Transport, (im)mobility and spatial poverty traps: issues for rural women and girl children in sub-Saharan Africa

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Introduction

This paper reflects on the experiences of women and girl children resident in rural areas of sub-Saharan Africa with poor physical accessibility (to services and markets) because of poor roads and inadequate transport (in terms of regularity, reliability and cost). Examples from field research conducted in diverse agro-ecological and cultural contexts in western and southern Africa are used to explore the impacts of relative immobility and poor access to services on women and girls. Three themes are examined in some detail: access to education, access to health services and access to markets.

The disadvantages associated with poor physical access to services may be felt by a wide cross-section of population resident in the area concerned, but there is substantial evidence to suggest that the impacts on women and their daughters are particularly severe because of stronger constraints on female mobility. Girl children, for instance, are particularly likely to suffer poor access to education services because of impediments to their school-going mobility, while distance and associated mobility factors may be a critical component in women's access to maternal health services. Access to education and health both have important implications not only in terms of immediate health and educational outcomes, but also for subsequent livelihood opportunities and life chances. For many women, especially those with limited formal education, market trading presents a key livelihood opportunity, but accessing markets tends to be particularly challenging for women living in remoter rural areas. Other potential openings for earning off-farm income – recognised as an important factor for spreading risk and thus insuring against deep poverty - may be similarly restricted by distance and limited mobility. The contribution of low female mobility and broader transport failures to the maintenance of inter-generational cycles of poverty is a major theme of the paper.

The final section of the paper considers the potential of a range of transport and non-transport interventions for initiating positive change among women. Improved accessibility has conventionally been perceived in terms of road improvement and improved motorised transport services. The paper reviews evidence regarding the extent to which road construction is able to counteract the negative effects of physical distance and time spent travelling to major markets and other services by women and girls in 'economically stagnant regions', the associated importance of low-cost, regular and reliable transport services, and the potential for Intermediate Means of Transport, including bicycles and motorcycles, to fill the transport gap where motorised services are poor. Non-transport interventions which can counteract remoteness and poor accessibility are also considered: in particular, the remarkable diffusion of mobile phones across Africa in the last few years and recent evidence of their growing impact in relatively remote areas, drawing on examples from Ghana and Malawi.

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Girls' physical access to schools and its impact on livelihoods and life chances

In remote areas, areas with poor physical access, or areas with strong (culturally imposed) mobility constraints on females, poor access to schools is likely to be an important contributing factor to girls' low educational achievement[2]. Data from Morocco suggests that in the area of influence of major rural roads which had been paved, the percentage of girls attending primary school tripled to 54% (while boys % doubled to 81%): increases in areas where road improvements had not been made were much lower (cited in Levy and Voyadzis 1996, cited in AU/UNECA 2005). Limited education has potentially far-reaching implications, not only for the current generation's access to work opportunities, but also for the life chances of the next generation through its influence on fertility rates, child-rearing practices and related factors. The linkage between fertility rates and female educational level is now well established (e.g. Ainsworth et al. 1995; Scribner 1995), but there is also evidence to suggest that girls' educational attainment can affect their child-rearing practices and the health of their children (Kabeer 2005).

This section draws on recent research with children, their parents and teachers in Ghana and some preliminary research in a linked three-country study (Ghana, Malawi, South Africa) currently in progress[3]. In each of these countries, girls living in remote rural areas with poor roads and poor or expensive transport services face particular problems in accessing educational services for a variety of cultural, economic, and social factors. In the rainy season when roads and paths may be flooded and rivers impassable, mobility problems are often particularly great.

In Ghana distance to school influences access, persistence and performance of both sexes, but may have a particular impact on girls' enrolment and attendance patterns (Avotri et al. 1999). The sort of pressures girls, in particular, may experience can be illustrated by the discussions we recently had with a number girls whom we accompanied on the 4-5 km walk from school to their home villages in a rural area of Central Region. The main route from school to the villages it serves is a narrow laterite road, only plied by transport on the two days each week when local markets are held: the vehicles are full of market women and, in any case, school children generally do not have the funds to pay fares.

Mary, a 13-year old JSS pupil, always walks to and from her Junior Secondary School with a girl friend who lives close by. If her girl friend is sick, she prefers not to attend, as there are places along the route where the road is narrow and the grass is high on both sides. She has heard stories of people being beheaded there and is scared to pass on her own. When she was late to school earlier in the week we met her (because of jobs she had to finish at home before leaving for school), the teacher made her carry sand to school (to be used in constructing a school building) as a punishment.

Another (11 year old) girl at the same school, Effie, had lived with her sister in Tema where schooling was better, but she was forced to return to the village because her sister was unable to pay her fees. Like Mary she has tasks to complete before she can leave her village for school (fetching water, sweeping, refuse disposal): she takes money to eat when she gets to school as there is no time to have breakfast at home. She also has fears about a particular place along her route where ghosts live, so she is keen to ensure she walks with

[2] Compounding the other educational hurdles commonly faced in poor countries such as inadequate school infrastructure, lack of books and other educational materials in school, fees charged at secondary school level, lack of funds to buy uniform or pay essential 'extras' such as PTA or nightwatch contributions, need for child labour to help support the family etc., all of which will impact on both boys' and girls' potential to attend school and receive a good quality education.

[3] The ESRC/DFID-funded study on child mobility in sub-Saharan Africa is led by the author. Collaborators are as follows: Albert Abane (University of Cape Coast); Michael Bourdillon; Kate Hampshire (Durham University); IFRTD secretariat (London); Mac Mashiri (CSIR, Pretoria); Alister Munthali (University of Malawi) and Elsbeth Robson (Universities of Durham and Malawi).

her elder brother but he is usually ready to leave home before her (because he has fewer household tasks to perform): if he does not wait for her she runs along this section. Effie doesn't see distance as a major problem in getting to school, despite the fact that she has to walk 5 kms to school: "I do not have a problem with walking since it has become part of me". She is learning to ride a bicycle (using part of her breakfast money occasionally to hire a cycle to practice) qne will soon leave the school to attend another in a nearby town, where she will live with relatives.

A third 14-year old girl, Comfort, has been living with her grandmother in the village, since her parents separated. Her main problem about getting to school is not so much the distance (4 kms) she says, but the work she has to do before school and the fact that she is not given food each day until she returns home from school (she says she only eats once per day, twice per day at weekends). She arrives at school tired and hungry, which she thinks makes it difficult for her to concentrate.

By contrast with the girls, the boys we accompanied along the same route in Ghana complained more about the distance, but still find time to play (football and fights) along the way. Like the girls, they are keen to avoid being late because of the fear of being lashed or required to carry sand as a punishment, but they appear to be more commonly delayed by games than by household tasks which must be accomplished before they leave home. Both sexes complained about the dust on the laterite road spoiling their clothes and consequent punishments at school for 'not being neat'.

Accompanying three schoolgirls (around the same age as the Ghanaian students i.e. early to mid teens) on a 4 km from primary school to home in a relatively remote area of the Shire Hills region south of Zomba, in Malawi, similar issues emerged from those raised by girls in Ghana, but with a stronger emphasis on specific fears of attack and rape. In this case the girls normally walk together, taking a route along a narrow footpath which required crossing five streams. In the wet season the route is potentially quite dangerous simply because of the slippery path, steep slopes and streams in full spate. If the rains are very heavy they sometimes wait to see if the water in the streams will subside but may then have to take a more circuitous route. None of these girls normally wear shoes to school (though one had borrowed a pair from her sister for this occasion), unlike the children we accompanied in Ghana.

One of the girls, Melina, who was fostered by her aunt, was particularly concerned about being late for school because of the household chores she had to complete before starting school. [Such chores commonly seem to be heaviest among fostered girls in both Ghana and Malawi.] If children are late, we were told they are sometimes forgiven and allowed to join the lesson in progress but at other times are simply sent directly home, despite the fact that, in their case, this entails a long, lonely and potentially hazardous walk. If they find they are very late they sometimes feel it is wiser to play truant that day.

All three Malawian girls had stories about ghosts, witches, bandits, wild animals and snakes they had encountered en route to and from school. They had once been chased by dogs, once by a 'mad man'. The eldest of the girls, Eva, aged 16, who has undertaken this journey to school since she was five years old (walking with her older siblings at first), said she had recently been chased by five older boys who were intent on rape. When we interviewed parents and teachers in this area, they very frequently raised the issue of rape and teenage pregnancy: we were told that most girls in this area do not finish school because they get pregnant.

In both Ghana and Malawi our qualitative research with young people indicates that girls at all ages are expected to perform substantially more house work and associated chores than boys. However, although household chores impose a common burden on children, which

may impact on school attendance in both rural and urban areas, the burden is especially severe in many remote rural areas where the transport gap brings additional demands especially for girl-child labour as transporters. This is well exemplified by the relatively remote Shire highlands village in Malawi (approximately 8 kms from the paved road, on a laterite road of adequate condition to allow motor access but with no regular transport passing through) where many children are absent from school on two days each week when markets are held in nearby towns since they are required to headload firewood for sale. The (female) head teacher observed that many of the pupils suffer lack of concentration, ill health and illness because of these chores, but this is particularly the case for girls. Not surprisingly, then, girls in this village tend to be less successful in the competitive examinations for entry to Secondary School. Only five out of 30 eligible children (four boys, one girl) had been selected in the previous year, so the remaining 25 who were not selected (boys and girls) are mostly enrolled as 'night scholars' at the secondary school on the paved road (i.e. paying for lessons from the teachers after the school day has finished there). The night scholars (usually around 13 to 15 years old) walk 8km along a laterite road to the secondary school in daylight but must return home in the dark: this poses hazards for girl students. "The older girls who attend [the secondary school] because it's so far and it's a night school and they come back late with the boys, they form 'marriages', then they get pregnant and drop out…." "Girls just fall into marriage" [group discussion with four mothers in their 30s and 40s].

Clearly the barriers faced by many children in remote rural areas with poor and expensive transport services in accessing even a basic education are impossibly high. Girls, in particular, may never be enrolled at school or only attend intermittently, not least because of their required role as porters to fill the transport gap. For those girls who are enrolled, the heavy burden of household chores required of them before they leave for the long walk to school in the morning seems to be ubiquitous. Fear of punishment for being late (due to the work followed by a long walk) in some cases encourages truancy, while failure to perform well at school may often be associated with exhaustion. There are also dangers associated with travelling alone along remote paths, or in the dark, such that parents living in remoter locations may prefer to withdraw their daughters from school at a young age (or not to send them at all) if they must travel alone. High rates of pregnancy, in any case, are commonly presented as a prime cause of school drop-out for girls in many rural areas.

In such circumstances it is hardly surprising that so few girls in remote rural areas are able to obtain even a basic education, that early marriage and motherhood are so commonplace, and that the opportunities for women to develop a livelihood which will lift them out of persistent poverty are so few. The majority of girls are condemned to follow a life very similar to that of their mothers and grand mothers before them, competing in the same narrow economic niches for the same meagre rewards.

Transport and mobility impacts on girls' and women's health and access to health services

While educational disadvantages imposed by mobility and transport impediments on girls and women are likely to be severe, the consequences of their poor access to health services in remoter rural areas may be fatal. Clearly, distance is not the only impediment to health care access – treatment fees commonly impose an even greater barrier (Airey 1992, AU/UNECA 2005[4]) - but in emergencies (where treatment fees are certainly waived in some places and cases) distance and transport failures may impose a critical hurdle (Murray and Pearson 2006). This is illustrated, for instance by work in a region of rural Zimbabwe (Masvingo) where access to transport was an implicating factor in 28% of maternal deaths,

[4] This refers to evidence from 10 national Demographic and Health Surveys: in Africa the highest problem cited by the main female in each household about problems she faces accessing health care were getting money for treatment, followed by distance to the facility and difficulty getting transport.

as opposed to 3% in urban Harare (Fawcus et al. 1996). Cham et al. (2005) in a study of maternal mortality in a rural area of Gambia, where maternal mortality rates are among the highest in the country, cites specific cases where poor roads and inability to access transport from home to health centre or from health centre to hospital were implicated in subsequent death of the patient. While interviewing rural women recently about access to health care in Malawi and Ghana, I have been surprised how many have, without prompting, pointed out one or even two of their children around them who were born on the roadside while they were walking to the clinic (usually accompanied by female relatives). Grieco's recent toolkit (2005) on gender, transport and maternal mortality (www.people.cornell.edu/pages/mg294/maternalmortality.htm) is highly persuasive on the urgent need for attention in this field.

The immediate dangers of poor access in the case of emergency obstetric care are obvious, but longer term health problems for women caused by failure to access timely health care (including obstetric fistula resulting from obstructed labour) are also now gaining attention. The health and socio-economic problems associated with obstetric fistula appear to be particular severe. Women afflicted with this problem suffer incontinence and thus may be ostracised socially, consequently finding it difficult to make any kind of living (GATNET communication, Bradbury: 26/4/2006). Although delays in accessing care may be caused by delays in decision-making and delay in receiving treatment after arrival at the clinics, remoteness and associated problems of inadequate and costly transport are commonly a substantial contributing factor: in a recent study by Addis Ababa fistula hospital, among the causes patients gave for failure to obtain early treatment, distance figured above other factors (distance 28.2%, distance and economy 23%, poor knowledge and distance 2.3%): the average time taken to reach the nearest road on foot was five hours (Muleta 2006).

McCray (2004) in a study of prenatal care in KwaZulu Natal, South Africa, emphasises the significance of the opportunity costs of travel time in remoter areas. Limited disposable time available to rural women areas on visits to healthcare facilities because of lack of basic infrastructure (notably water) in rural areas (and despite the fact that health care is free for pregnant women and children under 6) has an adverse impact on uptake. The paper raises an important issue concerning usage of mobile clinics: many women were found not to take advantage of this kind of service provision because of the difficulty of physically reaching the mobile points and the clinic schedules which begin in the afternoon and result in patients waiting late into the evening when transport is scarce or unavailable for the return journey home.

Another recent study in the same region suggests that wherever homesteads are located over 1 hours' travel time from the nearest clinic, usage declines rapidly with distance (Tanser et al. 2006). Interviews with health staff working in rural Ghana reinforce this perspective. The maternal and child health officer in a health NGO who had many years experience in remote rural areas across the country described graphically some of the problems she had personally faced*:*

"in Western Region we walked about seven kilometres to the people because they couldn't come to us. We worked until 6 pm, but then they found it difficult to go in the forest to go home, so they left at 2pm. In off-road places we think they're protected with vaccinations but they're not. Some didn't get attention... there are the regular child welfare clinics but she [the mother] can only take one at a time and the most precious one is the youngest. In eastern Region at places like... there are about 230 mothers waiting. By 2 pm we've only done one third and they don't want to walk alone so they go home. You'd find 6-9 month old children not immunised and they become too old eventually to get them under the vaccination programme. We'd get up at dawn, find drivers in the agriculture department, education, even some timber firms- when the drivers meet us they'd pick us up. But in hilly areas you have to walk. It tells on the health of nurses too: [they] wake at 6 pm, not home till 8 pm, she eats small and sleeps, then up at 6 am again the next day". [interview, Accra]

The role of girls in pedestrian porterage was discussed in the section above as a factor reducing access to education, but porterage by girls and women also needs consideration as a potential health risk. Many walk substantial distances each day carrying heavy loads, often while pregnant and/or with a baby on their back. Even very young girls generally carry water, but also often will be expected to carry firewood and agricultural produce too. During studies in coastal Ghana, for example, girls of 8 or 9 years were regularly encountered carrying heavy baskets, buckets and trays of cassava and maize (weighing between 10 and 20 kg): when asked whether this caused discomfort some mentioned headache and neckache, or waist pains (and it was noticeable how frequently this was the case among fostered girls) but they tend not to complain to their parents or carers. During a small load carrying survey in June-July 2000 (not the peak season for loads) in five off-road villages in Central Region (dawn to dusk, on one market day and one non-market day) we found all inhabitants carried very heavy loads: the maximum for girls under 18 was 34 kg, while one woman was recorded carrying 63 kgs of fuelwood with a baby on her back, over a distance of 8.2 kms (Porter, Acheampong and Blaufuss, 2003).

The majority of evidence about health impacts of carrying heavy loads is anecdotal, but includes reference to backache, head and chest pain, miscarriage, deformation of the spine, osteo-arthritis of the soft tissue of the knee, etc: see Carr 1983; Mudzamba and ILO 1998:12; Doran 1996:23, 61; Turner and Fouracre 1995). There is also potential inter-generational impact on children (miscarriage, poor growth of foetus, quality and quantity of breast milk: see Doran 1996:61 citing an ILO study regarding the high incidence of miscarriage among fuelwood porters in Ethiopia; Curtis 1986). In recent discussions with female health staff in a rural hospital in southern Ghana and with women in both Ghana and Malawi on this issue, I found little credence placed on the significance of such load carrying for health (except in terms of possible lower back-ache in later life where exceptionally heavy loads had been carried over a lifetime): head loading is simply considered part of a woman's 'normal' work: 'they *are used to it, those living here'* (senior nursing officer). However, in interviews with girl children in the Central Region of Ghana, headache and neckache were often raised as outcomes especially of carrying fuelwood (and sufficient to require treatment with painkillers)[5].

Although not so immediate in their impact as access to emergency obstetric care, access to pre-natal and other health services, including family planning, clearly has the potential to significantly shape not only women's livelihoods and quality of life but also the lives of their children. With health, as with education, the particular disadvantages associated with residence in remote rural areas distant from service points are considerable, especially for women. Women's need for emergency obstetric services may put them at immediate life-threatening risk in remote locations, but distance from health centres and hospitals is also likely to reduce their ability to access a range of preventive and curative services with potential longer-term impacts. This puts them more at risk of chronic health problems with potential consequences for their ability to make a living in future. Not surprisingly, poor health is a common component of the chronic poverty scenario. Fortunately, the significance of transport and mobility impacts on women's health is gaining growing attention and an international networked research project on mobility and health now in progress (www.mobilityandhealth.org) offers the promise of crucial new evidence.

[5] This is any area which needs more systematic research. We are pursuing the issue currently in our child research project and also hope to extend work with women health workers in a related study.

Mobility and access to markets and other off-farm livelihood opportunities

In much of rural Africa, women's principal means of livelihood is through agricultural production and associated trade. In areas with poor or expensive transport services women commonly face particular constraints in accessing markets. This may be a factor a) of limited availability of local markets in remote and off-road areas and b) of restrictions on women's mobility which affect their ability to travel to market.

The expansion of motorised transport and selective road improvements has led to a substantial rationalisation of the rural marketing system over the last fifty years or so across much of Africa. Markets along good paved roads easily accessible from urban areas by motorised transport have tended to grow, while markets in locations with poor access have declined and often disappeared, unless specific local conditions favour their existence (Porter 1988, 1995, 1997). Women's marketing mobility may be restricted not merely because of limited resources to pay fares to market (if transport is available) for themselves and their goods, but in some cases because they (together with their children) have heavy labour obligations including head porterage for male family members, or because male family members are suspicious of their women travelling long distances from home. Drawing on research in West Africa, this section reviews the mobility problems women living in areas with poor accessibility face in reaching markets and the implications of inadequate and delayed market access (in terms of reduced prices, loss of customers, spoilage of sale goods etc).

In-depth studies of access issues with women living in five villages located away from good paved or gravel roads in coastal Ghana over two periods (1997-8 and 2000-2003) illustrate many of these issues. In the first place it is important to note the potentially contentious nature of women's mobility. We tend to associated cultural constraints on women's mobility with Islam, but even in a region where the majority of people are not Muslim, there may still be an association of female mobility with promiscuity:

"*I think a woman who travels a lot is befriending other men and that's why she travels"* (men's group, Sampa village, March 2002).

'*She travelled to a place and returned and then within the same week she wanted to go … again, so I said she should not go, but she still went. I was angry with her. I often stop her from travelling… we quarrel often about that*.' (Husband of Esi, Adabra, March 2002).

'*One day my husband told me not to travel, but I disobeyed him and travelled. When I came back he and some soldiers had gone to my land and destroyed all on my land. He went to the landowner to collect my money and told him not to give me the land again [land she had acquired to build a house]…..Any time I wanted to travel, I needed to seek permission…If he doesn't want me to go and I go, then he would lock the door and not let me in when I returned'* (Victoria, Abora, June 2002).

Male attitudes do not seem to prevent most women travelling but it may constrain the time they can spend at market and their potential to travel to distant markets – *"he queries me whenever I stay late at market, but he does not stop me from selling*" (Akua, Gomoa trader, Pekuma, January 2000). Finding transport to speed and ease travel is another common constraint: no vehicles were based in the study villages (the few transport owners living there prefered to operate their vehicles from a paved road base, due to the high cost of maintaining vehicles which ply poor roads). Services to and from outlying villages are usually better on market days, but even so vehicles may be full by the time they reach the village in question and it can also be difficult to find a vehicle at the market for the return journey. Even if reliable transport is available, fares charged along poor roads tend to be substantially higher (often double) than those for travel on good paved roads. The unreliability of vehicles is such that it is rare for women traders in these villages to send their

goods unaccompanied to market. However, some drivers allow the market women they transport regularly to pay the fare at the destination market after they have sold their produce.

In all our five survey villages some women reported deterioration or loss of produce – notably cassava, but also plantain and some fruit and vegetables- as a result of vehicle unreliability and breakdowns and the impassability of roads, especially after heavy rains. Losses are incurred due to late arrival at market, because by this time the trader's regular 'customer' may have bought all they need from other traders. In that case, it may be necessary to sell the produce at a much reduced price, in order to off-load their goods before finding a vehicle for the long return journey home. However, if such women are observed selling at prices below the town-based traders, they are likely to be admonished by the market queens who regulate these markets. Given the constraints of transport availability and cost and male attitudes to female mobility, women tend to sell their goods in the closest market. This clearly reduces their potential to exploit opportunities in more distant markets where there are likely to be fewer traders selling precisely the same product, or where prices could be better[6].

In remoter areas, women's relatively poorer access to credit is another major problem for many market traders. In our five study villages in Ghana, few women have a bank account and there is considerable suspicion of susu due to defaulting collectors (Porter and Lyon 2006). Banks are more reluctant to lend to those living in less accessible locations, presumably because loan recovery is more difficult. Consequently, most women depend on loans from their relatives and market 'customers' because moneylender charges are extremely high. Interest rates of 15-20% per month for loans of 2 to 3 months were cited by women traders in Assin district.

There is considerable evidence that pluri-activity is a highly valued strategy in many rural areas of Africa, including remote areas, for insuring against the deepest poverty, not least among women (Bryceson 1999, 2002; Gladwin et al. 2001; Canagarajah et al. 2001; Yaro 2006). While women's more restricted access to labour and land resources is sometimes recognised as a constraint on their potential for pluri-activity, restrictions (whether cultural or physical) on female mobility are probably another crucial factor inhibiting their development of lucrative off-farm enterprises. In particular, women's ability to access markets is likely to have an especially important role to play since markets are not only utilised by women for agricultural produce sales but potentially offer access to a range of off-farm opportunities. Many women who regularly take unprocessed or processed farm produce to markets, for instance, if they have the time and available funds from their sales, may also purchase a small quantity of groceries or other manufactured goods to take home for sale in the village. Moreover, market visits may bring not just immediate monetary profit but also exposure to new ideas and the opportunity to extend social networks[7]. Advantages gained in this way may help women build the capital and connections to diversify into other businesses. In remoter areas, where credit availability it limited and potential opportunities for making substantial profits through marketing hampered by the costs of getting to market and the hazards associated with late arrival and spoilage of goods in transit, it would seem that women will be less likely to be able to obtain such advantages. Other mobility constraints may also be at work: Canagarajah et al (2001), in their analysis of the Ghana Living

[6] However, many of the village women interviewed also felt they were likely to be cheated by traders in larger, distant markets (particularly by the manipulation of measures). Strong 'customer' relations in the closest market offer not only a more assured market for goods, but also potential benefits in terms of credit.

[7] Bryceson (2002) argues that the family downsizing reported in many regions of Africa is being addressed by "a counter tendency on the part of women to seek wider spheres of economic and social support".

Standards Surveys, find a significant difference in earnings potential in rural Ghana between women in general and female household heads and suggest that this may be because female heads are freer to pursue more lucrative work opportunities farther from home. We can also hypothesise inter-generational impacts: women who make good profits at market and develop off-farm incomes are more likely to be able to afford school fees for their children[8], and to pay health care for their families and themselves. The linkages between gendered mobility potential and diversification (and their inter-generational impacts) appear to merit further research.

Possible interventions to initiate positive change

The previous sections have emphasised the weight of disadvantage which women, in particular, may face as a result of residence in less accessible and remote areas, in terms of educational levels, health status and economic opportunities. Interconnections between these factors may reinforce each other, thus further deepening patterns of deprivation and encouraging inter-generational transfers of poverty. Consequently, it is vital that interventions are identified which can bring positive change for women and their daughters. In this section the potential of a range of transport and non-transport interventions is examined.

Roads and motorised transport services

Improved accessibility has conventionally been perceived in terms of road construction or improvement. Road construction superficially appear an obvious way of counteracting the negative effects of physical distance and time spent travelling to schools, health centres, markets and other key services by women and girls in less accessible and 'economically stagnant regions'. However, the impact effects of road interventions can be complex and certainly not necessarily beneficial to all women.

Firstly, there is the obvious fact that roads are not enough, i.e. they must be accompanied by improved transport services (Dawson and Barwell 1993; Ellis and Hine 1998)). Low-cost, regular and reliable conventional transport services are hampered by the relatively low density of population across much of Africa (by comparison with Asia). But even where good roads exist and are plied by relatively regular motorised transport services it is very common to see women and children walking alongside the road in sub-Saharan Africa because they cannot afford the fares charged.[9]

The current emphasis on labour –based road construction programmes as an immediate means of improving women's economic status through targeted labour-based road construction programmes (including food for work), is an associated positive development, but without careful monitoring may only provide women with the most menial low-paid jobs (as reported by Mashiri and Mahapa 2002 in the case of the Tshitwe road in South Africa). Moreover, as villagers in a southern Ghana village complained, where their new road was under construction using labour-based methods, it is often easier for small contractors to recruit labour from the town where they are based, rather than in remote rural communities. In that case the contractor brought the whole road team with him daily on his lorry.

Meanwhile, in areas away from the new and improved roads, the overall impact on women may be negative. There is substantial evidence, particularly across West Africa, of market

[8] Many women traders interviewed in urban markets in Ghana and Nigeria mention children's school fees as a major focus of their efforts.

[9] A recent study by the Asian Development Bank (Hettige 2006) assessing the impact of rural roads in Asia suggests that for the very poor, an emphasis on improvement to basic village tracks and associated increased availability of IMTs that reduce the burden of basic household and productive tasks to allow accumulation of surpluses, is a greater priority than road construction for motorised transport (since, as is the case in Africa, the ability of the poor and very poor to make significant economic use of roads depends on their asset base).

relocation following road improvements to the roadside and accompanying decline of markets which are now considered less accessible. Typically, transporters prefer to channel their vehicle operations along the better roads and urban-based traders who travel out along the improved arterial routes start to focus their activities at more accessible roadside markets, only penetrating more remote areas when they are short of supplies.

Detailed work in two regions of northern Nigeria following the road construction boom of the 1970s and 1980s illustrated how the boom negatively affected some women resident in off-road areas: the effect appeared to be particularly marked in Moslem Borno where women were not secluded but younger married women are restricted in terms of the distance they were able to travel without experiencing censure (Porter 1995, 1997). In both Borno and the Jos Plateau, road construction appeared not only to impact on market health but also on the (already limited) range of services available in off-road villages. For instance, when a primary school at one Plateau village collapsed during the rains, it was not replaced: children were now required to walk 8 kms to the school (but they can only do so when access is possible: the road is often closed during the rains). Loss of off-road facilities may be almost inevitable when, as so commonly happens, there is substantial relocation of population to the roadside, following road construction or major road improvements.

Along the roadside, new and improved roads may also bring other burdens to women since with increased traffic speed and volume comes the likelihood of higher accident rates. Kwamusi (2002) emphasises the impact this may have on women particularly in terms of their role as carers. New roads may also be important routes for disease transmission. Increased mobility and the establishment of truck stops along major transit routes has been associated with the expansion of HIV/AIDs and other STDs (Mashiri 2004, Ferguson and Morris 2006). Transmission rapidly extends beyond the young female sex workers and their clients, but again the impact is likely to be greatest on women and children in their role as carers[10].

Intermediate/non-motorised means of transport and associated route improvements

Intermediate Means of Transport, including bicycles and motorcycles, may have an important role to play in filling the transport gap where conventional motorised services are poor, a fact increasingly recognised by international donors. However, there is a substantial literature which charts how IMT ownership and use is widely male-dominated as a result of economic and/or socio-cultural factors. These may include women's more limited resources to purchase transport equipment, their restricted access to equipment belonging to male household members when the latter view IMTs as symbols of social status and prestige (Leyland 1996), women's perceived lack of physical strength to handle draught animals or push heavy carts (Grieco et al. 1996: 92-3; Porter et al. 2003; Flanary 2004), cultural prohibitions on women handling animals, and perceived gynaecological dangers in riding astride transport equipment (Porter and Blaufuss 2002). However, the association of IMTs with improved personal mobility and women's perceived increased potential for promiscuity or for empowerment may be an underlying factor affecting individual male attitudes in many cases (Porter in press).

The low uptake of bicycles by girls and women provides a good example of the issues. This has been observed in many parts of rural Africa, including those areas where male cyclists are common (Kipke 1991, Malmberg Calvo 1994, ITTransport 1996:26; Grieco et al. 1996; Doran 1996:25; Mwankusye 2002; Flanary 2004). In our five-village study in southern

[10] Other impacts of road development may be less gender-specific. A recent detailed study in Burkina Faso, for instance, finds a strong association between good infrastructure including road access and urban migration: people in rural places with an all-weather road, telephone and electricity experienced risk of migration to cities more than three times as high as those living in locations without infrastructure (Beauchemin and Schoumaker 2005).

Ghana we ran an action research project in which women (who had previously expressed an interest in bicycles) were offered cycles on credit (Porter 2003; Porter, Acheampong and Blaufuss 2003). Despite the availability of women's cycles (without a cross-bar, which is sometimes suggested as a reason women do not cycle), all the women selected cycles with a cross-bar and handed them over to male family members. Most women had never had time or opportunity to learn to cycle in childhood and were now too nervous to learn, despite our efforts to encourage and teach them. However, in other parts of rural Africa, including areas with substantial Moslem populations, women cyclists are becoming quite common: for instance at the southern end of Lake Malawi, and in northern Ghana. It would thus be unwise to suggest that change will not occur: clearly once a critical mass of cycles exists not only will repair facilities and spares be more easily found, but cultural inhibitions may gradually disappear.

The provision of cycles and motorcycles to women health workers and to NGO staff can not only make an important contribution to health service provision but may also help in improving their acceptability in the wider population. The impact of motorbikes among nurses in Navrongo (northern Ghana) is described by the maternal and child health worker cited earlier:
"… all the nurses have motorbikes. They are off [to the villages] and by 2.30 they are back [at the health centre], all done. A big improvement. It's expensive but you are able to do more and it breaks the outreach size into small pieces. You can't do that when walking. [prompt] There's no problem with women riding motorbikes. In the north they're used to riding bikes, even women of 45. Down south now it's become the fashion to ride a motorbike... that's brave.. you actually mean business…this girl is serious with her work … there's a nutrition officer from the north in Central Region. She rides her motorbike up and down, she can even go home [to the north] and back… after some time some people also decided they must get motorbikes." [11]

Another example where motorbikes and bicycles have had some positive impact on women is to be found in the recent massive expansion of motorbike and bicycle taxi services in some parts of rural Africa. They commonly operate from market centres and major paved road junctions into remote areas where roads are poor and transport services sparse. I have not yet come across any example of a woman driving a cycle- or motorcycle- taxi, but on the Jos Plateau, Nigeria, and reportedly also in other regions, there are some (richer) women owners who profit substantially from motorbike taxi businesses (see Iliya 1999:27 for a case in north-west Nigeria). In most rural regions these services appear to be patronised more by men than women, but particularly younger women also use them, as Iga 2002 and Howe 2003 show in Uganda. On the Jos Plateau, despite the speed and dangerous driving of the young male drivers and the high fares (usually approximately double the standard bus fare) many rural women see motorcycle taxis as a lifeline when medical emergencies arise, particularly in the wet season when motor vehicles have difficulty negotiating rural roads (Porter 2002b). More recently, in a group interview with bicycle taxi operators in a rural trading centre in the Zomba region of Malawi, when operators were asked about their women clients, they explained how they require women to sit in the middle of the carrier, astride the cycle, 'to sit like men'. It is only older women who occasionally refuse. "Women know how they must sit if they want to hire [us]." The majority of their clients (male and female) are resident on bush roads: the bicycle-taxis are hired, for instance, to carry women back home after market or, less commonly, for visits to the clinic.

[11] The Ghana Ministry of Health, she observed, had a standard scheme with national and regional trainers, including 'peti-peti maintenance' (how to remove a plug, clean it and tighten the bolts).

While usage is obviously restricted by the cost of fares (as in the case of conventional motorised transport services), cycle and motorbike taxis offer relative speed compared to walking, (door to door) convenience, and may provide a lifeline in emergency situations. The fact that they can operate along unpaved paths too narrow for conventional motorised vehicles, and in difficult road conditions during the rains, is an additional advantage. [These advantages have also encouraged the growing interest in low-cost cycle- or motorcycle-trailer ambulances among donors, notably for use in safe motherhood programmes.] It is intriguing that the incidence of motorcycle and cycle taxi services varies substantially, especially between countries: in Nigeria the motorcycle-taxi service seems almost ubiquitous in some regions; in Uganda and Kenya a mix of services can be found; in Malawi, where rural incomes are low, bicycle-taxis predominate; in southern Ghana, neither has yet become prevalent.

Other IMTs such as hand carts which do not improve personal mobility, but can be used for transporting loads within the village area may still offer significant advantages in terms of reducing women's time poverty. In our southern Ghana IMT study, the locally-manufactured push trucks obtained by women through the project were mostly operated by boy children and men, but women in the families felt some benefit. Individual interviews with women recipients and their families indicate the potential for change:
'*now he can just send the truck while I work in the house…. I go less to his farm now than previously. If he wanted to fetch firewood I needed to go with him, but now he can just use the truck and the children to fetch it.'* (Paul Simpson's wife, interviewed alone, March 2002).

'*A lot of work done by women I can do now, because I don't carry, but I can use the truck…..Now for the firewood I can convey it to the edge of the village with the truck, but because of our custom a man shouldn't carry firewood, but with the truck I can.*
(Paul Simpson, teacher, interviewed separately, Lome, January 2002)

'*Previously he was not helping me with the firewood, but now he helps with the pushing of the truck loaded with firewood.*' (Aminatu, Lome, March 2002)

In this case there has also been a reduction in the amount of heavy crops carried by women, though this generally only occurs where the fields are easily accessible from a track which can be negotiated by a push truck:

'*When I want to process gari I just hire the truck to convey cassava. [who operates it?] my brother… pushes for me… [The truck] reduces my headload and I don't feel pains from headloading again…. it has changed my time of headloading. … we also used it to convey our maize… we used the truck for the entire harvest*'. (Dora, Ewe woman, aged c. 30, Adabra, June 2002).

'[The IMT] has reduced my time spent, because if I want to convey maybe 5 headloads, I can use the truck or power tiller once to convey all. If I have 10 headloads to be carried to the junction and the power tiller or truck is available, I can send my [male] child to take it to the junction, so I have much time to rest.

[what do you do with the saved time you now have?]
I use it for other work. If somebody wants to buy something and I am not around the person will not buy from me. But since I have time to be around now in the house, I use it for selling.

[Has your income changed?]The power tiller and truck have brought a difference to my income, because now I can convey about 20 headloads of firewood from the farm to the village because I know that the power tiller can convey it to the junction for me. But when the power tiller was not in, I could not convey all 20 headloads, because I wouldn't have been able to carry all the firewood to the junction at one time. (Aba Akon, Abora, January 2002)

One year after the introduction of the IMTs, despite some reduction in optimism, 74.7% of women in our sample survey (75 men, 75 women) directed at the village population as a whole felt that the IMT impact had been positive, and 62.7% that the positive change was very substantial. Just 5.3% of women suggested that change had actually been negative. In the case of pushtrucks, however, complementary pathway improvements are often necessary so that trucks can be moved into the main farming and fuelwood collection areas.

Non-transport interventions

The emphasis so far in this discussion of potential interventions has been on removing constraints on women's physical mobility. However, it has been argued that planning focused solely on improving mobility through conventional road and transport provision may actually enhance gender biases, since benefits from such interventions tend to accrue particularly to those already mobile i.e. male vehicle owners (Masika 1997:9). Moreover, mobility per se is not necessarily desirable, especially if it is simply required simply because of poor access to work and facilities (Bryceson et al. 2003: 43).

There is a range of non-transport interventions which could improve access to resources and thus substitute for some mobility with substantial benefit for women, both in the context of their time poverty and, in the case of poorer women, their lack of funds to pay for transport equipment and services. Basic interventions such as installation of improved water supplies, community woodlots, more efficient wood-burning stoves and crop-grinding mills are often suggested (Malmberg Calvo 1994a; Doran 1996: 12). These would all help reduce women's labour inputs, including porterage, and are thus likely to bring improved health, greater opportunities for girl children to get to school (and arrive punctually), and also potentially release time for women to travel outside the village area to market and other locations. Other elements of improved local service provision, particularly primary schools and health centres, would seem particularly important [12]. The trend to decentralisation in most African countries over the last decade or so might have been expected to bring a substantial improvement to rural service delivery, but evidence of positive change is sparse. Schools and health centres which lack equipment and adequately trained staff may offer little benefit to the communities they ostensibly serve. It is extremely difficult to recruit and retain good staff in remote areas (Porter 2002a, 2002b).

The potential for ICTs (mobile phones, VHF radio, internet etc.) to allow for elements of mobility substitution in health, education, trade etc. and for more efficient use of transport in Africa is beginning to look more promising (IFRTD 2002). Although concerns that the structural barriers of time- and income-poverty which currently constrain women's access to transport will similarly affect access to ICTs are regularly expressed (Schreiner 1999; Rathgeber and Adera eds. 2000; Fuchs and Horak 2006; Nite Tanzarn, GATNET contribution, 31/05/2005), recent developments, particularly in the expansion of mobile phone coverage, are very encouraging.

Some positive examples of ICT use in Africa can be found in the literature on health and trade. In the context of maternity referral, Murray and Pearson (2006 citing Africa Initiatives 1998 and Musoke 2002) relate how radio-telephones in health centres have reportedly been used to reduce average transport delays in Malawi's Mother-Care project from 6 to 3 hours, while in Uganda solar-powered VHF radios with a fixed base station at health centres and walkie-talkies for TBAs are used in the RESCUER project. A new Phones for Health project is to commence in Rwanda: this will reportedly equip health workers in remote areas with mobile phones and software so they can transmit and access information relating to the treatment of HIV/Aids patients (SciDev.Net, 15/02/07). Overa's (2006) study of the impact of

[12] Provision of market infrastructure is also sometimes suggested as a way to promote local trade, but such attempts to generate business do not usually work. Construction of market stalls, slaughter blocks etc. is only likely to be worthwhile if substantial trade is already conducted at the location

mobile phones on traders in Ghana indicates their potential in a marketing context, saving time and transport costs, though in the case of trading advantage this depends particularly strongly on the integrity of the person taking the call!

The expansion of mobile phone use has been dramatic in rural Africa over the last few years. Commercial competition between service providers is now so intense that prices are often remarkably low and the network is extending even into relatively remote rural areas: a recent prediction suggests that mobile phone coverage in Africa could reach 85% by 2010 (Global System for Mobile Communications Association, GSMA, reported in SciDev.Net, 15/02/07). This spontaneous diffusion looks set to have far more immediate impact on rural lives than most development interventions to date: perhaps the most comparable intervention in terms of scale of effect was the introduction of motorised transport in Africa in the 1920s and 30s. It is difficult to predict what the future impact will be on development trends in general and on rural women's mobility in particular. However, a few examples from recent observation and a limited number of interviews in a small rural area in Central Region in southern Ghana indicate the extent of impact to date[13]. In one roadside village where we worked about 30 kms north of Cape Coast, not only do most teachers, traders and other relatively advantaged people have mobile phones. Here mobile phone use is so prevalent that the head at the local secondary boarding school has banned mobile phones from campus: he has already confiscated two from girls who used them persistently. He said he had "heard on the grapevine" that many of the pupils make calls at a local booth nearby and that some parents actually want their children to be able to have mobiles so they can contact them. In the rural hospital, the hospital administrator reported that mobile phones are now crucial for getting in touch with the subdistricts: 'it has made a *great* difference….' Even within a remote village, 25kms down a dirt track from Sunyani in Brong Ahafo region we met a headteacher with a mobile phone (the reception was poor so he usually left it in town, where he lived). A one minute call can cost as little as 300 cedis in Ghana, and it was possible to buy units of just 2000 cedis (£1=17,800 cedis) in February 2007. When a taxi fare costs 5000 cedis per 'drop', the potential advantage of substituting visits where feasible with a phone call become obvious. Increasingly, across Africa, rural service centres have call booths where even those without a phone can make their calls. It is often women who are to be found operating (though probably not owning) these street-side businesses.

Conclusion

Physical remoteness and isolation often compound the effects of poverty and deprivation. This paper has emphasised the interconnectedness of deprivations associated with remoteness, women's and girls' poor access to transport, basic (health and education) services and markets and the gendered division of labour. Although transport failures play a significant role as a barrier to service access in some areas and for some women and girls, a more pervasive and fundamental issue is that of the gendered division of labour and associated time-poverty experienced by females. Girls living in less accessible areas often drop out of formal education not simply because the school is too far and transport costly or inadequate, but because the work required of them before they leave for school is particularly onerous and time-consuming (by comparison with boys). This puts pressures on them which are compounded by a long and sometimes hazardous journey to school and the fear of punishment if they arrive late. Exhaustion as a combined result of heavy pre-school work duties and a long journey to school are also likely to reduce their ability to concentrate once they arrive in class. Time poverty, when compounded by remoteness and the necessity of a long walk or journey to services, may similarly be a key factor which prevents women's ability to access timely health care: this has particular serious implications for maternal and reproductive health. In the case of market access, unavailability or high cost of transport probably represents a particularly substantial component of the barrier to travel,

[13] We are now undertaking systematic data collection about mobile phone use in our child mobility research in both Ghana and Malawi.

since unlike travel to school and health services, marketing usually requires transport of loads. However, the weight of demands made on women in the home may be reinforced by male association of female mobility to distant markets with promiscuity and lead to reluctance to enable women to be more mobile.

There is a range of transport and non-transport interventions which could ease rural women and girls' mobility and accessibility constraints. Of these, the recent spontaneous diffusion of motorbike- and cycle-taxis and mobile phone communications seem to offer most potential for dramatic improvement in cases where mobility is particularly crucial, notably health emergencies. Yet, despite their promise, these interventions cannot address the more fundamental problems of restricted mobility associated with gender inequality and time poverty still experienced by most women in sub-Saharan Africa. In this context, IMT and non-transport interventions focussed on reducing load carrying for girls and women in the village area are likely to be a crucial complementary approach.

To conclude, there is an urgent need for a stronger focus on gendered mobility and access issues within the development community: transport remains a surprisingly neglected area among gender specialists and transport specialists are still reluctant to take on gender issues (Porter in press). In the meantime, the prospects for the many rural women and their daughters who live in areas characterised by poor physical accessibility and inadequate transport will remain extremely poor: the implications in terms of inter-generational transfers of poverty are evident.

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