# Exploring Space:
## Researching the use of domestic space for income generation in developing cities

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## Abstract/Introduction

Increasing numbers of households in developing world cities are using their domestic space as a key resource to generate income in a variety of home-based enterprises (HBEs) as part of household survival strategies. For many, the HBE income is vitally important to their survival. Some of these productive activities appear to complement reproductive routines and requirements, whereas others create potential conflicts, particularly where dwellings are small and household sizes large. In all cases space is a key issue and one which requires further exploration.

As part of an international comparative research project examining the environmental impacts of home-based enterprises we carried out intensive fieldwork in informal settlements in four cities (Cochabamba, Delhi, Pretoria, Surabaya). It was important for us to document all the resources and factors involved. Documentation of space usage proved particularly challenging.

On the one hand, we calculated the effects of HBE space on the dwelling from a sample in each settlement of 150 HBE operators and 75 non-HBE operators using quantitative techniques. These included measurement of the amount of housing space available and how much was used for the HBE, both exclusively and shared with domestic activities. In addition, for a sub-sample of 20 in each place, we produced detailed plans and diagrams to record dwelling layouts and plotted how the spaces of the home were used, indicating where particular activities took place and, where possible, how these changed at different times of the day. To complement the graphic data we carried out long structured interviews with householders to gain greater understanding about how space was used and how decisions were made regarding the location of activities, and the spatial implications of juxtaposing or combining potentially incompatible activities. More importantly, such data allowed us to gain insights into the range of conceptualisations regarding how boundaries are established and negotiated, and to identify the strategies employed to accommodate competing activities and resolve conflicts.

This paper will explain and reflect on the effectiveness of the combination of quantitative, graphic, photographic data, and structured interviews used and the analytical techniques employed in attempting to understand the complex issues of space usage in constrained domestic and working circumstances.

## 1. Home and Space

'Space in itself may be primordially given, but the organisation and meaning of space is a product of social translation, transformation and experience' (Samarasinghe 1997:135). In other words spaces are socially constructed through the activities which take place within them. This is a two way process, as *social interaction is in part constituted by its spatial setting - where things happen is part of the explanation of why and how they happen in the way they do. (Giddens)[1] uses the concept of 'locale' to refer to the spatial context of action. ... The routine reproduction of the social world through interactions is accomplished within settings which help to make such interaction meaningful and so to some extent predictable.*' (Saunders and Williams, 1988:81-82). The spatial significance of where activities take place is expanded in the writings of Rapoport (1982) who uses the term 'behaviour setting'.[2] Within all cultures the dwelling environment is one of the most significant of all spatial settings. Saunders and Williams (1988:82) identify home *as a crucial 'locale' in the sense that it is the setting through which basic forms of social relations and social institutions are constituted and reproduced.*' Key relations including gender and age as well broader identities such as class and regional cultures are structured and reproduced. Similarly the home is where central cultural concepts such as public and private spheres are defined and reproduced. Economic relations must also be included here, particularly where the dwelling is a place of production as well as consumption. A focus on the home as a productive workplace is therefore helpful in casting light on some of these traditional binary categories: public/private spheres; male/female roles; productive/reproductive work. In summary the home is the site of numerous encounters and relations in which space plays a fundamental role.

It is clear that space can also be understood in terms of power relations, and this is particularly relevant when attempting to understand potential conflicts between competing demands for space within the dwelling. However as in other studies of housing behaviour there are particular challenges when examining activities within the very private sphere of the home, where domestic power relations are sited. The study of the micro spaces of the dwelling environment therefore requires particularly sensitivity, especially in cross cultural contexts. We recognise multiple ways of reading and interpreting space and space usage (Lawson, 2001) which require a series of complementary methodological approaches to fieldwork, documentation and analysis.

## 2. The Home Based Enterprise Research Project

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[1] Here they are referring to the structuration theory of Anthony Giddens (1984).
[2] Christopher Alexander's (1977) 'pattern language' also attempts to link activities to particular spatial or typological configurations which form the basic building blocks of built environments.

Throughout the developing word increasing numbers of householders are using the space of the dwelling and the labour of the household to generate income in a wide variety of ways. *In most cities such enterprises conflict with planning norms and zoning regulations with regard to economic activities within residential areas and consequently are actively repressed or grudgingly tolerated. Rarely are such activities acknowledged as playing a positive role economically or socially.* The growth of home-based enterprises (HBEs_ is closely related to the weakness of the formal employment sector and the inability of the state to deliver in many areas of urban policy, but there is evidence to suggest that such informal household initiatives have a vital role to play both in poverty alleviation at household level as well as contributing to the vitality of neighbourhood and national economies (Tipple, 1993). There are numerous studies examining the phenomena from an economic perspective, but a paucity of studies which look at home-based income generation from a housing perspective. A key issue which inspired our study initially was the way that substandard housing conditions may be improved through the *income-generating potential of HBEs even though their use of space and generation of externalities could be considered as harmful.*

As a small multi-disciplinary research team based in CARDO (now part of GURU) at Newcastle University, we obtained funding from the British Government's Department for International Development (DFID) to explore the environmental impacts of HBEs on the housing environment: in particular to assess using empirical evidence how potentially negative externalities could be accommodated within the residential environment and to produce recommendations to minimise health and safety risks and identify examples of good practice in the field (Tipple et al, 2001).

Following a funded pilot study in India to test the methodology, we set up a four country international research study drawing on contacts in academic and official institutions in four countries: India, Indonesia, South Africa and Bolivia.[3] Drawing on local expertise, informal settlements with high levels of home-based enterprises were identified in each of four cities: Delhi, Surabaya, Pretoria and Cochabamba. Throughout the project the close collaboration and communication between the local teams with local knowledge and skills and the Newcastle-based team who designed and co-ordinated the project was fundamental. This communication was not easy, not least given significant geographic, cultural and linguistic constraints. However the project funding allowed for a number of international flights in both directions to allow the local teams to visit Newcastle (and hence each other) and for the Newcastle team to travel to the various sites. In addition a research associate employed full-time on the project spent several months in each city and played a key role in training the local teams. Unfortunately it was not possible for local teams to spend time in the other's research sites which would have been particularly beneficial. Indeed this project indicates the value of increasing the active involvement not only of local teams but of the potential for more directly participatory action research. A more recent DFID-funded project exploring disability in informal settlements has developed this approach and team members from India and South Africa have spent time in both research sites and were involved in workshops in both countries.

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[3] We are indebted to Johan Silas and Dewi Septani (ITS Surabaya); Mark Napier and Mary Mothwa (CSIR, Pretoria); Subir Saha and Alpana Bose (SPA, Delhi) and Maria Ester Pozo and Maggie Anderson (Cochabamba).

## 3. Methods: numbers, drawings, words, images and observations

From the outset we recognised that given the complexity of the research subject no single methodological approach would be suitable to capture the various dimensions and aspects of the phenomenon. Instead we opted to use a range of complementary approaches, each designed to elicit and record different aspects which we hoped when brought together would be able capture the richness and varied nature of the subject. In this paper we will briefly introduce each approach and focus on the issues related to understanding space usage.

## a) NUMBERS: quantitative measurement

We used stratified sampling to obtain a sufficiently representative population in each settlement and of each activity found, using households as our unit of analysis: 150 HBE active households and 75 non-HBE operating households. A single questionnaire, with only slight modifications for cultural variations was translated into each local language and pre-tested. It was then administered to household heads in each case study area by a local researcher to obtain a broad range of quantitative data about the dwelling, household manager or head[4], household and HBE, including numbers of rooms, areas of rooms, occupancy rates (persons per room), space per person, areas used for HBE activities, shared spaces (HBE and domestic), dwelling improvements made, etc.

The quantitative data provides us with a solid empirical base onto which to add the richness of qualitative data. There were a few problems of interpretation which escaped our vigilance for comparability across countries. The most disruptive being:
1. Different interpretations of pay and profit, and one case study (Indonesia) in which they were impossible to collect, as money for the house and business was completely intermixed.
2. Different interpretations of what is a 'worker'. We expected all in HBE activity to be regarded as workers but, in South Africa, the proprietor was excluded. We later included proprietors during coding but missed much of the richness of data which could have been available.

Apart from these problems, we have a rich data base which will take many years to benefit from fully. On the space use issue, data collected includes measurement of the amount of housing space available and how much of that was used for the HBE, both exclusively and shared with domestic space. The surveyor discussed and then measured this rather than asking the respondents for their estimates which are liable to be inaccurate.

In the quantitative data analysis, we made use of the spatial data by generating additional variables for net space use. In addition to the measures for exclusive and shared use, net HBE space was generated by adding half the shared space to the exclusive space. This was then deducted from the total space to generate net domestic space. We could then determine some of the effects on domestic life and the profitability of the HBE according to the total and net amount of space it occupies and what those represent as percentages. The most important finding from this was the

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[4] Mostly we interviewed the (usually female) household manager but in South Africa, for cultural reasons, we had to interview the household head who was more often male.

crowding effect that even tiny spaces used for HBEs could have on domestic space when the dwellings are very small (as in our India sample where 15 square metres is common) and the relatively benign effect of HBEs on the spaces where dwellings are larger (above, say, 40 square metres).

## b) DRAWINGS: plans and diagrams

A subgroup of 20-25 households in each settlement was selected for more detailed documentation including plans, photography, and interviews. Fundamental to this project was the preparation of detailed plans of dwellings. For each dwelling, a detailed plan was prepared at 1:100 indicating the physical configuration as well as the position of all furniture and fittings (at the time of the survey). Detailed notes and examples of plans were prepared to assist fieldworkers who were encouraged to record as much detail as possible. Annotation was encouraged, especially on a second sheet (or overlay) which was used to document the use of space, environmental conditions and supplementary notes: particularly critical was the location of HBE activities (including 'passive' spaces for storage), spaces shared with domestic activities, routes in or through the dwelling of customers, suppliers, waste collection etc, and location of any environmental issues (eg dampness, smells, hazards, ventilation or lighting problems, etc.) Shading was used to identify particular places or activities, and cross-referencing was encouraged to fieldnotes, qualitative interviews, photographs etc. The intention was to document as much as possible the physical and spatial characteristics of the dwelling and the activities within it.

However in common with photography such graphic techniques based on recording the geometry of the space are unable to capture the dynamic nature of space use, particularly where activities and spaces change diurnally, weekly or seasonally, and how they develop and change over longer periods (reflecting changing economic and household circumstances and priorities). Where possible additional notes were used to indicate where certain activities take place at different times (even though not at the time of the visit); the time dimension was however usefully engaged with in the detailed interviews.

## c) WORDS: qualitative interviews

HBE operators(and when possible spouses) from the same subgroup were interviewed in order to record their own interpretations of their circumstances and the strategies they employ to cope with a range of frequently conflicting demands on domestic space, labour and time. A detailed list of themes was prepared by the research team to help the fieldworkers structure the interviews in a flexible but focused way [see Fig 1]. The interviewers were trained to encourage the respondents to speak at length in order to explore in some depth the perspective of each individual and their response to their own particular circumstances. Oral testimony approaches such as this offer great opportunities to examine issues which are impossible to engage with in quantitative work, and in the case of space usage, complement and add substance to the physical and visual data: we can obtain insights into what cannot be seen or questioned superficially. However such work is not easy, and local researchers adapted to the techniques with varying degrees of success. Firstly there are complex issues of language and personal communication with much hinging on the quality of the relationship between the two parties in the interview (Kellett, 2000; Kellett et al,

2002).  Interviews were conducted in the local languages (in India and South Africa the fieldworkers required fluency in four or more languages) and were then transcribed and translated into English.  This is time-consuming and difficult: unless great care is taken some of the meaning and much of the subtlety and nuance of detail can be lost (Slim and Thompson, 1994).

| Themes | Issues |
|---|---|
| **4) USE OF TIME** | **a) The allocation of time to HBE and domestic activities**<br>- Describe the previous day referring to demands of the HBE and the home  (also any other demands on time - such as community organisations, other income-generating work)<br>- Are there any conflicting demands on the interviewee's time? How does s/he resolve these? If they cannot be resolved, what does s/he do?<br><br>**b) Seasonal Activities**<br>- How do household activities change in the 'high' season as opposed to other times of year?  Focus on issues of time and space.<br>This question could also be asked of a particularly busy day of the week or time in the day. |
| **5) USE OF SPACE** | **a) Strategies are used to find space for domestic and HBE activities**<br>- methods of dividing space<br>- movement of furniture/equipment<br>- multiple uses i.e. sewing machine tables that become desks for children's homework in the evenings, bed that is used for stacking finished products during the day<br><br>**b) Conflicts concerning use of space**<br>- If family members are running more than one HBE within the home, do conflicts over space arise and how are they resolved? Which HBE(s) are given priority and on what basis?<br>- Difficulties/disagreements arising from domestic and HBE demands on space<br>- Shared space in the neighbourhood e.g. streets, alleyways, courtyards<br><br>**c) Dwelling Modification**<br>- Have changes to the house altered the way in which space is divided between domestic and HBE activities?  (Note - only relevant to those households where changes have been made)<br>- If interviewee has moved HBE from one house to another - how has the change in **space** altered the way in which s/he organises the HBE? |

*Fig 1  Extract from Interview Schedule used to guide the qualitative interviews*

Some of the resulting transcriptions proved not only useful in terms of supplying factual information for the research project but also as powerful personal testimonies of the constraints and problems facing poor people attempting to improve their life chances in circumstances of poverty.  The interviews from South Africa were especially compelling, perhaps partly because during Apartheid both housing and work activities were severely constrained by racist legislation with a strong spatial component.  For many the freedom to be able decide how and where to earn their living is still regarded very positively.  Here is small extract from the testimony of a Mr Nkosi, who rears chickens and runs a small shop from his improvised dwelling in Mamelodi on the eastern edge of Pretoria:

*'Truly speaking I have said lots of things, the difference is that there was nothing painful like knowing something but being denied to do it. I believe that even if you cannot find a job there is nothing more important than being given the opportunity to do what you want, […] You can buy tomatoes and sell here without being arrested, you can sell chickens where ever you wish. And these people who say they want jobs I think they fail to understand the life we are living, this is wealth, my baby, just to say 'you can do what you can', just that. [...] now we are very rich, with the opportunity we have been given. My baby, we could not work before. When you tried business you would get arrested and tell you that you don't have papers, and when you go there to find papers they would tell you that you do not qualify. [...] You were supposed to have worked for a white person for twenty years. [...] And that you should have a registered house, there were many conditions I forgot some of them, but these two I cannot forget because no one qualified for those kind of things'[5].*

## d) IMAGES: dwelling and settlement photographs

Photography can be particularly intrusive within the private sphere of the home therefore special efforts were made to ensure that householders were comfortable about it. Express permission was always sought and where appropriate they were encouraged to place limits on what was photographed. A series of photographs were taken of all dwellings in the subgroups. The aim was to create a detailed record of the key spaces of the dwelling, particularly those where HBE activities were taking place, and to document HBE activities. External pictures were also taken of the dwelling, open spaces, plots as well as streets and alleyways, especially where economic activities were present. The resulting images were carefully collated and captioned to facilitate cross-referencing to the data sets. These images proved vital in helping to interpret plans and useful in recalling places and activities later.

## e) OBSERVATIONS: participant observation

Although much HBE activity is visible and can be documented directly using plans and photographs, many of the activities and boundaries between them cannot be seen nor readily comprehended without a much closer involvement with the people and access to the more intimate spaces of their dwellings. All the fieldworkers were encouraged to prepare fieldnotes to record observations and insights gained whilst in the field, but with some exceptions it proved difficult to obtain much data of value in this way. Therefore in order to complement the main research data of the larger project, it was decided to draw on more personal and ethnographic approaches as typified by participant observation, which is regarded as the research method that most closely approximates everyday life (Hammersley and Atkinson, 1983). At different times, the first author and two graduate students had the opportunity to live with a family in the case study kampung in Indonesia. This was a home of a well respected community leader whose extended family was involved in a number of HBE activities and their home in the study area provided an ideal base from which to experience life within the *kampung* and carry out a series of more detailed household case studies for lengthy periods, noting changes and cycles of activity. Recording of

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[5] The original interview took place in a mixture of Sotho and Zulu, with a some phrases in English and Afrikaans. For a full version of this testimony see Kellett, Mothwa and Napier (2002).

oral narratives combined with field notes and sketches were a key component of the data collected (Kellett and Bishop, 2003).[6]

## 4. Discussion and analysis

In the next section we will use some of the data obtained to illustrate and explain the relative value of the different methodological approaches adopted.

**Space syntax**
A basic space syntax analysis was carried out of all the dwelling plans from three of the four case study settlements in order to clarify the sequence and linkages between spaces and the location of particular activities. Given the relative simplicity and small size of the dwellings, particularly those from India, the resulting analysis proved to be of limited value, although it certainly highlighted patterns of spatial use. For example with the Indonesian data it was clear that in over 80% of dwellings the HBE activities were located in such a way to make it necessary to pass through spaces where HBE activities took place in order to access the exclusively domestic spaces (Gilbert, 2002). This even occurred in three dwellings with more than one entrance: both entrances were dominated by HBE activity, and this is clearly visible in the gamma diagrams. This can be largely explained in practical terms: for both access and environmental comfort reasons (light and ventilation), most HBE activities take place towards the front of the dwelling. Typically the HBE activity will occupy the front third of the dwelling area.

**Shared Space: conflicts and problems**
Although a conceptual distinction is clearly made in most western cultures between 'home' and 'work' usually reflected in spatial separation, we believed it important not to presuppose that this would be the case in our study sites. However in all of them such a conceptualisation was clearly articulated in the interviews and where possible expressed in the dwelling layout and use of space. It was regularly underlined in the interviews when future plans were discussed and the issue of how dwellings could be improved (if resources were available).

In Cochabamba, Senor Chambi who makes clothes has managed to build incrementally to obtain more space:
*"Before we only had the one workshop, right there… plus the kitchen. Right there we would sleep too… it was tiring and you couldn't rest properly for work […] When we were working the small children would keep picking up one thing or the next. Our idea was always that the workshop should be completely separated."*

Not only does he create separation of activities within the dwelling, but the high walls boundary walls typical of dwelling here separate the inhabitants from neighbours to create very private realms within. The enclosed spatial arrangement which separates the inward looking dwellings from outsiders appears to reflect the largely autonomous and self-reliant household arrangement. In all cases it was clear how the economic unit of production maps very closely on to the extended social structure of the household.

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[6] The graduate student's fluency in *Bahasa Indonesia* greatly facilitated this work.

This contrasts markedly with the pedestrian alleyways in the Indonesian case study which are important for a number of HBE activities. Activities which do not require fixed equipment (such as hand sewing of shoes) frequently take place in the lanes where the light and ventilation make it more comfortable but also there are increased opportunities for social interaction. A shoe-sewing enterprise run by a woman at the end of one the lanes has at its core a group of related family members augmented by a broader network of friends from the same lane. As they sit chatting in small groups outside their houses, their sewing may be seen to symbolise the social act of knitting together and consolidating the social relationships between them.

The three generation Karminfamily from Indonesia (who make their living producing brightly painted papier mache masks) experience difficulties with their limited space. Mrs Karmin explains:

*"There are no special rooms for family and for business. We have furniture [..] for the guestroom and for the dining room. But it doesn't just function as the dining room or the guestroom, because [both] are also used to work in. So it all gets very untidy. [...] Sometimes we must move some furniture when we have a lot of orders. The dining table even sometimes functions as the place to put the masks on. To eat we don't have to use the dining table: we can eat wherever we like. For instance, sometimes when we have many masks, when we work the masks are placed on the bed then we cannot sleep on it. So my small daughter sleeps with me here* (in the living room). *There are usually three or four peoplewho sleep here. We provide mats for them, sometimes they use it and sometimes they don't. [...] where we sleep is not important. [...]. We have plans but the resources aren't available. [...] We have dreams; we want to raise the back part of the house to make two rooms specially for making masks. There are more plans but we don't have the money."*

In this case we were able to record the everyday space use in detail using plans and interviews. With their neighbours, also mask makers, participant observation was used to find out how space use changed when the dwelling (and street) was used to host a wedding. Although the HBE work had to stop to allow this, a wedding is a significant opportunity for other HBEs: these included cake-making, food preparation, personalised gift making and packaging, make-up and hire of costumes, equipment hire (e.g. sound systems and lighting), furniture hire (chairs, tables, stage), photography etc. The marriage ritual underlines the use of the house for key social events and reinforces the role of the home as a significant 'locale' for reproducing social values. In addition to co-existing or integrating with 'ordinary', everyday domestic activities, home-based enterprises must also respond to 'special', ritual occasions when the normal routines within the house change. In many instances HBE work must inevitably be curtailed for a limited period with consequent impacts on income generation. Therefore although this potentially reflects a greater sacrifice, the flexibility and control available to those who run their own businesses underlines one of the key advantages of HBEs. These occasions usually require furniture and equipment to be moved and space re-configured to cope with large numbers of guests. These understandings and insights were only possible through the use of a variety of research techniques.

**Gendered space and activities**
Gender of both HBE operator and customers can influence the spatial arrangements. In South Africa security and control appear to be more critical for activities with

exclusively male customers (such as beer drinking). In contrast, HBEs dealing only with women are less concerned with security or access to intimate spaces within the home. For example, Mrs J sews and sells clothes from a bedroom deep within the large dwelling. All her customers are women to whom access to bedrooms and other private areas is perfectly acceptable.

Members of a household may have differing opinions as to what constitutes an acceptable or appropriate use of domestic space. One respondent in the South African case study moved his fried fish business out of the home because he found it too difficult to combine his HBE food preparation with domestic food preparation. Clearing away after domestic food preparation cut into his work time, and his business activity impinged on the domestic space by damaging the furniture with spitting fat,

> "...What made me to shift from home is the fact that the place was not really meant for the food I am selling, and it was for domestic purposes. So I realised that I was disturbing them in the kitchen and I could not manage time for my business because of other domestic tasks. I found that there were other domestic tasks that I had to do. I had to wash [dishes] if they are not washed, sometimes you will find that I had to give them time to cook and eat, sometimes when they have finished you will find that they [his children] have not cleaned the way I want ... So you will find that I have to start by washing dishes, fetching water, and cleaning and ... I am running out of time, and the space is too limited, and ... fats from food get all over the furniture because of the space and ... I get shouted at!" [laughter].

For this respondent, the problem is not just one of combining different activities in one space. By running a business from the kitchen, he also transgresses gendered divisions of space in the home; he enters a space that his wife considers to be her own. He explains that many of the arguments with his wife arise out of his using cooking utensils that she considers to belong to her, and over whose responsibility it is to clean the kitchen. He feels that, because the business helps the whole family, divisions of male and female property are not valid and that cleaning the kitchen should have been equitably divided between HBE and domestic users. Because of this conflict, he separated the HBE spatially into a kiosk in the front of the plot.

The final examples illustrate how religious values impact on space usage. For traditional healer (*sangomas)* in South Africa, tradition demands that certain activities should be separated. However, limited space may make this impossible, as Mr. S. explains,

> "According to the rules where we grew up, where we learned traditional healing, salty food is not allowed in the 'ndomba' [medicine room]. ...You can only put medicines, and only you and your patients can enter in the 'ndomba'. ...We don't have a space, that is why we mix up things, but it is not the rule ... I sleep there, I read peoples' lives in there, and I put all my things in there. But it is not allowed; only ancestors belongings should be put in there."

Limited space also impacts on domestic religious activities. For example Mr Kusnari, a shoe maker in Indonesia, works in the main living area and has to accommodate the regular Koran readings of his wife.

> "It's never been a problem because I think all of them are willing to understand our conditions. It's true that sometimes the living room is needed for reading

*the Koran and I also use this room for working, so my family members which are many will clean this room and in a short time it can be used. When the reading of the Koran is finished so work activity will be back as usual. Reading the Koran also doesn't take a lot of time, so it's no problem for us to let this room be used first for other needs like that. It's never been a serious problem in this case."*

Of significance here is the importance of cleaning the room before the religious activity can begin. It reminds us how a dirty, polluting and profane activities are accommodated within the clean and sacred spaces of the home. The cleaning is much more than a practical action, it is a basic ritual which helps to establish the conceptual boundaries which organise the social behaviour within the dwelling.

## Conclusions

A complex international research project with teams in five countries and four continents is not easy to co-ordinate, and we certainly experienced frustrations and problems. However we have been encouraged to see how it is possible to generate high quality data using a number of complementary methodological tools. We found it appropriate to combine quantitative techniques with qualitative ones and to closely integrate them especially during the analysis. Greater of integration of visual and word based techniques during the fieldwork could have been especially rewarding, and ironically was picked up during the pilot study, where we identified the potential for the greater use of visual prompts such as photographs and plans of the dwellings as aids to more focused discussions. This could be particularly valuable in teasing out changing spatial locations of activities, priorities and alternatives considered by householders. This paper has only managed to sketch an outline of the work carried out and to offer a few short examples. Technical constraints have limited the use of graphic material within the text. We look forward to presenting some of the graphic material during the conference and discussing the approaches adopted.

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