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**Self-help transformations: infrastructure issues**

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INTRODUCTION

In the past, low income households have been regarded as consumers of housing rather than as producers, at least in the formal sector. Housing areas have been developed by government and large employers to provide completed units for rental (and more recently for sale) to low income households. However, the dwellings are generally small and areas where they occur are often notorious for structural, servicing and environmental problems arising from neglect through lack of resources.

A study sponsored by the Overseas Development Administration of Her Majesty's Foreign and Commonwealth Office (ref. 1) has made a preliminary examination of the way in which households living in such housing are increasingly altering and extending their housing in order to provide more room for improving their own residential conditions or for renting out, or for commercial and other economic activities.

In this brief paper which draws on the above study (ref. 1), we will describe the process and variety of transformation, present some likely reasons for its occurrence, note the contribution it makes to improving the housing conditions of the residents, and indicate some areas in which the involvement of infrastructure specialists could be particularly valuable.

In many developing countries, residents of public housing areas find themselves in similar circumstances. They are long-term occupants of well-built but badly maintained small dwellings (often two or three rooms), paying low or no rents (often having recently acquired ownership), but with little possibility of moving to a larger dwelling. Their children are growing towards maturity, marriage, and child-bearing, with little chance of acquiring suitable, cheap accommodation. The dwellings are often surrounded by relatively extensive open spaces which are under-used, strewn with garbage, or over-grown. The household heads are employed in the formal sector in an economy which pays low wages for low productivity, which forces them into extra-mural economic activity in the informal sector.

In this context, the dwelling represents a priceless but inadequately equipped asset which can be improved to serve their needs through ingenuity and willingness to flout the planning and building regulations. The following are some examples which came to light in our study:

In Dhaka, Bangladesh, very low income (Tk750-1500 in 1986, £15-30) tenants of single room 'bastuhara' dwellings have sub-divided and extended their living area into public spaces using bamboo matting and bricks. The original verandas have formed the basis of many extensions. Not only have the original households increased the number of rooms they occupy but they have also provided separate cooking and washing areas, rooms to let, and places to carry out small scale economic activity at a price they can afford (ref. 2).

In Harare, Zimbabwe, wooden sheds are added to the township houses in Mbare and Highfield to accommodate other households at Z\$50 per month (about £12, or one quarter of a labourer's wage), or the whole house is surrounded and replaced by new building with potential for more room for the household and space to rent.

In the mine townships of the Copperbelt of Zambia, occupants of 20 sq. m. employer-provided houses are extending them in very cheap materials to provide extra rooms. Because the corporate owner does not allow any capital value to be liquidated at the end of a tenancy, standards of construction are low and any materials of value are removed by the occupants when they leave.

Occupants of single roomed (and some two and three roomed semi-detached) dwellings built in the post-World War II period at Asawasi in Kumasi, Ghana, have extended to a considerable degree, mainly to rent out room by room. The original 1,700 rooms have been increased to nearly 5,000 as the rows of rooms are extended outwards from both front and rear. Where there were originally 1.3 rooms per household, there are now more households and a mean of 2.3 rooms each (well above the average for Kumasi). Extra toilets and bathrooms have been provided to supplement the public facilities originally supplied to the extent that all households

have access to services shared by all in the house. There are also rooms for commercial and industrial uses.

Work at Technion, Haifa, has highlighted the role transformations are playing in increasing the quality of housing enjoyed by low income households in Israel. In Givat Olga, a suburb of Hadera, the two bedroomed flats built in the 1950s have been extended to provide a mean of 110 per cent more living space. The renewal of the environment and structural standards have been significant enough to increase house values by up to 75 per cent. It has also been estimated that households who have extended have achieved improved housing of larger size and more cheaply than if they had relocated (refs. 3, 4, 5, 6, 7 and 8).

In the Jangpura and Kalkaji areas of New Delhi, India, two-storey blocks of two roomed flats built in the 1950s have been radically altered by their residents to provide an immense variety of flats, shops, workshops, clinics, etc. (refs 9 and 10). Beginning with additional toilets and bathrooms (to improve on the shared ones situated at the corners of the courtyards around which the flats are ranged), complex co-operative building operations have added many rooms and up to two more storeys. Agreements have been reached over rights of access and support which demonstrate a very sophisticated level of participation in design and planning processes (ref. 10).

The most spectacular examples of transformations of which we are aware are in Egypt, particularly in Workers' City, Helwan. In the 1960s, the Nasser government built large numbers of one, two and three roomed flats in five storey walk-up blocks for workers in the growing industrial areas around Cairo. Ownership was transferred to tenants after fifteen years, an event which appears to have triggered-off comprehensive extension activity among the residents who now have grown-up children ready to marry and have their own children but are unable to obtain independent accommodation.

Initially, balcony enclosures were almost universal, both for privacy and extra space, sometimes with the wall removed to extend the kitchen onto the former balcony. During the 1980s, however, groups of households living in line vertically have co-operated in planning extensions, engaging a contractor, and erecting a five-storey concrete frame attached to the original building and, typically, allowing each flat area to be increased by 40 to 60 per cent. Those on the top floors are adding another storey; those at the end of the blocks are now extending round the side and some blocks are completely en-

cased in new additions. A group of contractors specialising in this work are willing to finance the extension, with payments over a twenty month period, and have become expert in avoiding or minimising the effect of sporadic police action against their illegal building activities.

Residents of tiny flats in privately built high-rise blocks in Hong Kong have flouted building regulations to add 14 per cent more space by bolting light steel-frame balcony 'cages' onto the mother building. Assembled in ground-level workshops, and erected at dizzying heights from bamboo scaffolding, the 'cages' are more frequent higher up the building as they are less noticeable there and control becomes more difficult (ref. 11).

It cannot be denied that transformation activity increases the housing stock of a country without extending the urban area, extends the living space available to original and new residents, and does both at virtually no cost to government and affordable cost to the transformers themselves. Where once there was uniformity of dwelling type and tenure, transformations provides variety and opportunities to increase household income. Where the occupants of an area may all be in similar economic circumstances, and at similar stages in their family cycle (eg. in Helwan most are middle aged factory workers with grown up children), the transformations allow a new wave of occupants either through attracting new renters or by allowing young marrieds from the area to remain close to their parents during the first stage of their family cycle.

For the individual household, the benefits of transformations are physical, economic and psychological. They are able to increase the size and quality of their living space without having to relocate (even where that is possible). Thus the use-value of their dwelling is increased. In addition, the market value (and, thus, the household's wealth) can be increased at a cost which is much lower than starting from scratch on another site or buying an alternative, larger or better equipped, dwelling. In addition, transformation of an existing dwelling allows the economies of using a solid structure as a basis, and the ability to invest incrementally. Thus, the household can take advantage of existing locational and servicing advantages while having the flexibility of building new accommodation. Finally, the ability to shape one's own environment is accepted as being psychologically constructive.

There are, of course, negative sides to the process, sometimes for the households but especially for the larger neighbourhood and society as a whole. The internal layout of a

dwelling can be changed to an extent which reduces daylighting and ventilation to well below the standards adopted locally. In some cases, privacy may be affected by newly built rooms or newly fitted windows overlooking a neighbour's dwelling. In addition, they may be poorly built, even to the extent of being dangerous - although we found little evidence of that in the preliminary study. Externally, extensions use up open space which has been planned for gardens, circulation and access, or other public uses. They may impinge upon neighbour's rights of access and light, they may obstruct services, and will probably have a chaotic and uncontrolled appearance (though many would prefer this to the all too uniform appearance of some mass housing as built.

#### IDENTIFICATION OF INFRASTRUCTURE ISSUES

As the structures cover a greater proportion of the ground area after transformation, service lines may be affected in several ways:

- a. They may be built over with consequent danger of physical damage and making access for repairs and maintenance difficult. This is probably more likely to affect pipework and service lines close to the buildings than major distribution lines.
- b. They may be disturbed or damaged as ground is broken for extensions close by.
- c. They may be 'trapped' between buildings in spaces too confined for repairs and maintenance to take place.

The demands made on the infrastructure capacity are likely to change as an area is subject to transformations. While the super-structures are given a new lease of life, the subterranean infrastructure is unlikely to benefit in the same way though both may have been approaching obsolescence. At the same time, the system will probably be subjected to new pressures. Where rooms are added for rental income, or merely to accommodate household members who would otherwise move away, population in an area is likely to rise. Not only will renter households be added but also young couples with child-rearing ahead of them will remain. Thus, demand for access, water supply, and waste disposal, is likely to rise in the medium term, and is likely to exceed planned flows if transformations are at all substantial. In addition, a proliferation of non-residential uses are likely to change the scale and nature of demand for services.

Several transformations recorded made significant changes to the location, number and type of water and sanitary facilities within the dwelling environment. In Jangpura (ref. 9) and Kalkaji (ref. 10), and Asawasi, shared

toilets and bathrooms were superseded by private ones in increased numbers. Not only would there probably be uncontrolled and unauthorised connections to water and (where existing) sewer mains, there would also be an increase in flows through the system as an increase in accessibility compounds the demands caused by a larger population. The technology used in alterations to services may also have implications outside the dwellings. For example, in Asawasi, septic tanks are common additions and their presence has implications for access in order to allow for emptying.

The introduction of commercial and industrial uses is likely to increase the demand for access, particularly for heavy delivery vehicles, to places where this was unexpected. At a time when the ground area is being more intensively built up, such access issues are likely to be even more intransigent than normally.

The reaction of planning and environmental authorities to transformation activities needs to be carefully considered. Self-help transformations have the potential to provide literally millions of new rooms worldwide at almost no cost to governments. At a time when urban housing is in increasingly short supply, any new accommodation, or improvements in the existing stock to prolong its useful life, should not be dismissed just because it is supplied in unconventional or uncontrolled ways by actors who are not usually regarded as suppliers. While the initial reactions of engineers to extensions and alterations which could potentially play havoc with service lines is probably uncompromisingly negative, a more considered approach would be more appropriate. Therefore, it would be helpful to formulate ways forward to accommodate and provide for transformations, just as squatter upgrading required changes of approach in the past.

There will undoubtedly be some absolute limits to the extent to which buildings can be extended from the point of view of infrastructure provision. Trunk water mains, sewers, and surface water drains, and principal distributor roads must, perhaps, be safeguarded. However, at a house and house-group level, more flexibility may be required to allow extensions, or at least to ensure that they are not disallowed solely because of a lack of flexibility in the infrastructure.

If increases in capacity are being planned, with pipes being relaid, their routing should be carefully reconsidered. There may be a need to re-route some to allow for extensions.

There may be revenue implications for infrastructure, both on the cost and benefit sides. Alteration and renovation of pipes, surface-water drains and roads will undoubtedly have cost implications. As fiscal austerity indicates that these costs should not be automatically borne by the public exchequer, they should almost certainly be passed on to the beneficiaries. Whether this should be through increased property rates or an increase in consumption unit costs will depend on the service and the political preferences of the agencies involved. In each case, however, considerations of efficiency and equity should be prominent in policy decisions. Undoubtedly, services which are paid for by unit consumed have much to gain from the increased efficiency with which the infrastructure will be delivering chargeable units. Thus, water and electricity undertakings should benefit ceteris paribus.

#### SUGGESTED WAYS FORWARD

There is a need to approach the issue of self-help transformation in a multi-disciplinary manner in order to balance the sometimes competing issues which arise. Professionals in infrastructure provision would have an important role in policy formulation to cope with transformations.

In areas affected by, or ripe for, transformations, a multi-disciplinary team would be helpful. Its focus could be a Transformations Advice Centre (TAC) within selected neighbourhoods as a low-profile, low-cost organisation set up to maximise the benefits of the process for all the users. The TAC would need the participation of infrastructure specialists to determine inter alia areas which must be protected against building and those within which transformations can be contained. This would be a fairly close-grained exercise, probably resulting in a large-scale sieve map showing areas which must be reserved for infrastructure routes, essential access, etc. The design of these should be balanced against the need to maximise the potential of the existing stock to be renovated and extended by self-help transformation.

In areas where the infrastructure is in place and not liable to major renovation, there may be little scope for enabling transformation through the routing of service lines. Here the task may simply be one of protecting their routes against all-comers. However, in newly developing areas, or where infrastructure is to be upgraded, the use of space between buildings can be positively or negatively affected by decisions about service routes. Thus, where extensions are to be allowed, space should be left between the

services and the buildings, with lines or roads bifurcating spaces rather than skirting past the housing. Services which are grouped, especially at dwelling group level are likely to be more convenient for transformation than those which are spread out. In addition, pipes and roads can be sized to cope with future demand.

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