

URBANIZATION REQUIRES BRICK PRODUCTION A CASE STUDY FROM THE KATHMANDU VALLEY, NEPAL

With 10 figures, 1 table and 4 photos

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Zusammenfassung: Urbanisierung erfordert Ziegelherstellung. Eine Fallstudie aus dem Kathmandu-Tal, Nepal

Der Prozess der Urbanisierung verläuft in Nepal aufgrund der speziellen historisch-politischen Rahmenbedingungen anders als in den südasiatischen Nachbarstaaten. Anhand einer Nachzeichnung der städtischen Entwicklung in Nepal werden planerische Interventionen und aktuelle, offensichtlich von steuernder Planung abgekoppelte Entwicklungen vor dem Hintergrund der quantitativen und qualitativen Veränderungen im Ziegeleiwesen diskutiert. Am Fallbeispiel einer Ziegelei und der in ihr tätigen Personen in der Nähe von Bhaktapur wird deutlich gemacht, wie traditionelles, spezialisiertes Handwerk durch semi-professionelles Wanderarbeitertum abgelöst wurde, wie die Entstehungsbedingungen für eine um ein Vielfaches erhöhte Ziegelproduktion mit über Nepal hinausgehenden Verflechtungen verknüpft sind und wer in welchem Maße an der Ziegelherstellung partizipiert und von ihr profitiert. Die wachsende Nachfrage nach Baumaterial im Prozess fortschreitender Urbanisierung löst so eine zunehmende Flächenkonkurrenz zwischen stadtnaher Landwirtschaft und Bauwirtschaft aus.

Summary: The urbanization process in Nepal is to be distinguished from urban developments in neighbouring South Asian countries and remains a specific case linked to the political frame conditions in time. The paper offers a historical reconstruction of urban development in Nepal and discusses urban planning efforts and recent developments which seem to be detached from these. The case study emphasizes the quantitative and qualitative changes in brick production in Nepal while studying one annular kiln and its production system in detail. The kiln and the work performance of the people involved correlate to a system of production which has undergone tremendous changes since traditional craftsmanship was replaced by semi-professional migrant labourers. Brick production in the Kathmandu Valley is linked to contributing commodities and people from the East and West of Nepal and from India. All participants profit from brick production in rather varied ways. The ever-growing demand for construction material reflects the rapid growth of urban settlements in vertical and horizontal dimensions as well as the competition between brick production and agriculture when it comes to spatial utilization in the vicinity of towns and cities.

1 Introduction

By comparison with other developing countries, in Nepal urbanization as a process is lagging behind the global as well as the South Asian trend. The urban share (Fig. 1) was given as 9.2%, which is very low for any developing country. Even the projection for the year 2015 estimates only 18.1%. Basically Nepal remains a country dominated by rural areas, while in certain spots administrative headquarters and government installations were transformed into a municipality where circumstantially or logistically required. Although the Central Bureau of Statistics counts 58 municipalities (Fig. 2) only Kathmandu is identified as a metropolitan city and three sub-metropolitan cities are indicated (Biratnagar, Patan, Pokhara) in the census of 1991.¹⁾ Feeder roads enabled these administrative cen-

tres to develop as market places. Bureaucratic and statistical manoeuvres change attributes and percentage urban share in other countries as well, which makes it especially difficult to make the category "urbanization" mutually understood in comparative perspective.

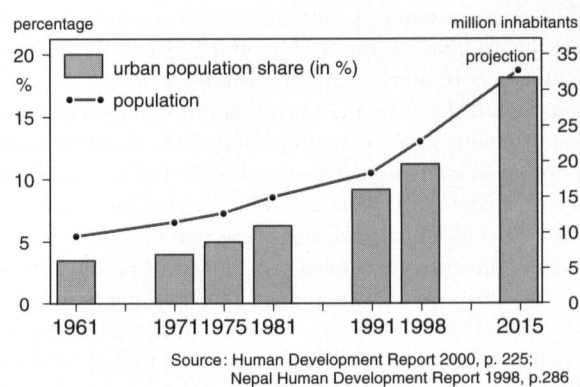


Fig. 1: Total population and urban share in Nepal
Städtische und Gesamtbevölkerungsentwicklung in Nepal

¹⁾ HMG 1997, 10–12. The smallest municipality is Dulikhel with less than 10 000 inhabitants while the metropolitan city of Kathmandu comes close to half a million.

Within South Asia the populations of Nepal, Bhutan and Pakistan grow fastest, and will double within 25 to 27 years if current growth rates persist (KHADIJA HAQ 1999, 204). But the share of urban population is much lower in the mountainous countries compared to the quota in the larger countries such as Pakistan and India (UNDP 2000, 224–225). Their urban populations are estimated to reach 30–46% of the total by the year 2015. In the following urbanization is understood as a progressive process of urban expansion and spatial transformation. Town planning is modifying and sculpturing certain aspects but seems incapable of steering this process. On the one hand the transformation possesses a high intrinsic momentum and on the other hand urban growth significantly affects other societal segments such as agriculture, trade and mobility. The case study of the Kathmandu Valley seeks to investigate these linkages from the microcosm perspective of a brick kiln located in Bhaktapur. Generally modernization is regarded as an exogenous process; in contrast this paper argues that the endogenous dynamics of urbanization are a central arena of “modern” change.

2 Urbanization and urban planning: an historical overview

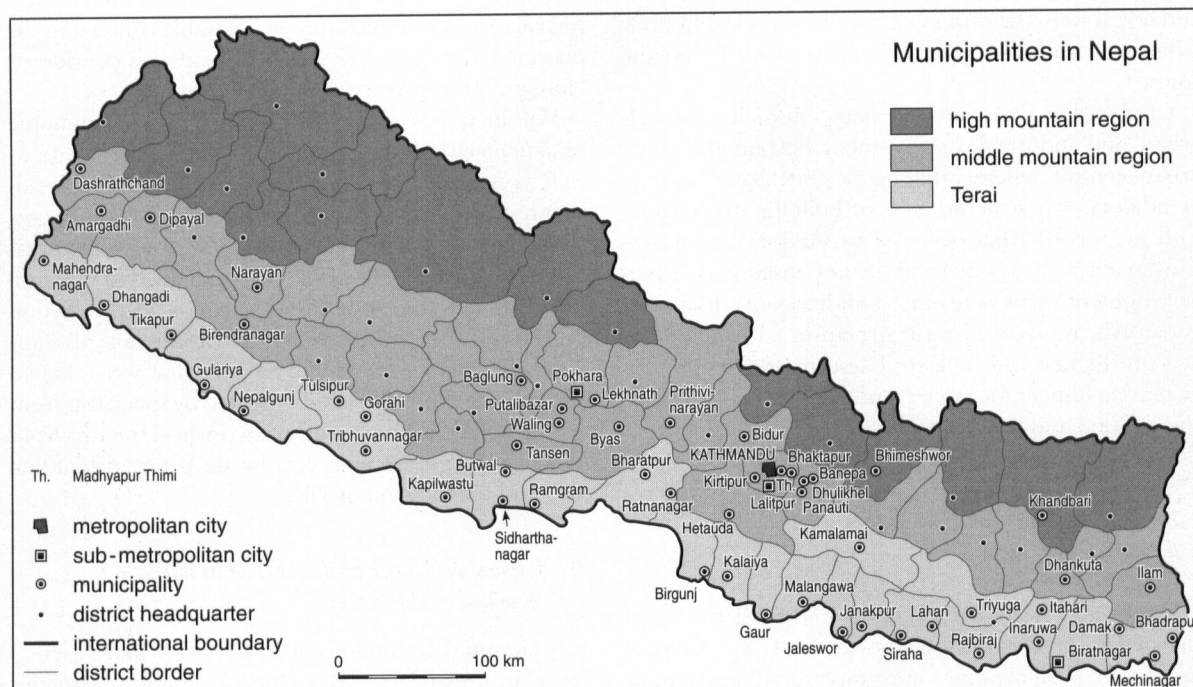
The three “royal cities” of the Kathmandu Valley must have attained an urban character with three-storeyed buildings already at the end of the first millennium AD or even earlier. Newars, an ethnic community the origin of which still remains contested, created densely clustered quarters around courtyards and public squares, the character of which survived fairly untouched until the advent of a modern state in 1951.

The analysis of the city plans reveals a process of growth around earlier village cores as well as linear development along the main roads (cf. GUTSCHOW 1982). The development of traditional clusters came to an end by the middle of the 19th century, when the ruling Ranas – hereditary prime ministers – resorted to construction of large compounds that housed neo-classical palaces with appliances imported from Calcutta and London as well as gardens that boasted trees imported from Mexico and Australia. These ensembles brought the world to Nepal including new building techniques such as lime mortar, stucco and – for the first time ever, a standardized brick named the “foreign brick” (*desiapa*). Two wide belts of palace-compounds developed north and east of Kathmandu as well as west of Patan, creating a kind of twin city.

Another development caused a transgression of the historical edges of the urbanized clusters – edges, which were visually strong but stronger and absolutely

strict as ritual borderlines. The urban community of within was protected by the gods, and rituals brought circulation of ghosts under control. The Rana rulers transcended the confined urban ritual entities and turned to the rivers. Grand schemes turned the river banks into architectural environments that were meant to rival Benares or Kashi, the sacred realm (*kshetra*) along Ganga. This extensive construction programme was carried out in traditional techniques with standardized bricks.

The earthquake of January 1934 was experienced as an important milestone, that brought Nepal closer to the rest of the world. An enormous amount of construction was managed within very few years, an entire quarter of Kathmandu was redeveloped around a wide road named Juddha Road after the ruling Juddha Shumsher Rana or – since the return of the king to power in 1951 – simply “New Road”. The requirements of the new state of Nepal were met by utilizing palace buildings as ministries and even hotels at a time when tourism was in its infant state. A “General Construction Office” (Sarbjajnik Nirman Adda), which was in charge of maintenance of palaces, roads and bridges, turned into a “Ministry of Public Works” in 1956 and entertained for the first time a planning department which lodged a request with the United Nations to assist in producing plans and the establishment of an administrative and legal background to enforce such plans (HERRLE 1983, 368–373). From 1962 to 1971 a number of planners from Norway and Austria set up a Town Planning Office and tried to establish norms they had emulated and internalised in quite a different cultural environment. Ten years later a planner commented under the title “Why planning fails in Nepal”, that “planning was part of an international image [...], planning was necessary in interesting others in giving aid” (WILDAVSKY 1972, 508–528). The – at least for the planning profession – devastating message was, that “planning in Nepal has little to do with anything that happens in that country”. Not much seems to have changed until today, and planning seems to have become a pervasive myth of the 20th century. Another rather banal objective was already coined in 1964 by an adviser from Norway, saying that planning would be needed in order to “avoid spoiling the best of the old and avoid economical and functional mistakes and produce the best solutions for the future” (LEFVERT 1964, quoted in HERRLE 1983, 374). The best of the old, however, was rarely appreciated. As one planner wrote in rather a racist manner as he commented upon the Newar cities: “You are lacking the impression of housing and the relation between room and human being” (ORTNER 1966, quoted in HERRLE 1983, 377).



Source: topography based on map "Nepal 1997", scale 1:1 Mio. and data from Statistical Yearbook of Nepal 1997, pp. 10-12

Design: H: Kreutzmann

Fig. 2: Municipalities in Nepal
Städtische Siedlungen in Nepal

No failure could disillusion planners who keep acting as advisers to the government: The first land use plan for the valley was prepared in 1969, others followed for smaller sectors. The German-aided Bhaktapur Development Project (1974-86) even produced detailed development plans and a land use plan, while the Asian Development Bank tried to guide the overall development with a number of recommendations as recently as 1991: A strategy plan aimed at a densification of established urban areas in order to reduce "the extent of urban sprawl" (HMG 1991, 2). "Sprawl" is the opposite of a planned development. It is acknowledged but it should be reduced. Therefore a border line on the plan defines an urban expansion area, although no legal or whatsoever instrument is at hand to check any land use or building development. Local observation shows a different reality, a development not in the least reflecting the implementation of planning.

By the end of the 20th century the daily newspapers keep repeating complaints about what at least the middle class describes as an awful situation: no water, no solid waste management, growing pollution and no management that can cope with an ever-increasing traffic. What had happened? Factories sought proximity to market and power, centralized in the country's

capital, Kathmandu. Every irrigated rice field near to a road qualified as a suitable construction site. Residential quarters developed in between, following the ancient lines of irrigation and widening a one-foot path to six feet.

In Bhaktapur, this development only started in the context of a highly cash intensive GTZ-sponsored development project that aimed at the renewal of the entire infrastructure and providing a water tap and a latrine to every house. Until 1970 the development of Bhaktapur was confined to the urban core as replacement of old structures was common practice that always necessitated a sizable brick production. By the seventies the first new houses dotted the main roads beyond the core, mainly turning towards south, where in the mid-70s a trolley bus station marked the advent of a new age that allowed large scale commuter movement. While in Bhaktapur that development remained slow, urban Kathmandu and Patan filled the space within the ring road – indeed a bold "present" built with Chinese aid in 1976.

After the revolution in 1990 the valley faced an entirely new quality of urban development. Almost every feeder road beyond the ring road became an artery of development. Carpet factories, private schools

and hotels were the thriving arms of business that drew a fundamental work force and clients from all over the country.

Until today there are no legal obstacles towards urban and industrial development beyond the three urban centres where building permits have become mandatory. Any structure may be built for any purpose with no record whatsoever as to services and waste. This reality of unrestricted if not unlimited urban development turns fields into building plots, footpaths into roads, replaces historic structures with new ones that are higher and bulkier. These trends develop an increasing hunger for bricks: 8 million in 1970, 600 million in 2000 and how many in 2030?

3 Bricks and brickmakers in perspective – the case of Bhaktapur

Craftsmen always figured in the middle of the social hierarchy, equal or below the level of the farmers (*gyapu*), who in Bhaktapur for example, constitute almost two thirds of the urban population. Above the farmers were the Brahmins, various ritual specialists and former members of the royal court who had joined business and the administration of an emerging new state since the early fifties. Below the farmers were members of castes that were considered unclean (barber, painter, butcher) or even untouchable (sweeper, scavenger). Those 77 Avale-families of brickmakers (Fig. 3), which until the early seventies not only produced bricks and roof tiles but also worked on building sites as masons, find themselves on the same social level as the 131 households of carpenters who not only produced doors, windows, joists and rafters but also were engaged in carving visible building elements.

Until the early seventies brickmakers produced either “local” bricks (*maapa*) or standardized “foreign” bricks (*desiapa*), which allowed a comparatively reliable bond. Brickmakers had their kilns within easy reach of their two clusters of houses in Bhaktapur’s upper and lower town (cf. Fig. 3). They were located just beyond the city limits in order to enable customers to carry building material on their shoulders to any site within the narrow limits of the settlement.

When the brick factories that were installed with Chinese aid in Harisiddhi (1970) and Bhaktapur (1972) produced a new standard of bricks with a smooth surface, a new status symbol was born. “Chinese” bricks immediately became the most favoured facing material, often used as a kind of veneer brick (*datiapa*) that was once the pride of Newar architecture. The availability of the new standard brick was instrumental in the

revival of brick architecture in a notable contrast to the plastered Rana palaces which were always considered “foreign” by the local Newars.

Within a few years the production of traditional brickmakers became confined to the veneer bricks as well as moulded bricks for cornices needed for restoration projects. For that purpose traditional kilns (*agah*, cf. for Newari technical terms GUTSCHOW; KÖLVER a. SHRESTHACARYA 1987, 172) have remained in use until today. By 1975 only one kiln was left for the production of “local” bricks while the entire production of standardized bricks was covered by kilns that were shaped after Indian prototypes and operated by specialists from northern Bihar. The import of two-wheel tractors from China at the same time cut the tie between building sites and the location of kilns.

3.1 Expansion of brick production and its impact on agricultural practices

Substantial technological innovations had reached Nepal by the mid-70s. All sectors of economic activities were affected by these developments. Traditional crafts were replaced by mechanized production. The availability of motor vehicles enabled the transport of goods from greater distances in big quantities at lower cost. Nevertheless, a competition arose between brick production and crop-farming on the outskirts of the urban settlements in the Kathmandu Valley. Valuable clay soil was in growing demand for brick production and the space could not be utilized for crops which were meant as supplies for the urban population. The linkage of both needs further investigation.

3.1.1 Quantitative growth of brick production

The dimension of change is not only reflected in the horizontal coverage of built-up space in the urban areas of the Kathmandu Valley (Fig. 4) but at the same time in the vertical growth of buildings. Both developments require a sizeable increase of brick production. Up to 1975 when the first top-fired (annular) “Indian kiln” (*bata*, *chimneybata*) was established in Bhaktapur eight “Nepali kilns” satisfied the demand for common bricks. Traditional kilns were losing out to modern ones in the Kathmandu Valley. In the beginning of the 1970s there were still 50 kilns operating in a four-month season producing approx. 150 000 bricks (new. *apa*, nep. *ita*) each.²⁾ A single *chimneybata* of today’s 77 operating in the Kathmandu Valley (45 in Bhaktapur, 25 south of Patan, 4 around Satungal and 3 near Balambu) provides more bricks than the community of traditional brickmakers could offer a generation earlier (Fig. 5).

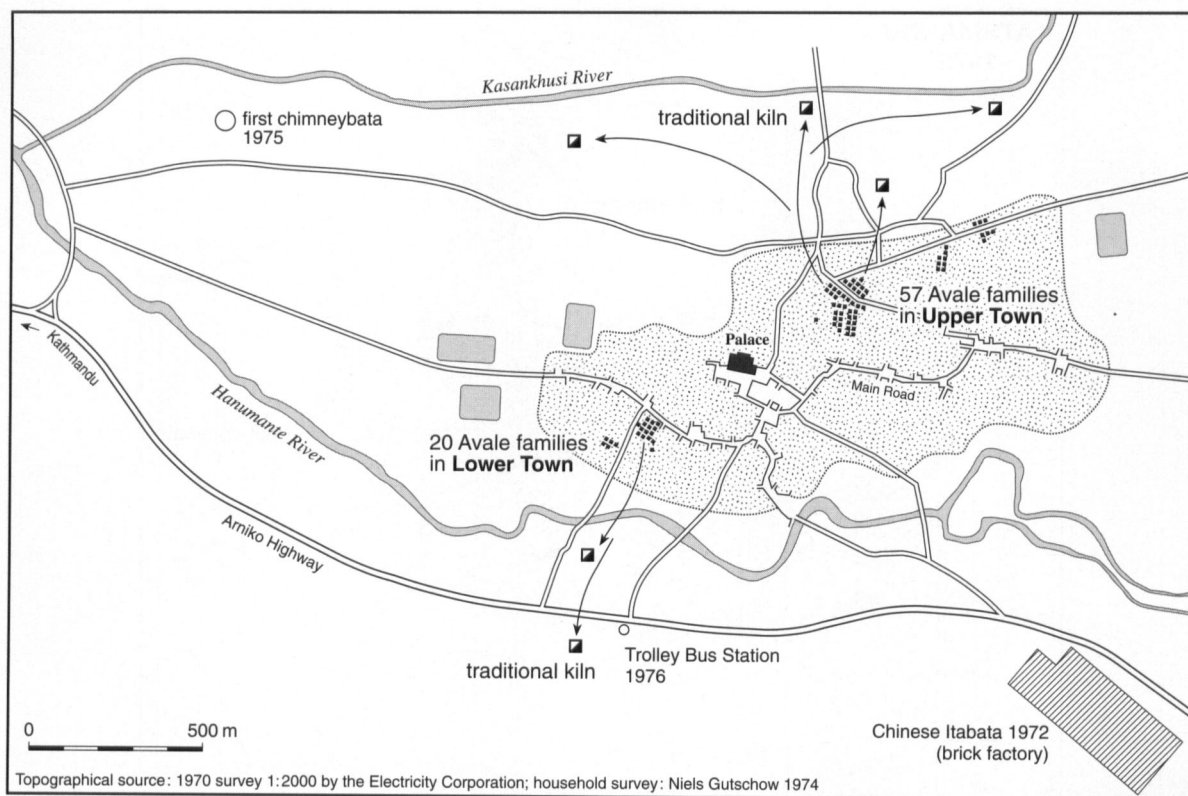


Fig. 3: Living quarters of the traditional brickmakers in Bhaktapur: 77 households of the Avale caste, who settled in two distinct clusters in the upper and lower town, were counted in 1974. Within easy reach fields were leased to produce bricks which were fired in traditional kilns

Wohnviertel der traditionellen Ziegelhersteller in Bhaktapur: In zwei Vierteln in der Ober- und der Unterstadt lebten 77 Haushalte der Avale-Kaste im Jahre 1974. In geringer Distanz zu den Siedlungen lagen die gepachteten Parzellen für Tonabbau. Ziegel wurden in traditionellen Öfen gebrannt

A third player appeared at the same time. When the first Chinese brick factory was established at Harishiddi (Patan) in 1970 its outline was determined for an annual production of 30 million bricks (HMG 1969, 93). The majority of bricks are produced nowadays in privately operated Indian kilns which seasonally utilize rice terraces by exploiting the valuable clay soil.

3.1.2 The interrelationship of agriculture and brick production

In the vicinity of Bhaktapur two production systems can be observed, which are distinguished by the intensity of cultivation, labour demand and expected returns (Fig. 6). The main crop in both cases is rice cultivated only during the monsoon period. In a labour-intensive approach rice is followed by vegetables such as cauliflower and cucumber on irrigated terraced plots. They require good quality soil³⁾ and sufficient moisture and/or water provision. The water storage capacity of clay

is a major asset to highly productive agricultural enterprises in the Kathmandu Valley. Another growth pattern is slightly less labour demanding as vegetables are replaced by wheat. Rice is transplanted in June/July and harvested in November, followed by wheat from

²⁾ Cf. for a contemporary photograph and description BOESCH (1972, 123–125). The Census of Manufacturing Establishments from 1965 records for the Kathmandu Valley a total of six establishments in the “bricks and tiles” sector with 129 persons engaged (HMG 1966, 20), lime kilns are given as four with 74 employees (p. 24). From 1974–1980 the Bhaktapur Development Project used for restoration work nearly no modern bricks from the Chinese brick factory but 1.6 million traditional bricks (*maapa*) and 1.8 million local kiln bricks (PARAJULI 1986, 283).

³⁾ This soil is classified as paddy gley containing in a sample (taken in Harsiddhi) 7.8% sand, 65.2% silt and 27.0% clay (MÜLLER-BÖKER 1996, 119).

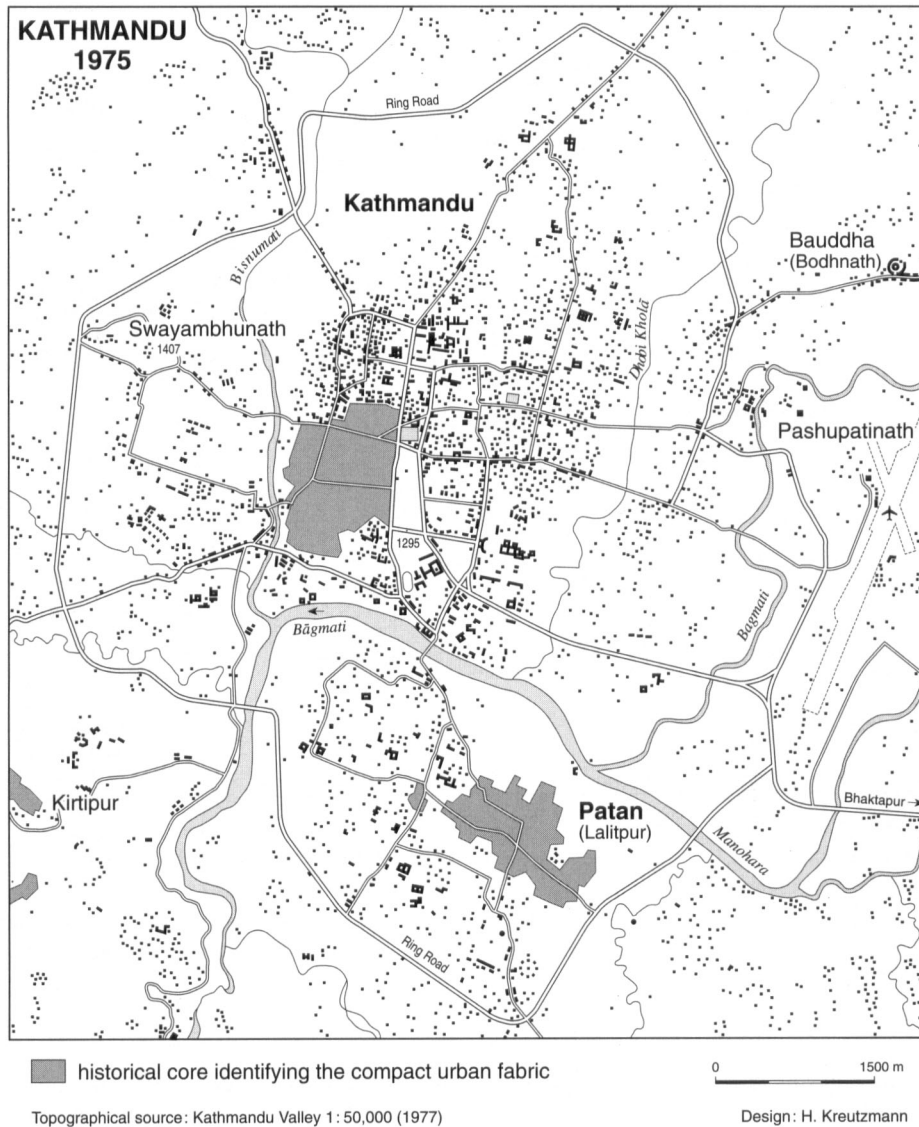


Fig. 4a: Kathmandu 1975

Kathmandu 1975: Der historische Kern ist mit der kompakten urbanen Siedlung fast identisch

December until May/June. Only recently fallow fields (cf. Fig. 8b) occur as cultivation of red pepper on slopes fails or provides little return. For the discussion of brick production the wheat producing fields are of prime importance. Here we find the majority of brick kilns (cf. Fig. 8a). The cultivation patterns are not solely dependent on agro-ecological location, and in a similar manner they are related to the workforce availability in the farmer's household or his concept of cultivation.

As a general rule brick production replaces wheat crops. The land rent paid to the farmer proves this rule.

He is remunerated with the equivalent of four *muri* of wheat (1 *muri* equals as a volumetric measure 91 litres, in the case of wheat 1 *muri* approximates to 68 kg). Thus the farmer is harvesting his "wheat" field without investing his labour, but paying the price of losing valuable soil. The terraces could be lowered as much as one metre per annum.

The high number of 45 kilns around Bhaktapur and their demand for fields has resulted in quite an exclusion of cultivation from food production. The wheat crop would cover a space of app. 250 hectares where

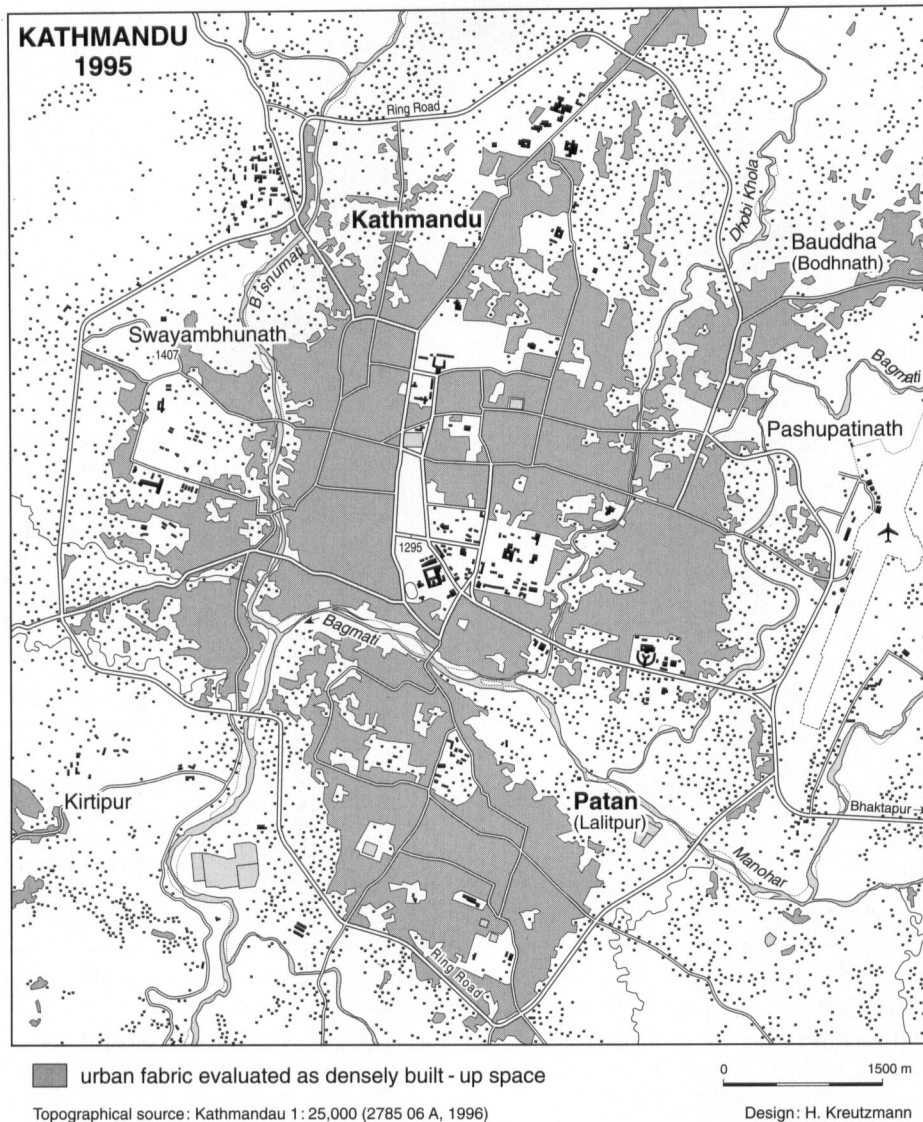


Fig. 4b: Kathmandu 1995

Katmandu 1995: Städtische Agglomeration als kompakt überbauter Raum

now kilns are to be found: a loss of 1350 t of wheat each year. In Bhaktapur District about 6.5% of all wheat fields are presently utilized for brick production (data for comparison are taken from the Statistical Yearbook of Nepal 1997, 61). Some farmers feel that the toll paid is too high. They are no more willing to rent-out their fields for brickmaking as they fear an irreversible damage of soil fertility. But when surrounded by brick-makers more problems occur. Their fields remain at a certain level while the surfaces of all others are lowered. The required moisture content and irrigation could

become problematic. Consequently there remains pressure on the farmer to comply with his neighbours' decision to cooperate with the kiln owners. A growing number of farmers complain about the adverse effects of air pollution affecting their field crops. Red pepper (chili) and cucumber crops failed repeatedly in recent years. Farmers of Bhaktapur have joined forces this year in letting down another entrepreneur. He had to refrain from establishing a new kiln. They successfully collected signatures and filed a complaint with the Village Development Committee (VDC). To underline

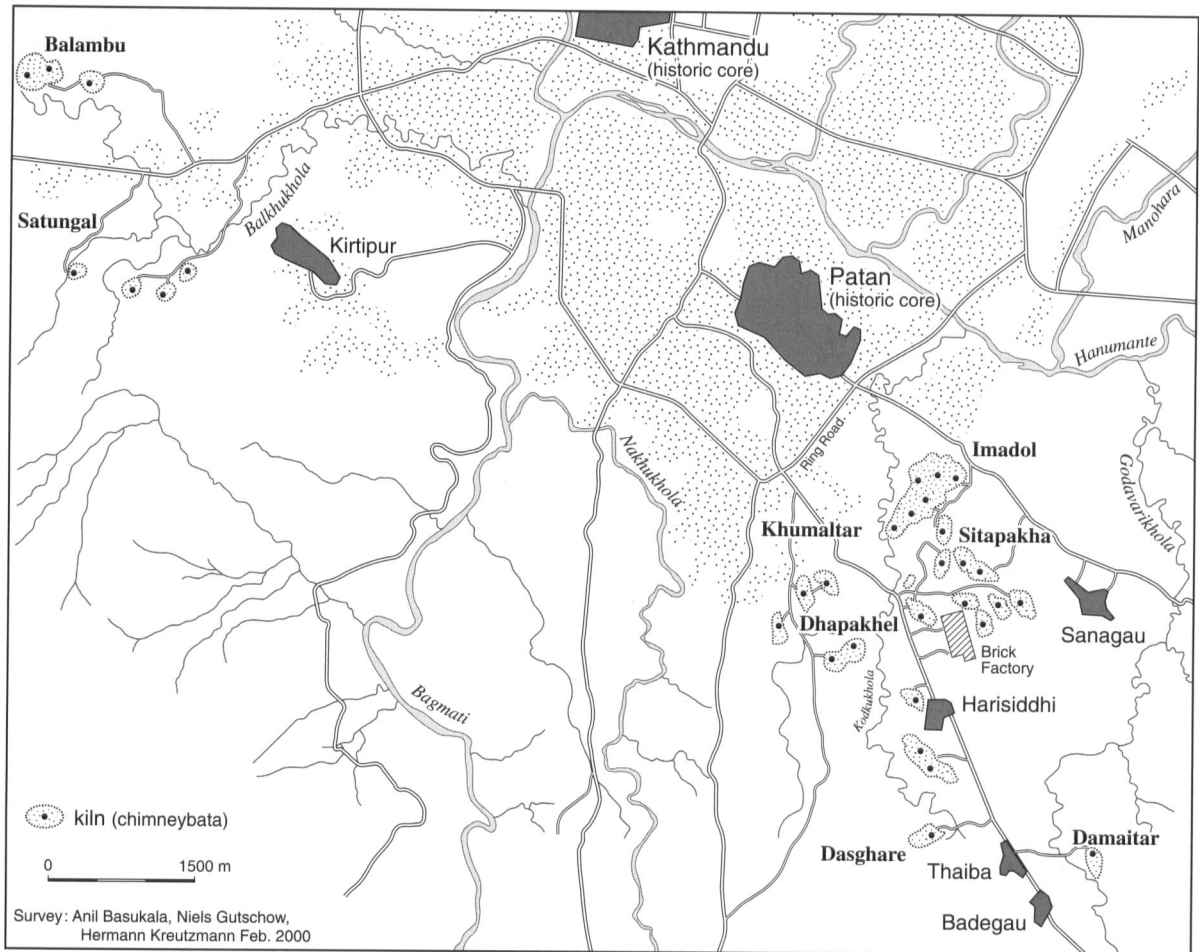


Fig. 5a: Kathmandu Valley: Location of brick kilns on the periphery of the conurbation of Kathmandu and Patan.

Topographical source: map 1: 25 000, sheet numbers 2785 06A, 06C, 1996

Kathmandu-Tal: Lage der Ziegeleibetriebe am Rande der städtischen Agglomeration Kathmandu-Patan

their demand they threatened to restrict the access to the kiln, a more efficient strategy to pursue their cause, as they had earlier voluntarily contributed to the widening of the road.

Traditionally more than two thirds of Bhaktapur's inhabitants were engaged in agriculture on fields surrounding the town.⁴⁾ The land reform of 1962 has in principle established property rights of the producers. In the aftermath new seed varieties and mineral fertilizers were introduced. Agrarian innovations reduced the work load, the cultivation scheme along with im-

⁴⁾ The Bhaktapur Town Development Plan (1977, 52) estimates for the mid-1970s that 70% of the inhabitants "depend mainly on agriculture" and "two thirds of the land is owner-cultivated".

proved opportunities to trade products on the urban market. Urbanization and a higher demand for building material led to the construction of two Chinese brick factories in Patan (1970) and Bhaktapur (1972).

Still in the 1980s the local brick production was undertaken by the farmers themselves on fields they owned as an additional source of income. They processed the clay and shaped it into moulds. The proprietors of the land offered their labour input and the raw material to the "new" kiln operators (*batawala*) who had replaced the traditional kilns mentioned above. In popular parlance this is the transition from "Nepali kilns" to "Indian kilns"⁵⁾, which in fact operate on different principles: the former resembles basically a clamp or scove kiln which has four enclosing walls and is charged once to full capacity, closed flat on top with-

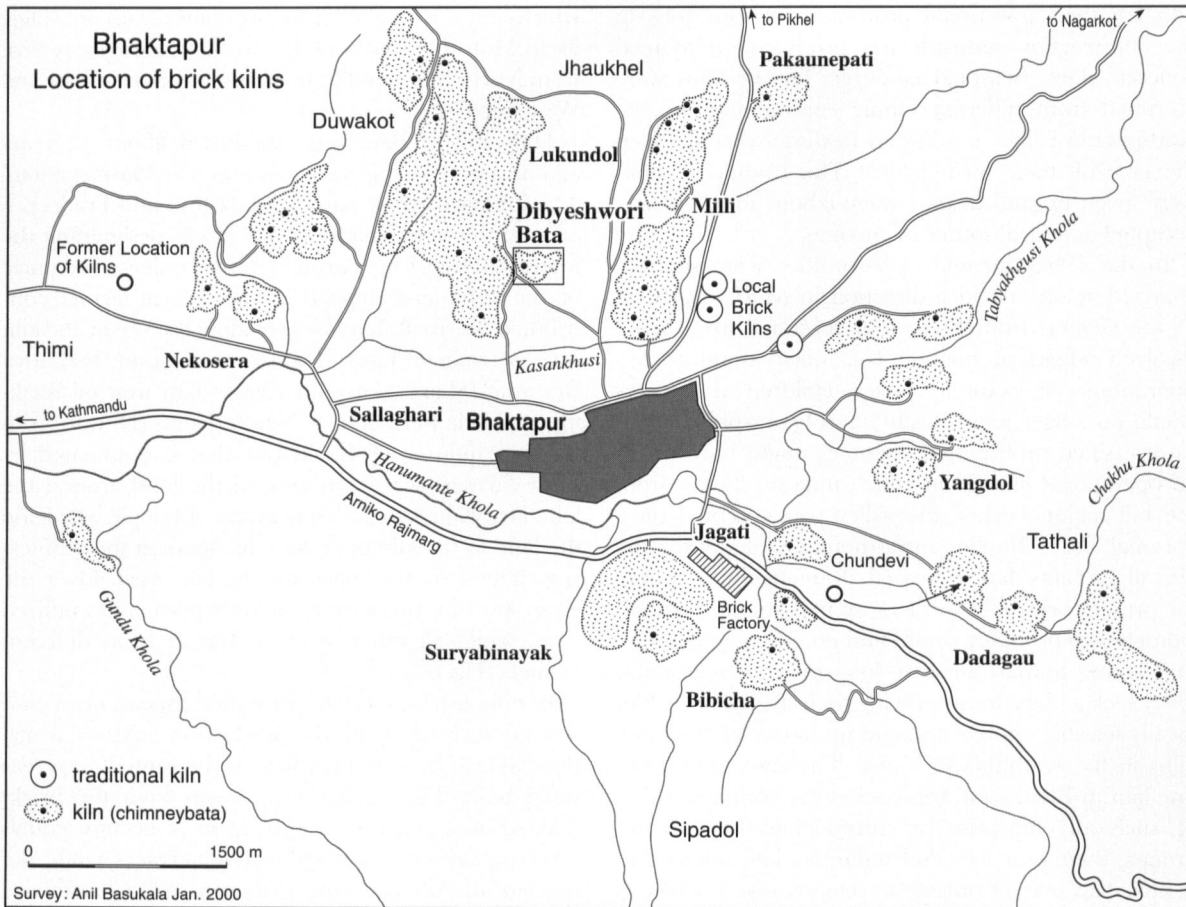


Fig. 5b: Bhaktapur: Location of 45 brick kilns within a distance of one to five kilometres from the centre of town, most of them made accessible for light Tata trucks since the 1980s

Topographical source: map 1: 25 000 sheet number 2785 06B, 1996

Bhaktapur: Lage der 45 Ziegeleibetriebe im Umkreis von 5 km vom Stadtzentrum, die Mehrzahl ist seit den 80er Jahren von Motorfahrzeugen erreichbar

out a separate chimney and then fired from a side furnace until the whole load is ready. Proper stacking and firing are instrumental in obtaining good results although the waste factor is high due to difficult temperature and ventilation control in the flat-topped kiln without a chimney. The annular or Indian kiln is based

⁵⁾ The annular kiln was invented in Germany and a patent was granted to E. Hoffmann and A. Licht in 1858. The worldwide export of annular kilns began in the last quarter of the 19th century and seems to have been a major innovation in enhancing the capacity of brick production (BENDER 1996, 630). Nevertheless, other contemporary machinery invented for brick production has so far never reached South Asia. Only the annular kiln was introduced in Nepal under the brand name "Indian kiln" or *chimneybata*, as the distinguishing mark is the funnel.

on a rotating system of charging and removing bricks in a continuing process while sections are fired through stokeholes on the top. Smoke leaves the section through metal chimneys.

The innovations in brick production were accompanied by socio-economic changes which not only affected the demand for more construction material but which significantly changed the patterns of division of labour and income opportunities. Social reforms, proprietor-orientated tilling of fields, farming innovations and motorized transport reduced the number of persons involved in agriculture and released quite a workforce and entrepreneurs for "modern" undertakings. The 1970s are the period when these developments coincided. By the mid-eighties the traditional brick-makers, who had always also been masons and roofers,

had left their traditional profession for new jobs in the construction industry, e.g. producing reinforced concrete slabs. Seasonal labourers for the kilns were recruited from different ethnic communities of the Kathmandu valley in addition to those who moulded the clay of their own fields.⁶⁾ The traditional links were given up and in part wage-labour in a kiln was accepted as a local source of income.

In the 1990s income opportunities seem to have changed again and in a direction in which nearly all of the farmers from Bhaktapur refrained from being involved in brick production. Urbanization, status considerations (for example: jobless children of farmers would no longer join the kiln), and better-paid as well as diversified professional openings might have led to an operational change in which migrant labour from the hill region outside the valley was accepted on a seasonal basis. Besides intra-montane migration the overall mobility has increased dramatically.⁷⁾ Among the present brick kiln workers we find young men and women who probably would find no other opportunity in working abroad all-year-long or even seasonally. They seek a niche for improving their livelihood, adopt locally feasible options and end up in one of the brick kilns in the Kathmandu Valley. The case study from one kiln in Bhaktapur approaches the complex set-up of such an enterprise by introducing the different groups, their practices and interests. The microcosm is linked to overall outside developments, but has its internal rules and regulations which form the basis for functioning as an enterprise.

4 Case study of a microcosm: Dibyeshwori Bata in Lukundol, Bhaktapur

At Dibyeshwori Bata about 180 people from various ethnic communities come together to offer their skill and labour that produces approximately 7 to 8 million bricks within a six-month span. For 70 kilns that operate in the Kathmandu Valley in the 1999/2000 season a workforce of more than 12 000 people turned up, of

which only a negligible minority comes from the valley itself. More than 90% of the workforce migrates here from North Bihar and from remote districts in East and West Nepal (Fig. 7).

Dibyeshwori Bata was established about 12 years ago as a partnership between two *sauji* (businessmen). The initials of their names – Lakshmi and Pradeep – created the brand name of LP bricks designating the impressed frog. One partner left the business, the uncle of the remaining stepped in and a local farmer contributed his small share by providing the site of the kiln on a permanent basis. The two owners are Parbatiya Brahmin (Sharma) from a village 5km west of Bhaktapur. Their partner is a Newar Jyapu (Duwal) from Byasi, a quarter of Bhaktapur that is dominated by those farmers who own and till the land around the kiln. He belongs to the same group of people who lease the land to the kiln operators, his share in the business is weighted by the space for the kiln itself. Over the entire year his property is the only permanent utilized land, while all other space is rented from different farmers (Fig. 8).

In establishing a brick kiln several aspects need consideration. First of all, the production fields of which the clay can be exploited have to be rented on a seasonal basis (Fig. 8): in Dibyeshwori Bata the brick-making area consists of 120 *ropani* (1 hectare equals 19.66 *ropani*) of wheat cultivation terraces while the space of the kiln and some storage area (7 *ropani* of rice and wheat cultivation fields) is held permanently during a seven-year lease. A local partner is required for the acquisition of the contiguous agricultural area demanded as he is acquainted with the neighbouring farmers. Their fields offer a good quality initial clay of appreciable depth and sufficient space to produce enough raw bricks for continuous charging of the kiln in a revolving process. After a critical depth is reached some terraces have to be given up for extraction of clay while others replacing them are sought for rent. Thus the area of the kiln may change slightly every season while the site of the annular kiln remains to mark the centre.

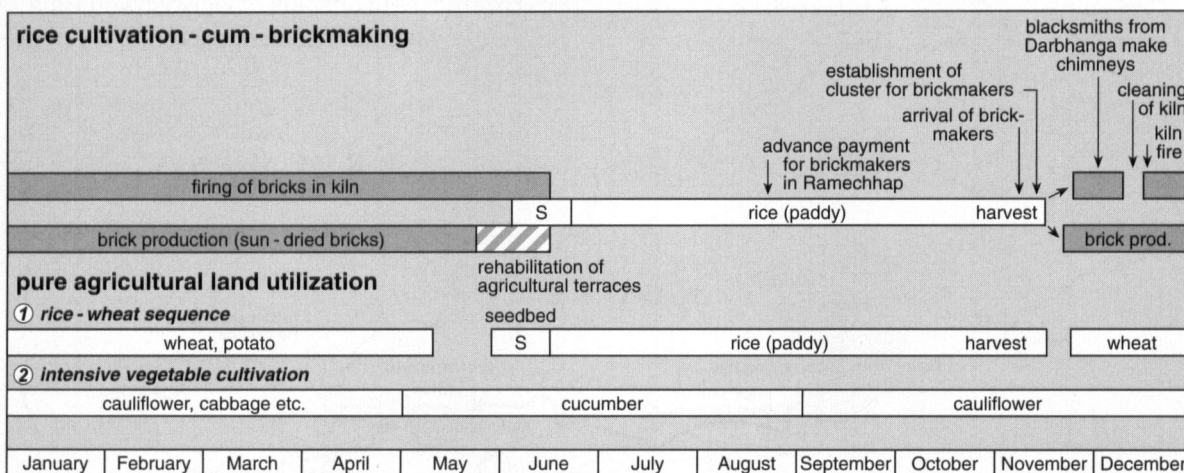
In the case presented the filling capacity of the Indian kiln (Fig. 9) amounts to 650 000–700 000 bricks (*kaciapa*). In a 16-day cycle one complete fill of the kiln can be processed into ready-made common bricks (*desiapa*). The bricks are top-fired in the chambers of the annular kiln section-wise on a day-to-day basis.

To sustain the continuous supply of the kiln about 65 people are engaged in shaping the terrace soil into standardized raw bricks. Two producers are from the Newar community in Chaling, one from Bhaktapur who combines brickmaking with tilling his fields in the

⁶⁾ In a brief survey in a kiln in the mid-80s the brickmakers belonged to settlements within the Kathmandu Valley (MÜLLER-BÖKER 1996, 114).

⁷⁾ While income from army pensioners and overseas soldiers topped the list of Nepal's foreign currency earnings in the early 70s this trend was later on altered by a growing importance of tourism and related domestic service industries. Only recently the prime importance of remittances and pensions from overseas was acknowledged for the upkeep of the Nepalese economy (DAHAL 2000).

Agricultural utilization strategies for irrigated fields in Lukundol (Bhaktapur)



Design: H. Kreutzmann

Fig. 6: Agricultural utilization strategies for irrigated fields in Lukundol (Bhaktapur)

Landwirtschaftliche Nutzungsformen im Bewässerungsland von Lukundol (Bhaktapur)

vicinity, and one Chetri household from Chaling. All other brickmakers are from villages outside the Kathmandu Valley.

They migrate seasonally from Ramechhap District (Fig. 7) on the eastern edge of the Central Development Region. Sixty men and women are counted as work force, while 20 children are brought along. Only seven are Chetri, while all the others including the leader are Majhi, a community of fishermen. Years ago it was a two-day's walk to Dhulikhel, the nearest place to catch a bus to Bhaktapur. In the year 2000, the kiln owner sent a pick-up to meet part of the group on November 1 at the banks of the Tambakoshi near their village. This was necessary to make sure that the first dried bricks enter the kiln by mid-December.

The leader of this group (*naike*) has taken the contractual responsibility and acknowledged to the kiln owner that the 60 brickmakers hired by him will supply the kiln with a minimum of 6 million bricks in the course of the season. Most of them operate in one or two-person teams (*kala*), sometimes supported by women and children. Immediately after their arrival at the kiln an effort is made to construct small huts (*jhaul*) close to their work space (Fig. 10). Sun-dried, stackable bricks compose the walls while corrugated iron sheets provided by the owners are applied for roofing.

The procedure of brickmaking starts with the removal of top soil from the terraces which were still used a few days earlier as rice fields and where roots and stems hamper brickmaking. Under the top soil suitable raw material appears. The unworked clay has to be

crushed with the short-handed hoe (*new. ku, nep. kodali*), put in a proper place to mix it with water to make a stiff body material by kneading it with feet. The composition of the body has to settle overnight before the desired consistency for moulding is reached. The brick-making material is brought by the hoe to the space where bricks are shaped by pressing the body into moulds (Photo 1). The result is placed bed-faced for drying on the prepared ground. The floor and the mould are dusted with fine material (*panca*) in order to avoid sticking. This fine, dry material is provided by the kiln owner and carried in sacks by the brickmakers to their work space. After a day the bricks are turned on edge to continue the moisture reduction process in a smooth manner. Later on the "green" or partially dried bricks are stackable and stored in long walls along the work space to dry. The process takes twenty days altogether to reduce the moisture content sufficiently.

The kiln supervisor will be informed when a course is ready and comes to the site for counting. He issues a receipt to the brickmaker and keeps the remainder of the slip for his accounting. In addition an account book is kept by the *naike* for recording the daily supply, which on a good day could be as much as 60 000 bricks but varies between 38 000 to 70 000 depending on how many *kala* provide bricks on a given day: in January 2001, the account book registered 50 300 pieces on a day when 51 *kala* had bricks ready for removal. For each unit of 1000 sun-dried bricks the producer is entitled to receive 210 Rs. After counting and book-keeping the supervisor informs the carriers to whom he indicates



Fig. 7: External relationships of Dibyeshwori Bata: Migration and supply routes. Brickmakers come from Ramechhap in the east and carriers from Rolpa and Dang in the west. Kiln operators and more carriers come from North Bihar, and coal is imported from Assam

Topographical source: map 1:2 million, prepared by the Topographical Survey Branch, Survey Department H.M.G. Nepal 1987

Außenbeziehungen der Ziegelei Dibyeshwori Bata: Migrations- und Versorgungswege. Ziegelmacher stammen aus Ramechhap in Ost-Nepal, während Träger sowohl aus Rolpa und Dang als auch aus Nord-Bihar, Indien kommen. Das Ofenpersonal stammt ebenfalls aus Indien. Kohle wird aus Assam über Ost-Nepal eingeführt.

the site from where the bricks are to be brought to the kiln.

All carriers (*bogne manche*) originate from areas which differ from those of the brickmakers. Basically two groups have been hired for the transport of bricks to the kiln. First, the so-called Madeshi – the inhabitants of the lowlands. No distinction is made between Nepalis living in the Terai at the foothills and those who live across the border in Bihar.⁸⁾ Altogether 45 people arrive in early December from the area around Darbhanga, Bihar's northern industrial centre; most of them come from Kotwara, from where also the *mistri*, the master of the fire, and an accountant originate. On the day of their arrival in early December the first sun-dried bricks are placed into the kiln while the *mistri* performs a small ritual that will ensure smooth production.

The Madeshi establish their own dwelling as a cluster settlement close to the kiln and distanced from

other groups. The five blacksmiths offer their services to different kiln operators and leave after the completion of the chimneys. In our case the people hired for the whole season are employed as kiln operators, skilled craftsmen and as carriers. The majority of the 45 young men (Photo 2) carry bricks on a wooden tablet positioned on a cylindrical buffer piece of coarse cloth

⁸⁾ The carriers do not comply with the migratory pattern which is usually stated as a feature of mobility between India and Nepal: "... The popular impression in Nepal remains that labourers from India to Nepal are much more skilled than labourers from Nepal to India. It has been argued that the wage rates of labourers from India, because they are more skilled, are higher as well." (Nepal South Asia Centre 1998, 104–105). This quotation underlines the observation that contemporary migration research is missing out in investigations about migration processes within the developing world as it is mainly emphasizing mobility between First and Third World countries (cf. PRIES 1998).

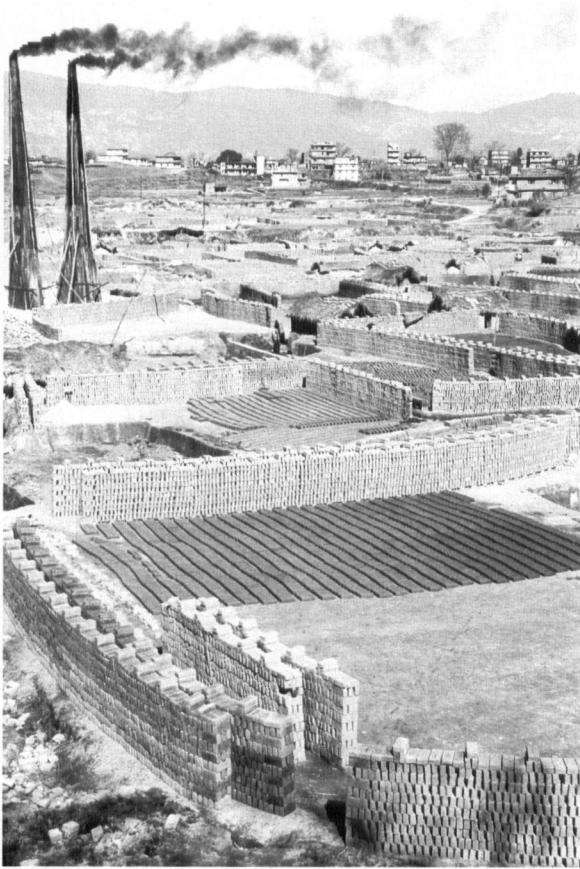


Photo 1: Dibyeshwori Bata: Brick production in a *kala* and kiln. Bhaktapur in the back ground

Photo: H. Kreutzmann Jan 11, 2001

Dibyeshwori Bata: Ziegelherstellung in einer *kala*, der Ringofen vor der Kulisse von Bhaktapur

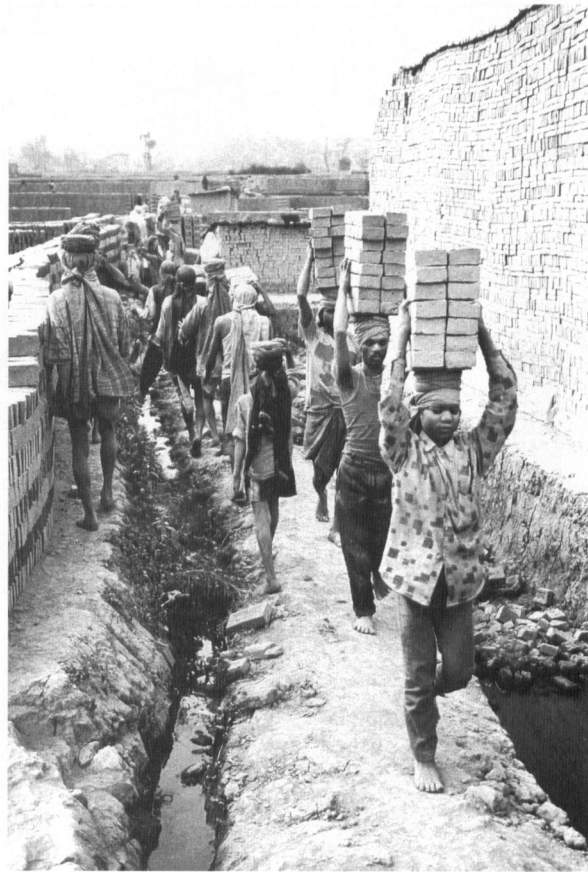


Photo 2: Brick carriers from Darbhanga, Bihar, India

Photo: H. Kreutzmann March 31, 1999

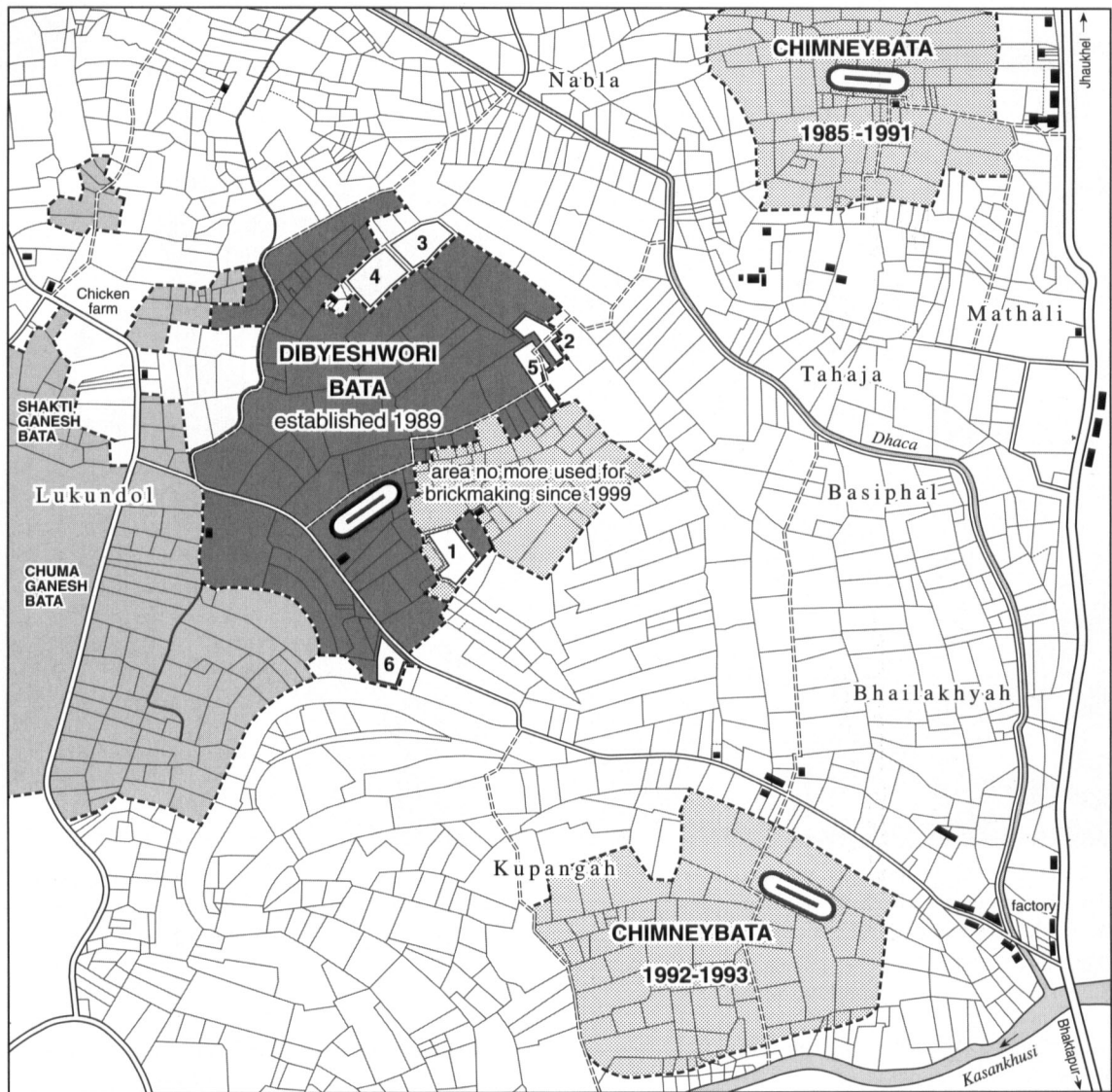
Ziegelträger aus Darbhanga, Bihar, Indien

on their heads. According to the individual carrying capacity the load consists of even numbers between 10 and 16 bricks. For every load carried to the kiln they receive a token (*kauri*)⁹ which values their individual amount of bricks which is entered as their personal carrying capacity in a register book. If the bricks have to be carried from a distance farther away than 105 steps from the kiln then two token are issued, if the distance exceeds 210 steps the load value triples. In the evening the daily number of token is entered in the account book of the supervisor. For every 1000 bricks

carried the equivalent of 25 Rs (less than half a Euro) is paid to them at the end of the season.

The Madeshi provide all the workforce for the kiln as well: 17 persons are required to operate the kiln smoothly; a master is in charge for the whole operation, his prime task being to safeguard proper and continuous firing. The temperature might range around 1000°C, but no measuring instrument is employed. Experience counts and the regular view into the firing holes is practice. Four men take turns for the continuous firing of ten rows of bricks at a time. They fire the fourteen top openings (two rows) with coal (imported from Assam) and locally available saw-dust at 15-minute intervals around the clock. The firing staff works in 12-hour shifts. The firing mixture is prepared at the coal store. Two persons hammer the coal lumps into small pieces, mix them with saw-dust, carry the fuel to the site and fill the barrels of the firing staff. Six persons are working in the kiln for proper building-up of the stacks

⁹ The term *kauri* reflects symbolically the shell of the same name which functioned as a currency in earlier times in South Asia and elsewhere. Present-day *kauri* are metal tokens of different shapes as in the case of Dibyeshwori Bata, or are sheets of paper which are stamped by the supervisor with a rubber stamp, as was observed in neighbouring kilns.



Jhaukhel, detail of the cadastral map of ward no. 8 (area kha, ga, cha), surveyed in 1966 at the scale 1:1.250. Delineation of areas used for the production of bricks. Two chimneybata were in use for a limited time span of only six and two seasons, because of limited availability of clay. The southern chimneybata had to be given up because the farmers were fearing floods in case the level of fields would be lowered considerably. The area of Dibyeshwori Bata adjoins those of Shakti Ganesh Bata and Chuma Ganesh Bata. The working area changes its configuration every year: Towards southeast some 15000 m² have been returned to the agricultural cycle in 1999.

- 1 Field of which tests in November 2000 proved limited availability of soil. It was rented for the season but will no more be exploited.
- 2 A small field that is under contract for the season of 2000/2001 for the first time.
- 3 A field that was given to the bata in the previous season, but is used to grow potatoes for the 2000/2001 season.
- 4 A field used to grow wheat in the season of 2000/2001, but the owner is under growing pressure to lease the field to the bata for the season to come.
- 5 Working area (kala, 2040 m²) of Surya Bahadur Basukala, a Newar farmer from Bhaktapur (see detailed site plan)
- 6 Vacant working area (kala) for which no brickmaker could be found at the beginning of the season.

0 100 m

Fig. 8a: Dibyeshwori Bata in Lukundol, Bhaktapur: Utilization of space and temporary establishment of brick kilns in Jhaukhel

Dibyeshwori Bata in Lukundol, Bhaktapur: Raumnutzung und vorübergehende Ziegelestandorte in Jhaukhel



Jhaukhel, detail of the cadastral map of ward no. 8 (area kha, ga, cha), surveyed in 1966 at the scale 1:1.250. Survey of present utilization in January 2001 by Niels Gutschow. Three chimney bata exploit the southwestern section for clay, while a major irrigation channel and a parallel slope determines the location of fields used to grow potatoes, cabbage, cauliflower, onions, garlic and peas. Accessibility by bike and availability of workforce also represent important factors for the growing of cash crops. Fields with sandy soil along the slope remain fallow but were traditionally used to grow red pepper and mustard.

Fig. 8b: Dibyeshwori Bata in Lukundol, Bhaktapur: The inter-relationship of seasonal brick production and agricultural utilization of terraced fields in Jhaukhel

Dibyeshwori Bata in Lukundol, Bhaktapur: Verflechtung von saisonaler Ziegelproduktion mit landwirtschaftlicher Nutzung von Terrassenfeldern in Jhaukhel

Bhaktapur - Dibyeshwori Bata

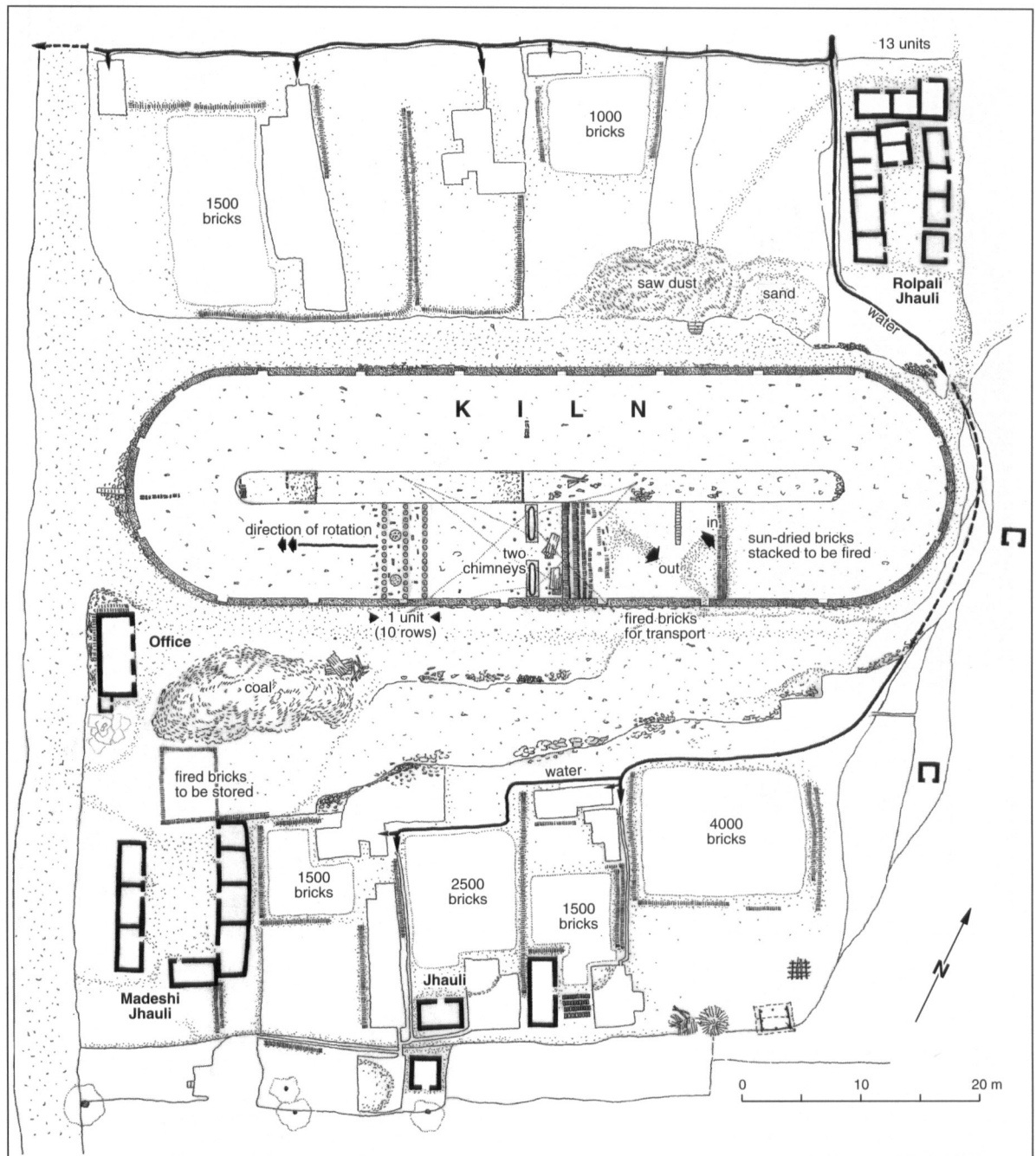
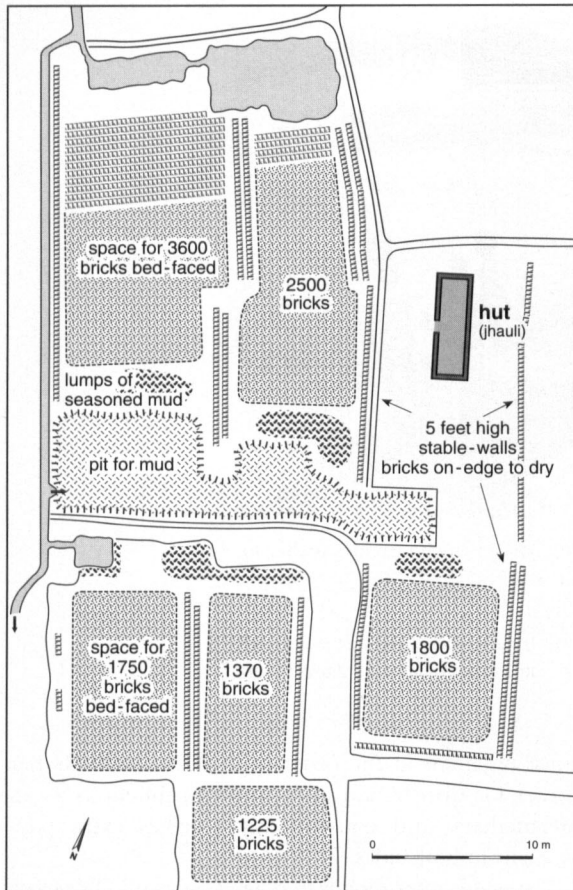


Fig. 9: Dibyeshwori Bata in Lukundol, Bhaktapur: The *chimneybata*, a 70 m long annular kiln with a production capacity of 7.2 to 8.4 million bricks in a six-month-long season.

Dibyeshwori Bata in Lukundol, Bhaktapur: Der Ringofen (*chimneybata*): 70 m lang mit einer Produktionskapazität von 7,2 bis 8,4 Millionen Ziegeln in einem Halbjahres-Zyklus

of bricks, one applies the top layer with spares for the firing holes and three men remove the brick dust from the kiln and put it aside for covering the top layer. After

the bricks are fired and cooled down the kiln workers assist the carriers in removing the ready-made bricks. In times of great demand they are loaded directly on



Survey: Anil Basukala and Mohan Yakami, Jan 10, 2001

Fig. 10: Dibyeshwori Bata in Lukundol, Bhaktapur: A *kala*, the brick production unit of Surya Bahadur Basukala, a Newar farmer, that allows a maximum of 12 245 bricks to dry on a surface of 2040 m² at a time. With his wife, two sons and a daughter he dwells in a small hut of 3 m².

Dibyeshwori Bata in Lukundol, Bhaktapur: Eine *kala*, das Ziegelproduktionsareal von Surya Bahadur Basukala, newarischer Bauer. Auf der Fläche von 2040 m² können maximal 12 245 Rohlinge getrocknet werden. Mit Frau, zwei Söhnen und einer Tochter lebt der Haushalt in einer 3 m² großen Hütte

trucks, otherwise stored close-by. The carriers receive another token for this job.

Through the last row of brick courses the smoke escapes, channelled in metal double-smoke pipes.¹⁰⁾ Within 24 hours every chimney has to be moved once to serve the next shift of ten rows. All kiln workers are required to drag and carry the chimney to the next location. Corrosion and acidic exhaust from the burnt coal affect the chimneys in such a way that they last for one season at a maximum.



Photo 3: Female brick carrier from Rolpa

Photo: H. Kreutzmann Jan 30, 2000

Ziegelträgerin aus Rolpa

Nevertheless, in addition to the Madeshi a second group of brick carriers was hired in Rolpa and Dang Districts of the Mid-western Development Region (cf. Fig. 7). The 35 men and women carriers plus 20 family members (mainly children) arrived at the site by mid-December and have established a separate cluster of huts as their temporary settlement (Photo 4).

These men and women at the age of 15 to 22 form a group of their own which comprises Kami (blacksmiths), Brahmin, Chetri and Magar, a composition of

¹⁰⁾ These have been prepared prior to the first firing on December 15 (*ek gate* = first day of the month of Mangsir) by skilled Madeshi metal workers. Five of them worked for five days to hammer rectangular metal sheets into proportion to form the eleven metre-high chimneys distinguishing the kiln from a far distance (Photo 3). The investment for a pair of chimneys ranges above 100 000 Rs.

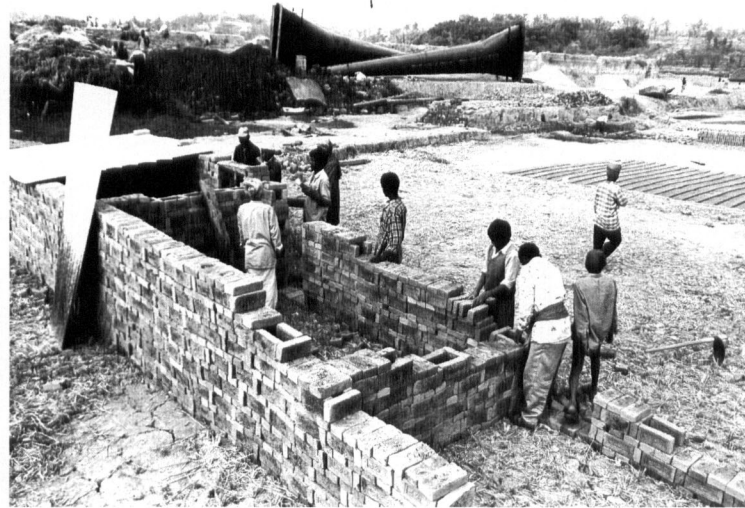


Photo 4: The construction of a make-shift hut (*jhauli*) which provides shelter for kiln workers during the six month-long season

Photo: N. Gutschow Dec 11, 2000

Der Bau einer Hütte (*jhauli*) als Unterkunft für die sechs Monate währende Arbeitszeit. Ziegeleiarbeiter errichten sie aus ungebrannten Ziegeln am Beginn der Saison

a surprising variety which in this form is often found at the foothills of the Himalaya.

What is decisive for this mixed "community" is their common place of origin. They figure as people from Dang and Rolpa. Their nine huts form a visually prominent cluster beside the kiln, while those who produce bricks live in detached houses which only in one case form a row of three. It is obviously the place of origin that provides the necessary group identity and at times solidarity in case competition arises to fight for advantages. The group identity and honour centres around Gorahi (recently renamed Tribhuwannagar in memory of the grandfather of the late king Birendra), the main bus station of Dang district, where the leader of the group (*naike*) calls for to hand out a small advance payment in August in order to ensure the appearance of the members in early December.

Similarly as in the case of brickmakers, the *naike* who has assembled this group, takes some responsibility as a foreman. The people from Dang and Rolpa apply a different carrying technique than those from Bihar. Load piles on their backs range from 20 to 32 bricks supported by the traditional Nepali forehead belt (*namlo*). As they are carrying mainly bricks from long distances they are remunerated with 60 Rs per 1000 bricks. Different tokens (*kauri*) are distributed among both groups of carriers. Prior to the brickmaking season the foreman visits the kiln owner to assure the arrival of his workforce and to receive contract-ad-

vance payment in the order of 2000 to 4000 Rs per worker for distribution. The foreman functions as an intermediary and consequently receives extra payments from both sides.

The whole operation is managed from an office close to the kiln. Six persons are employed here. The two office managers are from Lokanthali while the supervisors and token issuers are related to the respective groups. They see to it that everything goes smoothly. Book-keeping of advance payments to brickmakers and carriers, purchase of required materials, repair works and of course the factory sale of kiln-fired bricks and the arrangement of brick transport to the storage place of the *sauji* in Lokanthali, are managed by the office staff. In addition one or the other of the owners are somehow present most of the time in order to control operations and to supervise marketing. They are members of the "Bhaktapur Batawala Association", a recently formed organisation (1998), which aims at controlling the market price of bricks and setting equal standards agreed upon by the members. Every season there remains some uncertainty for all persons involved as the final setting of wages and prices needs to be negotiated and announced only in April.¹¹⁾

¹¹⁾ Thus all values referred to in our economic calculation (Tab. 1) are related to the last season ending in the summer of 2000.

Table 1: Expenses and contributions in Dibyeshwori Bata

Ökonomische Kalkulation der Einnahmen und Ausgaben in der Ziegelei Dibyeshwori Bata		
contributions/expenses	lower margin	upper margin
<i>i) costs depending on quantity of bricks</i>	(7.2 million bricks)	(8.4 million bricks)
remuneration for brickmakers	1 512 000 Rs	1 764 000 Rs
wages for carrying of bricks from the <i>kala</i> to the kiln	360 000 Rs	420 000 Rs
wages for carrying of bricks from kiln to truck/store	180 000 Rs	210 000 Rs
transport to godown, market, construction site	900 000 Rs	1 050 000 Rs
subtotal	2 952 000 Rs	3 444 000 Rs
<i>ii) regular costs for six months of kiln operation</i>		
land rent (7 <i>ropani</i> permanent, 120 <i>ropani</i> seasonal)		349 600 Rs
clay/sand (50 truck loads)		75 000 Rs
water rent		12 000 Rs
chimneys (material and wages for construction of a pair)		130 000 Rs
fuel (400 tons of coal plus saw dust)		3 300 000 Rs
wages for kiln staff (one <i>mistri</i> and 16 operators)		177 000 Rs
office costs (six staff for supervising, issuing token, accounting and sale) and food expenses		360 000 Rs
dwindling of bricks		100 000 Rs
costs for levelling of fields at the end of the season		100 000 Rs
contingency reserves for damages, loss of production etc.		200 000 Rs
government taxes and other dues		500 000 Rs
subtotal		5 303 600 Rs
<i>iii) sales price at 1400 Rs per thousand bricks</i>	10 080 000 Rs	11 760 000 Rs
<i>iv) profit margin for batawala</i>	1 824 400 Rs	3 012 400 Rs

Source: survey by authors

At the close of the season additional Madeshi workers are hired to level the working areas of the brick-makers in order to permit the farmers immediately to proceed with rice transplantation after the end of the season. Suitable terraces, adequate and functioning water supply through channels have to be guaranteed.

5 The economy of Dibyeshwori Bata: different perspectives

Dibyeshwori Bata was established eleven years ago on the basis of an initial seven-year-long lease of 7 *ropani* of permanently utilized space for the establishment of the kiln and store room. In addition approx. 120 *ropani* of agricultural land – varying in size and location – are rented on a seasonal basis during the wheat growing period (November to May). Way into the second lease phase several plots (about one third) had to be given up due to non-availability of sufficient clay material. The critical horizon under which sandy layers are hidden is reached there, further activities would threaten the whole production system of paddy and bricks. New plots were rented in exchange and every year the kiln area is adjusted and shifts (cf. Fig. 8).

5.1 The entrepreneurial calculation

The rent of the required land amounts to 349 000 Rs per season, while for the access to water 12 000 Rs are paid to the owner of a nearby water source (Tab. 1). From his well the water is directed in pipes and open channels to the work space of individual brick makers.

A regular requirement for the operation of the kiln are about fifty truck loads of fine clay/sand (*panca*) at a cost of 75 000 Rs, which are stored near the kiln. Every season two chimneys need to be replaced by the expert blacksmiths from Bihar. Material and wages amount to 130 000 Rs for the pair. A substantial input is connected with the firing material. Coal from Assam is purchased from Betamud (Eastern Nepal border place) at a cost of 80 000 Rs per 10 ton-truck. About 40 truck loads are required per season. The admixture of saw dust can be locally purchased at a nominal cost of 100 000 Rs.

The *mistri* from Darbhanga hires his staff for charging and firing the kiln; he earns a higher monthly salary (5500 Rs) while all his staff earn about 1500 Rs. The income of the accountants and supervisors who are responsible for the recording of bricks, issuing tokens

(*kauri*) and book-keeping of sun-dried and fired bricks ranges in between. The office staff is fed on site, which is taken as a cash value into account of their salary. Food-wise all other kiln workers care for themselves.

Although all costs are basically dependent on the period of operation and the quality and quantity of fired bricks the above-mentioned expenses occur on average each season. For an economic calculation of the kiln performance the number of bricks produced is the salient factor. In our case study the production varies between 7.2 and 8.4 million bricks per season. Consequently both margins are considered. Three major components comprise the variable expenses.

First of all, about half of all expenses in this section go to the brick makers. For every thousand bricks they are remunerated with 210 Rs at the end of the season. While working the brickmakers sustain on advance payments made to them and the carriers on a weekly basis through the office staff. The advance payments, fuel and office expenses amount to about 100 000 Rs per week.

The second component are the expenses for carrying the bricks from the *kala* to the kiln. Two groups are involved in carrying the bricks. On average 50 Rs per thousand could be estimated as the cost of carrying unfired bricks to the kiln, while removing common bricks from the kiln involves only short-distance transport and loading near the kiln at rates of 25 Rs per thousand.

In addition about one third of the expenses is accrued by the transport of bricks to a storage place or the customer's construction site. Some entrepreneurs buy bricks in the production season in order to sell their stocks at higher prices in the off-season.

The basis for the calculation are prices and wages of 2000, the figures for the 2000/2001 season have still to be agreed upon although present factory prices for common bricks range up to 1700 Rs per thousand (2100 Rs market rate in Kathmandu) which reflects an increase of 20 to 30%. Fluctuations are to be expected, although at the beginning of the season there was unceasing demand.

The calculation shows the profit margins and indicates that a higher production results in significantly higher profits for the owners as the overheads lose weight (cf. Tab. 1). Taking all production costs and overheads into account, the profit of the owners reaches 18% of the sales and rises to 26% if the expected maximum of bricks are produced and sold at the envisaged price of the season. This means that each of the two owners makes a profit of approx. 13 000 Euro. We know how difficult it is to base such a calculation on factual expenses and real production numbers

– especially in a country that seems to have “invented” regular taxation only a couple of years ago following rising pressure from the World Bank. Regardless of what we managed to compute in the table we must assume that the accrued profit is even higher than presented.

5.2 *The economy of brickmakers and carriers*

Hitherto our budgeting focussed on the entrepreneur's perspective and his ability to maximize his profits. For brickmakers the profitability is strongly linked to their ability to produce a high number of bricks within the season of demand. If a brickmaker provides the lower limit of 100 000 sun-dried bricks during a six-month span then he will be remunerated with 21 000 Rs. While living in the *kala* in his make-shift hut (*jhauli*) his basic weekly needs range around 350 Rs for food supply solely. No expenses for tobacco, alcohol or other distractions are included and still at the end of the season 8400 Rs will be deducted from his account. In addition the advance payment, which was received as a contract agreement loan prior to his coming to Bhaktapur, less than 10 000 Rs (equivalent to 150 Euro) can be brought home. If he is able to maintain his frugal lifestyle and to produce more sun-dried bricks within the same time span his take-home income may raise to 15 000 Rs. The Newar brick makers from Kathmandu Valley fare better as they utilize family support and consume self-produced food from their household. Their profit after six months might range between 20 000 to 30 000 Rs. The Newars working in the kiln seem to be more disciplined and may eventually make such a profit of 500 Euro per season. All others may return home with nothing more than a new shirt and a pair of trendy sneakers from Kathmandu's abundant markets.

The wide gap between the profit of the owners and the mere survival of those who produce bricks or work in the kiln reflects the reality of “modernization”. Inequality, environmental degradation and cultural deprivation is the result – inevitably. It is survival that makes the uneven contract between the owners and workers feasible.

Similar expenses as for the brickmakers from Ramechhap occur for the carriers who live in the Madeshi and Rolpa cluster settlements respectively. After deducting all living costs they might return to their homes in Darbhanga and Rolpa with a profit of 10 000 to 20 000 Rs (app. 300 Euro) after six months of hard labour. The wide range reflects the individual carrying capacities and personal preferences. Probably the actual amount returned is much lower as other ex-

penses have to be taken into account, such as tobacco, alcohol, medicine or the occasional snack and the replacement of clothes and slippers. Having been away from home for half a year the returning migrants managed to survive, earned very little money and were no burden on the household budget in their villages. If a small profit materializes then seasonal labouring in a kiln remains somehow attractive as a source of income.

6 Conclusion: Urbanization and migration

The observations presented from the brick kilns in the Kathmandu Valley and Dibyeshwori Bata in particular are contradictory to general development theory under the brand of "modernization". Urbanization and migration resemble two backbones of modernization theory and are classified as positive developments within it. The process of urbanization is taken as a qualifying indicator for attaining modernity. The same applies for migration. Increasing regional mobility enhances social mobility. The present cases of the Kathmandu Valley underpin different observations. The overall urbanization in Nepal seems not to be in tune with other countries of the developing world. The pace and the structural characteristics differ. Nevertheless, urbanization takes place and is observed in our case study from the construction point of view: urbanization requires brick production. The demand for building material led to a number of innovations in the 1970s which can all be characterized as enhancing modernity.

The division of labour became more complex, agriculture lost in importance, new professions and technologies were introduced. "Traditional" craftsmen expanded their professions. Skills were lost and "modern" replacements were introduced. Emphasizing brick production we observed all these changes. Traditional brickmakers became masons, while presently bricks are produced by migrants from the middle mountains who mainly come from agricultural backgrounds and different communities. Their regional mobility has increased, but their incomes remain on a very low level and they thus are not improving their economic status by undertaking this seasonal work. Socially their status might have improved, as they have been "abroad" living in "luxury" in an urban area. Local agriculturists are only in rare cases involved in "modern" brick production. The European innovation of the annular kiln, which was introduced to India in colonial times, reached Nepal quite late. With technology transfer trans-border mobility by carriers and skilled labourers such as blacksmiths and *mistri* coincided. The kiln is

a meeting place of people who cover great distances for minimal income opportunities, quite contrary to modernization theory. Consequently other explanatory models need to be considered.

The utilization of agricultural space for urban non-food demands leads to the limitations of available resources, although the Kathmandu Valley is not short of brick production material for the near future. The competition of agriculture and construction industry, different appreciation of production values, and new job opportunities for land owners create the space for this soil-consuming industry. Its microcosm – that is how every *bata* appears – is well linked to the globalized economy of Nepal. Nevertheless, the working conditions of the employees seem to be far removed from the outside world. When traffic in the Kathmandu Valley came to a stand-still during the Nepal *bandh* (general strike) in January 2001 the daily routine in the kiln continued and bricks were produced as every day. The migrant workers in the brick kilns are bound to the owners through a complex system of contracts, debts and advance payments which leaves little to be negotiated.¹² In contrast, the kiln owners operate a highly profitable enterprise which reflects the social relationships in *bata* microcosm.

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¹² In his recent book on "disposable people" Kevin Bailes devoted one chapter to brickmakers in Pakistan. Working conditions are worse there and the character of bonded labour is what made the connection to "new slavery" (BAILES 2000). We only hope that the workforce in the kilns in Bhaktapur was not bonded. At least we could not make out any signals.

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