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Housing and development objectives in India

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Abstract

India faced the challenge of providing adequate shelter to 18.5 million households in 1991 and employment for its citizens. The construction sector represents the most pressing need, viz., shelter. This sector has a great potential of generating employment through its forward and backward linkages. Earlier researchers have indicated that construction activity contributes 17% to the carbon dioxide emission in India. In this paper we have tried to interweave these three issues and propose a construction strategy for the Indian housing sector. Affordability of a house and availability of building materials for its construction are the main determinants of access to shelter. This demands efficient use of resources at low cost. In this paper we analyze whether it is possible to reduce cost, reduce emissions and generate employment in house construction. We have developed a model for technology evaluation in house construction based on design codes for India. Recent Government policy statements have indicated that an annual supply of two million new houses would be required to meet the current shortage of housing in India. This model is applied to the construction of two million houses. The construction technologies that we evaluate are the *pucca*[1] construction technologies as well as low-cost techniques. It is asserted that by a proper selection of such techniques and material the costs and emissions can be reduced substantially and at the same time employment can be generated.

Keywords: Housing; Low-cost housing; Housing models; Input–output; India

1. Introduction

At the beginning of 21st century, providing adequate shelter, employment and sustainableenvironment are the three most pressing challenges faced by developing countries. These issues will

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[1] *Katcha*: Construction with materials such as thatch roof, grass, reed, mud, etc. *Pucca*: Construction with materials such as cement, bricks, stones, etc. *Semi-pucca*: Construction with a combination of above two techniques.

The technologies that are based on *pucca* materials such as cement, lime, concrete, bricks and stone, are referred as *pucca* construction technologies. Low-cost technologies use building materials like stabilized mud blocks, filler slabs, etc.

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continue and a puzzling question still remains: Is there a paradigm which would be a guide map to provide shelter, employment and good environment to all the citizens?

In India like other developing countries, house construction is predominantly a self-help activity. India faces an acute shortage of housing. An unholy alliance of social snobbery, technological conservatism and extravagant spending culture has pushed up the cost of construction.

Housing activity is very closely linked to the macro-economy. The number of housing starts is the first leading indicator of economic growth. An upsurge in housing starts indicates an upward swing in economic growth and a downward trend precisely the reverse. The house construction activity's manpower requirements are diverse and extensive. This activity provides employment to both skilled as well as unskilled labor. An estimate by United Nations indicates that an investment of Rs. 10 million[2] in India at 1990 prices generates employment of 970 person years and offsite employment of 1480 person years (Draft Housing Policy Report, 1990).

Another implication of house construction activity is energy consumption by this sector. Many papers on energy consumption using an input–output table-based modeling approach for developed countries showed that building materials like cement, bricks, tiles, refractories, etc., have high direct and indirect energy intensities.

Energy is consumed in housing construction mainly in three ways:

- in the procurement, manufacture, processing and recycling of building materials;
- in transporting building materials to the building site; and
- in on-site construction activities.

In both large and small developed countries, such as the USA and the New Zealand, the energy consumed in the production of materials amounts to 70% of total construction energy, the remaining 30% being primarily consumed by on-site construction-related activities (UNCHS, 1991). In developing countries this proportion ranges between 90 and 100%, as the on-site energy consumption in construction of housing is low due to rare use of machinery.

An important inference that can be drawn from above discussion on high-energy intensity of building materials is that burning of fossil fuels in construction is associated with carbon dioxide emissions. In a research on Indian economy using input–output analysis, Parikh and Gokarn (1993) concluded that construction becomes the largest carbon dioxide emitting sector and its share was 17% when final demand is analyzed with its direct as well as indirect emissions (Fig. 1).

House construction activity constitutes a significant part of overall construction activity. The share of house construction in overall construction is around 60% (Development Alternatives, 1995).

A new National Housing and Habitat Policy 1998 has been formulated (Ministry of Finance, 2000). The objectives of the policies are to facilitate construction of two million houses every year. With this objective the paper estimates the role that construction activity would play at a macro-level in India. Specific questions that have been addressed are:

(a) What are the total investment requirements of meeting national objective of constructing two million houses annually?

[2] Year 2000 exchange rate is around 1USD = Rs. 42.6.