The Pressure of Urbanisation Rice-milling Machine with

HE provisional figures of the 1991 census of Bangladesh indicate that there has been a high speed of urbanization. Although the preliminary count shows that 10.29% of the population of Bangladesh live in municipalities compared to 9.23% in equivalent area of 1981, the actual figure in 1991 for all urban areas are expected to show a much higher level of urbanization. At least 16 new municipalities and other urban areas have come up since 1981 census. The only statistics available in the Preliminary Report of the population census of 1991 limit our interpretation and conclusion for the time being but the growing fast. overall growth of population

size is alarming. There is a growing awareness of the complexity of urbanization. In less developed regions like Bangladesh, the urban crisis is all the more distressing in view of the fact that urban centres are important areas of economic and social development and the pro-

cess of cultural change. Levels and Trends of Urbanization

In 1965 the urban population was estimated to be at six per cent while that rose to 16 per cent in 1989, a significant increase over the period. Average annual growth rate was documented at 6.9 and 6.6 per cent during the period 1965-1980 and 1980-1989 respectively (UN 1991). Although the current level of urbanization (16%) is low compared to other developing countries, the rate of growth and the absolute size (19 million in 1990) is quite alarming. Total urban population more than doubled both in 1974 and 1981 with respect to the figures in 1961 and 1974 respectively. The urban population of Bangladesh during 1961-1981 increased by 401 per cent. According to the Bangladesh Bureau of Statistics (1984) about 30 per cent of the total urban population increase during 1974-1981 could be explained by the extended definition of urbanisation in 1981. The inclusion of thana headquarters and small hats and bazars (market places) with electricity which were not previously recognized as urban centres accounted for about 4' million

population (BBS, 1984), The absolute size of the ur ban population is project to rise to 35 million by the year 2000. By 1981 Bangladesh had 491 urban centres compared to only 48 in 1901. Dhaka, Chittagong, Khulna and Raishahi are metropolitan cities, each being the largest city in each of four administrative divisions of Bangladesh. Among these four, only Dhaka and Chittagong are million plus cities. 1981 data identified 11 urban centres with population size between 100,000 and 10,00,000.

Laskar (1985) evaluated the changing pattern of urbanization through the comparison of number of urban centres with size categories of population, distribution of urban population by size classes etc. and found that the urbanization is dynamic.

Metropolitan Growth,

Slums and Squatters In 1981, the metropolitan cities, namely Dhaka, Chittagong, Rajshahi and Khulna held 45 per cent of the total urban population of the country while Dhaka alone had 25 per cent of the total urban

population. Dhaka the largest city of the country and being the capital of Bangladesh has an important role in the urbanization process. It had a population of 3.5 million in 1981 and its current population is about 6.7 million and projected to grow about 12 million in the year 2000. The second largest metropolitan (Chittagong) city's population was estimated at 1.3 million in 1980 and 2.3 million in 1990. According to the United Nations report, Dhaka and Chittagong combined together accommodate about 47 per cent of the present total urban population (UN 1981). Similarly Khulna, Rajshahi are

The rapid urbanization and big city growth have led to the concentration of hundreds of slums and squatter settlements. A recent study identified over 1125 slums and squatter settlements in Dhaka metropolitan area (CUS 1988). These are not concentrated in one or two particular areas but spread over all parts of the city. These squatters accommodate about 50 per cent of the total population of the city.

ties or even small towns have

slums in existence, which are

expanding. About 30 per cent

of the population of these ur-

ban centres are from slum ar

eas. Living conditions in these

slums/squatters are very unhy-

gienic and inhuman. The popu-

lation densities have been es-

timated to be 2000 persons or

more per acre. Per capita liv-

ing spaces have been found to

be less than 10 square feet in

many cases. Sanitation is very

bad. Utilities are inadequate.

Rents are exorbitant and

tenure is uncertain. Because,

these settlements have grown

illegally on public or semi-pub-

lic lands, the inhabitants of

these areas are under constant

Causes of Urbanizations:

contribution of internal migra-

tion cannot be carried out ad-

equately for want of sufficient

data, we can throw some light

based on other observations

Chowdhury (1983) in a study

estimated the difference of

expected and actual population

in urban areas in Bangladesh,

assuming the natural growth

rate of population to be equal

in urban and rural areas. He

found that "quarter of a million

people migrated from rural ar-

eas. During 1961-74 the num-

ber stood at 2.5 million and

during 1974-78 about 1 mil-

lion people have migrated to

urban centres." Besides

scarcity of migration data,

most statistics on migration

(when available) cannot reveal

the picture of return move-

ment of the people to rural ar-

eas or smaller towns from the

the urban population in the

country has grown much faster

than the rural population -

almost 3 times during the past

30 years. Therefore, the

growth of urban population is

not only due to natural in-

crease but also due to other

factors such as rural-urban mi-

gration, change in the defini-

tion of urban areas and the

horizontal expansion of the

existing urban areas. The Task

Force Report indicates that

It has been observed that

other urban areas.

Although the analysis of the

threat of eviction.

by S I Laskar

the most dominant component of urban population growth has been the migration. During 1974-81 migration has contributed about 40 per cent of the national urban population change. It further says that the larger cities attracted even higher percentage of migrants. Task Force Report (1991) and BIDS study (1985) explained reasons of rural urban-migration in terms of 'push' and

pull' factors. Economic opportunities (perceived or real) mainly at tract the rural young people to migrate to the cities. Educational and health facilities and marital condition also pull rural people to the cities. Big cities enjoy positional advantage and have good linkages with the hinterland areas. Similarly the rural push because of the employment or landlessness and natural calamities like cyclone, famine, flood and river erosion lead mass exodus of

people from village areas. Rural-Urban

Differentials:

The cause and effects of urbanization are related to the Other big-and medium-size ci- rural-urban differentials in re-

And hence strategies must have to be conceived emphasizing redistribution of

population and the location of economic activities in a regional way so that

investment may not spread to uneconomic areas but in selective production centres.

source allocations and income

generating activities. The de-

mographic transformation of

urbanization has an important

bearing on the distribution of

population in agricultural and

and hence on the structure of

the economy. Tremendous

population growth is exerting a

pressure on the land available

and hence on the existing

levels of unemployment. In our

economy the maximum level of

employment is attained when

the level of wages (determined

by marginal product) is equal

to the minimum subsistence

level. Beyond that point many

workers have to find work out-

side agriculture. This is one

significant "push factor" of ru-

increase in non-agricultural

labour force compared to the

increase in agricultural labour

force in each decade since

1961. The mon-agricultural

labour force increased from

2.6 million in 1961 to 11.6

million in 1983-84 and 17.7

million in 1989. The 1981

census as well as the latest

labour force survey recorded

higher participation rates for

urban areas than that of rural

mated (in 1990) at 24.6 for

urban and 34.1 for rural areas

show that the difference in

quite high. Similarly there has

been a significant difference in

NRR between urban and rural

and 1.76 for urban and rural

areas respectively. Age at mar-

riage is also substantially lower

for rural areas than for urban

areas and the proportion of the

population married is higher

for rural areas, particularly for

women in the reproductive

ages. This may be attributed to

higher literacy rates and com-

paratively modern attitudes in

urban areas. Literacy rates are

52 per cent for males and 33.7

per cent for females in urban

areas compared to 30.8 per

cent and 13.2 per cent respec-

tively in rural areas (BBS,

1981). As Bangladesh is be-

coming more and more urban-

ized there is a possibility

areas. In 1990 NRR was 1.20'

The crude birth rate esti-

There has been a relative

ral-urban migration.

non-agricultural occupations

(weak) of reduction in fertility level in general. Since the urban population generally has better education, occupation, higher social status and higher income than rural population, they are more prone to have a small family.

Urban crude death rate (7.8) is lower than the rural comparative figure (11.80) in 1990. Expectation of life at birth for urban population is also higher than the rural areas, the estimated figures for urban and rural areas being 59.5 and 55.5 respectively in 1990. The causes are medical

as well as socio-economic. Sex-ratio in urban areas in 1981 has been found higher in all age groups compared to rural areas. The number of males per 100 females in all the major three cities exhibited high figures. The ratio has been found larger in big industrial and port cities. For example Chittagong, Dhaka, Barisal and Khulna indicated very high ra-

The imbalance in the sexratios in urban areas may be attributed to social and economic factors. More young men migrate to urban areas for

tional training etc. than

women do. Majority of the

womenfolk work as housewives

in rural whereas their hus-

bands work in industries and

the tertiary sector in different

Effects of Urbanization:

has accelerated during 1961-

74 and 1974-81. The number

of big cities and medium-size

towns increased substantially

during 1961-81. Metros and

big cities grew faster than the

medium and small towns. In-

dustry, trade, commerce and

business activities tended to

concentrate in bigger town

and as such cities and metros

tion in Bangladesh like other

developing countries are the

rapid growth of urban popula-

tion, disparity in income dis-

tribution between urban and

rural population, sub-human

conditions of average living

standard, mushroom growth of

slum areas and shanty towns -

all serious impediments to the

proper planning and develop-

ment of urban areas. Cities and

big urban areas are becoming

congested and over-crowded

exerting a tremendous pres-

sure on existing housing facili-

ties, job opportunities, trans-

portation system, imbalance

in the ecological and environ-

mental system, available food

Young literate as well as il

literate people move to the ci-

ties in the hope of getting jobs

for higher studies and for

business activities. But finding

nothing gainful, many of them

become vagrants. This means

that urban growth and the ex-

pansion of urban economic ac-

tivity are not in balance. Mass

influx of migrants created new

problems like unemployment,

a high incidence of crime, the

proliferation of shanty towns

and substandard housing. Nat-

ural calamities like cyclone,

famine, flood and river-erosion

render many people homeless

and economically destitute. Lot

ties for shelter, security and

of them had to migrate to ci-

protection.

and medical facilities.

The problems of urbaniza-

expanded faster.

The process of urbanization

The implications of massive urbanization in a poor country like Bangladesh manifest in poverty, inequality in urban-rural resources, housing problems, environmental hazards, very high unemployment, crimes, tension, political disruptions, severe transport congestions, poor hygienic conditions and public health problems, overcrowding to the access of every available social services including medical and, educational facilities.

Policy Strategies

All these problems call for proper management of urbanization and this in turn need proper policy strategies. In the past the urban development policies adopted were to main tain the status quo. Those policies were favourable mainly for the few privileged classes. The overall situation deteriorated day by day a large section of the people, mainly the poor and the middle class suffered.

They did not have proper access to the existing facilities or they could not share the beneficial aspect of the policies. Hence a pressing need arises "to reorient the existing urban policies to ensure a better life to the poor and to make them more valuable human re-

By and large the policies should be designed to overcome the acute poverty level and reduce inequalities. The government in fact is aware of the population growth and rapid urbanization and has initiated decentralisation policy. Both the Second Five Year Plan and the Third Five Year Plan chalked out a plan for a number of growth centres along with the development of upazila centers. This policy is still being continued in the current plan (Fourth Five Year Plan). The main purpose has been to diffuse the urban problems reducing the rate of growth of big cities and towns to contain the rapid growth of metropolis by developing secondary towns. A National Physical Plan is being prepared which is supposed to focus on all aspects of urban development and diversification of urban rural settlements. Urban Development Directorate with funds from international organizations is involved in such type of works. Although there are problems of inadequate support of planning personnels, the master plan for zila and upazila towns are progressing well in terms of substantial works done in the development of infrastructure in small growth centers.

Besides these direct policies on urbanization, policy measures in other sectors such as policies on population, rural development and rural settlements, regional development, communication and transport, housing, land utilisation, environments have strong bearing on urban development and hence needs to be co-ordinated. Social cost of overconcentration in our country is very high and detrimental to the normal function of social life. And hence strategies must have to be conceived emphasizing redistribution of population and the location of economic activities in a regional way so that investment may not spread to uneconomic areas but in selective production centres.

(The writer is Research Fellow, BIDS.)

a Difference either hand-operated (sham T is now almost mid-day, ghain) or foot-operated but the sky is grey and Lovereast with heavy (dheki). Manual husking methods have certain advantages in monsoon clouds, and it is dark in Dalagram Village in Kaligani respect of nutrition, increased Thana 36 km northeast of Laimilling yield and in providing monirhat district town in employment for women at the

village level.

The disadvantage of manual rice husking is its very low productivity, even in Bangladesh. A woman working hard from dawn to dusk can manually husk 40 kg of paddy.

The same amount of rice can be processed in an electric or diesel powered rice huller in a few minutes at the cost of only Tk 5-10 (\$ 0.14-0.28). Assuming a daily wage for unskilled labour of Tk 25 (\$ 0.70) manual rice husking provides a very meagre livelihood.

In contrast with manual methods, mechanized rice processing is very profitable. However, rice mills are owned and operated by men with only a few low paying jobs like paddy-drying being available mount the diesel engine and rice huller as a single portable

This eliminates the need for (and cost of) permanent foundations and a building. The technical feasibility of this has been piloted and demonstrated during 1990 and 1991

in both men's and women's

After a detailed evaluation of the technical and economic feasibility of the milling operation, and training for the women's groups which will be taking up machine rice milling, the prospects for replication, both within RDRS and in other organisations, will be clearer.

Bangladesh produces upward of 18 million tonnes of rice annually. Every year this is processed at a cost of about Tk 10 (\$ 0.29) per maund (37 kg). Annually this amounts to Tk 5,000 million (\$ 143 million). If women were able to capture a portion of this mar-



Maleka and Nirubala working at the rice mill.

ing the rice milling equipment newly developed by RDRS. The four women come from two different parent groups organised by RDRS, a large Non-Governmental Organisation (NGO) working in northern Bangladesh.

northern Bangladesh. Ap-

proaching the cluster of

thatched huts amidst mango

trees and bamboo clumps, the

drone of a mechanically-pow-

ered motor is clearly audible.

In the little hut that houses

the device, two poor women -

Jahanara and Shoneka - in

their early thirties are working

at a small rice milling machine

and sweating on this hot, hu-

Today it is Jahanara and

Shoneka's turn to operate the

rice milling machine which

has been developed by Rang-

pur Dinajpur Rural Service

(RDRS) as a household tech-

nology for creating employ-

ment for rural women. Two

more women - Maleka and

Nirubala - make up the sub-

group of four from the Chameli

Women's Group which is pilot-

mid and gloomy August day.

Rice processing is a multimillion dollar business in Bangladesh. At the village level it is controlled by women. In its small industrialised form, the roadside mill, it is controlled by men. Putting lowcost mechanised rice milling equipment in the hands of women offers a way to maintain this essential source of income at the village level, under women's control.

Traditionally, women in Bangladesh are responsible for post-harvest operations related to cereal grains. In the case of rice, women parboil (soak and steam) the paddy, sun-dry it, and finally husk it and separate the finished rice, broken rice and the mixture of husk and bran. Parboiling improves the flavour and reduces breakage. The rice and broken pieces are consumed or sold. The husk/bran mix is used as fuel for the parboiling operation or fed to livestock.

The manual husking methods used by women in rural Bangladesh work on the principle of a mortar and pestle,

for women. At a time when so much emphasis is being placed on increasing employment opportunities for women in rural areas of Bangladesh, it is ironic that as rice processing becomes really profitable, women are excluded by virtue of the high capital costs and the technical nature of the activity.

One way for women to profit from machine-based rice processing is for them to own and operate the equipment.

With this objective in mind RDRS has undertaken a project to adapt mechanicallypowered rice milling equipment to suit it for ownership and operation by women's groups.

The aim is that women's groups would finance and operate small rice husking machines which use small (5hp to 8hp) diesel engines and have a capacity for 150-250 kg of paddy per hour. Individual women working at the household level will procure paddy, parboil and dry it and then pay to have it husked by the groupowned machine. Each household would be responsible for the purchase of paddy and sale of rice.

To facilitate the introduction of this small-scale processing technology, a system has been developed to close-

ket, this would mark an enormous gain for women's employment and income.

Jahanara and Shoneka or Maleka and Nirubala can process about 20 maunds (740 kg) of paddy in a good day but on a cloudy or rainy day they can manage only up to 10 maunds (370 kg). Customers are charged at the rate of Taka 10 (\$ 0.29) per maund and each of the two women working at a time receive Tk 2 (\$ 0.06) per

The remaining money goes to the group fund. If the two women can process 20 maunds, they will receive Tk 40 together or Tk 20 each which is about the local wage

Therefore, household rice milling will not be economically viable unless they can process at least 20 maunds per day. For this reason, the women's groups operating milling machines need to publicise their venture more widely in order to attract more customers. RDRS will be making further technical refinements of the machine to compete better with the larger, roadside mills, with the aim of generating employment for thousands of poor women in rural Bangladesh.

- RDRS Feature

Dollar-a-Year Pump Brings Hope to the Farmers

HE other day curious villagers and ent-husiastic children converged on a patch of farmland at Savar, 25 kilometres west of Dhaka Bangladesh's capital.

They had come to help inaugurate a new irrigation pump which the village doctor had just put up on his five-acre

The pump, consisting of simple mechanical gadgets built with PVC pipes and bamboo levers, was standing ready to be commissioned .

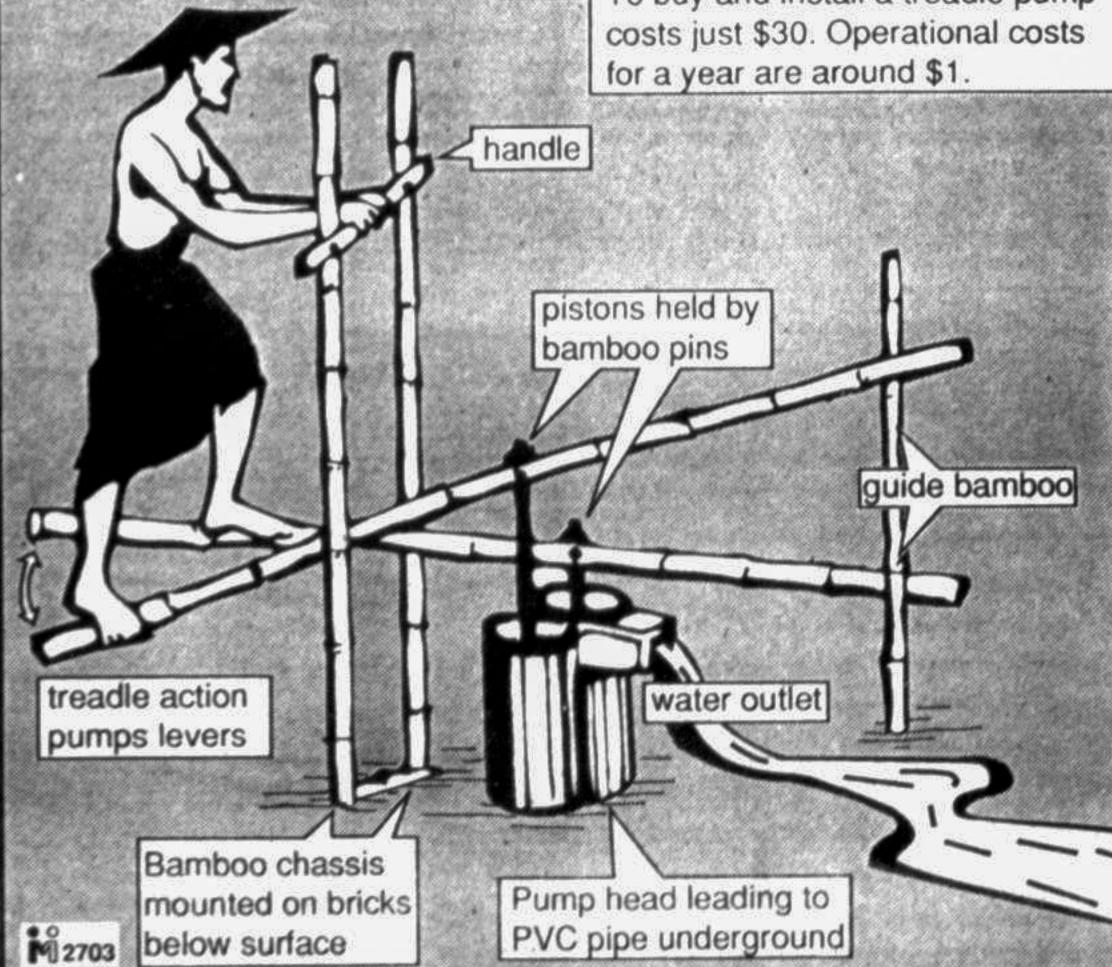
The crowd watched with deep curiosity as four children stood on a pair of bamboolevers and started to Treadle with great gusto. Water gushed out through the pump's nozzle and soaked the sun-baked soil.

This was the first Treadle Pump demonstrated to the villagers of the Saver area, where the land is called tangor and the ground water level is 40 feet deep. In local Bengali dialect, tangor means high and arid land.

The opening of this new irrigation device can bring good luck for Dr. K.A. Manzur. More importantly, it heralds new hope for thousands of marginal

farmers in the area. Unproductive land across the country can now be irrigated and cultivated round the year to grow a wide variety of mixed crops.

To buy and install a treadle pump handle



The Treadle Pump is footoperated and works on the suction mode. It has a doublepiston cylinder with foot valve, two bamboo treadles, a bamboo frame and PVC pipe to lift

ground water. This is not a piece of transplanted technology, but originated as a specific response to a painful part of Bangladesh's reality - drought and famine.

The device was conceived

Dev wondered if multiple cylinders could be attached to a single tubewell and the down-stroke to one would energise the up-stroke to the other working in a suction-

Rangpur-Dinajpur Rural Service (RDRS), a local nongovernment organ_isation (NGO) in the country's northern districts, took Dev's idea. In the 1970s and early 1980s, two RDRS engineers - Gunnar

irrigate up to one acre of land. International Development Enterprise (IDE), a Swissfunded NGO which has been promoting the pump, has now developed another version to lift water from as deep as 40 feet. Power-operated mecha-

depending on the crop, it can

nist deep tubewells are expensive as well as complicated for the poor farmer. The Deep-set Treadle Pump, as it is called, will bring vast tracts of arid

They call it 'The Friend of the Farmer." The Treadle Pump — an indigenous manual irrigation system innovated in Bangladesh — is poised to bring about a

green revolution. Gemini News Service reports on new appropriate technology which is bringing hope for the agricultural development of other developing countries, too. Barnes and Marceline Rozario

by Bangladeshi farmer Narendra Nath Dev, a modest but concerned man from Ulipur village in northern Kurigram district.

In the early 1970s, Dev was moved by the misery of his fellow farmers -men, women and children, desperately trying everyday to sustain their failing crops with a pitiful supply of water carried in clay pots and pitchers from distant wells or reservoirs.

He thought there had to be more efficient means of delivering water to them. He was not a mechanical engineer, but he knew the mechanics of tubewells.

- patiently and methodically designed, tested and experimented with hundreds of models until they came up with the Treadle Pump.

Over the last five year's it has been used successfully across the country by farmers who found it cheap, useful, simple and easily maintainable. To buy and instal, it costs a farmer only \$30. Its operational cost round the year is just about one dollar.

Depending on the depth of the water table, a single pump can move from two to four litres of water a second. And

highlands under irrigation facilities.

William H. Derrenger, IDE Director, calls the pump "a miracle in the context of Bangladesh's needs. This is the kind of appropriate technology that development agencies

have always dreamt of. "It's a franchise ... it's like Honda and Toyota cars for the poor people.

"In the context of a fragmented rural farmland, and in view of a huge, largely unproductive rural labour force, and abundant surface and sub-surface water resources, Bangladesh - with the help of the Treadle Pump, should

more productively utilise all its agricultural resources." The pump should lead to the formation of a productive partnership between the wealthy owners of unproductive land and the eager but jobless sharecroppers. It should provide highly productive employment to thousands of rural

A recent study suggested that food production could be increased by 50 per cent in Bangladesh if the landless and marginal farmers are equipped with the Treadle Pump.

More than 100,000 were sold across the country last year, according to IDE figures, bringing the total to about 700,000. And now interest in the pump is growing abroad in countries like India, Nepal, Sri Lanka, Vietnam and Brazil, where they want to introduce it for farmers of the Amazon

IDE has given the pump the brand name Krishak Bandhu. It means "The friend of the farmer." - Gemini News

About the author: ROUSHAN ZAMAN is a Bangladeshi who is Chief News Editor of the United News of Bangladesh. Born in 1950, he Graduated with Honours in History from Dhaka University, did an MA there and became a journalist in 1973.