

Women and Nonmotorized Transport: Connection in Africa Between Transportation and Economic Development

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Transportation is a vital element of every healthy economy and is crucial to any strategy that addresses poverty. Africa, a region struggling to alleviate rampant poverty, will have its success dictated largely by development of its transportation sector. In Africa, as in the rest of the world, a planning process that does not adequately assess the transport needs of its users is rendered far less effective than one based on a more comprehensive and inclusive analysis. Women, responsible for most transportation demand in Africa, have been mainly ignored by the current process. Both rural and urban women carry out a variety of tasks that often require trips of considerable distance. Most of these women, members of Africa's impoverished majority, cannot afford motorized transportation. Chores requiring transportation are carried out using carts, shoulder poles, and bicycles. However, transportation planners, development professionals, and policy makers continue to address mobility needs with projects and policies that are based on motorization. If the intended outcome of transportation planning in Africa is economic development and an increased standard of living, alternatives to a transportation system based on motorization must be a primary part of any policy and planning effort. Women traditionally have been responsible for almost all household production and transport labor associated with agricultural production. They hold a primary transport role in both urban and rural areas. Adequately assessing and addressing the nonmotorized transport needs of low-income women are crucial to bridging the connection between transportation planning and policies, transport technologies, and economic development in Africa.

Transportation is a vital element of every healthy economy and is crucial to any strategy that addresses poverty. Given that Africa is a region with many struggling economies and high rates of poverty, transportation and poverty alleviation strategies should go hand in hand. A planning process that does not adequately assess the transport needs of transportation system users or stakeholders, many of whom are low-income women, is rendered far less effective than one based on a more comprehensive and inclusive analysis. The purpose of an efficient transportation system is typically to spur economic progress and enhance overall quality of life. A transportation planning process that emphasizes private automobile use and motorization at the exclusion of other options and does not adequately assess and address transport demand of the system's users or stakeholder groups typically does not result in an efficient transportation system that serves transport needs and spurs economic progress to its greatest potential.

The problem is that although transportation planners, development professionals, and policy makers address mobility needs

with projects and policies based on motorization, most transport needs of low-income people are met by some form of nonmotorized transport. A recent United Nations survey shows that in several large cities in Africa walking accounts for at least half of all trips (1). In rural areas, which comprise some of the poorest and most undeveloped communities, most trips related to household and agricultural production are made by women hauling carts and using shoulder poles. The frequent marginalization of nonmotorized transport by development strategists has resulted in transportation systems that often fail to meet the needs of women.

Modern transportation planning has continued the trend of ignoring the needs of one of its major stakeholder groups. The region's transportation sector uses 20 to 40 percent of public investment funds, with over 80 percent of these funds for road construction. More than 20 percent of loans from the African Development Bank between 1973 and 1989 were targeted for transport projects, of which 90 percent went for roads mostly in urban areas (2). In the face of this high level of investment in a transportation system based on automobile ownership and the use of motorized transport, less than 1 percent of the population in developing countries can afford an automobile (3). The situation is similar in Africa. Given that the price of a medium-sized car is the equivalent of 12 to 15 years' salary for the average person (4), only a few people own automobiles in the region. Other forms of motorized transport are also expensive relative to income. Even with subsidies, the cost of a bus ride is often beyond the financial reach of many. But the emphasis on the automobile and motorized transport persists, at the exclusion of other more affordable alternatives.

If the intended outcome of transportation planning in Africa is economic development and an increased standard of living, alternatives to a transportation system based on motorization must be a primary part of any policy and planning effort. Women traditionally have been responsible for almost all household production as well as much of the transport labor associated with agricultural production. They hold a primary transport role in both urban and rural areas. Adequately assessing and addressing the nonmotorized transport needs of low-income women are crucial to bridging the connection between transportation planning and policies, transport technologies, and economic development in Africa.

RURAL AND URBAN WOMEN'S TRANSPORT: SOME CHARACTERISTICS AND EXAMPLES OF OPPORTUNITY COST

Are there really transport considerations specific enough to women that they warrant deliberate attention? If so, what are they

and how can they be assessed? A list of the common daily responsibilities of African women demonstrates the importance of nonmotorized transport. Women use carts for hauling, shoulder poles for carrying, animals for traction, and a variety of other nonmotorized alternatives to carry out other chores. The emphasis on women does not imply that men do not have transportation concerns. This paper recognizes the traditional and specific division of labor between men and women at the household level in Africa and attempts to elicit the unique set of transport concerns that have resulted for the continent's women. In many situations, rural and urban women go unrecognized as a transport stakeholder group with a specific set of transport concerns. The result is that their transport demand and the level of their need for transport resources is often inadequately expressed in a transport demand assessment or analysis.

Historically, women and girls in rural areas have shouldered most of the transport burden for the household in terms of time and volume transported. The majority of women's labor time in household production is dedicated to transport. Study after study (5,6) have identified trips for collecting water and firewood and trips related to agricultural production and marketing for the household as the main sources of transport demand in rural areas. For example, women and girls are responsible for approximately 79 percent of the total time spent on household transport in the Makete district of Tanzania and carry 90 percent of the total volume (5). In Beira, Mozambique, women typically spend 28 percent of their time in a 12-hr work day transporting agricultural materials and produce (7). Transporting water and firewood for the household consumes another 30 percent of their time. Table 1 shows how much transport time the average woman spends on foot in 1 year in rural Tanzania.

The total annual time an individual woman spends in Tanzania on transport is 1,648 hr, compared with that of a typical man who spends approximately 531 hr contributing to the same tasks. Children, mostly girls, average 296 hr per year carrying water, firewood, and agricultural products. A study from Burkina Faso concludes that the amount of time that girls between the ages of 11 and 17 spend on transport is three times higher than that of boys of the same age.

The amount of time spent on trips and the frequency of trips also differ for men and women. On the whole, women make trips related to household needs more often than men. The average woman makes three to four trips per day. She spends over 4 hr solely on transport and moves approximately 50 kg/day. The average man, by contrast, makes one trip per day related to household production. Trips for transporting water and firewood or trips related to agriculture usually are made under difficult conditions and without the use of carrying equipment. The most frequent methods of transporting heavy loads are headloading and the use

TABLE 1 Average Annual Time for Women Spent in Transport in Tanzania

Transport Activity	Hours Spent per Year (%)
Household water needs	510 (31)
Household firewood needs	302 (19)
Agricultural materials and produce	237 (14)
Accessing markets and village center	234 (14)
Accessing health and education	65 (4)

TABLE 2 General Household Trip Characteristics and Observations

Trip Characteristic	Observations
Movement of small loads	10 to 100 kilograms
Short distances	1 to 7 kilometers
High trip frequency	3 to 4 trips per day
Primary household transport responsibility	Women perform majority of household transport tasks
Non-motorized transport	Headloading, backloading, shoulder poles

of a headstrap, both of which are known to cause considerable discomfort and countless injuries. In addition to carrying 40 kg by headloading, a woman often also carries one of her children. Despite potentially harmful physical effects, headloading and the headstrap remain prevalent because of their affordability. Rural trips related to household and agricultural production are characterized in Table 2.

A survey discussed by McCall (6) reflects that up to 50 percent of the average working day on a farm in Africa is devoted to walking to and from fields, often with a load on the head or back. In northern Nigeria, for example, women may spend as many as 7 hr/day traveling to and from the fields. Other studies confirm that up to 20 percent of women's total household labor time is spent walking and headloading. Because headloading goods uses labor that might otherwise be devoted to agricultural production, Pankaj of the World Bank observes that the opportunity cost of headloading makes it about 8 to 12 times more expensive than any other method of transport (personal communication, July 3, 1988). Inadequate transport causes a decrease in productivity and the effective working day. On the basis of an 8-hr working day, walking 4 km to a plot reduces fieldwork time by approximately 25 percent. Each additional kilometer walked to reach a plot represents an additional 5 percent reduction in the time that can be devoted to productive purposes (6).

Rural women are not the only ones who have a difficult time getting the transportation they need. Urban women face similar challenges. In Africa, the rate of urban population growth is much higher than that in the rest of the world. Most of the added population will probably join the existing urban poor in shanty dwellings located in extended areas that have sprung up within a radius of 10 to 20 km around the cities (8). These areas typically have bad roads and are far from city centers and other places with essential services. Women in these regions need transportation to work and run their households. Urban trips to and from paid work made by women replace those associated with rural agriculture. Many women work in the child care and domestic sectors and therefore have a wide variety of destination points throughout the city that are not necessarily on a public bus route. Generally, poor urban women make fewer trips than higher-income women because of transportation's high cost relative to their incomes. An average low-income family will spend approximately 30 to 40 percent of its earnings on transport, compared with 5 to 7 percent for families with more income. The mobility of the poor is therefore essentially limited to procuring necessities such as work, food, and water.

One of the most difficult dynamics faced by the urban poor is that, as rents in the city increase, they are pushed farther and

farther to the outer perimeter, where rents are more affordable. Unfortunately, these residential areas are often seen as undesirable squatter settlements by governments. In an attempt to deal with them, some governments have a policy to periodically raze these settlements by bulldozer. Obviously, this policy adds to the difficulty of establishing public transportation services or paratransit services offered by the informal sector. People are left with very few economic choices of where to live and how to get themselves to work or to the city to search for work. Women in particular are hit hard; the nature of their employment is such that the destination points are often varied, making adequate transportation even more difficult to procure.

EASING THE BURDEN AND SPURRING ECONOMIC DEVELOPMENT: ROLE OF NONMOTORIZED TRANSPORT

Several obstacles to economic development are access to transportation resources and access to an accommodating transportation infrastructure. In any serious strategy to address poverty and spur economic development, through either microenterprise or increasing the volume of agricultural produce taken to market, transport is an important piece of the puzzle. To increase the productivity of women, transport is critical.

What are a few of the measures that can be taken to alleviate the transport burden for women and their communities and aid economic development? There are several. In household sites and services planning, for example, the necessity for trip making would be reduced if water pumps and health care facilities were located closer to households. In land use planning, reserving land for low-income residents through zoning regulations would assist in locating workers' homes closer to employment opportunities. Recognition of squatter settlements would permit transportation routes for bus service, paratransit, and nonmotorized transport to be established. Some of the most important steps that could be taken to reduce the transport burden are as follows:

- Reduce the frequency of trips and distance over which goods and services must be carried through land use and site planning;
- Improve, provide, and maintain a nonmotorized transport infrastructure, including roads, paths, and tracks; and
- Develop and stimulate the private sector to provide more efficient and affordable transport and load movement technologies.

Can nonmotorized transport serve as an economically viable part of a development strategy? If an individual is able to transport a larger volume of goods at a faster rate, the result is an increase in productivity and income. Although little analysis has taken place, some preliminary data show that nonmotorized transport can have an exceptional internal rate of return. According to preliminary data, although the average rate of return on road infrastructure projects is about 22 percent, the direct provision of bicycles at market value to fisherman in Mozambique showed an internal rate of return of almost 400 percent (9). Although the internal rate of return will certainly vary according to circumstance, these data suggest that infrastructure investment in nonmotorized transport is worthy.

Technology has a central role to play as well. Although it is clear that carrying aids (such as improved backframes or carrying poles) can help women carry heavy loads, pedal-driven vehicles

can be more advantageous in the right situation. The reason is basically speed and the volume that can be carried: a person can travel about three times faster on a bicycle and move even heavier loads than headloading or portage. Additionally, pedal-driven vehicles use human energy four times more efficiently than walking (10). Bicycles by themselves or with carts can be particularly beneficial to women because they can reduce total daily travel time. For example, if it takes a woman 15 min on foot to travel 1 km but 8 min by bicycle, with all other factors being equal, a bicycle would reduce her annual transport time by almost half, from 1,648 to 878 hr. The additional time available for other activities would amount to almost 2 hr/day. In Mozambique, the average cargo carrying capacity of headloading was 17 kg. After the acquisition of the bicycle, the average amount transported increased to 26 kg (11). It is important to note, however, that the type and size of the bicycle are important. For example, for most labor needs, it is not necessary to have a 15-speed bicycle. Additionally, a bicycle that is too big or bulky would not be as easy or as productive to use.

Optimum results are more likely to occur when a combination of solutions works together. Transportation initiatives should incorporate land use considerations, as well as site-specific factors (such as household proximity to a water pump) to be most effective. The result of this comprehensive style of planning would be to increase an individual's time and personal energy available for other economic activities such as cultivation, education, income generation, or any other activity associated with enhancing the quality of life.

OVERCOMING OBSTACLES AND STEERING A NEW COURSE

In much of Africa the prestige and power of automobile ownership, based on an emulation of Western ideals, have led governments to ignore nonmotorized transport as a legitimate transportation option. In many countries, an attitude of disdain exists toward bicycles; they are seen as vehicles of the poor and symbols of backwardness. To achieve successful integration of the nonmotorized and motorized sectors, several important conditions are needed, including (a) political support from local, regional, and national governments; (b) private-sector support, such as providing credit and finance arrangements for low-income people; and (c) inclusion of nonmotorized transport in all transportation and land use plans. Examples of each follow.

Political Support

An example of political support and commitment to human-powered vehicles as a partial solution to transport problems can be found in Accra, Ghana. After years of encouraging motorized transport, the government of Ghana recognized that its transport sector was failing to meet the most basic requirements for moving people and goods. With assistance from the World Bank and Intermediate Technology Transport, a nongovernmental organization based in the United Kingdom, the Ghanaian government is now promoting the production and use of bicycle trailers and handcarts and is considering a proposal to build low-cost rural roads intended for human-powered vehicles. The roads may also accommodate an occasional jeep without upgrading the construction

standards. They would cost about \$2,400/km, or roughly 8 percent of the conventional rural road cost (12).

Private Sector

Transportation affordability for low-income people is perhaps the most critical obstacle to overcome. In Santo Domingo, Dominican Republic, a credit union of *tricicleros* helped finance vehicle purchases and a tricycle assembly workshop (12). Another example of private-sector support is found in Hyderabad, India, where commercial banks were encouraged to lend money to cycle rickshaw operators for the purchase of vehicles. Another mechanism for extending credit in India is that every government employee is entitled to a loan for a vehicle, which can be a bicycle, motor scooter, or car, depending on salary level.

The average cost of a bicycle in West Africa is approximately 60,000 CFA, or U.S. \$120 (assuming U.S. \$1 = 500 CFA), depending on the model and import taxes levied. How will a domestic worker in Senegal, who typically earns 500 to 1,000 CFA (U.S. \$1 to 2) a day, or a rural farmer in Tanzania whose income is irregular, save enough money to purchase a bicycle? Just as the typical middle-class family in an industrialized country buys its automobiles on credit, similar credit arrangements can be devised to enable low-income people in developing countries to buy bicycles and other forms of nonmotorized transport.

Land-Use Planning

There should be a review of zoning regulations and urban planning practices to remove provisions that contribute to excessive separation of residential areas, working places, and services. There should also be some means of providing affordable land for residential settlement to reduce urban sprawl. In terms of urban planning, design elements that accommodate pedestrian and bicycle uses should be standard elements in transportation and land use plans. The ideal physical design would separate cyclists and pedestrians from motorized traffic. Reducing speed limits for motorized traffic and educating the users of nonmotorized and motorized vehicles to respect one another's needs on the road would go a long way toward creating an environment in which all means of transportation safely coexist. In Rio de Janeiro, Brazil, the Institute of Technology for the Citizen is developing a bicycle master plan for the city that reallocates street space to enhance the safety and viability of nonmotorized alternatives.

Some Other Important Considerations

How can transport needs for women, and communities in general, be better assessed? In assessing needs at the community level, and of women in particular, one should begin with an analysis of the household. Although this is not a revelation in project planning or design for development programs and projects, it is still too often overlooked as an integral part of any development effort's success. A comprehensive and inclusive household analysis, disaggregated by both gender and age, should include the following:

- Household data on the means of transport, travel time and distance, travel volume and frequency, and trip purpose and destination;

- An analysis of transport requirements, the extent to which these transport requirements are currently being met, by what methods, and available resources; and

- Identification, in conjunction with the local people, of suitable, low-cost vehicles, available credit, and forms of ownership and operations.

One of the most important parts of any effective analysis of a transport project is affordability. A transport policy or project may be technologically appropriate, but if it is not affordable, it cannot be effective. Although bicycles and other nonmotorized vehicles are comparatively low cost, they are not always affordable to many of the poor, especially women. The issue of affordability is especially acute for women because, according to custom, many give their incomes to the male heads of the household and must gain their consent to obtain credit. Providing credit directly to individual women, therefore, should be a priority.

In the best of all possible worlds, a solution to the general transportation demand would meet the needs of the low-income majority. It would be affordable, serve a variety of destinations and points of origin, minimize capital outlays, and be environmentally sound. Such a solution exists: a comparative planning process that incorporates policy and technology options and social and environmental costs into regional and local transportation planning. Such a process would compare, for example, the cost of building a road with the cost of enhancing bicycling and pedestrian facilities and would offer a framework for choosing the least expensive means of satisfying transport demand. The results of this process would

- Provide a balanced mix of public and private transport modes that serve a given area in the prevailing social, economic, and environmental circumstances;

- Be convenient, reliable, and safe and serve the needs of all users, including pedestrians, cyclists, and those using animal-drawn vehicles;

- Have minimal adverse effects on the natural and manmade environment; and

- Make rational use of energy and land resources.

This type of planning process, which considers societal and environmental costs for each option, bodes well for low-income people, women in particular. It will allow options other than road construction for motorized transport to be considered—options that may be more relevant to women's economic and social circumstances. By comparing the costs and benefits of a variety of options, the particular transport requirements of women and the value of nonmotorized transport will become more difficult to marginalize. Without relevant transportation policies and technologies that provide for the needs of those who depend on the system, communities are isolated from the resources they need for economic development.

The need for increased and affordable mobility options, not just for women but for everyone, can be partially met with the bicycle as well as other affordable, traditional, nonmotorized means. Bicycles and other human-powered vehicles can enhance people's mobility at little cost, improve access to vital services, and create a wide range of employment opportunities. They are a legitimate transport solution that is long overdue.

REFERENCES

1. *Urban Transport: A Baseline Assessment and Strategy for the Second United Nations Transport and Communications Decade for Africa*. The World Bank, Washington, D.C., Oct. 1990.
2. Musa, E. S. The Role of the African Development Bank in Energy Development. *Energy Options in Africa: Environmentally Sustainable Alternatives*. Humanities Press, Atlantic Highlands, N.J., 1993.
3. Renner, M. *Rethinking the Role of the Automobile*. Paper 84. World-watch Institute, June 1988.
4. Davidson, O. Opportunities for Energy Efficiency in the Transport Sector. In *Energy Options for Africa: Environmentally Sustainable Alternatives*, London, England, 1993.
5. Barwell, I., and C. Malmberg Calvo. *The Transport Demands of Rural Households: Findings from Village-Level Travel Surveys*. Makete Integrated Rural Transport Project. International Labor Organization, Geneva, Switzerland, 1989.
6. McCall, M. K. The Significance of Distance Constraints in Peasant Farming Systems with Special Reference to Sub-Saharan Africa. *Applied Geography*, 1985.
7. Hook, W., K. Overton, and R. Hambrecht. *Economic Benefits of Non-Motorized Transportation*. Institute for Transportation and Development Policy, New York, 1993.
8. Linn, J. *Cities in the Developing World*. The World Bank, Washington, D.C., 1983.
9. Hook, W., K. Overton, and R. Hambrecht. *Economic Benefits of Non-Motorized Transportation*. Institute for Transportation and Development Policy, New York, 1993.
10. Hathway, G. *Low-Cost Vehicles: Options for Moving People and Goods*. Intermediate Technology Publications, London, 1985.
11. Hook, W., K. Overton, and R. Hambrecht. *Economic Benefits of Non-Motorized Transportation*. Institute for Transportation and Development Policy, New York, 1993.
12. *The Urban Edge: Issues and Innovations*, Vol. 14, No. 2. The World Bank, Washington, D.C., March 1990.