User-Initiated Transformations of Government-Built Housing Stocks: Lessons from Developing Countries[1]

by A. Graham Tipple
Reader in Housing Policy and Development,
Centre for Architectural Research and Development Overseas, University of Newcastle upon Tyne, UK.

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Abstract

People love to alter and extend their homes. Many countries have large stocks of government-built housing which, for various reasons, are in poor physical conditions and/or do not conform to the expectations of occupants as we approach the second millenium. In many developing countries, occupants of such housing make unauthorised but quite considerable changes and extensions to their dwellings for their own use and for renting out. This phenomenon is known as "Transformation" and may contain useful models for countries around the world.

In this paper we examine user-initiated transformations to government-built housing in Bangladesh, Egypt, Ghana and Zimbabwe, studied in an ODA (now DFID)-sponsored research programme. The 1600 dwellings surveyed show how relatively low income households are capable of supplying new rooms and services both to improve their own housing conditions and to supply rental rooms or accommodation for family members living rent-free. In addition, the new construction is often of at least as good quality as the original structures and sometimes envelops the original in a new skin. Thus, transformation can be

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seen to be a means of renewing the housing stock at the same time as adding accommodation and services.

Suggested policies to encourage transformations for the renewal of government housing include the provision of loan finance; the encouragement of co-operation between neighbours, especially in multi-storey housing; and the planned colonisation of open space next to the dwellings where plots are not provided. For new housing, transformations suggest larger plots rather than smaller ones and wider ones rather than narrower. In addition, the original dwelling should be close to the edge or corner of the plot rather than being centrally placed.

Introduction to Housing Extensions (Transformations)

Most observers of housing in developing countries will have noticed the phenomenon of self-help extensions to government-built housing. The (mostly small) single household dwellings provided to the fortunate few, supposedly low income, households are being extensively altered and extended. Most planning authorities seem at best only tolerant of, and at worst totally opposed to, the extensions. A recent ODA(now DFID)-sponsored study has examined transformations in an international comparative study, in Bangladesh, Egypt, Ghana and Zimbabwe, with a view to showing whether such extensions are effective in housing supply and whether, on balance, governments and citizens have more to gain by encouraging transformations or not.

The case studies

In Dhaka, Bangladesh, the *bastuhara* housing in Mirpur forms the context of our study. Built in the early 1970s to house displaced squatters and refugees from Pakistan, each of the 4,300 semi-detached dwellings, arranged in closely-spaced grids, has a single room and veranda. Since their first occupation in the mid-70s, the houses have been extended until now they cover most of the plots which have been demarcated around them. Although all the main households are still tenants of the Housing and Settlement Directorate, there are plans to sell the land and houses to their occupants as if they remain as built, except for some allowance for depreciation.

In Greater Cairo, Egypt, two estates of five-storey walk-up blocks of flats have been chosen; the Economic Housing of Workers' City, Helwan, and the Medinet Nasr estate in Cairo. Here, occupants have managed to extend by co-

operating amongst themselves to engage specialised contractors to build stacks of rooms attached to the mother building. This activity began in earnest around 1980 when the first occupants passed the fifteen years in tenancy landmark which signals their attaining ownership of the one, two and three-roomed flats. The new rooms appear to provide added accommodation for growing households including some young marrieds unable to leave the parental home owing to the unavailability of alternative accommodation.

The Ghana case study is divided between two estates in Kumasi; Asawasi and Suntreso. There are two house types which present contrasting potential for extensions. Many of the original dwellings are single rooms with verandas set in terraces so the narrow frontages severely constrain the potential for extension activity. The remainder are semi-detached dwellings standing in their own plots, many of which are very substantial. They were built in the late 1940s and early 1950s. Most have been bought from the State Housing Corporation. Though there are renters, the main motive for extending in the Bangladesh, Egypt and Ghana samples has been the need to accommodate the growing household.

On the other hand, in our Zimbabwe sample, about half the transformers are motivated mainly by the possibility of rental income. Our Harare sample is taken from two local authority low income housing areas, Mbare and Highfield. The estates consist of semi-detached and detached bungalows, mainly with three habitable rooms and a kitchen, set in relatively generous plots (250 sq.m. at the median). Transformations began when occupants completed paid off their housing loans. Some of the rented space is in the form of sectional wooden structures (known as shacks), but the remainder is, as in the other country studies, at least as high standard as the original structures. Transformers who have only built shacks are known in the study as shacks-only transformers.

In the next section, we will examine the various lessons we learn from the study in developing countries which could be of assistance in addressing housing issues in countries with large numbers of government-built estates.

Quite low income people can extend

We collected data through both income and expenditure and used the most reliable for each country. In all our discussions of money, we have converted

local currency into £ Sterling at Purchasing Power Parity (PPP) using data from UNDP (10: table 1).

We might expect transformers to be better off than non-transformers because they would require higher incomes to carry out the prodigious building work that their activity represents. However, though transformers are better off in some countries and using some measures, there seems to be no pattern to the data between countries except that transformers' household incomes are higher than non-transformers' across the board. In Zimbabwe, for example, transformers have the higher household income (and lower expenditure on food which is a good indicator of wealth), but they have lower per capita income. In Egypt, on the other hand, per capita incomes of transformers are higher.

Taking the £240 per year per capita absolute poverty threshold adopted by Ravallion et al (7), we can see from table 2 that our median transformers vary from twice the threshold in Ghana to 2.7 times in Bangladesh. Very few of our households have incomes below the absolute poverty threshold; only in Egypt does it exceed 10 per cent of transformers. We are clearly dealing with people who are not rich by any standards but neither are most of them numbered among the very poor within their country.

Table 1. Incomes and wealth in PPP Pounds (Medians)

	Bangladesh	Egypt	Ghana	Zimbabwe
Annual Household Income				
Transformers	4210	2440	3430	3770
Non-transformers	-	2280	3160	3150
Annual Per Capita Income				
Transformers	650.3	531.9	479.3	625.6
Non-transformers	-	462.8	622.6	723.7
Food expenditure as a percentage of household income				
Transformers	59	68	61	39
Non-transformers	-	73	60	40
Percentage expecting to be better off next year				
Transformers	1	37	10	18
Non-transformers	-	32	3	16

PPP functions inflate the currency values by the following: Bangladesh = 4.1524; Egypt = 3.259; Ghana = 2.6051; Zimbabwe = 2.2831 (10: Table 1). Thus, for example, instead of C1,000 per £ Sterling, there would only be C384 per PPP£.

Table 2. Per Capita incomes in relation to the Absolute Poverty Threshold of PPP£240 per annum (Medians)

	Bangladesh	Egypt	Ghana	Zimbabwe
Index (Absolute Poverty Threshold = 100)				
Transformers	271	222	200	261
Non-transformers		193	259	302
Percentage with incomes below the Absolute Poverty Threshold				
Transformers	2	13	4	7
Non-transformers		6	2	9

Transformations increase housing space

We might expect that large households would be more likely to transform than small ones. We find a consistency among transformers in all the samples in their household size and composition. All tend to feature more than just a nuclear family household of one or two adults and their juvenile children. With medians of seven members (but only five in Egypt) including four adults, all show signs of transformers' having large households and being in a relatively advanced stage of family life. The presence of four adults at the medians indicates a greater need for privacy than might have been expected when the original dwellings were designed for nuclear family households of parents and children. In most cultures, a married couple with a grown up (over 16) son and daughter would require three rooms. Thus, most of the original dwellings are incapable of providing adequate space for all the occupants or sufficient privacy in their unaltered state. Non-transformers tend to have smaller households, fewer adults and marginally fewer children than transformers, indicating fewer points of housing stress.

It is obvious that one of the main factors contributing to transformation is likely to be the shortage of accommodation; the main need in housing in the countries studied appears to be for larger dwellings, especially for more rooms. As we will see from the data, the effectiveness of transformation in providing more space is quite impressive.

There is a two stage process of capturing extra habitable space. First, the original space is redivided into more rooms (albeit some are very small, e.g., original verandas). Second, new rooms are added which are generally smaller than the originals. The habitable space has increased by about half in Egypt and Zimbabwe and more than doubled in Ghana and Bangladesh. The numbers of rooms, on the other hand, have doubled in Ghana and increased five-fold in Bangladesh.

Table 3. Increase in floor area through transformation (Medians)

	Bangladesh	Egypt	Ghana	Zimbabwe
Floor area of original houses	22	36	37	50*
Floor area of transformed houses (sq.m.)	55	65	87	79
Estimated increase in floor area achieved by transformers (%)	149	57	75	48

* For comparative reasons, these figures reflect the original house type without being influenced by whether any of the original has been demolished.

The houses as currently used have median areas of between 55 and 87 sq.m. (table 3). Although some transformers have undoubtedly made prodigious increases in space (in Bangladesh, 149 per cent), the medians for our samples generally show increases of 48 to 75 per cent. This is only a snapshot in an on-going process, however, and there is no reason to expect the current stage to be the end of extensions. In Zimbabwe (where the floor space index is 30 per cent for transformers), there is still plenty of potential to extend within the plots. However, there is less room in Ghana (where the floor space index is about 60 per cent for transformers) and Egypt, and virtually none in Bangladesh.

Transformations improve accommodation for main households

Table 4. Measures of occupancy for main household (Medians)

	Bangladesh	Egypt	Ghana	Zimbabwe
Habitable Space occupied by main household (sq.m.)				
Transformers	23.0	41.4	39.7	34.4
Non-Transformers	14.1*	39.8	24.1	27.5
Habitable space occupied per person in main household (sq.m.)				
Transformers	3.3	8.0	5.8	5.2
Non-Transformers	-	7.17	4.87	4.51
Occupancy rate of main household (persons per room)				
Transformers	2.5	1.5	1.8	1.8
Non-Transformers	-	1.5	3.0	2.2
Habitable rooms occupied by main household				
Transformers	3	3	4	3
Non-Transformers	1*	3	2	2.5

* Data for non transformers is inferred from the original provision

In government-built housing, it is common for there to be not enough room for the resident household. However, even though many other households are now accommodated in extensions, all our samples have achieved more habitable space at the median for the current main household than was originally available in the whole house. Although transformers in Bangladesh have added prodigiously in comparison to the original provision, table 4 indicates that they have not been able to catch up with those who started with larger houses and/or more space round the house. Even with the extensions, main households in Bangladesh only have 3.3 sq.m. per person at the median while Egypt has 8.0 sq.m., Ghana has 5.8 sq.m. and Zimbabwe has 5.2 sq.m. per person.

In Egypt, transformers have tended to increase the area of small flats to that of the large ones (which have tended not to be extended). Otherwise, we can see that main households have considerably more space in transformed houses than in non-transformed. In table 4, the most marked difference in occupancy rate is in Ghana where the main households in transformed houses have only 1.8 persons per room compared to three in non-transformed houses, and two rooms for the household have been added to medians. In Egypt, there are few additional households in the dwellings, so the continuity of occupancy rate demonstrates that transformations are keeping up with household growth. However, the means (not shown on the table) indicate that transformers in Egypt occupy 3.7 rooms, non transformers, 3.3.

Transformations accommodate more people without extending the city

Except in Egypt, where there has been little or no increase in population parallel with the transformations, there are about 50 per cent more people in transformers' houses than in non-transformers' and probably about double the originally planned population. The medians of around 10 (table 5) fall between the expectation for single household dwellings and multihabited rooming accommodation.

The difference between types of renting can be seen quite clearly in table 5. In Bangladesh and Zimbabwe, renting is a business venture for at least some profit. Seventy per cent of transformed houses have tenants and a total of three households per house at the medians. In Ghana, however,where renting rooms to tenants is not normally a business venture (6) only 27 per cent of transformed houses have renters while 33 per cent of them have rent-free (family) tenants. The latter demonstrate housing's role as a social safety net for the poorer members of families (1) (5). In Ghana and Zimbabwe, even non-transformed houses may have a tenant in residence as well as the main household.

Table 5. People currently accommodated

	Bangladesh	Egypt	Ghana	Zimbabwe
Persons per house (Medians)				
Transformed	11	5	10	10
Non Transformed	-	4.5	6	7
Households per house (Medians)				
Transformed	3	1	2	3
Non Transformed	-	1	1	1
Percentage of houses with tenant households				
Transformed	71*	2	27	70
Non Transformed	-	1	13	38
Percentage of houses with rent free (family) tenants				
Transformed	n.i	7	33	13
Non Transformed	-	4	2	5

* No differentiation could be made between tenants and rent-free (family) tenants in Bangladesh but we expect that the latter would be quite rare

Such tenants have only between one quarter and one third as much space as main households (with about 8 sq.m. in Bangladesh and Zimbabwe, and 14 sq.m. in Ghana) but their smaller households reduce the crowding effect of having much smaller spaces than the main households.

From the foregoing, we can see that occupancy rates improve with transformation. Main households fare well in gaining considerably more space and rooms, and the transformation process should be seen as a way in which households improve their own space use and that of other residents in their houses. This is one of the most cogent arguments in favour of transformations as a valid housing adjustment mechanism and as effective housing supply which should be encouraged in countries where there is a great need for housing. As a corollary, it argues against the "building slums" accusation of local planners.

Levels of investment can be quite high

Table 6. Cost of phases in the extension process, PPP Pounds (Medians)

n	Bangladesh	Egypt	Ghana	Zimbabwe
Phase 1	2310 *(N=370)*	2480 *(N=249)*	3260 *(N=237)*	2620 *(N=293)*
Phase 2	1550 *(N=244)*	1360 *(N=16)*	1780 *(N=68)*	1000 *(N=64)*
Phase 3	1090 *(N=85)*	480 *(N=2)*	2360 *(N=14)*	430 *(N=12)*
Phase 4	850 *(N=18)*	-	920 *(N=4)*	-
Phase 5	850 *(N=6)*	-	-	-
Total cost of Transformations	3880	2500	4790	3660

All costs are adjusted to 1993 values.

Transformers are making substantial investments in new accommodation (table 6). Indeed, they are spending between 90 and 120 per cent of a year's income on their transformations at the medians. For the upper 25 per cent in Ghana and Zimbabwe respectively, spending on extensions exceeds 5.7 and 4.2 times annual income. In each country, phase one is the largest and most expensive but phase 2 is also substantial with only Zimbabwe's falling slightly below £1,000 at the median. The majority of transformers have only carried out one phase, only in Bangladesh have more than 40 per cent added a second or subsequent phase up to the date of the survey.

Variety out of uniformity

Perhaps the most obvious feature of the housing in the study is the evidence that transformers are producing variety out of uniformity. The variety is expressed in the following features.

1. Variety of house size

The houses provided in the estates studied tend to be of a few standard designs but transformers have superimposed a variety of house sizes upon this more or less uniform canvas. In Bangladesh, Ghana, and Zimbabwe, the difference between the 1st and 3rd quartiles is at least as large as the original dwelling size and reaches a massive 72 sq.m. in Ghana. Even in Egypt, where the five storey stack construction imposes a level of conformity, the flats have been extended so that there is 12 sq.m. difference between the 1st and 3rd quartiles.

2. Variety of accommodation for the main household

Main households have a greater variety of space than the original dwellings provided. They have the option of occupying more space (and most do), space in either the original or new structures (which may be of different quality), or less space by allowing tenant or rent-free (family) households to occupy part of their original space or by moving into a new smaller portion of the transformed house. They can choose to have their own bathroom, toilet and kitchen, or share with others.

3. Variety of house value and housing cost

While the original houses tend to be of very similar value and cost (especially if measured per square metre), the new housing is very varied in value and cost. For example, in Egypt, where the value per square metre was very uniform, there is now a perceived difference from the first to the third quartile of PPP£50 per square metre.

4. Variety of use

The original residential estates now have a variety of uses within them. Of course, people carry out business activities from the home even if no alterations or extensions are possible. Through transformation, however, opportunities arise for doctors' surgeries, shops, manufacturing activities, and many other space consuming non-residential activities. There are examples in our surveys of mosques, churches, nursery schools, and night clubs.

All these provide not only employment and income generating opportunities in otherwise economically barren areas but also serve the local people for their

social, cultural, and religious needs and provide opportunities to obtain goods and services without leaving the neighbourhood. Although specially designated plots are provided for such activities, and are undoubtedly used as such, converted and extended dwellings provide cheaper opportunities for these activities and may deal with a lower income clientelle than use the formal shopping areas and social facilities.

5. Variety of tenure

Out of a uniform hire purchase or renting from government tenure regime, transformations create opportunities for tenancies and sub-tenancies in the private sector, rent-free (family) tenancies, sharing, and other tenural forms. The recent trend towards a much more complex tenural split than just owning or renting (4) is clearly reflected in the opportunities for variety in tenure arising in transformations.

6. Variety of occupants

When they are first completed, houses in government-built estates tend to be allocated to homogeneous groups of people (young middle-ranking factory and government workers with children). Having won the lottery of obtaining a highly rationed and subsidised good, they are loath to leave. Thus, there is a tendency that all the households are in a similar phase of life, growing older together. This may lead to a boom in demand for schooling followed by a dearth of children, and later a concentration of retired people for whom the dwellings are unsuited.

Transformers tend to create space for new households in different stages of their lives to move in as tenants or rent-free (family) tenants. New rooms can be created for the next generation. The availability of single rooms allows relatively poor households to find accommodation in the area. The extension and renovation of the original small dwellings encourages original allottees who prosper to stay and to express their new higher income and gain status without moving away.

High quality construction can be expected

The original estates are very soundly built as it is in the interests of government agencies to save on running costs by high initial standards of strength and durability. However, many other features of the estates are causing them to appear to be at the end of their economic lives. A lack of maintenance tends to create the impression of poor quality construction. Leaking water pipes and

drains, badly maintained roofs, unrepaired and unpainted woodwork, unkempt and damaged grounds and access ways, all lead to accelerated decline and the poor appearance which is symptomatic of housing at the end of its economic life or in need of more than ordinary levels of maintenance. In addition, changing lifestyles create incongruities between the provision of space and services in the dwellings and the needs of the occupants.

Transformation is leading to the upgrading of the estates. The original dwellings, with all their poor physical appearance, cracks, blemishes and leaks, are being enveloped in new development or, in other cases, subjected to major renovations as part of the transformations process. This repair and renovation is occurring with no cost to the government or its agencies, the occupants are bearing the full burden.

The change to ownership as a likely signal for transformation

In the past, writers such as Carmon and Oxman (3) pointed out that ownership was probably a prerequisite for transformation while Andrew and Japha (2) held that, with ownership, all houses could be regarded as core houses, liable to be extended. Our experience in Bangladesh shows that ownership is not absolutely necessary. However, ownership does appear to be a powerful catalyst in the process and the extensions in Egypt and Zimbabwe date back to the time of converting from tenant to owner. In many countries emerging, home ownership in government-built areas is a new and uncertain phenomenon, especially within the existing, previously subsidised rented stock. It is likely that many of the new owners will extend in order to make their property more suitable for their way of life and that of their children (especially after the children marry). As money is likely to be in short supply, the efficiency of transformation in adding low cost floor space to the cities' housing stocks should be very attractive to housing policy makers. The issue will be mainly one of controlling and enabling.

Enabling transformations through the planning process

We have seen that transformations allow consumers of housing to become producers. The people who would not be expected to supply housing (those who have been allocated ready-made dwellings against subsidised payments) have produced more housing and show every sign that they will continue to do so. Furthermore, they appear to be doing it very efficiently in terms of cost and their ability to afford. They are unlikely to have entered the housing supply

scene through building on new plots because they could probably not have afforded it. Furthermore, the housing supplied is contained within the existing built-up area and on serviced sites. Thus, additional costs to the taxpayer are minimised.

Against measures of housing quality, the extensions demonstrate that they are not "slums", however that may be defined by the users of the word. They provide more space and have improved levels of occupancy; most appear to be built as well as the original structures and have a higher level of finish; and they have not reduced the attraction of the area where market prices are available.

In terms of value/cost, the residents of 4,304 *bastuhara* houses will have added housing worth PPP£22.35 million; those in the 3,660 flats in Helwan and Medinet Nasr, Egypt, will have built PPP£12.1 million worth of housing. In Ghana, if we aggregate the mean spending up to the 5,000 or so government-built houses in Kumasi, we could estimate a massive investment of PPP£200 million. The 13,113 township houses in Mbare and Highfield, Zimbabwe, represent an investment potential of PPP£170 million. On the other hand, the 100,000 township houses throughout Harare would represent a possible investment on extensions of PPP£1.3 billion.

On housing supply grounds alone, governments have much to gain from encouraging transformations. We suggest that governments should adopt an essentially permissive attitude to transformers with light control to prevent the worst excesses. These excesses could be characterised (in a spirit of hyperbole) as a dominant neighbour sweeping all local objections before him (or her) to erect a giant edifice of tiny rented rooms for personal profit. On the other hand, governments have much to lose through heavy-handed, unhelpful policies which freeze out the potential extensions through introducing bureaucratic delays and interference. It is more important that neighbours are satisfied with the level of development in transformed estates than to maintain some notion of ordered development close to the heart of a few policy makers. Thus, neighbourly co-operation should be a goal of policy, perhaps enabled through appointing people trained to be involved in assisting negotiation and in dispute settlement. This is particularly important in multi-storey environments as the scale of a lower-neighbour's extension is highly influential in the scale of any household's own extension.

It must be remembered that regulations need not be fully upheld for their presence to inhibit development. There are costs to circumventing regulations;

the timid will be put off and may not add the housing they would in the absence of regulations. For the less timid, bribes add up against the price of construction but the regulation avoided in that way has had no positive effect on the environment. There is a need for a balance between control which inhibits and control which enables. We are not in a position to prescribe such standards, nor would we recommend that standards should be prescribed. Turner (8) (9) long ago argued that prescriptive standards (those which prescribe action in specific ways) inhibit the ingenuity of potential house-builders. Thus, we would recommend, with Turner, that standards should merely proscribe activities and building techniques and technologies which are unacceptable and allow a wide range of actions within the field of acceptability. With the onset of transformations, it could be argued that control activity must prevent the totally unacceptable, e.g., dangerous construction, blocking access, building over drains or service lines, etc. It should be lenient with less serious departures from building and planning regulations, for example, accepting technologies and types of spatial organisation that are commonly used in the area but not in line with the often high standards incorporated in law. Then the potentials of transformation as housing supply could be realised.

The privatisation of public open space next to dwellings is an almost universal phenomenon and may be essential to the orderly and effective extension of government-built housing. The income and spending potential of transformers would not require heavy subsidies in its sale, indeed reasonable profits made from the sale of such land could be ploughed back into upgrading the services in the area.

Although the scale of activity demonstrates that transformers can afford extensions, finance is overwhelmingly the most difficult problem facing them in their incremental improvements. Phasing represents the most effective way for low income households, who depend on cash, to invest. They build as much as can be afforded for cash at any one time. It would make a great deal of sense for policy on housing finance to take account of the scale of borrowing required to fund an extension and to make sure that suitable loans were available in the formal finance system. With market repayment rates, such loans would impose no unreasonable demands upon the public purse.

Implications for the planning of new estates

Transformations encourage a physical planner to regard the residential area as a constantly changing place where plot ratios and floor space indexes on initial

completion are likely to increase through time. If households are to extend efficiently and with the minimum of disturbance to their neighbours and the layout of the area as a whole, plot shapes and sizes should take account of the pressure to extend houses. Opportunities for extensions appear to be strongly influenced by the availability of space around the original dwellings as, within the same case study, dwellings within tight sites have smaller transformations than those on generous plots. Thus, though planning school may have taught us that plots should be narrow and small for economical land coverage and servicing, transformations show that they should be wider and larger in order to conveniently cope with the increases in population over time. In addition, if the initial dwelling should be positioned close to the edge or corner of the plot, extensions spaces would be broad and convenient for large extensions. The current practice of placing dwellings centrally on the plot can leave little convenient open space for extensions.

Despite early short term losses in density from the larger plots, the long term densities may be very similar to, or even higher than, those resulting from smaller plots. However, more of the housing will have been financed privately and incrementally by the occupants and the variety of housing provided in size, price and tenure is likely to be greater.

Increased space on the plot provides more opportunity to extend and increase the use value (and market value where appropriate) of the property. Therefore, it makes sense to price plots in proportion to their size to recover some of the potential for the public purse. On main roads and other favourable sites for commercial activity, land prices can be higher per square metre in anticipation of extensions for commercial purposes.

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