PROMOTING THE USE OF INTERMEDIATE MEANS OF TRANSPORT - VEHICLE CHOICE, POTENTIAL BARRIERS AND CRITERIA FOR SUCCESS

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Objectives of the paper

Abstract

Production, trade and daily life require the movement of goods and people. Numerous different transport technologies exist employing human energy, animal power or the use of motors. They range from basic walking and carrying to large-scale motorised transport, including motor cars, large trucks and buses, trains, aircraft and ships. Between these extremes, there is a wide range of intermediate means of transport (IMTs) that can increase transport capacity and reduce human drudgery without the high costs associated with large motor vehicles. Options include single-wheel technologies (eg, wheelbarrows), two-wheel hand carts, bicycles and tricycles, motor cycles, rickshaws, rickshaw vans and cycle trailers, animal-powered transport and low-cost boats. This paper focuses on land-based IMTs.

There have been many paradoxical experiences relating to IMT adoption in Africa, Asia, the Americas and Europe. In some parts of some countries, there have been very positive lessons concerning IMT adoption. There have also been many disappointing experiences. In some situations technologies seem to have taken off spontaneously, without government assistance. In others, adoption only occurred after extension campaigns. In some countries, potential users rejected particular IMTs, despite subsidies, credit provision and strong promotional campaigns. The diverse experiences illustrate the importance of technical appropriateness of IMTs to local transport needs within particular environments. More significantly, they highlight lessons relating to user-perspectives and the overriding importance of social, economic and cultural issues.

Key issues

- Technical choices, diversity and complementarity
- Cost, affordability and Vehicle operating costs
- Supply, distribution and maintenance systems
- Credit and subsidies
- Critical mass
- Programme focus and prioritisation
- Monitoring and evaluation
- Gender issues
- Networking and information exchange

1. INTRODUCTION

This paper has intentionally focussed on IMTs and issues relating to their adoption. However before conclusions relating to IMTs are drawn, there is a need to recall the developmental context. The issues being addressed relate to the problems of transport and accessibility. Such problems may be best solved through non-transport solutions (eg, water reticulation, improved village infrastructure and services). They may also be addressed through the combination of human walking/carrying and large-scale motor transport. Although IMTs are clearly useful in many different situations, they are not a universal panacea. Nothing in the following sections should be taken to suggest that IMTs should be promoted unless there is a clear reason to do so. IMTs should not be actively promoted unless their technical, social and economic appropriateness have been clearly established by all concerned (particularly the potential users).

Organisations implementing IMT programmes may well be private sector manufacturers and retailers, and/or broadly-based development organisations (regional projects, NGOs, women's groups, farmers' associations). The term 'IMT programme' is meant to cover all initiatives relevant to the manufacture, promotion and use of IMTs.

2. TECHNICAL CHOICES, DIVERSITY AND COMPLEMENTARITY

Hand carts and wheelbarrows appear well-suited to short distance transport in towns and around markets. Bicycles with simple carriers are very widely and increasingly used for personal transport and some load carrying. Ox carts and donkey carts, using automotive technologies, are increasingly used in the rural areas of Sub-Saharan Africa, particularly in semi-arid areas. Pack donkeys can have important local roles, assisting women and men, particularly in dry zones and hilly areas. To date, most carts and bicycles are owned and used by men. While there are a large number of technologies that can be used by rural women to transport domestic water, this common transport problem has yet to be adequately resolved.

Motorised IMTs are common in Asia but have yet to be widely adopted in Africa. While there is a steady increase in motorcycles for personal transport, their present use affects only a small proportion of the population (with the notable exception of parts of Burkina Faso and neighbouring countries). Power tillers have yet to be widely used for rice production or transport. Trends from Asia suggest this technology may first be adopted in areas of irrigated rice production with high population densities, close to towns where motorised vehicles are widely used and maintained. The conditions for adoption of other motorised IMTs (motor tricycles, autorickshaws) are most likely to be met in peri-urban areas, where there is economic demand and supporting infrastructure.

Lessons from Asia and Africa suggest that a wide range of complementary IMTs can coexist. Conditions in urban areas and around markets often favour their production, adaptation and use. The various IMTs complement motorised transport systems, fulfilling needs for collecting and distributing goods and people over relatively short distances.

Given the wide range of possible technologies, IMT programmes should, as far as possible, offer technological choices to the potential users. There are some advantages in concentrating on the establishment or improvement of one technology, as this may provide economies of scale for the support systems, accelerating the achievement of critical mass. However, working with a range of technologies may lead to greater understanding of the issues and more appropriate technologies being adopted. As transport needs are many and diverse, overall adoption may be higher if several technologies are promoted. While there may be specialists working with cycles, carts, donkeys or small motors, programmes should try to support a range of IMTs.

Women and men may require access to different types of IMTs for physical reasons and in order to fulfil their different gender roles. In promoting the diversity of technologies, IMT programmes should ensure they have technologies suited to the different requirements of women and men.

3. COST AND AFFORDABILITY

The adoption of IMTs is strongly influenced by their cost and their potential to provide economic benefits. Their overall affordability may depend on income generation prospects. Provided funds or credit are available to allow the process to start, the potential to gain income, rather than actual cost may be the more crucial issue. Thus relatively expensive IMTs may be adopted in peri-urban areas, while there may be little uptake of socially-beneficial low-cost IMTs by disadvantaged people (including women) in rural areas. Users have been willing to pay the premium for steel carts with rubber tyres rather than cheaper wood options. A large number of people (mainly men) have purchased bicycles, even when their price has been high relative to average incomes. Increased personal mobility has a high social as well as economic value. On the other hand, few people have felt it was justified to spend the extra needed to buy a cycle trailer or even an extended bicycle (Box 1).

Box 1 Extended bicycles in Sri Lanka: not worth the extra money?

When the members of the IT Sri Lanka team started to promote bicycle trailers, they became aware of how much the ordinary bicycle was used for load carrying. A cycle trailer, with a safe load of up to 200kg, could carry more than was practical with a normal bicycle, but its cost was similar to that of a second bicycle. It seemed that there might be benefits from increasing the load-bearing capacity of the normal bicycle. This would allow greater loads to be carried, but without the expense and complexity of a cycle trailer. The extended bicycle was developed as a reversible modification of a 'normal' bicycle. The extension produced a larger frame that allowed a larger 'carrier' to be fitted behind the saddle. This could carry a safe load of up to 100kg. Extending the frame required several modifications including a longer chain. The cost was about 25% more than a normal bicycle, whereas the cycle trailer was almost 100% more.

It was initially anticipated that sales could be high, since 'normal' load-carrying bicycles were very common and the additional cost was relatively modest. It was planned to sell 1,250 extended bicycles and 800 bicycle trailers between 1994 and 1997. In fact uptake of the extended bicycles was minimal. Users did not consider the possible benefits justified the costs. Only 32 extended bicycles were sold. IT Sri Lanka continued to promote the extended bicycle, but without much expectation of further success.

Some lessons relating to IMT adoption

- The engineers believed the extended cycle was genuinely better and affordable **AND**
- Potential users indicated they would pay a modest amount for a significant improvement **BUT**
- In reality, users did not perceive the 'improvement' was worth the extra cost.

Source: IT News, 1994

One implication for IMT programmes, is that efforts should be made to keep the costs of IMTs low. Some programmes have felt it worthwhile to subsidise IMTs. The types and rates of taxes and duties might be well reviewed: there have been cases of very high mark-ups on imported IMTs and components (Howe and Dennis, 1993). Other options may include support to develop low cost manufacture, marketing and distribution systems. Initiatives could include bulk purchases of materials/components for resale to small workshops, possibly through decentralised depots.

Another implication which is potentially more important, is that IMT programmes should endeavour to identify or stimulate income-generating activities for IMT users. Examples have been provided of carts being afforded thanks to marketing opportunities and road construction.

4. VEHICLE OPERATING COSTS

Figure 1 and 2 show VOC data for a range of vehicle types from a bicycle to a truck. No account is taken for road roughness in the VOC data, and a 50% utilisation level is assumed. VOC's are very sensitive to levels of utilisation. This is particularly the case for motorised vehicles where capital costs are high. For example a tractor's operating costs per tonne km are 8 times higher for a 50 tonne demand than for a 750 tonne demand over a 50km distance. Similarly an ox cart is 50% more expensive for a 50 tonne demand than for a 250 tonne demand over a 10km distance.

In determining vehicle choice, every effort should be made to assess likely demand. Many of the vehicles suitable for use in rural areas are multi-purpose in that they can be used for goods and passenger transport and agricultural preparation. In order to determine the total demand in tonnes, certain crude assumptions can be made on the productivity of the non-goods transport related activities:

- One passenger = 70 kg
- One acre ploughed in equivalent tonnes =

(Hours to plough one acre * Av. speed of vehicle * Load capacity) / Av. trip distance

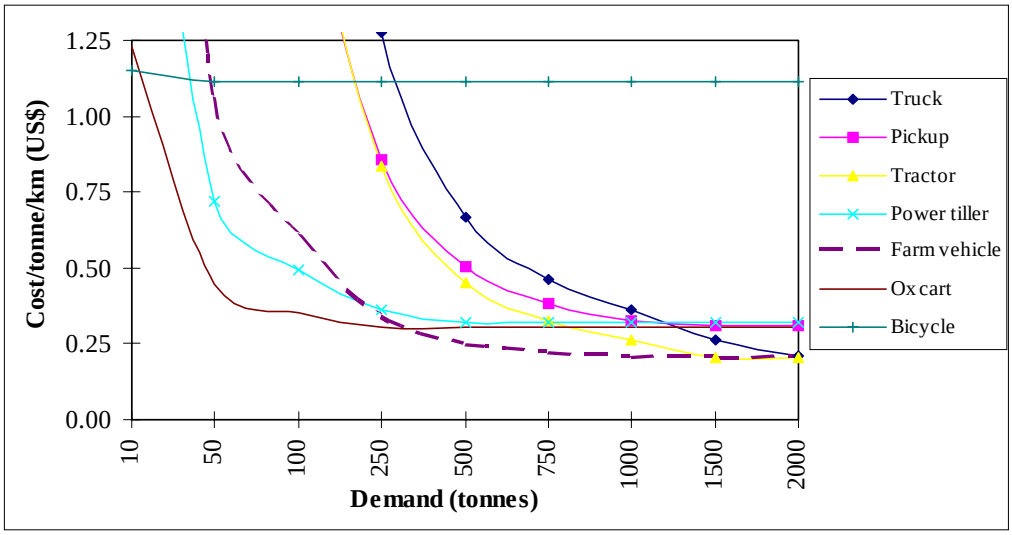
Figure 1 shows that the bicycle has the lowest operating costs only at short distances and where demand is low. However, the transport of small loads over short distances is the principal characteristic of rural transport movements. In addition, much rural transport takes place away from the formal road network on informal paths and tracks. These factors go a long way in explaining the rapid increase in bicycle ownership across Africa, together with the fact that it is the most affordable means of transport for most rural households.

The load capacity of a bicycle can be increased by attaching a trailer or where it is used as a rickshaw. For similar loads motorcycle technology can also be considered either when a trailer or sidecar is attached or when the vehicle is designed to have a payload area on the front or back. These types of technologies are very rarely seen in SSA although they are in widespread use in parts of Asia.

Figure 1 shows that the ox cart remains the lowest cost option over a 10km distance until the demand reaches about 250 tonnes per year. In Figure 2 it remains the lowest

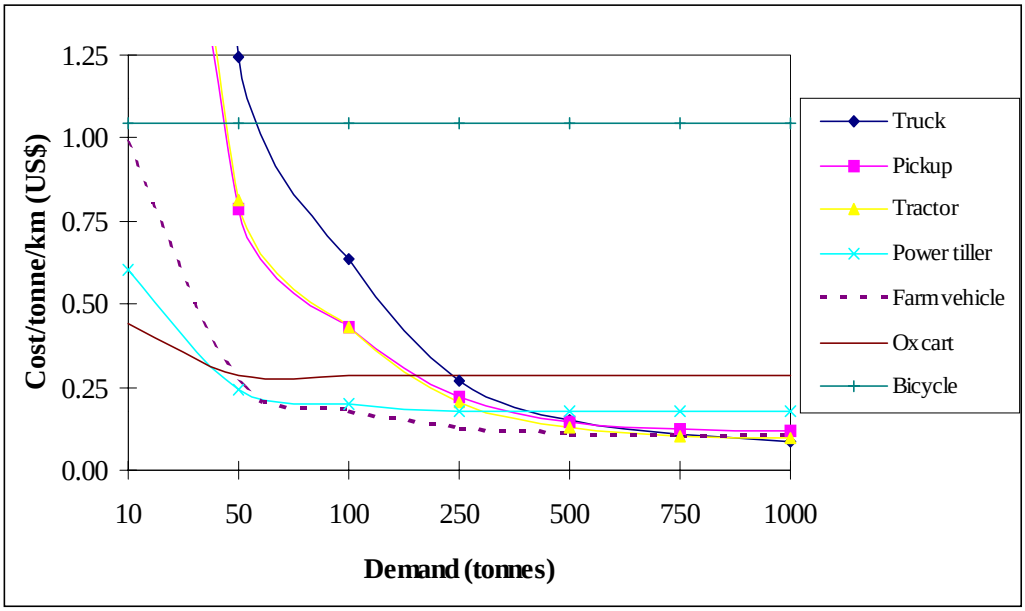
cost option until about 50 tonnes per year. The ox cart has the advantage that it can also be used for agricultural preparation and can therefore maintain relatively high utilisation levels. Although the ox cart is slow it can use most types of infrastructure, maintenance costs are low and the cart is simple to repair. Disadvantages include a limited range and the need to find food for the animal having reached the final destination.

Figure 1: Vehicle operating costs assuming a 10km distance and varying levels of demand



While the ox cart is one of the more common modes of animal transport there are many other animals which can be considered. These include donkeys, mules, horses, camels and even elephants. These animals can be used in conjunction with a cart or as pack animals. Horses maybe considered where speed is important, pack donkeys for poor quality mountain paths and a camel and cart for high load capacity.

Figure 2: Vehicle operating costs assuming a 50km distance and varying levels of demand



The manufacture of the farm vehicle is described in Box 2 as a cost effective alternative to the pickup. The vehicle is roughly a third to a quarter of the cost of a conventional pickup, a similar load capacity, is very simple to repair and maintain and suitable for local manufacture. As such the vehicles operating costs are lower than other conventional vehicles over a wide range of distances and loads.

Box 2: Local manufacture of power tillers and farm vehicles

There are some 80 factories producing power tillers and farm vehicles in Thailand at the moment and despite fluctuating demand due to variations in producer prices, the success of this industry is set to continue. In both cases the vehicle chassis' are manufactured in the factory, while the rest of the vehicles is made up of second-hand conventional vehicle parts, new conventional vehicle parts and parts that are assembled in the factory. For example, it is now common for the transmission mechanism in the power tiller to be assembled using gears that have been imported from China. The result is a vehicle that is cheap to buy, easy to maintain and easy to find and replace spare parts.

Power tiller specifications

	Thai Manufactured Chassis	Japanese Manufactured Chassis
Gear Box	Welded case of mild steel - heavy but easy to repair.	Cast iron case.
Transmission	Sprocket and Chain - cheap and easy to maintain.	A compact gear system.
Clutch	Four teeth at right angles to each other - the wear is greater but they are cheap to make.	Multi-teeth dog clutch.
Brakes	No. Must disengage the transmission to stop.	Yes. Drum brakes.
Power Take Off	No.	Yes.
Gears	1 - 3 gears.	4 gears.
Dimensions WxLxH (mm)	1,080 x 3,250 x 810	1,080 x 3,250 x 810
Engine	8 - 11.5 hp	8 - 11.5 hp
Price - Chassis Engine	B11,000 - B15,000 B23,000 - B29,500	B25,500 B23,000 - B29,500

In addition, the factories provide after sales support so that the farmers have a guarantee for reliability. For example, a power tiller factory in the Sukhothai province provided a 3 year warranty for faulty parts and labour costs. They also had a service vehicle that travelled around the villages providing doorstep service. Their production had increased from 1000 to 2000 units in a year.

Farm vehicle specification

Chassis	Manufactured at the factory from general steel
Rear Axle	From Toyota pickup, brakes are replaced but nothing else is done.
Suspension	New suspension from Izuzu pickup for the rear (very hard) and new suspension from Toyota for the front (softer).
Transmission	From an old Toyota pickup, it is checked over and has new transmission oil.
Electric's	Built up in the factory.
Tyres	Goodyear 6.00 - 14 Nylon 6 ply rating.
Dimensions WxLxH (mm)	1,560 x 2,700-3,500 x 2,160
Engine	8.5-16hp supplied with or without engine
Cost - Chassis Engine	With cab - B66,500 No cab - B40,000 With cab - B86,500 No cab - B60,000

Exchange rate 1993: US$1 = 24.5 Baht

Tractor based technology is often forgotten as a means of rural transport, associated instead for its role in agricultural preparation or as a vehicle for haulage in labour intensive road works. However, the evidence from many countries is that the tractor is used for rural transport tasks, sometimes up to 100%, and that these tasks are often the most profitable for the operators. One of the major constraints to conventional vehicles in SSA is the inability of the operators to maintain high utilisation throughout the year because of the seasonal nature of demand. This is where the tractor has a big advantage because there are a number of activities in which they can engage including agricultural preparation, transport tasks and haulage as part of road construction and maintenance works.

The quality of infrastructure is not a constraint to tractor operations, the technology is relatively simple and the load capacity is high. A study in Malawi found that a tractor and two trailers could be operated more cheaply than a conventional truck over distances of up to 40 kms (Cheesman, 1990). On poor quality roads speed is not an issue and the provision of a second trailer means that the second trailer can be loaded as the first is being transported.

Another vehicle which performs well over both 10 and 50km is the power tiller and trailer. This vehicle has often been discounted for use in SSA because of its poor performance with ploughing in hard soils. However, in irrigated areas or in areas of high rainfall it is possible to maintain high levels of utilisation with these vehicles. The power tiller is truly multi-purpose, it can be used for ploughing, transport, pumping water, threshing and electricity generation. At lower levels of demand the power tiller is much cheaper than the tractor because of its lower capital costs. It provides the ideal step between draught animal power and conventional tractors.

5. SUPPLY, DISTRIBUTION AND MAINTENANCE SYSTEMS

The low adoption of IMTs in Sub-Saharan Africa is related to problems of availability and supply. Clearly there is a 'chicken and egg' situation, with a vicious circle of low demand and low supply. There are many examples where the creation of improved supplies (of carts, axles, bicycles or donkeys) has stimulated demand and lead to more rapid adoption.

In order to increase availability, it is necessary to identify the limiting factors. These may be components and raw materials (local or imported), manufacturing/assembling facilities and skills, IMT designs, capital availability and/or marketing systems. Each one of these may have to be addressed.

In some cases, shortage of supply can be overcome by training artisans or workshops to make the IMTs. In many cases, technical training is not enough (see Box 3). Technical training may need to be combined with credit and/or training in marketing, the management of small businesses and the establishment of stocks of raw materials.

In many cases, the problem of supply may be linked to the low purchasing power of the users. Suppliers will not invest in manufacturing or stocks if they do not believe there is an economic market (as opposed to a felt need). Such situations may be over come through credit provision, income-generating schemes (eg, labour-intensive road construction) or possibly subsidies.

Box 3 Training artisans to make IMTs: training may not be enough

Katopola Agricultural Engineering Centre (KAEC) near Chipata in Zambia provided services relating to vocational training and rural structures. During the 1980s, the Sida (Swedish International Development Agency) provided nine years' funding including the services of Swedish personnel. The Vocational Training Section aimed to train male and female school leavers and upgrade rural carpenters, metal workers and blacksmiths. It offered courses on the making of IMTs and farm implements, blacksmithing and rural technology for women. During the final three months of the six-month woodwork course, participants were taught how to make wooden ox carts, push-carts, wheelbarrows and farm implements. In the initial six years, none of the course participants trained went on to manufacture the heavy wooden carts and wheelbarrows they had been trained to make. Most trained carpenters worked on furniture production and house carpentry. KAEC staff were unaware of any rural people actually using the technologies with wooden wheels that had been promoted for several years. However some ox carts with pneumatic tyres were in use. these had been purchased in nearby Malawi.

Some lessons relating to IMT adoption

- The project had no obvious impact on IMT use in the area.
- The project had predetermined the IMTs it wished to promote and did not offer design choices.
- The project addressed one perceived element (shortage of trained artisans) but did not assist in other aspects of the production and marketing prossess (there was also some general promotion of the technologies through the local extension service).
- The wooden-wheeled technologies did not prove popular.
- There was no self-critical or participatory evaluation of progress that might have allowed the project to react to the situation and change its direction.

Source: Starkey, Dibbits and Mwenya, 1991

6. CREDIT AND SUBSIDIES

There is ample evidence that points to the importance of credit in stimulating IMT adoption. Credit is not always essential, and some credit programmes linked to particular technologies have failed. Credit provision may allow users (men and women) to purchase technologies. Just as important can be credit to workshops to fund the cost of manufacturing, or credit to traders/retailers to allow them to stock IMTs and spare parts. The choices of manufacturers, distributors and customers may be distorted if credit is restricted to particular technologies. However, if it is not limited, the credit may be used for entirely different purposes. Distortions may be limited if the credit is made available for a range of transport technologies, although this may favour the 'safe' choices, such as basic bicycles. An example of a successful credit scheme is given in Box 4 from the Bank of Agriculture and Co-operatives in Thailand.

Credit-providing programmes may need to make special efforts to ensure women benefit. This may include making information and application systems easily accessible to women, and ensuring credit and repayment conditions are appropriate.

Subsidies may be used to help introduce new products. However, subsidies do distort markets, and may create problems when they are removed. Particular attention must be paid to ensure subsidies do not create unfair competition. In particular, imported or urban manufactured technologies (eg, motor-based IMTs) should not normally be subsidised when comparable indigenous technologies exist.

7. CRITICAL MASS

The concept of critical mass has major implications for IMT promotion programmes. If a technology is to be viable and quickly adopted, there is a need to establish as soon as possible a 'critical mass' of users. This means sufficient users to make potential adopters comfortable with the idea of using the technology and sufficient users to justify support services (manufacture, sales, repairs).

Box 4: The Bank of Agriculture and Co-operatives in Thailand

In the rural areas of Thailand the most important credit organisation is the Bank of Agriculture and Co-operatives (BAAC) which provides loans for agricultural inputs, farm machinery, farm vehicles and longer term agricultural projects such as plantations. Farmers wishing to qualify for a loan must receive their equipment directly from the BAAC who have a department buying machinery in bulk from manufacturers. This has two main advantages. Firstly it means that farmers can buy their machinery cheaper than from conventional retail outlets and have a guarantee that the quality is good. Secondly the BAAC can ensure that the loan is being used for its intended purpose.

The BAAC provide loans at an annual rate of interest of 12% repayable over 2-10 years. Commercial banks, finance companies and retail outlets charge an annual rate of interest in the range of 20-30%. The traders charge in the region of 5% per month. An official from the BAAC will come around every month to collect repayments whereas traders will only collect their money after the harvest.

The BAAC has a novel way of getting around the problem of security for loans. Farmers who do not have deeds to land or other collateral to secure their loan can form groups with other farmers in their village and they all take responsibility for the loan. In this way if the farmer who has applied for the loan defaults on repayments the whole group becomes liable for his debts. This effectively places the borrower under peer pressure to repay and also gives a considerable incentive to the others to make sure he does, even to the point where ultimately they will repay the loan themselves in order that they do not jeopardise their chances of receiving a loan in the future. In this way the loan goes to an individual but the security is provided by the group. The more formal institutions require conventional security for loans and the traders rely on detailed knowledge of the trustworthiness of their clients.
Source: Ellis and Hine (1998)

Strategies designed to achieve a 'critical mass' may involve a variety of promotional techniques. There may be demonstrations, field days, training, media coverage, advertising and other forms of publicity. The provision of credit to manufacturers, retailers and/or purchasers may prove particularly effective. Promotion may also include some form of direct or indirect subsidy. Direct subsidies tend to distort markets and are unfair to alternative products. Credit is often provided on easy (subsidised) terms. Credit for pre-financing production runs and retail stocks may be an effective subsidy. If production credit is provided on a 'sale or return' basis, the promoting organisation is effectively funding the risk of production or holding stocks. A common form of indirect subsidy involves intensive in-kind support and training from the promoting organisation to the manufacturers, retailers and/or purchasers.

The private sector may try to develop a critical mass of users in a variety of ways. Following product development and optimistic market research results, pilot marketing is attempted. Early promotional attempts may involve advertising, fairs and

events, discounted prices, free samples, goods on trial and linking of products with important personalities and events. Consumer reaction is monitored and evaluated in the pilot area, before wider campaigns are initiated.

One big problem with the 'achieving critical mass' concept has been the great optimism and lack of self-criticism of IMT programmes. The great majority of IMT programmes have concluded that the technology being introduced was highly appreciated by the potential users. They therefore would conclude that the next stage was active promotion to achieve critical mass. The programme optimism applies to clear successes (donkey carts in West Africa), technologies of unproven status (cycle trailers in Sri Lanka) and IMTs that appear to have been rejected ('Flintstone' carts, wheeled toolcarriers, wooden wheelbarrows, cycle trailers in India). Many people involved in these technologies have blamed the 'failure' not on the technology, but on the lack of effective marketing and promotion.

If all these technologies had opted for achieving critical mass, it is likely that there would have been some expensive 'failures'. Some technologies may have been adopted or adapted. In any case, overall progress may well have been faster if there had been quicker adoption of some technologies and faster realisation that other technologies were not appropriate.

8. PROGRAMME FOCUS AND PRIORITISATION

IMT programmes must undertake thorough 'market research' in order to understand the needs, wants, preferences, priorities and purchasing power of the diverse users in their target groups. Priorities should be set in terms of specific target groups (eg, disadvantaged rural women) and programmes based on the special requirements of such groups. A distinction should be made between access and ownership, noting that for some target groups access may be sufficient. Once suitable technologies have been identified, promotional activities should be carefully targeted, in terms of area of intervention and beneficiaries.

With innovative technologies, there may well be a case for commencing work in areas/conditions where adoption is most likely. The idea would be to establish the technology firmly under favourable conditions, before trying it in conditions where the physical, socio-economic and infrastructural environmental conditions may be less auspicious. What constitute favourable conditions will depend on the technology. Favourable conditions for IMT use are likely to include centres of trade and population, with transport demand and income-generating prospects. In many circumstances, men are more likely to be the first adopters. It may seem strange to assess an IMT designed to relieve rural poverty under more favourable conditions, but in some circumstances it may be a pragmatic early step. Once a technology has become well-established near a local or regional market, it should be easier to introduce it into outlying villages, and then to more remote ones.

9. GENDER

Transport studies have shown there is not only gender inequality in the transport burden, but also in the interventions designed to alleviate that burden. IMT promotion programmes must ensure there is gender-disaggregated data relating to rural transport problems, needs, priorities and programme impact.

Integrating gender into IMT strategies requires ways of identifying gender differences in transport needs and priorities as well as ways in which the gender inequalities in transport interventions can be addressed. There is a need to involve women and women's perspectives in decision making processes concerning transport policies and IMTs initiatives at national level, at decentralised regional level and within communities. IMT programmes should make a point of involving women. They should work closely with local organisations that target women and provide innovative information provision systems and credit arrangements for women. IMT programmes (public, private or NGO) should aim to address gender imbalances in IMT adoption and use, and this involves more than being 'gender neutral'.

For some IMTs, there are differences in the design requirements for women and men users. Since the market for IMTs has been dominated by sales to men, there have been few economic incentives to produce designs more appropriate to the needs of women. IMT programmes may wish to address this issue, and help create a 'critical mass' of women users that will justify the manufacture and sale of suitable IMT designs.

10. MONITORING AND EVALUATION

Self-critical monitoring and objective evaluation are fundamental to the success of any programme to develop and/or promote the use of IMTs. In the past, there has been clear evidence of enthusiasm for particular technologies running into 'hobbyism', lack of objectivity and irrational optimism in the face of disappointing adoption patterns. Such problems may be overcome through mechanisms that include potential users (of different genders, status, purchasing power, etc) and other interested parties in programme planning, monitoring and evaluation procedures. Methods need to be developed to enable programme staff to understand the viewpoint of the diverse users. The various stakeholders must be allowed to talk honestly about their needs and concerns and realistically about their willingness to buy or use certain IMTs. This 'attitude' information needs to be regularly cross-checked with objective information from actual sales and use patterns, and any discrepancies investigated at an early stage.

Regular objective evaluation is also vital. Many programmes and individuals fear the potential for criticism that may come with external evaluations. Sympathetic evaluators are often selected. This may be more comfortable in the short term, but restricts the potential for learning and programme changes. Self-evaluation, aided by an independent external person, can be useful and may involve both programme staff and key/representative stakeholders. If someone from an IMT project in another country assists the evaluation, the learning process may benefit two programmes simultaneously.

The lessons from evaluations should be documented and widely shared (see Box 5). Many of the positive and negative IMT lessons shared in this paper have been

identified through the circulation or publication of evaluation reports. More lessons could be learned more quickly, if there were more open and rigorous evaluations. The sharing of both successes and failures is an important networking function that speeds up learning and progress for all concerned.

11. NETWORKING AND INFORMATION EXCHANGE

The record of inter-institutional information exchange and collaboration in the field of rural transport and development has been good. The strong links between IFRTD, ITDG, IT Transport, ILO, World Bank have resulted in knowledge sharing and synergetic programme development. However, the field has tended to be dominated by anglophone experience. This seems to have been reflected in what may prove to have been a disproportionate interest in certain IMTs (eg, wheeled toolcarriers, 'appropriate technology' carts, cycle trailers, some wheel making technologies).

Box 5: Cycle trailers in India: what happened and why?

India has a huge number of bicycles and cycle-based transport technologies. Bicycle production is about ten million a year and there are about five million cycle rickshaws in use. All towns and many villages have small workshops capable of servicing cycle technologies. Entrepreneurial activity in the small-scale manufacturing sector is high. The environment and infrastructure would appear ideal for supporting cycle trailers, provided there was an economic demand for them.

1987: "Popular demand for the IT Transport-designed cycle trailer has prompted an engineering company in Andhra Pradesh to take up production. . . The cycle trailer is proving very popular for a wide range of agricultural and small business uses. Sale of the first batch of 100 has generated substantial interest from a number of NGOs".

1988: "Cycle trailer manufacture accelerates in India. Some 200 units are now in circulation. Most users report considerable savings on transportation of goods associated with businesses, as well as improved convenience and speed, in comparison with other available methods of transporting goods. A promotional campaign to make the cycle trailer more widely known to potential users has started."

1990: "The cycle trailer … developed by IT Transport and tested in partnership with organisations in India ... is well established in four states: Andhra Pradesh, Uttar Pradesh, Bihar and Tamil Nadu."

1992: The Water Development Society (WDS) in Andhra Pradesh had been training small-scale cycle trailer manufacturers. The Council for Advancement of People's Action and Rural Technology (CAPART), a Government of India body involved in technology transfer had provided funding for this. CAPART however considered the cycle trailer project had been a failure, primarily because it was a "weak technology". The various partner organisations (WDS, MACE, IERT) were not actively networking with each other. They considered the lack of success was mainly due to lack of programme coordination (by IT Transport), competition from cycle rickshaws, lack of marketing and too much individualism/hobbyism. The trailers were relatively expensive due to costly jigs and fixtures. The target group of users lacked purchasing power and credit, making the market outlook poor. There were no large-scale production and marketing initiatives.

1999: The external organisations involved in the funding and implementation of the Indian cycle trailer initiative during the 1980s were unaware of the present situation. There appeared to be no recent reports of significant on-going manufacture or of widespread or sustained adoption.

Some lessons relating to IMT adoption

- There should be many valuable lessons to learn from the attempts to introduce cycle trailers into India, but there appears to be insufficient accessible information to allow this.
- There is a need to follow-up and evaluate IMT programmes, and share the lessons learned.

Source: IT News, 1987, 1988, 1990; de Silva, 1992.

Although indigenous experts have implemented most national IMT programmes in Africa, international programmes have been slow to build on African expertise. The IMT experts' meeting for which this paper has been prepared should help identify

ways of increasing the influence of African experts in planning and implementing national and international programmes relating to IMTs.

Some national networks (transport forums, RTTP steering committees) have been formed, and these should play important roles in both information exchange and policy development. Continued strong national and international networking is required, with increasing emphasis on inter-African networking and honest exchanges concerning the success and failure of IMT initiatives.

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