

# **The Maxims of Khona: A Contextual Study of Sustainability over Vernacular Architectural Practice of Bangladesh**

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*Architecture is not an abrupt phenomenon; rather it was an adoption of creativity throughout the development stages of human being; where humanity finds its relation with greater surroundings. This 'understanding' involves observations; range from herbal treatments provided by native fauna, impact of climatic changes in different seasons to the vast imagination of astrology. The maxims related to vernacular architecture, belongs to subaltern astrologer Khona; which reflect human nature in general, suggesting that the composer or composers were intimate to this land and were acquainted with the ways of life here in Bengal. This paper suggests that agriculture, health concern and architecture should 'response' to establish a goal for the betterment of mankind, exactly somewhat concerned meticulously by Khona; which can be referred as today's well-known sustainability. How this same thought was felt by this wise lady over a millennium ago? And surprisingly, why people of this fertile delta bore her legacy by these simple maxims throughout centuries? Thus this practice of thousand years should not be overlooked. The objective of this research is to reveal the truth that the land should be proud to practice its own architecture according to this ancient Wise's knowledge. In addition, it may try to indicate some possible outlines for both contemporary practice and academic curriculum.*

**Keywords:** Dak and Khona, Maxims, Vernacular Architecture, Agro-Landscaping, Native Botany and Public Health.

## **1. Introduction:**

If one account for the built-forms of vernacular architecture of Bangladesh, one might not disagree according to *Khona*; where she urged that the house should be built in a high and arid land over a spacious platform. There should be the source of pure water, as it can be a pond and poultry farm, vegetable garden along with it. The motto is, to ensure the nutritious source of complementary food. Her suggestion that a spacious courtyard is mandatory, where light and ventilation should be enough and keep balanced in all year round regardless of winter or summer. The location of *Dheki* (the equipment to thrush paddy and gain rice installed in a thatched shelter close the house) and the kitchen should not be in the south, as it may carry the dust and fume to the inner rooms where people lives and make them sick. The allocations of rooms according to functions are also discussed in her maxims. She directed the people when architecture was not directed by any architect.

As agriculture was the base of her philosophy and astrology, architecture might come second to landscape if it goes through an evaluation. She observed every detail of native trees, recommended some of them for cultivating in homestead, prohibited some as not to cultivate near of house and suggested non-profitable trees as they do not

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provide neither flowers nor fruits, but yet can be planted in the promenades of home to ensure healthier environment as all these trees have some sort of impact over weather.

Those trees of herbal qualities, like *Neem* and *Tulsi*, should be cultivated near to the house. She also urged not to cultivate the big trees nearer to the house as they create darkness, wet and unhygienic circumstances by obstructing the ventilation thus that environment is likely to make people sick. The herbs also should not encroach to the home as it may accelerate the decay and make the surrounding clumsy. The surroundings of any home should be arranged with different trees to make the house well protected. This type of study had not come from architects thus it is unique. The aim of the study includes curriculum extension in bachelor study along with the opportunities of native botany. The significance is: botany and vernacular practice will be understood and thus get promoted.

Based on the analysis of *Khona's* maxims with their historical values this study is an evaluation of recommended architectural spaces and treatments of built-forms in vernacular context of Bangladesh. The primary focus of the study is to define the effects of her maxims on rural lifestyle as well as vernacular architecture and the environmental quality through landscape according to her proposals for plantation. This study has five main objectives, as illustrated below:

1. To ascertain the causes of existing ineffective practice of urban architecture, that does not show any respect for traditional values and deteriorating the environment day by day. Human need to go back in the woods, indeed!
2. To investigate the possible options to introduce botany in landscape planning and public health care in environmental design at the curriculum of architecture study.
3. To provide some recommendations for concerned authorities to ensure better integration of urban dwellings according to sustainability and traditional practice.
4. To make the people conscious about the possible effects of environmental treatments of thousand years' agricultural practice along with vernacular architecture as a part of landscape.

It is a pity that the 'dominant' knowledge of modern world failed to recognize the information and experiences of these subalterns' as 'science.' *Khona*, the subaltern scientist, astrologer and philosopher had already discovered the nature of adaptation with ecological and climatic factors with architectural treatments in her verses. This lady of merit, *Khona*; was first to learn from nature and her contribution with those rhythmic maxims, not written in the books rather in the folk-minds, are precious assets for us. This might be referred as something, which engulfs *the inherent*, *the instinct* and *the intuitive* in a single point. Again, this 'meeting point' only has one identified source of teaching, 'Nature'- played significant role in this study.

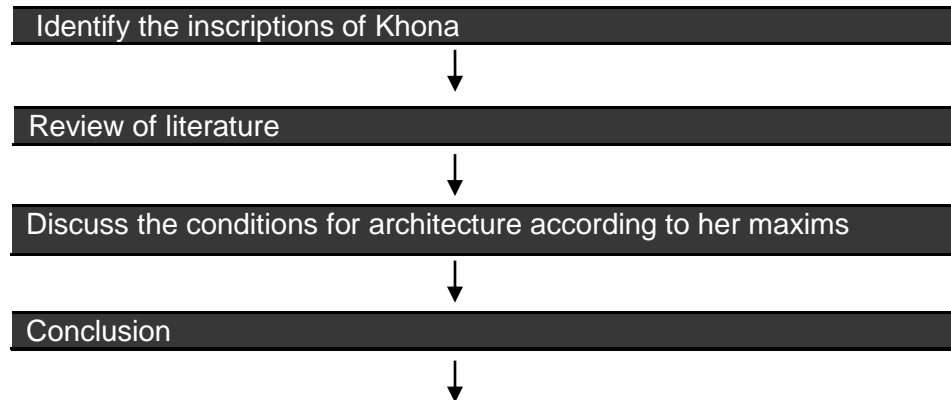
## 2. Material and Methods:

This study is emphasized on the synthesis of symbolic languages, found in *Khona's* collected maxims from different parts of Bangladesh regardless of any timeline. Common issues of vernacular practice, social and cultural aspects which shaped the plan of traditional architecture have been discussed. Besides, how regional microclimate influenced the practice of indigenous materials and building technology. As the study is history based, thus literature review was the prior tool. Again a

questionnaire was prepared to extract the field data only to know the implement of maxims and regions and persons were chosen arbitrarily in this regard. There were no usage of complex equipment and materials in this research. The research is based on two broad approaches:

1. To establish a Theoretical framework for analysis (based on literature review)
2. Deriving results from Empirical basis (based on analysis and survey of the study)

The investigation of the particular objective consists of the following steps are outlined below:



### 3. Literature Review:

#### 3.1 Vernacular Architecture: An Obscure Perception, yet Decent

The architecture, that include primitive or aboriginal architecture; indigenous architecture; ancestral or traditional architecture; folk, popular, or rural architecture; ethnic architecture or ethno-architecture; informal architecture; the so-called "anonymous architecture" or "architecture without architects;" and even "non-pedigree" architecture. (Paul, 1997)

"Contemporary architecture should therefore seek a greater understanding of local culture if it is to be sustainable" - Guy, Simon and Graham Farmer (Guy et al, 2000)

Again, Paul RI Coeur said properly-"How to become modern and to return to sources; how to revive an old, dormant civilization and take part in universal civilization."

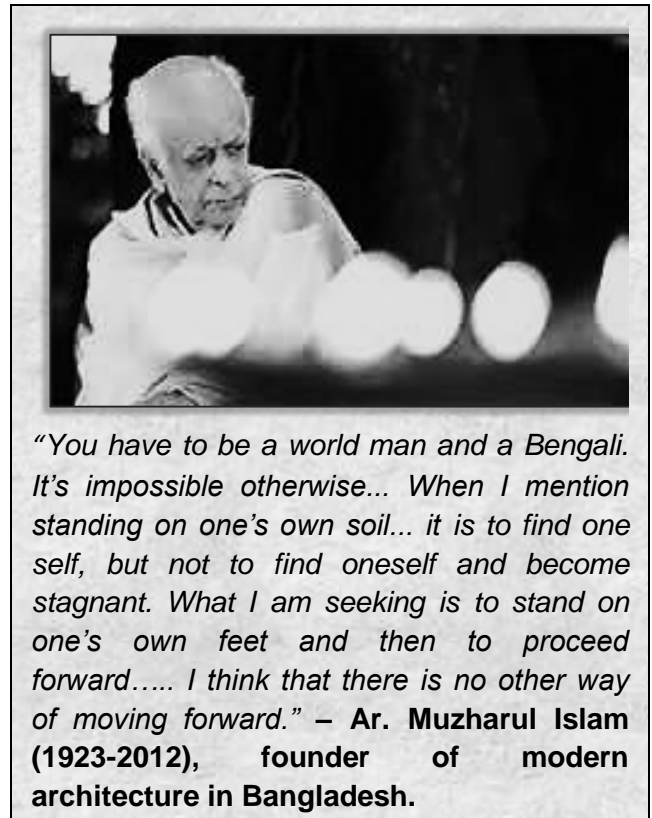
Critical regionalism, literal and philosophical synonym of vernacularism in architecture; by the means of conception, is a progressive approach of design that seeks to mediate between the global and the local languages of architecture. In his book, 'Towards a Critical Regionalism: Six points for architecture of resistance'; where Kenneth Frampton insisted that emphasis should be on topography, climate, light and tectonic form rather than on scenography (i.e. painting theatrical scenery) and should be on the sense of touch rather than visual sense. These six points are:

1. Culture and civilization
2. The rise and fall of the Avant-Garde
3. Critical regionalism and world culture
4. The resistance of the place-form
5. Culture vs. nature: Topography, context, Climate, light and tectonic form
6. The visual vs. the tactile

He draws a phenomenology:

***"Perhaps with somewhat unfair pejorative implications, as a kind of 'scenographic' reduction of architecture to a scenography which makes a very gratuitous, or parodied, use of historicist motifs."***(Frampton, 1983)

In addition to Alvar Aalto (Finland) and John Utzon (Denmark), many architects have used Critical Regionalism in their works from Framptonian sense: Mario Botta (Switzerland), Alvaro Siza (Portugal), Mazharul Islam (Bangladesh), Raj Rewal, B. V. Doshi, Charles Correa (India) and Geoffrey Bawa (Sri Lanka).



## 3.2 Background: Who are they?



Figure 1: Khona-Mihirer-Dhipi, West Bengal

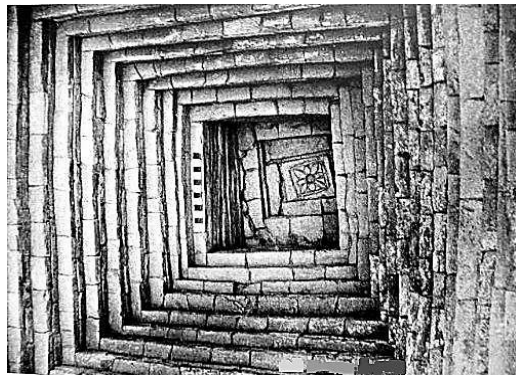


Figure 2: Kunda with foundation tablet carved lotus, 64'X65'

To identify the address of *Khona* and *Dak* from the womb of forgotten past is somewhat a dubious proposition. *Khona*, ancient Indian poet, philosopher and legendary astrologer, is considered in literature as a lady of olden times who authored the famous sayings; which are still popular in the rural society of Bangladesh. The attributed date of her lifetime ranges from 400 AD to 1200 AD. According to one account, she lived in the village of *Deuli* in *Barasat* in 24 *Parganas*,

West Bengal. Her father is said to have been an *Acharya* (principle and abbot), and she was a resident in King *Chakraketu's* monastery for a considerable period. According to another account, *Khona* was the daughter of the king of Sri Lanka. She was named *Khona*(moment or mute) because she was born at an auspicious moment or going to be mute by her destiny. Whether the legend is true or not, *Khona's* expertise in astrology surpasses that of her father-

in -law and he ordered his son to sever *Khona's* tongue and she bleeds to death. Meanwhile, at the court of *Harsha-Vikramaditya*, the wife of the astrologer *Varaha* had given birth to a boy named *Mihir*. When *Varaha* cast *Mihir's* horoscope, he found, as the legend goes; the boy would die shortly afterwards. *Varaha* put the child in a pot and floated the pot out to sea. The pot floated to Sri Lanka where its king brought the boy up and subsequently arranged his marriage with *Khona*. Both *Mihir* and *Khona* studied astrology and became experts. *Mihir* supposedly hailed from South Bengal, in the ruins of *Chandraketugarh* there is a mound called the mound of *Khona* and *Mihir*.

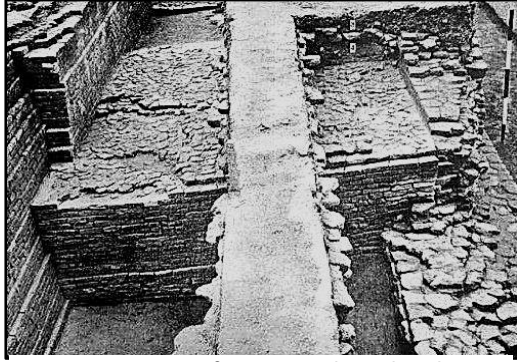


Figure 3: Ruins of main temple at the Dhipi (mound)

*Mihir* became a courtier of King *Vikramaditya* (*Harsha*) and there, *Khona* successfully solved all the problems by foretelling and was honored as tenth jewel of his court. *Khona* is associated with many popular sayings, known as *Khona's maxims*, about the weather, architecture, astrology, crops, agricultural productivity etc. She suggested which way a house should face, where trees should be planted, and where a pond should be dug.

*Khona* was an intelligent Hindu woman but not mentioned in the pages of history because she was against the ruling Hindu *Brahmins*; rather she followed the atheist *Charvaka* (Hedonist). Maybe *Khona* had never existed. It is possible that the myth of *Khona* was circulated in order to give an authority to the accumulated wisdom of the rural society acquired from experiences and passed on from generation to generation in her name. Through the centuries, *Khona's* advice has acquired the character of an oracle in rural Bengal (today's Indian state of West Bengal, parts of Bihar and Bangladesh). Ancient versions in Assamese and Oriya also exist. (Azhar, 2012) Her wise words ring in the voices of the common people almost all over the eastern part of the Indian subcontinent - Assam, Bengal, Bihar, Orissa. Some of her adages are also found in *Telegu* language.

*Dak* (literally, a man versed in mantra, may be an alternative to the character of *Mihir*) a soothsayer of ancient Bengal, according to *Haraprasad Shastri*, who discovered the manuscript of *Dakarnava* in the royal inscription (*Puthi*) collection of Nepal, believed that *Dak* and *Khona*

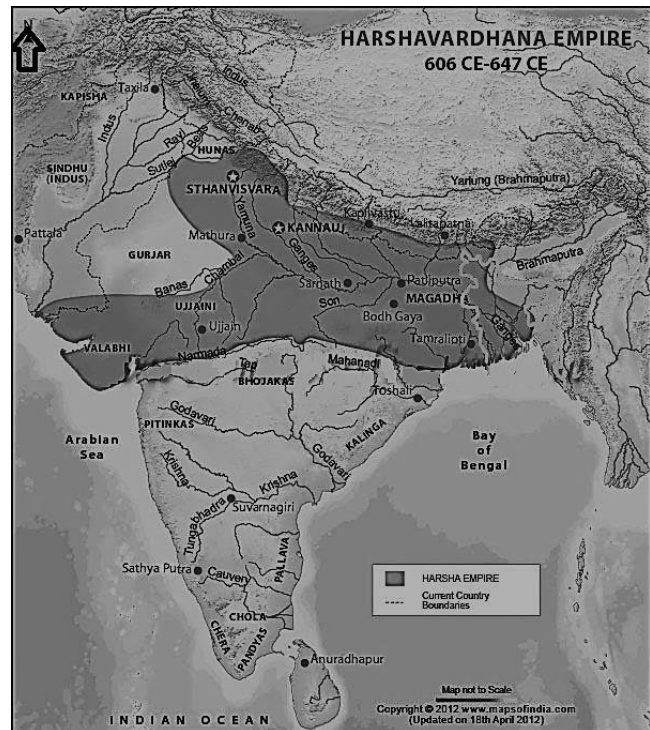


Figure 4: Area of king Harsha's kingdom, estimated time and expansion of the maxims of *Khona* and *Dak*.

were Buddhist scholar ascetics. According to the Assamese writer *Buruvzi*, *Dak* lived in *Kamarupa*. Other scholars believe that the maxims attributed to *Dak* were not created by a single individual, but were composed by a number of people over a period of time dated between the 8th and 12th centuries. However, as many of the sayings were transmitted orally, they underwent considerable linguistic changes. Some scholars described him as the Socrates of Bengal. (Sen, 1996)

### 3.3 Review of the Maxims:

In our socio-cultural context, *Khona* is indispensable part of rural architecture. Rabindranath Tagore introduced her maxims are likely to natural rhythm or folklore rhythm in the creative minds of subaltern people for its spontaneous progression. The maxims can be divided by three categories: planning, construction treatments considering public health and agro-based landscaping.

#### 3.3.1 Architectural planning

First of all, Let us consider some quotation of *Khona* for a complete plan of vernacular architecture of Bangladesh with its surrounding landscape. The short couplets or quatrains reflect a robust, common sense of planning.

পুবে হাঁস, পশ্চিমে বাঁশ  
উত্তরে বেড়ে (কলা), দক্ষিণে ছেড়ে,  
ঘর করগো পোতা জুড়ে।।

Pronunciation:

Pube hash, poschime bash,  
Uttare bere, dakkhine chere,  
Ghor korogo pota jure.

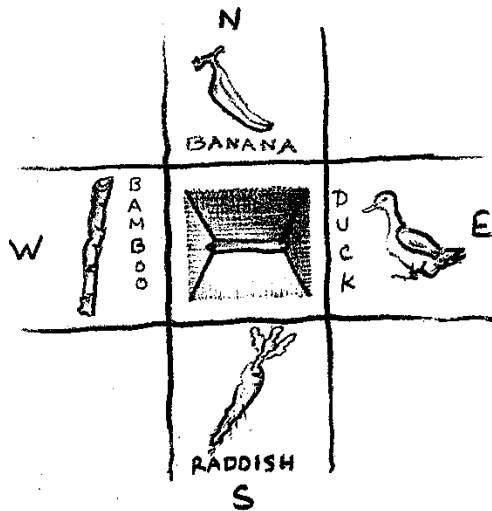


Figure 5: The metaphor of vernacularism in Khona's maxim

This is the most famous proverb regarding traditional architecture and is found almost same with some exceptions in *Bikrampur*, *Pabna*, *Faridpur* and West Bengal. Literally this maxim depicts a total planning- duck in east, bamboo in west, banana in north, left empty in south, build your home taking all the area of the high and spacious platform. Let us fragment the verse in four quotations:

**Duck in east**-means dig a pond in east side of dwellings. According to another point of view, as duck swims in the pond, *Khona* preferred east side for farming the poultry. Again, this is traditional practice of Bangladesh to dig a pond in the site first, to erect the walls from these cut

soils. This can be referred as 'cut and fill'. Besides, it can be used to raise the plinth level of house. In addition, evaporation of water from pond associated with south breeze helps to reduce the heat and humidity. Thus allocation of pond in the east is an environmental treatment for the climatic consideration of Bangladesh.

**Bamboo in west**-means the cluster of bamboo trees should be in the west side in an optimum distance. This treatment is only to protect the sun of west and keep the house and entire courtyard cool, providing calm shades and shadows. Astronomer *Varah* also showed interest for four cardinal tree plantations in his '*Brihat Shānghita*' book of *Ayurveda*. For further information, according to *Manushānghita*; an architect should be a practitioner of 62 arts.

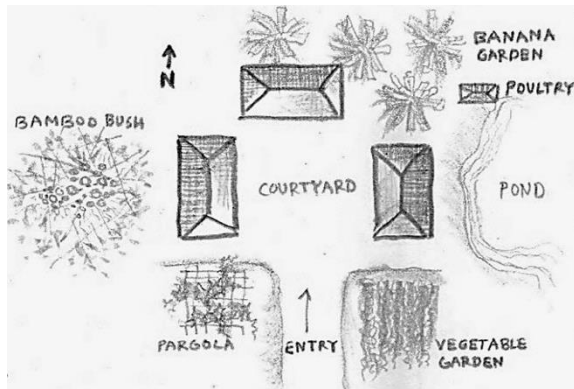


Figure 6: The pattern of vernacular architecture of Bengal

**Banana in north**-means plant banana trees in north side. Profitable trees like banana could be planted as the height of this tree is small and do not obstruct the passing of winds of south-north orientation. Again north is the source of defused light and it is charming for the dwellers.

**Left empty in south**- let the wind flow to penetrate the homestead and define this cardinal as an entry. This is exactly somewhat that was inscribed in Sanskrit in *CharakShānghita*'s 12<sup>th</sup> chapter, during 200 AD – “The happily southern breeze, which increases the purified span of life.” In other opinion, hedges or vegetables such as reddish and carrots can be planted in the south side of any house which is not a problem for proper ventilation as well as receiving the breeze of south.



Figure 7: The ideal environment according to the first maxim of Khona

**Build your home taking all the area of the high and spacious platform**-the relationship with *Dak* of Assam can be found in this regard. As he says, ‘মনে যদি লইকসর, পোখরি পাহাড়ে তুলিব ঘর’ (pronunciation: Mone Jodi loikosor, pokhri pahare

tulibo ghor) which means that ‘one should build one’s house in the high land, if one is intended to’. The parliament building of Bangladesh is erected on a raised platform having artificial lake around it; probably master architect Louis I. Kahn borrowed the idea from traditional architecture of this region.

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দখিন দুয়ারী ঘরের রাজা,  
পূব দুয়ারী তাহার প্রজা,  
পশ্চিম দুয়ারীর মুখে ছাই,  
উত্তর দুয়ারীর খাজনা নাই।।

Pronunciation:

Dokhin duary ghorer raja,  
Pub duary tahar proja,  
Poschim duarir mukhe chai,  
Uttar duarir khajna nai.

Literally this rhythm depicts a total entrance system- south oriented room is the best, east oriented room is quite comfortable, west oriented room is worse but north oriented room is the worst. If a door is erected against the south, the dwellers get sick recurrently as the air contains pollution and cannot pass the room by cross ventilation. This is collected from *Dhaka, Rangpur and Bogra*.

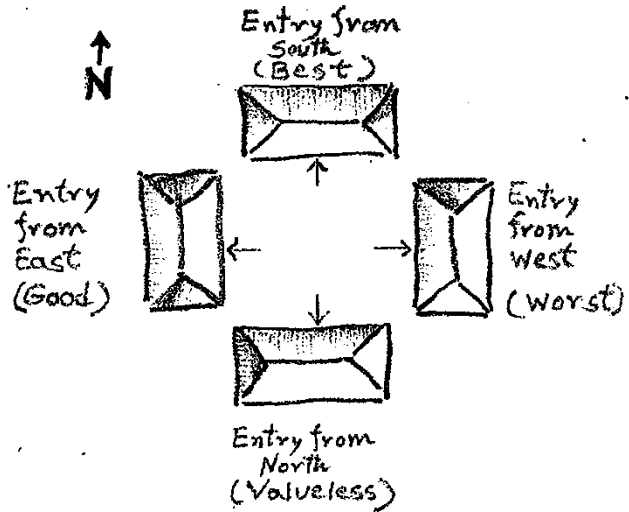


Figure 8: Entries from four directions according her second maxim

উত্তরের ঘরেরা দুধে ভাতে,  
দক্ষিণের ঘরেরা মরে শীতে,  
পশ্চিমের ঘরেরা খায় ভাত,  
পূবের ঘরেরা ফেলে পাত।।

Pronunciation:

Uttorer ghorera dudhe vate,  
Dokkhiner ghorera more shite,  
Poschimer ghorera khay vat,  
Puber ghorera fele pat.

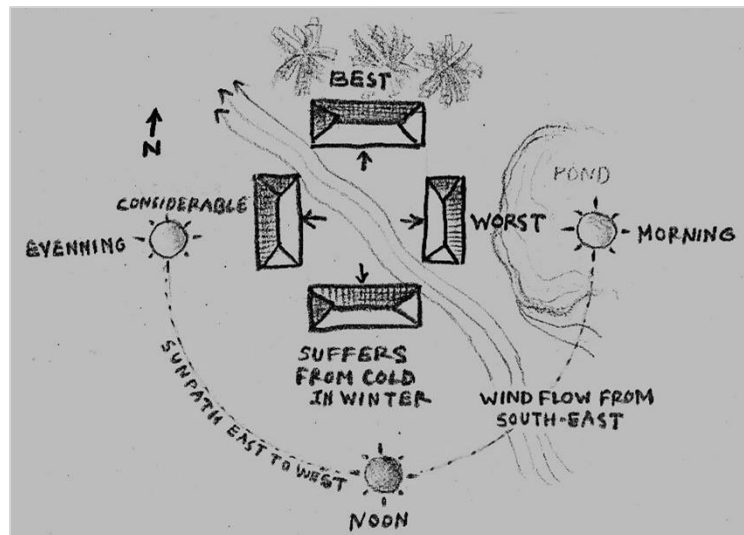


Figure 9 : Locating rooms with climatic considerations in different seasons respecting the sun and ventilation.

This maxim is based on environmental design and it means, the dwellers of northern rooms having door in south are enjoying the best condition. Again, the dwellers of southern rooms having door in north suffer from cold wind during the winter. Besides, the dwellers of western rooms having door in east are quite good but the dwellers of eastern rooms having door in west are unfortunate as light and wind cannot reach them. Despite erecting a built-form in the east, a pond is to be dig. This is collected from *Bikrampur*, the ancient capital of during the *Pala* (Buddhist) period.



### 3.3.2 Construction treatments considering public health

Now, some quotations of *Khona* for the concern of public health, associated with the treatment of flooring and ventilation.

জর ভিটায় তুলে ঘর, যে আসে তারই জ্বর।।

Pronunciation: Joro vitay tule ghor, je ase tari joor.

It means, if somebody builds in a area where soil is dirty and wet, everybody who comes to this home ought to has a fever. Here fever represents all kind of sickness.

পিড়ে উঁচু মেঝে খাল, তার দুঃখ সর্বকাল।।

Pronunciation: Pire unchu mejhe khal, tar dukkho sorbokal.

It means, if the surroundings of plinth is high and plinth is low; the owner need to suffer for life long. Here the message is, that a lower plinth cannt be clean properly; thus the fool remains wet and creates unhygienic circumstances to effect inhabitants by increasing deseases throughout their life span.

আলো হাওয়া বেঁধ না, রোগে ভুগে মরো না।।

Pronunciation: Alo hawa bedho na, roge vuge moro na.

It means, do not creat obstacle on the way of ventilation (both light and wind) and do not die by the sufferings of deseases. This is such kind of proverb which indicates the cause and effect. A room without ventilation is a adorn of sickness. It is collected from Indian state of Gujrat.

Let us consider some quotations of *Khona* that associated with the treatment of gardening and vegetation. This can be regarded as selection of botany with their herbal importance or demerits, in terms of landscaping.

### 3.3.3 Agro-based landscaping surrounding the home

Again, some maxims of *Khona* in the terms of Botany, associated with the treatment of landscaping.

ঘিরিলে বাড়ি, সাজায়েলে তিরী।।

Pronunciation: Ghirile bari, sajaile tiri.

It means, if you have surrounded (with trees) the house, then you have organized the world. The message is, plantation in the surroundings of house brings happiness and healthiness in your mind. It is collected from chittagong region.

নিম নিসিন্দা যথা, মানুষকি মরে তথা।।

Pronunciation: Nim Nishinda jotha, manushki more totha.

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It means, where there is Nim, Nisinda trees, man cannot die. This is a scientific truth that such trees emit fragrances and purify winds from bad odor and of well known reputations for herbal medicine.

দক্ষিণে তাল / তেঁতুল, উত্তরে বেল;

লক্ষ্মী বলে এই বাড়ি গেল।।

Pronunciation: Dokkhine tal / tetul, uttore bel, laxmi bole ei bari gel.

It means, if palm or tamarind trees are planted in the southern side and Wood apple tree is planted in the northern of any house, the goddess Lakshmi abandons the house. Here, the message is, if the houses have big trees too close to them, then the wind flow and sun get interrupted and inhabitants suffer from diseases.

তাল, তেঁতুল, কুল; তিনে বাস্তু নির্মূল।।

Pronunciation: Tal, tetul, kul; tine bastu nirmul.

Same as previous.

তাল, তেঁতুল, মাদার, তিনে আন্ধার।।

Pronunciation: Tal, tetul, madar; tine andhar.

Same as previous. in addition, these trees are responsible for darkness of home.

বামুন, বসাক, বাঁশ; তিনে বাস্তু নাশ।।

Pronunciation: Bamun, bosak, bash; tine bastu nash.

Same as previous. In addition, the vicious character of brahmins are criticised.

বক, বকুল, চাঁপা; তিন পুঁতোনা বাপা।।

Pronunciation:

Bok, bokul, chapa; tin putona bapa.

same as previous. In addition, these trees should not be planted in the same area. Whether that is for religious or environmental purpose, yet to be identified.

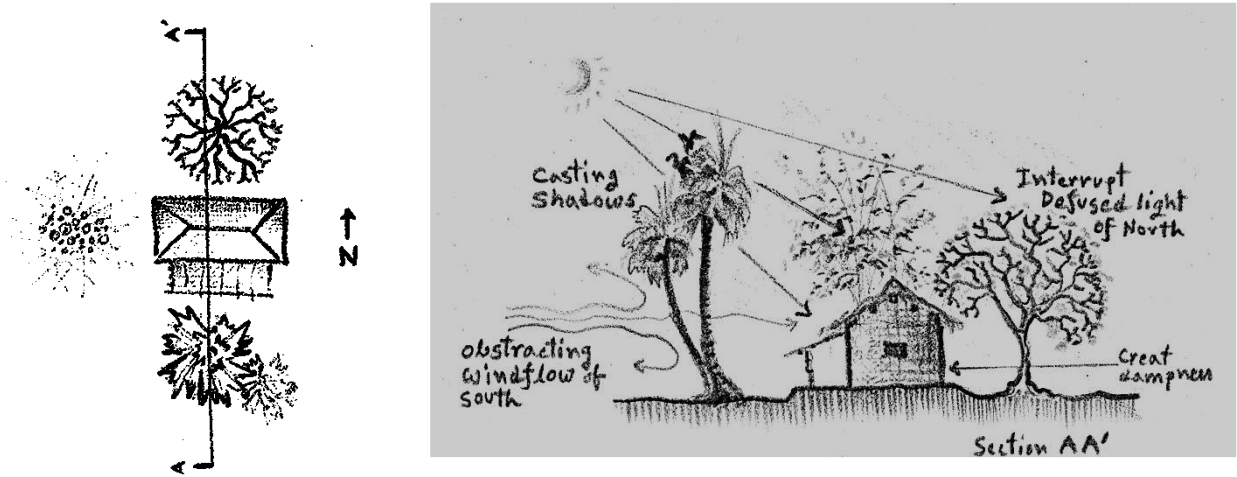


Figure 10: The "Not to Do-s" according to Khona's proverbs considering ventilation and sun in any homestead

গৃহ-পাশে খিলে তাল, অল্পদিনে পুরেকাল;

শকুনপক্ষী বসিতা 'পরে, নানা ব্যাধি জাত করে।।

Pronunciation:

Griho pashe khile tal, olpo dine pure kal;

Sokun pokkhi bosita' pore, nana bedhi jat kore.

Same as previous. In addition, palm tree is a shelter for corpesescavenger birds like vultures. They spread germs of touchy deseases. As a result, the inhabitants get short life. This is collected from Indian state of Odisha.

## 4. Results and Discussions:

Possible estimates according to historical evidences were derived and the accumulations of all data of four surveyed districts are presented. Again, how local botany and consideration of public health correlates with spatial quality of vernacular architecture also discussed below as findings of the research:

### 4.1 Practice of Ancient Ages

In '*ManshaMangal*', a famous medieval epic of Bangla literature, where the poet *BipradasPipilai* gave an account that indicates the planning of *Chand Saudagor's* (trader) homestead. He was the richest and powerful merchant of *Champak Nagar* in ancient *Anga*, todays *Maldah* district of West Bengal. (Ray, 2007) Whether *Chand Saudagor* is a historical person or a character of literature, is not important for the context of this study; but it is sure that the aristocrats of Bengal in the then era followed such sort of planning to erect their home. From the medieval inscriptions, it is

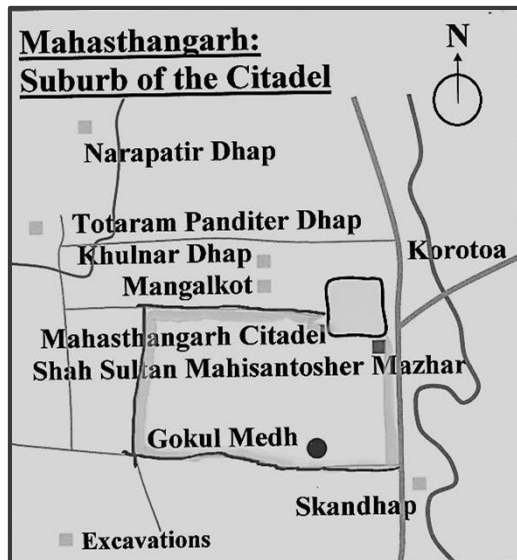


Figure 11: GokulMedh is a temple dedicated to wife of chandSaodagor, Senoka.

said that *Chand Saudagor's* house was erected with the directions of *Khona*. At the middle of the citadel and the eastern embankment at *Gaur*, a ruined structure, that is not excavated; is claimed to be the house of him. Some polished, ash colored and black columns are lying here. Near this *SagarDighi* (pond as huge as sea), homestead of *Chand Saudagor* looks like a mound of bricks with a large number of stone pillars scattered about. The remains seem to indicate a square corridor, enclosing a courtyard. The trade center of the city assumed to the high land of north from *SagarDighi*. (Basu, 2006)



Figure 12: Ancient ship anklet chains found at the ruins of *Jahajghata*, as evidence that there were a river port at *Gaur*.

It indicates that the character of *Chand Saudagor* is associated from this land.

To correlate the evidences, it can be brought in light that; to the west of this suspected homestead was the river Bhagirathi, a tributary of the Ganges, and it flowed adjoining the place, named '*Jahajghata*' (means, where ships are anchored) left unfortified for trade. Between the embankment of *Darashini* gate and *Fulwari* gate, some rectangular platforms are still present with deep canals around it. According to De Barros, during 1540; these were used to load and unload the trading boats. According to another source from D. Bukanon Hamilton in early 1800's, the city covered an area of 25 square miles and a population of 1.2 million in its culmination stage in 1640. (Shaheb, 1912)

### The Poet Wrote:

দীঘে পাশে আরোপিয়া যোজনেক মুড়ি,  
পুরীর উত্তরেত কৈল বাগানবাড়ি,  
নাংগার কমলা রোয়ে সোলাংগশাকর,  
মিঠা জাজি নানা কলা লাগায় বিস্তর;  
বাড়ির মেধ্যেত দিল দীঘি পুকুরি,  
তার পাশে লাগাইল নারিকেল সারি।।

### Pronunciation:

Dighe pashe aropia jojonek muri,  
Purir uttoret koilo baganbari,  
Nangar komola rowe solangsakor,  
Mitha jaji nana kola lagay bistor;  
Barir moddhet dilo dighi pukury  
Tar pashe lagailo narikel shari.

It means,

Erecting a certain amount of pillars besides the huge pond,  
A home with garden has built in the north of the city;  
*Nangar* orange (desired genre of that fruit) is planted, also thin bodies of sugar are planted (sugar cane)  
Banana trees of both sweet and sour bananas are planted a lot;  
In the middle of the site, a huge rectangular pond is dug,  
The rows of coconut trees are then planted beside this pond.



Figure 13: Scattered pillars of ancient ruins are common in Gaur and Pandua.

### 4.2 Realization of Medieval Muslim Rulers



Figure 14: interior of ShaitGombuj, an example of intimate scale of vernacularism

After the conquest of Bengal, Muslim rulers tried to impose their architecture but failed because of very different climate of Bangladesh. Ruins of Adina mosque in West Bengal is the best example of this, as it was built with Damascus influence. However, they soon realized their fault and started to imitate the tone of Bengal's indigenous architecture. One of the first mosques in the country, the mosque of sixty domes, maintained *Khona's* maxim subconsciously.



Figure 15: Adina mosque, built in 1373 by Sultan Sikandar Shah, the failure of conception.

light of the orientation. This small-scaled mosque with its hut-shaped roofline, undoubtedly a local practice; including 7 *Chau-Chala* (four-sided pitched roofing system) domes in the middle row; (Alam, 2012) later which became the emblem of 'Bengalization' of Islamic architecture, where the belief is Arabian, but the space it created is intimate to this soil.



Figure 16: ShaitGamboj mosque, Bagerhat

For information, *Shait-Gumbad Masjid* (160'x108'); which is now a world heritage site, is the largest mosque in the country from the Sultanate period, during the reign of Sultan *Nasiruddin Mahmud Shah* (1435-1459); erected by *Ulugh Khan Jahan*. Construction of the mosque was started in 1442 and completed in 1459. It was also used as a *madrasah* and assembly hall. Walls were unusually thick, approximately 6 feet (1.8 m) thick with a slight taper over the hollow and round walls and echo the *Tughlaq* style of Delhi.



Figure 17: The Magnum opus of Louise I. Kahn, raised platform on the artificial lake

### 4.3 Respects from Modernism

What about the most famous building of the world of 'Modernist' era, the parliament building in Dhaka; over a site area of nearly 2000 acres? As we know, Modern architecture does not bode well with identity; its identity sits within the autonomous dichotomy of modernist architects and their works are far from culture and architectural precedents. Unlike, being transcribed as a part of

vernacular architecture of Bengal, it is unique in the sense that it might be modernist in principle, but deeply rooted in its context. It cannot be placed almost anywhere in the world without any fuss. He wanted to see the archaeology of his architecture, like the



***"It was not belief, not design, not pattern, but the essence from which an institution could emerge."***

**-Architect Louis Kahn**

ruins of *Paharpur*, his endeavor to 'Volume O'. We need not know, whether the master architect, Louis I. Kahn had studied the maxims of *Khona* or not, but he studied the consequence of her tradition-the vernacular practice of Bengal, which inspired him to fetch the ideas; where a raised platform and the crescent lake were the comprising elements of his master piece, indeed. Along with the idea of 'served and servant' spaces, the architect's key design tool was to optimize spatial configurations while the supporting programs (offices, hotels for parliamentary officials, and a restaurant) project out of the center volume; exactly

somewhat that correlate with an advice from *Khona*, 'build your home in a spacious platform'. He used brick, to resemble the color of mud platform (*Viti*) which contrasts against the focal object of huge concrete mass. Such types of elements like platform and water body are recommended requirements of *Khona*. As we can quote from Russell; 'gentlemen think alike.'

Again, Kahn's design calls for simplistic local materials that were readily available and could be implemented distinctly. For instance, the entire complex is fabricated in concrete texture with inlaid white marble, which is not only a modernist statement of power and presence, but also is more of a testament to the local materials and values. (Andrew, 2010) Besides, the skillful use of water was chosen to portray the riverine beauty of Bangladesh. This artificial lake surrounding the building acts as a natural insulator and cooling system that creates an environmentally controlled system for the interior as per the colossal fenestrations over the skin walls may able to create some 'chiaroscuro' with the monsoon climate.

### 4.5 Public Health and Our Architecture



**Figure 19: Rituals arranged in the courtyard with a decoration set of banana trees, to call the rain in monsoon: marriage of frogs.**

Likewise, these maxims can be inferred as the consequence of enriched background of this part of world. How much old that the habit of public health care along with architecture in this subcontinent? It is sure that before the Aryan invasion of Indus valley, *Mohenjo-Daro* was the most planned city of the ancient era (Chalcolithic age: 3000-900 BC) having a urban planning according to the primary knowledge of public health erected by local Indians (e.g. *Ahar* culture) and also developed the most

effective sewerage system in the ancient world. From 800 BC to 600 AD, the practice of public health associated with architecture reached its culmination in this subcontinent. History depicts the name of *Sushrut* of 400 BC in this regard. In Bengal, during the reign of Pala (850-1250), the most famous writer about physiology was *ChakrapaniDutt* who redeveloped a thesis paper named '*Charak-tatporzo-dipika*' about the skills of '*CharakShanghita*', the pioneer medical research of 200AD during the Vedic period. *Khona* is likely to be addressed as the folk transformation of these sequences. 'Prevention is better than cure' this philosophy inspired the verses of *Khona* to meet architecture and public health in a same point. In this purpose, she can be compared to the Greek physiologist Hygeia.

#### 4.6 The Native Botany

Scientific name (Botanical)	General name (in Bangladesh)
<i>Melicaazadirachta</i>	Neem
<i>Vitexnegundo</i>	Nishinda
<i>Ocimum sanctum</i>	Tulshi
<i>Adhatodavasica</i>	Bosak
<i>Musa paradisiaca</i>	Banana
<i>Aeglemarmelos</i>	Wood apple
<i>Zizyphusmauritiana</i>	Indian plum
<i>Tamarindusindica</i>	Tamarind
<i>Borassusflabellifer</i>	Palm
<i>Bambusaarundinacea</i>	Bamboo
<i>Mimusposelengi</i>	Bokul
<i>Hedychiumcoronarium</i>	Chapa
<i>Sesbaniagrandiflora</i>	Bok
<i>Erytherinaindica</i>	Madar

Table 1: List of native trees found in the verses of *Khona*

useless but still available around the homes in villages of Bangladesh for fencing and demarking the areas. For further information, living people of any community, having diversified ethnic history of rituals and performances, are closely associated with their ambient vegetation what the emporia of 'ethno botany' are. The surrounding environment directly and indirectly influences the human life and culture. In fact, these verses of *Khona* are best example of ethno-botanical observation of native trees in the remote past to adorn the pattern of architecture that is associated with landscape design.

Here is a list of native trees which are found in the discovered maxims of *Khona*, till present. These trees are most common and cultivated regardless of regions and seasons. In the list, the names of trees are arranged in priority basis according to *Khona*. In the chart, first four trees are of herbal values, next three are recognized for nitrous fruits; eighth and ninth number trees of the list are of less importance. Again, the bamboo is the most important element for construction and used as a building material in vernacular architectural practice of Bangladesh. Below this, next twos are cultivated for their flowers of sweet fragrances. The rest twos are



#### 4.4 Impact over Different Regions of Bangladesh



Figure 18: The outer belt of West Bengal, four districts were surveyed

	Comilla, where Khona's maxims are prominent
	Mymensingh, where Khona is less followed
	Dinajpur, where Khona is important
	Sylhet, tradition of own climatic design

Truth be told, to derive any finding from these maxims; the term 'germination' might be appropriate for the practical application of *Khona's* verses. For instance, in north east Bengal (Sylhet region), people of the *Haor* area (goes under water in monsoon and rises in winter) have identified the changes in the season, nature and pattern of natural calamity. Thus, they have developed their own vernacularism, their own architecture of clustered pattern on high lands, can't be affected by flash floods. This is a unique pattern within the periphery of Bengal itself and *Khona's* irrelevant in some extent.

However, the consequences of these proverbs are so influential that even the Islamic conquest of Bengal could not reduce its appeal. A survey in north, mid and eccentric Bengal indicates that along with aristocrat Hindus, the Muslim wealthy peasants have practiced these morals for thousands years. 50% of *Dinajpur* (north) and *Mymensingh* (mid)

peasant families respect the proverb of *Khona* about building their house where the south side should be open to air. But people of *Comilla* (eccentric) gave 90% consent in this regard. 60% rural people of *Dinajpur* and 40% of *Mymensingh* are in favor of *Khona's* second choice that the east side should be open for entry and ventilation.

From these figures, it can be inferred that the tradition and heritage of *Comilla* is much richer than those of rest two's because there were an ancient civilization and *Somapura Vihara* (Buddhist University) in this region, which indicates a better culture of erecting buildings. On the contrary, the north Bengal people might have preferred the climatic consideration as one can get the sun of east earlier in the winter to get the house warm for whole day if the east side remains vacant instead of pond. In *Comilla*, winter is not dominant and they preferred to enjoy the south breeze in the hot and humid summer. Thus *Comilla* ranked high while *Mymensingh* ranked low with these factors.

The influential factors for this survey of peasants were of four categories and we followed a previous study to choose the user group only (Nawaz, 2011)-

1. Possession of land (minimum 1 acre),
2. Literacy (who can sign their name),
3. Average age group of farmers over 45 years and
4. Aristocrat Muslims (e.g. having family names like *Chowdhury*, *Vuiyan*, *Molla*, *Talukdar*) of secular view.

## 5. Conclusions

Academic and institutionalized knowledge just has discussed historical, climatic and environmental aspects through the archeological, paleontological and other sources of evidence. But rural subaltern people of Bangladesh have practiced eco-friendly architecture over the thousand years and inherited this knowledge through ecology, while *Khona* was a great inspiration. Now, the prior limitation of study was less available resources in written format, and thus all maxims that we found were of oral tradition. Again, this limitation can be turned as significance also. As little concentration was provided here, this research may ignite the architecture academicians to reveal the past and implement the ideas in modern practice. Our findings have different emphasis and values in this regard because Bangladesh, with its rapid urbanization with blind imitation of the western world should be restrained. This paper suggests native botany, as a part of landscaping and public health as an associated part of planning could be introduced in the curriculum of bachelor study of architecture throughout the world. Again, this study may suggest us for remodeling the homegrown material practice according to achieve sustainability in today's architecture. To recapitulate, this paper emphasized on its value that it is not important to answer every question, but it is important that a question is asked. It will definitely open new windows for further researches in the future.

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