuel for firing bricks.
• Assess availability of alternative resources and prepare a long term plan with clear time line and target to substitute coal in brick kilns.
• Ban on import of pet coke with immediate effect as pet coke has high sulfur content compared to coal.
4.2.2.4  **Clay Availability and Brick Size**

- Promote production and application of hollow and perforated bricks on a gradual basis by creating enabling environment.
- Develop standards for hollow and perforated bricks. Make preferential provisions in public procurement policies to use hollow/perforated bricks in public buildings.
- Create demand for hollow and perforated bricks through awareness and promotion among the consumers.
- Support access to finance to buy machineries for brick entrepreneurs willing to produce hollow/perforated bricks.
- Provide necessary trainings to brick entrepreneurs as well as masons for production and application of hollow/perforated brick.
- Review existing standards for solid bricks and make mandatory provision to use standard size brick in public construction.

4.3  **Labor Conditions**

4.3.1  **Issues – Labor Conditions**

4.3.1.1  **Workplace and Employment Conditions**

- The brick sector, generally, adopts informal operating practices, and brick kilns are not considered as preferred employment opportunity despite being one of the largest employment-generating industries for poorer communities. Increasing out-country migration has additionally contributed to the labor shortage in the sector. The basic workplace facilities such as drinking water, toilets, first aid as well as occupational hazard preventive measures, etc. are not in place mainly due to temporary mindset of kiln operation. The enforcement and compliance monitoring of regulatory provisions in relation to workplace and employment conditions is not effective. Although there are policies (Act and Regulations) in place, these provisions are not yet reflected in the guideline for implementation. The brick kiln establishment guideline and respective IEE (promulgated by DCSI) do not mandatorily require investors to submit their plans for implementation of such provisions. Hence, it is utmost important to define and include the provisions of workplace and employment conditions either in the DCSI Guideline or IEE format; and to approve the proposed Minimum OHS Standards for the effective implementation of the relevant policies (Acts and Laws). The Minimum OHS Standards has been developed and submitted for approval by the Department of Labor. The consultation meetings, specifically by private stakeholders, have raised doubts about the feasibility for full compliance of following clauses in the proposed Minimum OHS Standards.
  - **Maximum permissible dust particles** in working space (10 mg/m³) and canteen/relaxing space (2 mg/m³) – this proposed standard is not aligned with any of the parameters of the national ambient air quality standards.
  - The **heat exposure limit** in working space is 26.7 to 31.1 Degree Celsius – this standard is not feasible to achieve as brick making includes also firing
process, and often the atmospheric temperature in some parts of the country exceed this limit. There is not yet the heat stress standard in Nepal.

- **Size of shelter (8x10x8 ft)** – The shelter size cannot be standardized as it largely depends on needs of the family as well as climatic conditions; and on the other hand, the shelters are temporary in nature due to seasonal operation.

- **Separate relaxation space** – Since kilns are not operated in a compact area and task-specific space is dedicated, the need for separate relaxation space seems not relevant.

- Although the Labor Law and subsequent Regulations promulgate the clear employment conditions, the practice of wage determination and payment system is ambiguous in absence of proper and transparent documentation. The cyclic advance system coupled with non-transparent documentation mechanism has created a circumstance for bonded-labor situations. Hence, the brick sector in Nepal is seen as highly exploitative industries. In order to clean its image, there is a need for this sector to practice and demonstrate the fair employment conditions.

- Multiple government agencies are involved and there is no coordinated effort for inspection and/or compliance monitoring of labor conditions including that of child labor. The capacity of labor office is limited in terms of numbers and skills to carry out such inspection/compliance monitoring. The results of inspection and/or monitoring are not shared as well as the action plan for future compliance is not developed together with the concerned industry management. And, the further actions are not taken based on the action plan. Hence, the industries do not feel bound to comply with the rules and regulations. In absence of actions against non-compliance and incentives for compliance, all the industries are put in one basket of “exploitative sector”.

4.3.1.2 **Child Labor, Child Protection and Education**

- Enforcement and compliance monitoring of policies related to child labor, protection and development has been limited. Despite the legal restrictions to put children in work, generally different kinds of child labor conditions prevail in brick kilns. Children accompanied by the legal guardians are often used as helpers. Unaccompanied children without legal guardians are seasonally migrating (also cross-border) with friends, relatives or **naikes** making them more vulnerable and susceptible to trafficking. Hence, the sector has also perceived as a vulnerable sector for in-country and cross-border child trafficking.

- One of the reasons for difficulty in identification of unaccompanied children and their repatriation is absence of labor profile record keeping practice in brick kilns. It is reported that the child labor repatriation and rehabilitation guideline has been drafted and submitted for approval but yet it is taking time to get approval. In absence of such approved guideline with clear roles and responsibilities of different government agencies including that of the employers and **Naikes**, the effectiveness of efforts to remove and rehabilitate child labor has been limited and hence having less impact on child labor reduction/eradication. Additionally, a key government agency (District Child Welfare Board) lacks resources for proper repatriation and rehabilitation of the unaccompanied children.
• Although few of the children migrating with parents attend schools, school continuation is usually hampered due to seasonal migration pattern. Few practices are in place to issue school transfer certificates for such children. However, there is no policy provision for issuing such certificates. Such policy provision will likely ensure children’s education as well as put them out of work.

4.3.1.3 Animal Labor

• Large number of working animals (donkeys, mules, horses and other pack animals) are used in brick kilns as brick transporters. These animals face and suffer from severe health and welfare problems caused by poor working conditions and inhuman behavior. These animals are generally under fed, over-worked and made to carry over-load causing serious health problems.
• Animals in brick kilns are managed by handlers, brought from India and are mostly children. Issues of child labor, child trafficking and right for education are closely associated with donkey handlers.

4.3.2 Strategy and Policy Recommendations – Labor Conditions

4.3.2.1 Workplace and Employment Conditions

• Accelerate the approval of the proposed Minimum Standards of occupational health and safety for brick kilns (promulgated by the Department of Labor) after consultation with brick entrepreneurs. Subsequently, revise the Guideline after the approval of the proposed Minimum Standards or based on the already prevailing policies (Acts, Laws and Regulations). Carry out a baseline study and define the Ambient Air Quality Standards for the permissible limit of dust exposure for brick industries. Review and revise heat exposure level, shelter size considering the hazards as well as feasibility and achievable in Nepali brick kiln context.
• Approve new labor law and implement the provisions under the new labor law to ensure workers welfare and safety. Prepare labor regulations and guidelines that would be applicable in brick industries.
• Include the clear indicators of the employment conditions (based on the prevalent policies) and Minimum Standards in the compliance monitoring mechanism (refer to chapter 4.4.2 and diagram-2 in this report for details).

4.3.2.2 Child Labor, Child Protection and Education

• Have a target to consider and achieve zero occurrence of unaccompanied child labor with immediate effect.
• Accelerate approval of the Child Labor Removal, Repatriation and Rehabilitation Regulation and implement with immediate effect.
• Have a uniform age definition of child labor and minor for the Brick Sector in reference to the Labor Act and Child Labor (Prohibition and Regulation) Act.
• Make employers and Naikes accountable for repatriation of unaccompanied children. Make the employment records and profile of workers a mandatory provision in the compliance monitoring system.
• Include representatives of local labor office, DCWB, other relevant government offices and representative of FNBI in the joint monitoring/inspection team while
designing the monitoring and enforcement mechanism (refer to chapter 4.4.2 and diagram-2 in this report for details).

- Draw lessons from the ongoing initiative of the Indo-Nepal child protection alliance to deal with cross-boarder child trafficking. Determine policy action based on the lesson drawn from the initiative.
- Have a target to provide access to education for all accompanied children by 2020. Employ school transfer certificate provision in the relevant education policy for seasonally migrating families.

4.3.2.3 Animal Labor

- Implement the provision of animal welfare directives (under the animal health and livestock service act 2055) in the brick factories. While implementing the directives, consult with concerned stakeholders and reach a consensual understanding.

4.4 Monitoring and Enforcement

4.4.1 Issues – Monitoring and Enforcement

4.4.1.1 Monitoring Mechanism

- One of the major issues that have not motivated the sector to comply or improve towards cleaner and socially responsible business is little or no regular compliance monitoring for the enforcement of policies. On the other hand, monitoring is done and corrective actions are taken only when there is public pressure. Additionally, multiple government agencies such as Ministry of Environment, Ministry of Labor, OCSI, DCWB/CCWB, local bodies – CDO/DDC) are carrying out their independent monitoring activities without coordination. Additionally, neither the action plan is prepared in consultation with the management nor the actions are taken against the inspection results. Hence, these actions have put the pressures on the industries resulting in the resistance to change thus hampering its growth.

4.4.1.2 Monitoring Protocol and Capacity

- Inspection/monitoring of emissions, ambient air quality requires standard scientific methodologies (protocol). Similarly, inspection/monitoring of labor conditions (workplace, employment conditions and child labor) also require uniform and acceptable monitoring protocol. So far, there is no approved protocol both for emissions and labor conditions. In absence of standardized inspection/monitoring protocol, results are in the discretion of the monitoring agency/personnel and achieving varying results and thus creating doubts for acceptance. Often the credibility and legitimacy of monitoring organizations (governmental and non-governmental) and results are questioned creating doubts on overall monitoring requirements. On the other hand, there lacks the capacity along with required resources (financial, human resources and skills) of government agencies for regular inspection and monitoring. One of such examples is that there are limited numbers of labor inspectors and most of them happen to be from engineering background having limited capacity to monitor the labor and employment conditions including the social issues such as child labor. Similarly,
the capacity for emission monitoring requires sensitive equipment with high precision skills, both of which are limited.

### 4.4.1.3 Incentive Linked to Monitoring

- There are few incentives provisioned in policies to reward/encourage good practices. However, in most cases, incentives are inaccessible and/or not delivered due to lack of incentive delivery mechanism.

### 4.4.2 Strategy and Policy Recommendation – Monitoring and Enforcement

#### 4.4.2.1 Monitoring Mechanism Linked to Incentives

- In order for enhancing the effectiveness of policy enforcement, a multi stakeholder joint monitoring mechanism linked to incentives should be in place. Functioning of such mechanism is discussed briefly below and presented in the following figure.
- Formulate and activate, with authority and resources, a joint monitoring committee comprising different relevant government bodies with participation of industry association/FNBI at sub-national level for overall governance of the compliance monitoring system. Prepare (regulation-if absent) and guideline for joint monitoring mechanism. Carry out periodic review of joint monitoring mechanism to ensure well-functioning and effectiveness of the mechanism. In case of non-compliance, make a provision for an industry to prepare and implement a time-bound action plan for full compliance.
- A competent and relevant government institution or government-accredited institutions should be authorized to monitor and issue the compliance report both for environment (emission and ambient air) and labor conditions (including child labor).
- Develop guidelines for accreditation of emission/environment and ambient air monitoring institutes/laboratories. Make provision for issuance of ‘Environmental (emission and ambient air quality) Compliance Report’ by DoE-accredited institutes/laboratories.
- Labor conditions (including child labor compliance) should be monitored, verified and a report to that effect should be issued by competent government authorities. These authorities may authorize/assign specialized non-government or private institutions to monitor, verify and certify ‘Labor Compliance Report’. Ministry of labor, CCWB and Ministry of Women, Children and Social Welfare, should accredit such institutions. Refer and adopt applicable provisions under the proposed child labor inspection and monitoring (CLIM) guideline.
- Such compliance reports (both on environment and labor conditions) can also be used as a verification mechanism to avail/access incentive schemes, provided by the Government such as income tax rebate.
- Include animal welfare as one of the core indicators to monitor and enforce within labor condition.
- Develop capacity at different levels (government institutions as well as non-governmental lab and institutions) to institute compliance monitoring mechanism.
Diagram 2 – Joint Compliance Monitoring Mechanism

**Joint Monitoring Committee**
- Develop guideline for the monitoring mechanism
- Monitor overall functioning of the system
- Arrange for accreditation and certification of institutions/laboratories

- **Department of Environment**
  - Develop guidelines for accreditation and certification of emission monitoring institutes/laboratories

- **Relevant Government Body (OCSI/CSIDB/Municipality)**
  - Avail/access incentives based on compliance reports

- **Department of Labor**
  - Develop guidelines for monitoring and issuance of compliance report

- **Accredited Local Institution**
  - Monitoring and Issuance of “Environmental Compliance Report”

- **Brick Kiln**
  - Development of Time-Bound Action Plan for Compliance (in case of non-compliance based on reports)

- **Compliance Monitoring Reports**

- **Accredited Local Institution**
  - Monitoring and Issuance of “Labor Compliance Report”
4.4.2.2 Monitoring Protocol

- Standardize the inspection/verification protocol for monitoring of emission and labor conditions based on international practices and scientifically accepted procedures.

4.4.2.3 Incentivizing

- Use public procurement policy as instrument for positive change. Include provision for preferential treatment in procurement policy (tender document) to incentivize cleaner brick production meeting all the standards (emission and labor conditions).

5 Regional Good Practices

5.1 India

The Ministry of Environment and Forests of India/State Pollution Control Board in 1999 enacted a regulation that all brick-manufacturing units within a radius of 50 km from any thermal power plant should utilize fly ash, pond ash or bottom ash in optimal proportion for making bricks. The provision is expected to protect topsoil and also assist in safe disposal/utilization of fly ash. The State Pollution Control Board in 2003 has made a regulation for manufacturers of clay bricks or tiles or blocks for use in construction activities within a radius of 100 km from coal or lignite based thermal power plants, to use at least 25% w/w of ash (fly ash, bottom ash or pond ash). In 2008, government even made mandatory provision that all construction agencies within 100km distance from coal or lignite based thermal power plant must only use fly ash based products for construction.

The Ministry of Environment and Forests of India has revised the standard for SPM emission to 250 mg/Nm$^3$ from the previous standards of 750 and 1000 mg/Nm$^3$ for FCBTKs, and has also planned to replace the existing FCBTKs by 2020 with kilns that meet the revised standards for SPM emission. The revised standards has not been yet approved and published in the gazette. In several areas like national capital region where almost 4000 kilns are in operation, Central Pollution Control Board has issued a notification that existing kilns should change over to zigzag or other improved kiln technologies and FCBTK will not be allowed to operate.

5.2 Bangladesh

The Government of Bangladesh on July, 2010 announced a ban on operational FCBTKs and instructed the brick industry to change over to cleaner brick-firing technologies within a period of three years. However, it has been reported that the policy has not been effectively implemented.

The Brick Manufacturing and Brick Kiln Setting Up (control) Law of Bangladesh has imposed a restriction to collect and use soil from agricultural land, hills or hillock as raw material for brick making and enforced that hollow bricks (with at least 50% empty/void) should be produced in modern brick kilns to reduce the use of clay resources as raw materials for brick production.
5.3 Vietnam

The national policy on building materials of Vietnam mainly addresses the loss of agricultural topsoil due to brick making, excessive coal use and CO$_2$ emissions, and the need for better insulation of the buildings for better thermal comfort and energy savings.

The main goals of the policy are:

- Promotion of hollow clay-fired bricks through clean technologies such as tunnel kiln.
- Promotion of non-fired bricks (with emphasis on light-weight bricks, autoclaved aerated concrete blocks, foam concrete, etc.) with an aim to provide 30%-40% non-fired type bricks by 2020.

5.4 China

The Chinese laws and regulation of the brick and tile industry is two main objectives:

- Control the use and production of solid clay bricks
- Promote research and development for production and use of new walling materials

The major steps towards achieving the objectives include:

1999: Banned in use of solid bricks in coastal cities and cities where land was scarce.

2000: Advised to phase out the use of solid clay bricks in coastal areas, and medium and large cities in provinces where per capita arable land is below 0.8 mou (about 534 m$^2$) by 2003. In the first phase, 170 cities were identified for the phasing out the solid clay bricks.

2005: Prohibited the use all types of clay-building products in 170 cities. Set target to limit production of solid bricks 80 billion by 2006 and limit nationwide production of solid bricks under 400 billion by 2010. Also, decided to ban the use of solid bricks in 256 cities additional cities by 2008.

2007: Devised 11th Five-Year Plan for China’s brick and tile industry that aimed to develop new walling materials, conserve land resources, save energy and phase out old technologies.

The 11th Five-Year Plan on Brick and Tile Industry in China

The plan set up targets to:

- Develop new wall materials. In the 11th Five-Year Plan (2005–10), new wall materials were to increase at a rate of not less than 10%; the plan called for development of hollow and heat-insulated wall materials and product improvements to increase energy savings for building.

- Conserve land resources. By 2010, the total production of solid clay bricks was to be controlled at less than 380 billion per year, thus reducing their annual production by 20 billion; the plan called for fired hollow products to reach 210 billion (a 5% rate
of increase per year) and waste-using bricks to reach 230 billion, thereby saving about 170 million t of clay.

- Save energy and other resources. By 2010, energy consumption standards were to be reduced from about 5–6 tce per 100,000 bricks in the 10th Five Year Plan (2000–05) to about 4–5 tce per 100,000 bricks, leading to 10 million tce of energy saved and 300 million t of waste usage.

- Phase out outdated technologies. The plan strictly followed the National Coercive Industrial Standard, “Industrial Standard of Kiln for Firing Brick and Tile” (JC982-2005), banning energy-intensive small vertical kilns, small horse-shoe kilns, and small Hoffmann kilns with fewer than 18 gates. For new fired wall materials, the average single-line production capacity was required to reach at least 30 million standard bricks, with production capacity of products from coal gangue, coal ash, etc. comprising at least 50 million standard bricks.

### Environmental Standards in China

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*Note: Not just limited for brick industries*
6 Bibliography


## 7 Annexes

### 7.1 List of People Consulted

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<td><strong>Government Officials</strong></td>
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<tr>
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    Entrepreneur  
    Brick Association – Rautahat
26. Padam Chhetri  
    Entrepreneur  
    Brick Association – Tanahu
27. Kameshwor Yadav  
    Entrepreneur  
    Brick Association – Rautahat
28. Mohan Shah  
    Entrepreneur  
    Brick Association – Rautahat
29. Bhimsen Basnet  
    Jaya Gorkhali
30. Purushottam Pradhan  
    Seven Group
31. Dil Bahadur Thapa  
    Lapha
32. Mohan Shah  
    Entrepreneur  
    Brick Association – Rautahat

Participants of the Nepalgunj Workshop (12th November 2016)

<table>
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<tr>
<th>S. No.</th>
<th>NAME</th>
<th>DESIGNATION</th>
<th>ORGANIZATION</th>
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<tbody>
<tr>
<td>1.</td>
<td>Sunita KC</td>
<td>Women and Child Officer, Banke</td>
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<tr>
<td>2.</td>
<td>Kamal Prasad Ghimire</td>
<td>CIO, OSCI</td>
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<td>3.</td>
<td>Khagendra Paudel</td>
<td>District Administration Office, Banke</td>
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</table>
4. Prakash Rawal | Entrepreneur | Brick Association Mahakali
5. Jeevan Joshi | Entrepreneur | Brick Association Mahakali
7. Keshav Bhandari | Entrepreneur | Brick Association – Banke
8. Gokul Prasad Parajuli | Entrepreneur | Brick Association– Banke
9. Taufek Ahmed | Entrepreneur | Brick Association – Banke
10. Surya Paudel | Entrepreneur | Brick Association – Banke
11. Binod Shah | Entrepreneur | Brick Association – Seti
12. Dipendra Shrestha | Entrepreneur | Brick Association – Seti
13. Ganesh Bhatta | Entrepreneur | Brick Association – Seti
14. Purna Prasad Adhikari | Entrepreneur | Brick Association – Dang
15. Shahbuddin | Entrepreneur | Brick Association – Dang
17. Ganesh Bhatta | Entrepreneur | Brick Association – Seti

Participants of the Kathmandu Workshop (14th December 2016)

<table>
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<tr>
<td>1.</td>
<td>Bishwo Ram Kawa</td>
<td>Senior Vice-</td>
<td>FNBI</td>
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<td></td>
<td>President</td>
<td></td>
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<td>2.</td>
<td>Sujit Kafle</td>
<td>Engineer</td>
<td>FNBI</td>
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<td>3.</td>
<td>Ramkaji Awale</td>
<td>Entrepreneur</td>
<td>Brick Association-Lalitpur</td>
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<td>4.</td>
<td>Asha Ram Vaidya</td>
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<td>Nati Bhai Hyomba</td>
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<td>Jeetendra Khayemali</td>
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<td>Asha Ram Phaju</td>
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<td>Purna Maharjan</td>
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<td>Kedar Gosai</td>
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<td>10.</td>
<td>Devendra Maharjan</td>
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<td>11.</td>
<td>Mr. Jaya Bahadur Lama</td>
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<td>Brick Association-Nuwakot</td>
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Experts

<table>
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<tr>
<td>1.</td>
<td>Bishma Pandit</td>
<td>Energy Expert</td>
<td>Freelancer</td>
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<td>2.</td>
<td>Soniya Rijal</td>
<td>Program Manager</td>
<td>Child Development Society</td>
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<td>3.</td>
<td>Anil Maharjan</td>
<td>Technical Coordinator</td>
<td>Bio Energy Project</td>
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<td>4.</td>
<td>Sanu Babu Dangol</td>
<td>Civil Expert</td>
<td>MinErgy</td>
</tr>
<tr>
<td>5.</td>
<td>Nirman Ojha</td>
<td>Civil Expert</td>
<td>Abari Technology</td>
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<td>6.</td>
<td>Shyam Maharjan</td>
<td>Entrepreneur</td>
<td>Rajdhani Brick</td>
</tr>
<tr>
<td>No.</td>
<td>Name</td>
<td>Role</td>
<td>Brick Name</td>
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<td>7.</td>
<td>Rajendra Maharjan</td>
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<td>Trishakti Brick</td>
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<td>8.</td>
<td>Raj Kumar Lakhemaru</td>
<td>Entrepreneur</td>
<td>Swet Bhairav Brick</td>
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<td>9.</td>
<td>Devendra Maharjan</td>
<td>Entrepreneur</td>
<td>Jai Maitribhumi Brick</td>
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