

IMPROVING MOBILITY AND ACCESS FOR THE OFF-ROAD RURAL POOR THROUGH INTERMEDIATE MEANS OF TRANSPORT

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This paper examines the issue of spatial poverty traps with particular reference to off-road areas in sub-Saharan Africa. I define 'off-road' as areas located away from a paved (or good gravel) road which, for at least part of the year, are inaccessible or accessible only with difficulty by motorised transport. My focus in this paper is on people who live off-road in rural areas which have some limited - albeit basic - transport infrastructure (i.e. a regional paved road network along which motorised vehicles operate), rather on very remote areas without any transport infrastructure.

In the first section I briefly review the range of difficulties commonly faced by men, women and children resident in off-road locations as a result of restricted mobility and poor access, drawing both on my own research in Ghana and Nigeria and on the (limited) published literature specifically concerned with off-road areas and populations. The second section of the paper focuses on the potential of Intermediate Means of Transport for alleviating access/mobility problems in off-road areas. Constraints on IMT use among different sectors of the off-road rural poor are examined through presentation of a case study from coastal Ghana, while recent evidence from the Jos Plateau, Nigeria, is used to illustrate the enormous potential of IMTs, in favourable circumstances, for improving access and reducing isolation.

Living off-road: perspectives from the village

There is remarkably little published material which specifically focuses on poverty in off-road rural settlements in low income countries, yet the inhabitants of off-road villages are almost inevitably disadvantaged in terms of both service provision and access to transport and it appears that this has substantial impact on livelihood opportunities (Moore 1979, Airey 1985, Barwell et al. 1985:34-47, Ahmed and Hossain 1990, Porter 1997 and in press). Moreover, regional road construction programmes, I have argued (1995, 1997, 2001), can actually make conditions even more difficult for those who live away from the new roads. In this section of the paper I briefly review off-road service provision, off-road transport deficiencies and costs, and the feelings of isolation, invisibility and powerlessness frequently experienced by off-road residents, even in settlements located just a few miles from the paved road.

So far as service provision is concerned, most secondary schools, hospitals, banks, post offices, major markets, government agricultural extension services and other

public facilities are located in centres with relatively good access: generally along paved or good gravelled roads. Electricity supply lines tend to follow major routeways. In the context of limited funds for rural service provision in low income countries, this is inevitable. Some low order services - notably primary schools and dispensaries - may be located in less accessible locations, but it is extremely difficult to find professional staff who will work there for any length of time: lack of electricity and good water supplies are commonly major deterrents. In coastal Ghana off-road village primary schools tend to be mostly staffed by young (male) graduates on their first appointment. As soon as they have experience they want to move on. Stephen, a young teacher based in a Gomoa village described the difficulties he experiences living off-road:

'Living here is not easy at all. I wasn't used to such a place.... And I must spend two years on this, as it's my first posting. ...You don't get access to anything you want. I have to go and buy everything and bring it down [here]. Food is not so costly over here, but the water!... it's not good drinking water... the borehole water is salty and so not easy to drink.'

Stephen walks to the paved road junction and picks up a minibus travelling to the nearest market centre once every fortnight. He has to charter a taxi to bring him back to the village, and finds it difficult even then to get anyone to bring him in, because the road is so bad. He only gets back to his home in Eastern Region in the vacations. When asked if he mixed with the villagers, his response was direct:

'I personally don't want to mingle with them. I want to keep a distance... They're not so civilised in their speech. I only have contact with the new person here [the other teacher]. I speak Twi not Fanti, I find Fanti pronunciation difficult... they can't always understand my Twi...

Stephen's attitude is by no means uncommon among teachers and other professionals encountered in this region. I interviewed a village headmaster in another Gomoa village who was in the process of relocating his residence to a roadside village, from which he intended to commute by bicycle. He complained that he had been stigmatised because of living 'in the bush' (just three miles from a paved road), and feared he would never obtain a good posting and better himself unless he moved:

'It's like a doctor living with the lepers.... I've been here six years..... I'm becoming like them.'

Regional road improvements do not necessarily improve matters for those resident off road. Indeed, they may lead to growing disadvantage for those unable or unwilling to move to the improved road. In parts of northern Nigeria during the oil boom period when there was a massive road construction programme, I observed a spiral of decline set in whereby the more enterprising and younger off-road inhabitants migrated to the roadside and the off-road villages became less viable as locations for markets, schools and clinics. Subsequently, as recession set in and structural adjustment measures were imposed, trained personnel such as teachers become even more reluctant to live in the off-road villages as track conditions deteriorated and transport services were refocused along the improved routes. The weakest, poorest and least entrepreneurial

tend to be left behind in such circumstances: i.e. essentially those probably most in need of the services which are becoming increasingly remote.

Mobility to service/market centres at the roadside is commonly severely hampered by transport deficiencies in off-road areas. When roads are in poor condition vehicles are frequently delayed and may fail to arrive at all, particularly in the rainy season. This has serious implications particularly for produce traders who usually need to reach markets early in the morning in order to meet their 'customers'. Many off-road women in coastal Ghana complain about the loss of sales caused by transport failure: the urban traders with whom they deal will buy from other traders if they fail to arrive at market in good time and they may even have to return home with their good unsold. Vehicle owners interviewed in this region regularly bar their drivers from taking specific routes which are known to be in bad condition.

High transport costs present a further major deterrent to off-road mobility. Transport charges tend to be much higher for both passengers and goods along roads in poor condition than along paved roads; this is usually ascribed by transport providers to greater wear and tear on vehicles. In 1998 minibus transport costs along earth roads in coastal Ghana were roughly double those along paved roads (100 cedis as opposed to 50 cedis) over distances of around ten miles. In off-road areas the GPRTU (Ghana transport union) leaves individual operators to set their own charges, whereas charges along major routes are regulated by the union. On the Jos Plateau, Nigeria, in January 2001 minibus transport cost between 4 and 4.5 Naira per passenger per mile on earth roads, compared to 3 Naira per passenger per mile on paved roads over the same distance of about 10 miles: the rather more favourable ratio for unpaved roads in Nigeria probably reflects the higher frequency of services and greater competition between transporters on the Jos Plateau. Ratios for Zambia are similar to Ghana, averaging 4.5 to 5.0 US cents per passenger kilometre on poor quality earth feeder roads, compared to 2.5 cents on the main bitumen roads. In Ethiopia, goods transport statistics suggest enormous differences between trucks travelling along bitumen (5-12 cents per tonne km) and earth or gravel roads (60-100 cents per tonne km) (Ron Dennis, pers. comm.). In Tanzania studies indicate that, over a 50 km distance, an increase in road roughness of 50% would increase truck charges by 16% and increase pickup charges by just under double (Ellis and Hine 1998). The impact of these high charges is to deter both off-road travel by urban and road-based traders and professionals, on the one hand, and off-road residents travelling to the roadside to take advantage of goods and services available there on the other. In many cases, the solution for off-road inhabitants is simply to walk to the roadside, headloading any goods which have to be transported.

Livelihood opportunities in off-road settlements are constrained in a variety of ways. So far as agriculture is concerned, inputs and market output must be transported from and to service centres, adding to the costs of production (1). Information on market prices and supply conditions in major bulking centres is commonly poorer in off-road areas (Lyon 2000). Extension services are usually few and sporadically provided off-road: staff tend to restrict their visits to more accessible areas. Off-farm employment opportunities are often similarly restricted by high transport costs and infrequent and unreliable transport services. Madulu (1998) in a rare comparison of an on- and an off- road village in Kwimba district, northern Tanzania, found only 7% of villagers in the off-road village engaged in non-farm activities, compared to 31% in the village on

a major road, where a whole range of occupations, from trading to cooked food selling, tailoring, cycle repairing and butchering were pursued. Food selling is a common source of income, particularly for women, in roadside villages and can lead to substantially higher incomes in roadside than off-road villages for women (Kaur, cited in Booth et al. 2000:70). Trading from an off-road base is commonly hampered by the difficulties of finding transport and reaching markets in time to meet customers. Trading opportunities within the off-road settlement are usually restricted by the low incomes of potential customers and the similarity of items produced at home. Jobs in the formal sector are extremely rare in off-road settlements since, as discussed above, neither government nor private services are likely to be located there.

Off-road inhabitants are thus less likely to have a broad-based income to help them withstand either seasonal shortages or crop failure and other disasters. Women and children usually bear the brunt of the particularly heavy portage burden imposed by costly and limited transport services. For children, residence in an off-road village probably implies a particularly disadvantaged start in life: they are less likely to get vaccinated, go to school, or see a doctor if they are ill. It seems likely that infant mortality rates will be substantially higher in off-road than roadside villages in the same region (though I have found no data which compares on- and off-road populations). Often it seems only the absolutely poor, particularly the elderly, find solace in village life off the beaten track. An elderly cooked food seller in a small off-road village in Gomoa, coastal Ghana, who ekes out a very precarious living selling maize balls, together with a little farming, weighed the pros and cons:

The people at Apam and Ankamu [roadside settlements] are rich.... They live by the road, they get access, they get car, they get jobs, go fishing. Here there is no money. It's better living at the road.... But if you don't have money it's better to live here... if rain comes all the time you can go farm and don't have to buy... if you stay here and have land'

Finally, a brief comment is needed about the invisibility of off-road populations to policy makers and the consequent feelings of powerlessness which are so often expressed in off-road villages. The common trend towards administrative decentralisation in sub-Saharan Africa might have been expected to aid off-road dwellers, since it is supposed to bring government closer to the people, but evidence to date is not encouraging (see, for example, Samoff 1990, Ayea 1996). In Ghana elected district representatives frequently live outside the district and can often barely afford transport costs to visit even their roadside constituents. Development projects initiated by local government tend to be located in the district capitals and other major centres, all usually located on paved roads, as Kyei (1999) illustrates with reference to two districts in Ghana, (Nadowli in Upper West Region and Andansi West in Ashanti Region). This is unsurprising, Kyei suggests, because district administrative officers and political leaders are university graduates who have spent most of their lives in urban areas and have inadequate understanding of the nature of rural poverty, particularly in less accessible regions. Moreover, as comments from the teachers quoted above illustrate, there is a tendency among urban-based professionals to look down on the remote rural poor who have had least opportunity to acquire education as uncivilised 'bush people'. Even local NGOs tend to prefer to site their activities in on-road settlements (Kyei 1999: 267). The significance of these negative attitudes

among local professionals cannot be underestimated: it is often extremely difficult to get them to visit off-road settlements even on an occasional basis. Yet the only way they are likely to develop a real understanding of the lived experiences and needs of off-road dwellers is through regular visits.

To summarise, off-road rural populations appear to be disadvantaged and vulnerable in many respects. They characteristically appear markedly poorer in income terms, in health and in life chances than those in comparable roadside locations in the same region, though, obviously, not all off-road people are disadvantaged to the same degree by their location: women and children in sub-Saharan Africa suffer much of the burden of off-road transport, for instance. Unfortunately, there is very little detailed published evidence to support this view of off-road disadvantage and very little interest at either local or central government in most low income countries in ameliorating it. Chambers pointed to the dangers of tarmac bias nearly twenty years ago (1983: 13-16), but few researchers or policy makers appear to have made access beyond the tarmac a priority, in investigating and addressing issues of rural poverty. There remains a clear need for livelihood studies which focus on on-road/off-road comparison.

Intermediate Means of Transport (IMTs) as a means of improving off-road access

It is clearly impossible to provide an all-season access road and a regular conventional transport service to every off-road settlement in Africa, although the provision of a good road (together with a health centre) tends to come at, or close to, the top of the development 'wish-list' of most off-road villagers, men and women (Francis 1996:8, Crook and Manor 1998: 257-). Nonetheless, there are various means by which problems of off-road disadvantage might be alleviated. These could include improvements in conventional motorised transport services through such interventions as subsidies on targeted routes and community owned transport; and, perhaps, the greater provision of mobile services. Non-transport interventions might also have a role to play: improvements in low-cost crop storage and processing technologies, for example, and development of high-value organic agricultural produce could reduce input and output loads. The potential of telecommunications developments has recently received much attention, though their impact on less powerful groups is by no means uncontentious (Graham 1998, Hillis 1998, Schreiner 1999). Donors, however, increasingly see the development of Intermediate Means of Transport (IMTs) as a principal key to improving access and mobility in both on- and off-road conditions, and a number of initiatives are now in place across sub-Saharan Africa to promote IMT use among the rural poor. The World Bank, through its Sub-Saharan Africa Transport Policy Programme (SSATP), is playing a major role in this. Consequently, a consideration of the potential for IMTs in off-road contexts seems particularly appropriate.

A long line of studies has shown, in broad terms, many of the advantages to be gained through the introduction and promotion of equipment like animal-drawn carts, wheelbarrows, motorised and unmotorised cycles and tricycles (with or without trailers), all of which are relatively cheap to acquire and operate, by comparison with conventional motor vehicles. So far as off-road populations are concerned IMTs seem to offer particular advantages, in view of their low cost and - in many cases -

their suitability for operation along uneven, unpaved tracks. Nonetheless, the limited success of many IMT programmes has led to growing caution about their benefits, about the dangers of 'hobbyism' among IMT specialists, and to calls for a more realistic appraisal of the difficulties associated with their introduction (Starkey et al 2001). In particular, the difficulties of promoting IMT use among women due, above all, to problems of affordability, have been observed in a number of regions (Bryceson and Howe 1993, Fernando and Porter, in press).

In this section I first discuss the impact which IMTs have had on men and women in three districts on the Jos Plateau over the decade 1991- 2001. I then briefly outline a small IMT project currently underway in coastal Ghana, aimed at assessing the potential of IMTs for alleviating farm to village and village to market access in off-road areas, where IMTs have - potentially- the greatest role to play.

'Achaba' aids a revolution in rural access: a case study from the Jos Plateau, Nigeria

In 1991 I undertook a dry season rural markets study in the former mineland region of the Jos Plateau, in Nigeria's Middle Belt. The study covered 23 markets and their associated settlements in three rural vegetable-producing districts and revealed that, while markets situated on the paved road were thriving, many off-road markets were in serious decline or had already died as a result of track deterioration and decline in off-road transport services (Porter 1993, 1995, 1997.) The deterioration in roads was associated the decline of tin mining and the introduction of structural adjustment programmes, both of which had led to cut-backs in road construction and maintenance. There was growing reluctance at that time for transporters and traders to take vehicles off-road, as roads deteriorated, and it became increasingly difficult to obtain spare parts for vehicles. The consequences of off-road market decline were particularly serious for rural women who were faced with long journeys with their own and their husbands' produce to the paved road (along which commercial vehicles continued to ply.) There were other implications of declining off-road transport too, including a decline in off-road education and health services as staff became more reluctant to reside in increasingly inaccessible settlements. Meanwhile, richer farmers resident in settlements by the paved roads had begun to purchase irrigation pumps in order to utilise surface water from streams and defunct mineponds to grow dry season vegetables. Those markets situated on the paved roads close to suitable irrigation sites were growing impressively, but off-road conditions appeared to be deteriorating rapidly.

In the dry season of 2001, exactly a decade later, I repeated the study in the same three districts in order to reassess rural trading conditions and the significance of access in the light of changing political, institutional and economic conditions in Nigeria. In terms of transport and access conditions in off-road areas, remarkable change was observed and confirmed during discussion with villagers. Although off-road laterite tracks mostly appeared to be in as poor or only slightly better condition than in 1991, transport availability is now vastly superior in all the villages except one particularly remote off-road village which has little irrigation potential. Of particular note are the numerous motorcycles now to be seen speeding along remote dirt tracks carrying passengers and their loads, even including the occasional sheep or goat. There has also been a substantial expansion in vehicle ownership and the ownership

of bicycles and a range of other IMTs. The key to these changes includes firstly an enormous expansion in irrigated vegetable production, secondly a change in government policy on vehicle import duties (2) and, thirdly, the availability of cheap imported motorcycles. In the following section, following a brief discussion of the irrigation developments which have underpinned the massive improvement in rural access on the Plateau, I focus on the latter component of change - the availability of motorcycles and other IMTs and their impact.

Across the study area, wherever water is available from streams and former mine ponds, irrigated vegetable production was found to have expanded substantially since 1991. This expansion is particularly marked in areas along the paved road, but is also evident even in settlements most remote from the paved road. As a result of the increased availability and reduced price of irrigation pumps since 1991, irrigation is no longer solely a rich man's activity - around 20-30% or so in many villages now participate. Few women, however, have been able to enter irrigation production because of the cost of pump purchase or hire, petrol, fertiliser etc. The impact of this expanded vegetable production has been enormous, but is most marked where it has occurred in off-road areas because of the implications for transport and access conditions. Since farmers are dealing with a highly perishable product, investment in improved access has gone hand-in-hand with investment in irrigated production. The increased profits from expanded vegetable production has brought individual investments in both motorised transport and IMTs, and even some community investment in road maintenance, necessary to keep roads open in the absence of local government investment. Although only a portion of villagers can afford to participate in irrigated production, the expansion of transport has had much broader impact.

There are many facets to the access changes evident in the study area, but probably the most remarkable change is the massive expansion in motorbike ownership and the emergence of motorbike taxi services (*achaba* - meaning 'going') in both roadside and many off-road villages. *Achaba* was absent in the Jos Plateau survey area in 1991, and probably even in Jos town, though it was already well established in southern Nigeria, where it is known as 'okada'. Yunusa (1999) reports that operating one's motorbike as a taxi in Doma, a roadside settlement in Plateau State, is considered a sign of 'poverty and economic degeneration', but I did not come across anyone in any of the off-road villages who took such a stance (3). On the Plateau the appearance of *achaba* is linked to the increased availability of cheap motorbikes and is now widespread in the urban centres, where a new motorbike costs around 35,000 Naira (about £200 in January 2001), a used one c. 19-25,000 Naira (compared to 6,500N - around £38 - for a sturdy new bicycle). Dealers travel to Onitsha to buy motorbikes (split into parts to avoid customs) which are reassembled in Jos. It is clear that a situation of 'critical mass' has been achieved so far as motorcycles are concerned on the Plateau: well stocked spare parts dealers cum repairers are found at major road junctions across the region and even in some off-road villages.

Motorbike ownership is particularly high, as a proportion of all vehicle ownership, in off-road villages (where conventional motorised vehicle ownership is generally limited, though much higher than in 1991) (Appendix 1). Many owners here are vegetable farmers who use their motorbikes principally for their own purposes, such as taking inputs to the farm, but operate *achaba* on an occasional basis according to demand and their own movements out of the village. Motorbikes purchased purely or

principally for use in achaba services appear to be more common in roadside villages, where some people (mostly men) own a number of motorbikes and employ (mostly young, male) drivers. They can be commonly seen waiting for customers at major road junctions, often a dozen or so together. Most services operating from such roadside centres, however, are focussed on routes out to the off-road villages, rather than along the paved road, where frequent conventional motorised transport services limit the demand for achaba.

A small number of achaba drivers were interviewed about their work. One young man at the off-road settlement at Na FanDreji described how he uses his motorbike in the afternoon for achaba services when there is no transport out of the village (the village transport generally leaves in the morning). The motorbike is his own possession. He also runs a shop in the village and so usually only operates his motorbike in emergencies, such as when someone is sick, or a woman is in labour and needs to go to hospital. Another achaba driver in his early twenties, interviewed at a major (paved) road junction, works for himself on a regular basis, carrying, he estimates, 10 to 50 people per day. He also sometimes carries loads alone for people he knows and farms throughout the year. Most of his passengers are young people, women as well as men, and many of his journeys are made to off-road settlements.

Achaba services appear to have contributed substantially to the altered perceptions evident among both men and women in off-road villages regarding their position in relation to major service centres, which are now seen as fairly easily accessible. This is despite the fact that the principal function of achaba seems to be to provide emergency or occasional as opposed to routine transport. (Few market traders interviewed at markets in the study area had used achaba to get crops to market, for example.) In villages where roads are particularly bad, men and women say achaba has provided a lifeline for them, being used in medical emergencies, or when people have missed the morning bus or when there is no market bus. In the wet season when motor vehicles have difficulty leaving off-road settlements the achaba services are reportedly particularly important. And achaba has the great advantage of providing transport to the doorstep at all seasons.

However, achaba fares are high; for instance it costs three times the bus fare to travel by achaba from Kushe Rabak to the market centre at Mangu; over shorter distances the fare is around double the standard bus fare. Clearly, only better off villagers will pay such a high premium, except in emergencies. According to villagers, achaba benefits both men and women living in rural areas, particularly in off-road areas where transport services are fewer and less frequent, but most passengers I observed were men. Lower usage of achaba by women in rural areas is probably also in part a reflection of the dangers of achaba riding (4). Despite the overall visibility of IMTs on the Plateau, it is important to note that ownership (and use) of all types of IMT among women - both (Moslem) Hausa and (Christian and Moslem) Birom - is very low (Appendix, table 2). I was told (by men) that *'women don't have an interest in buying IMTs... and women don't have an association so they are difficulty to afford; women can't afford them.'* (Kwi village head and male elders) (5). It would be necessary to undertake detailed studies with women to assess the extent to which they actually benefit, directly and indirectly, from achaba and other IMTs. Observation suggests that while the expansion of motorbike and other IMT ownership has had an enormous impact on the everyday mobility of young and middle-aged men in off-road

villages, its impact on women of all ages may be mostly limited to emergency situations.

Introducing IMTs in off-road villages: a case study from Coastal Ghana

In northern Nigeria there is a long history of IMT usage. The Plateau case study illustrates that, if economic and policy conditions are favourable in regions like this, the potential for expanded ownership and use of IMTs is substantial, in both on- and off-road areas - at least among men - and is likely to occur spontaneously, without external intervention. The impact on off-road mobility can, in these circumstances, be marked. In many parts of Africa, however, IMTs of any kind are rare. This has encouraged the development of a number of recent projects aimed at IMT promotion across the continent.

In rural Ghana IMT use is limited, though substantially higher in the north. In northern Ghana IMTs consist principally of bicycles; in southern Ghana, particularly in the forest zone, there are remarkably few IMTs of any type (Howe and Barwell 1987). The World Bank has sponsored a series of studies of IMT use and potential in Ghana (Howe and Barwell 1987; Anchirinah and Addison 1998, White et al. 2000) and is now funding a Village Infrastructure Project that incorporates an IMT component (Anchirinah and Yoder 2000). Ghana's past experience of IMT schemes has not been positive: a World Bank- funded bicycle trailer project in the 1980s in northern Ghana seems to have been a conspicuous failure (Salifu 1994, White et al. 2000). In addition to technical problems, few of the expected beneficiaries could afford to purchase a trailer in addition to the bicycle, while group ownership proved difficult due to arguments over maintenance. The current project's pilot programme, which was completed last year, has also experienced some difficulties, both of a technical and organisational nature. In particular, there were problems with the connecting rod between the power tillers which were supplied and their trailers, difficulties in getting beneficiary groups to combine and work together effectively, while a shortage of trained mechanics meant that it was difficult to get equipment serviced at reasonable cost (Anchirinah and Yoder 2000). Discussions with recipients of the pilot project in southern Ghana suggests that bicycle trailers manufactured in Ghana have suffered technical problems and some collapsed soon after their receipt. IMT adoption in Ghana clearly still faces many hurdles.

My second case study is based on some recent off-road mobility/access studies and a small ongoing action research project on IMT adoption, conducted in five off-road villages in Ghana's Central Region. Research on rural marketing in four coastal savanna villages in Gomoa district and one rainforest village in Assin district emphasised the enormous obstacles created by lack of reliable transport, particularly for women traders here. Conventional motorised transport was rarely available when needed and the very few vehicles owned by villagers were usually kept at the paved road (where they were used as taxis), because of the bad condition of local tracks. IMT ownership was also extremely low (6). Only a few men in each village owned bicycles and these had usually obtained the cash to buy them from hunting or farming profits. Only one woman owned a bicycle, obtained through her job as a 'motivator' with an NGO. Men usually did not loan their bicycles to their wives, and few women knew how to ride a bicycle, in any case. Many of the bicycles were out of use and awaiting new parts, which had to be purchased from roadside repairers: there was no

cycle mender in any of the villages. Hand carts were mostly restricted to the district capital and no one in the off-road villages owned a motorcycle (Appendix, Table 4).

The reason most villagers put forward for low levels of IMT ownership and use in 1998 was - perhaps unsurprisingly - simply expense. At that time a new bicycle could be obtained for under £50 and a reasonable second-hand one for under £20: IMTs, while cheap by comparison with motorised vehicles, are still expensive to poor farmers (Barwell 1996). Across all the settlements, a principal restriction on increased IMT use appeared to be financial constraints imposed by the need to purchase IMTs with a cash lump sum. Lack of a 'critical mass' had also created problems for the few existing IMT owners, because there was insufficient market to support village menders or parts dealers.

Discussions with villagers about transport suggested there was considerable interest in IMTs, particularly among women, who saw their potential for assisting in a wide range of tasks, encompassing both farm to village as well as village to service centre transport. This prompted some further research on IMT preferences in which groups of men and women in different age sets were asked to discuss and rank a collection of IMT photographs.

Subsequently, a small action research project was initiated in collaboration with the Ghana Ministry of Agriculture. This was partly a response to local access problems which had emerged in the marketing study, and partly to the growing interest in IMTs in Ghana which was being generated by the VIP project. Our project offered an opportunity to look at the impacts (economic, social and environmental) of introducing a range of IMTs in villages where market access problems had already been researched in some detail. The project would also take a slightly different approach from VIP, in the type of equipment introduced, the mode of selecting equipment and the arrangements through which it was provided. Thus, IMTs were to be selected by the villagers, women would be given priority in the scheme, and both individuals and groups would be eligible (in contrast to the VIP project which requires group acquisition). Villager would be offered the opportunity to purchase IMTs on credit, through the project, in return for allowing us to monitor their use and impact over a two year period. The VIP coordinating unit in the Ministry of Agriculture were willing for us to compare progress and impact in our project with the VIP IMT introductions in the same region.

A workshop was thus held in each village where villagers were given the opportunity to try out a range of IMTs which, from our earlier work with photographs, appeared to be likely to be of interest to them. They comprised a wheeled handcart based on drawings from IT Transport and manufactured locally, a locally made wheelbarrow, a locally made push-truck of the kind typically used in Ghana's urban markets, a man's bicycle, a women's bicycle, and a power tiller. Information was also provided at the workshop on prices and credit arrangements were discussed. Following the workshop we received orders (approximately half of which came - ostensibly - from women) for 44 push trucks, 1 hand cart, 3 power tillers, 16 bicycles (all men's with cross-bar) and 7 wheelbarrows, all of which have now been supplied. Most of the purchases (except for the power tillers) were by individuals, rather than groups. Of note, in the light of the Nigerian study, is the fact that only one person expressed any interest in purchasing a motorcycle. By comparison with Nigeria, motorcycles are relatively

uncommon in Ghana, though ownership appears now to be expanding, particularly near urban centres. The most interesting element in the selection of IMTs was the strong preference for the quite heavy but familiar local pushtrucks, when a lighter, more manoeuvrable option, the hand cart, was available at the same price.

The project is still in progress: the IMTs were introduced in the villages in early 2001 and thus have yet to be employed through a major harvest season (September-November). Villagers are very positive to date about their potential and even those men and women who were unable to purchase equipment currently seem to view the innovation favourably, arguing that it assists the village as a whole. In all the settlements there have been encouraging reports by women that the push trucks were being used to transport firewood from farm to village before the onset of the rains, and that this reduced their work burden to some degree, since children are keen to push the trucks (a fact which village children themselves confirm.) One of the power tillers has been used to prove a regular passenger service (in the trailer) to the main market centre (until recent objections by the GPRTU).

Nonetheless, the project has already raised a number of issues which indicate some of the complexities of IMT introduction in general and the particular complexities faced in off-road areas. For example, although the project aimed to focus at aiding women, who face the largest transport burden, and who are often neglected in IMT schemes, it has transpired that very few women had the funds to purchase a piece of equipment, even on easy terms over two years. (This is partly a consequence of cedi devaluation which has raised the cost of the IMTs very substantially since our first studies were conducted in 1998). Consequently, their husbands are often contributing most of the cost of repayment, and thus gain first call on the equipment. In a few cases the IMT has even been removed to a settlement at the paved road where it can be hired out, in order to provide ready funds for repayment (in the off-road villages many people are too poor to hire an IMT).

Another difficulty has arisen around the regular monthly repayment collections, which are supposed to be made at the off-road villages by rural bank staff. An arrangement had been made with two banks to pay staff to travel to the off-road villages for collection of repayments, so that individual villagers would not need to spend time and money finding transport to reach the banks (which are located on paved roads). Despite initially expressing a willingness to collect repayments in the off-road villages, bank staff have frequently failed to turn up on the days appointed for collection: their excuses revolve inevitably around the difficulties of getting transport to off-road villages! Obtaining access to credit has long been a particular problem for inhabitants of remote and off-road settlements (Hine and Riverson 1982; Creightney 1993; Richards 1985: 127; Meagher 1999). Experience in this project suggests that it is very difficult for off-road villagers to conduct business with the banks, not just because of their poverty per se, but because of bank staff attitudes towards them.

Conclusion

Improving off-road mobility and access will be crucial to successful rural poverty alleviation in sub-Saharan Africa and IMTs can play an important part in this. The potential of IMTs to alleviate off-road access problems appears to vary considerably,

however, particularly in the short term. The evidence from the Jos Plateau in Nigeria is extremely encouraging: in this case 'critical mass' has clearly been achieved for a wide range of IMTs. While small unpowered equipment like wheelbarrows provides considerable assistance for farm to village transport tasks, the impact of high motorcycle and bicycle ownership has been substantial in facilitating movement between off-road and roadside centres and reducing the feeling of isolation which is so common among inhabitants of off-road settlements over the last decade. Nonetheless, women's access to IMTs is clearly wholly insufficient, as a result of a mix of economic and cultural constraints.

In coastal Ghana the potential value of IMTs in alleviating off-road transport burdens is also evident, but the challenges of promoting IMT ownership and use in an area where current IMT ownership is very low are considerable, as the research project outlined indicates. It also illustrates some of the complexities involved in introducing IMTs to women in off-road areas. As in northern Nigeria, it would appear that women face particular obstacles in obtaining access to equipment, due to economic circumstances which restrict their ability to purchase even relatively low cost items. Nonetheless, credit availability has certainly encouraged women to contemplate IMT purchase in coastal Ghana. This suggests that in areas where a critical mass of IMTs is already present - as in northern Nigeria - credit arrangements for women specifically to purchase IMTs, coupled with training programmes to teach women how to ride bicycles and drive motorcycles, could have a massive impact.

Notes

(1) There is substantial evidence to show that road construction increases agricultural productivity *at the roadside* (e.g. see Platteau 1996). However, off-road impact is less certain and could be negative as I have argued (1997).

(2) Import duties on second-hand vehicles ('Belgians') are reportedly now down to 5% in Nigeria.

(3) The concept of achaba is believed to have originated in the Calabar area of south-eastern Nigeria. It is very widespread particularly in congested urban areas where achaba is often used to avoid traffic jams and the fare is around the same as by taxi, but much more expensive than bus.

(4) There is a serious need for road safety training for achaba drivers to reduce reported high accident rates. This would also probably encourage more women to use achaba services. Traffic accidents can have devastating impact on individual families and their livelihoods, as recent research in Uganda (Kwamusi, in press) indicates. Training of the type provided by the NGO Riders for Health would be enormously beneficial. There have apparently been some moves to introduce helmets on the Plateau, but these are resisted. Legislation on wearing helmets etc. is unlikely to be effective unless accompanied by adequate training.

Many women ride achaba in urban areas in Nigeria. (In Zamfara State, where Sharia law operates, women were reportedly banned from riding achaba, leading to major protests by urban women. Plateau State, by contrast, is relatively liberal.)

(5) Male village elders stressed that it is quite acceptable for Birom women to ride bicycles if they wish (married Moslem Hausa women are not allowed to ride), but added that though there are no restrictions on Birom women riding bicycles: *'most women don't like to ride bicycles.. they have no interest in riding and thus few learn to ride'*. Few women in the survey area rode their husbands' bicycles, with the possible exception of women in the remote off-road villages of Bawan Dodo and Kushe Rabak, towards the eastern edge of the survey area.

(6) There is limited use of bicycles and other IMTs such as push carts and wheelbarrows in the region as a whole. This may be attributable, in part, to factors such as the rolling topography, the high humidity and to cultural preferences for conventional motorised transport (further north, in Ashanti areas, bicycle riding purportedly makes you lower class!) Nonetheless, IMT use along the paved road is certainly far higher than in off-road settlements in the region.

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APPENDIX

Table 1: Vehicle and motorcycle ownership in the Jos Plateau survey area, Nigeria, 2001

Estimated vehicle ownership in selected off-road market centres (village-based vehicles only) (M=male, F=female)

Market	Car	Taxi	Minibus	Lorry	Pick-up	Motorbike
Marit	15M	0	4M	0	0	0
Dorowa Tsoho	0	6M	0	0(a nearby village has 3 lorries)	2M	6M (3 operated as achaba)
Ropp Labeng*	8M	15M, 2F	0	0	Many M, 1F	12M (3 operated as achaba)
Barakin Choji	0	0	0	0 (3 in nearby villages)	0	5M (3 operated as achaba)
Kushe Rabak	4M (1=clinic staff)	2M	4M, 2F	0	3M	15M (4 operated as achaba)
Kuru Station	1M	3M	0	0	2M	c. 15M (7 operated as achaba)
Na Fan Dreji	3M	4M	0	0	4M	5M (3 operated as achaba)
Nding Rankassa	5M, 1F	12M	0	0	15M	8M (7 operated as achaba)
Kwi	0	8M	1M	0	5M	25M (c.20 operated as achaba)
Rim	c. 15M	10M	5M	0	3M	10M
Wereng Camp	0	2M	3M	0	0	3M
Bawan Dodo	1M, 1F	5M	0	0	?	10M, 2F
Fan Loh	4M	0	0	0	c.10M, 1F	25M, 1F (many operated as achaba at the roadside)
Jol	0	0	0	0	1 (owned by church)	40M

- 4 tractors also used for transport

Estimated vehicle ownership in selected roadside survey market centres (M=male, F=female)

Roadside Market	Car	Taxi	Minibus	Lorry	Pick-up	Motorbike
Dorowa Babuje	Plenty M, 0F	Plenty M, 1F	Plenty M, 1F	3M, 0F	Plenty M, a few F	Plenty M, a few F (for achaba)
Tudun Mazat	3M	2M	1M	0	3M	6M
Ra Hoss	0	0	c. 15M	0	?	Many
Riyom	12M, 3F	4M	8M, 2F	1	?	20M, 5F
Bindi Hoss	0	0	1M	0	?	4M
Ta Hoss	24M, 6F	12M, 3F	3M, 2F	0	?	30M, 10F

Table 2: IMT ownership in the Jos Plateau survey area, Nigeria, 2001 [excludes motorcycles, listed in table 1].

Estimated IMT ownership (excluding motorcycles) in roadside survey market centres (M=male, F=female)

Roadside Market	Bicycle	Donkey and cart	Handcart	Wheelbarrow	Other
Tudun Mazat	M=almost every household, F=0	0	0	0	0
Ra Hoss	M=many, F=0	1M (no cart)	0	10-15M	0
Riyom	M=50, F=7	0	0	M=150 households, F=0	0
Bindi Hoss	M=12, F=0	0	0	M=2	0
Ta Hoss	M=over 200, F=over 10	M=2 (no cart)	0	M=over 100, F=0	0

Estimated IMT ownership (excluding motorcycles) in off-road market centres (village-based vehicles only) (M=male, F=female)

Market	Bicycle	Donkey and cart	Handcart	Wheel-barrow	Other
Marit	M=150	0	0	M=Every household	0
Dorowa Tsoho	M= 90% of households, F=0	0	0	M=over 8, F=0	0
Ropp Labeng*	M=every household, F=8	0	0	M=12,F=0	0
Barakin Choji	M=virtually every household, F=0	0	0	0	0
Kushe Rabak	M=almost every household, F=2	0	0	M= almost every household, F=0	0
Kuru Station	M=almost every household, F=0	0	0	Many but not all households, F=0	0
NaFan Dreji	M=most households, F=5 (all Birom)	0	0	M=4, F=2	
Nding Rankassa	M=every household, F=1(a Birom schoolgirl)	0	0	Over 8	0
Kwi	M=200, almost every house. F=0	0	0	M=many, F=0	0
Rim	M=100+, F=0	0	0	M=50-60	0
Wereng Camp	M=50-60, F=0	0	0	M=5, F=0	0
Bawan Dodo	M=almost every house, F=1	0	0	M=7	0
Fan Loh	M=almost every house, F=many	0	0	M=Many, F=some	0
Jol	M=34, F=4	0	0	0	0

Table 3: % of traders interviewed in on-road and off-road market owning various means of transport, Jos Plateau, Nigeria, 2001

	2001 rural markets data set		2001 on-road data set		2001 off-road data set	
Transport type	Men as a % of all men interviewed	Women as a % of all women interviewed	Men as a % of all men interviewed	Women as a % of all women interviewed	Men as a % of all men interviewed	Women as a % of all women interviewed
Bicycle	28.1	4.0	27.1	3.7	29.1	4.6
Motorbike	9.9	2.9	7.1	4.2	12.8	0
Minibus	0	0.4	0	0	0	1.1
Pick-up	0	0.4	0	0	0	0
Donkey	0	0.4	0	0.5	0	0
Other	4.1	1.4	0	0	1.2	3.4

Table 4: Village based transport in Ghana's Central Region: motorised and non-motorised ownership in five study villages, 1998

Village	Abora		Sampa		Adabra		Lome		Aworabo	
	M	F	M	F	M	F	M	F	M	F
Private car	0	0	0	0	0	0	0	0	0	0
Taxi	0	1	0	0	0	0	0	0	0	0
Tro-tro	0	0	0	0	0	0	0	0	0	0
Bicycle	2	1	2	0	6	0	5	0	6	0
Motorbike	0	0	0	0	0	0	0	0	0	0
Handcart	0	0	0	0	1	0	2	0	0	0