



Rural Transport for a Greener Future

Current research and advocacy on the links between transport and the environment focus heavily on urban transport, the reduction of greenhouse gas emissions and the need to cure existing and ongoing environmental damage. Transport planners are yet to fully embrace environmental issues from a rural perspective, despite the impact that urban transport development has already had upon rural environments through the construction of transport infrastructure and the transfer of polluting technologies.

If the prevailing rhetoric in sustainable transport debate continues to concentrate on cure alone, for example environment related funding is usually prioritised according to the potential for reducing emission levels. We will lose the opportunity we now have to prevent rural areas from directly replicating the environmentally damaging transport systems that were developed in our cities.

Already while activists lobby for minimum standards for vehicle gas emissions in big cities, little attention is paid to the provincial towns and urban centres that link to rural areas. The use of second hand vehicles, removed from urban areas due to the strict measures taken by urban authorities to ensure smoke free cities, has become a real problem. The demand for motorised public intermediate means of transport (IMT) is increasing in rural areas, particularly in Asia and Latin America, with many African countries catching up fast. This adoption of IMTs is important for the increased mobility of rural communities, connecting them to markets and services and opening up livelihood opportunities. However motorised IMT use in rural areas should be encouraged or given incentives to use environmentally friendly fuel alternatives such as re-chargeable DC electricity and gases such as Compressed Natural Gas (CNG) or Liquefied Petroleum Gas (LPG). The article on page 3 charting the introduction of LPG vehicles in Nepal highlights the need to study all aspects of vehicle conversion to ensure the sustainable application of alternative fuel technologies.

Rural areas are often low density areas in terms of population and conventional transport means are not viable. Non-motorised transport (NMT) modes such as bicycles are commonly used and are environmentally friendly, but do not receive the promotion they justify. The article on page 2 shows how designers are challenging the perception that rickshaw services are outmoded and uncomfortable with newly developed prototypes. In urban areas they have been able to demonstrate to donors the impact of improved NMT design on the modal share of transport service users, highlighting a shift away from polluting transport services. In rural areas where the focus is on



Upendra Shrestha, Practical Action Nepal 2003

Gravity Ropeways in Nepal, an environmentally and economically viable alternative to roads in mountainous areas.

preventing the drift from NMTs to more 'modern' motorised vehicles it is not so easy to demonstrate a tangible reduction in environmental impact

Rural road construction can in no way be compared to the environmental damage caused by expressways and highways, but extreme caution should still be taken to preserve the existing environment particularly in mountainous and hilly areas. Rural access roads are mainly gravel or earth surfaced and a lack of knowledge about how these roads should be constructed and maintained, combined with deforestation, leads to land erosion and in some cases land slides. The relevant authorities often fail to mobilise community involvement, and where this does occur sufficient steps are not always taken to raise awareness of environmental aspects pre and post construction. For example it is commonly seen that communities living in hilly areas will make their own footpaths from their homes to the nearest road and these footpaths become small streams during the rainy season. Rural roads constructed by communities without technical support with regard to drainage, will face similar environmental hazards.

The development of traditional waterways and gravity ropeways in isolated rural areas are both environmentally sustainable, energy efficient

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The Modern Cycle Rickshaw – a Sustainable Solution

Alongside the search for sustainable modes of transport that will reduce the global dependency on fossil fuels, is a rising trend among Asian governments for eliminating the use of cycle rickshaws in a false endeavour to create a more 'developed' way of life.

Despite a massive modal share in Delhi with 300,000 cycle rickshaws making on average 1.5 million trips per day and directly or indirectly supporting around 2 million people, government agencies are banning cycle rickshaws from more and more streets. One can imagine the disaster that could ensue were all these trips to shift to polluting motorised modes.

Part of the reason why cycle rickshaws are not favoured by local authorities is due to their antiquated, unsafe and uncomfortable image. Cycle rickshaw design has remained unchanged in 50 years and the lack of infrastructure for non-motorised vehicles exacerbates their reduced patronage. In 1999 the Institute for Transportation and Development Policy (ITDP) in association with some Indian organisations, undertook to develop and promote a modern cycle rickshaw that could demonstrate the possibility of growth of this traditional mode of transportation as a counter to the growing menace of motor vehicle pollution. Grants were provided by the United States Agency for International Development and other donors.

Three years of work involving non-motorised vehicle designers and the local community, produced the modern Indian cycle rickshaw. It involved the participation of all people involved with the rickshaws – rickshaw drivers, passengers, manufacturers and assemblers, and others such as tourists. Participation by local small scale industry played an important role in its success. The design process kept in mind how the new design could be incorporated with ease into the structure of the existing rickshaw industry.

The weight reduction of over 30% by means of an integral ergonomic tubular frame and an optional multi-gear system, results in less stress and exertion for the rickshaw driver. Independent surveys show that they can work for one third longer and increase their earnings by up to 50%. The comfortable passenger seating, easy step-in, luggage space, and jerk-free ride entice more and more passengers to opt for the new rickshaws as their preferred mode of transport.

The modernised rickshaw sells for around US\$100–110 which is on a par with the prices of the traditional rickshaw but with the advantage of a much longer life (expected to be three times more durable) with lower maintenance and repair costs. The new design retains most of the basic features of the traditional vehicles. This assists not only with commercialisation and acceptability but means that components in good condition from the old vehicles can be refitted on the new structure reducing the cost of upgrading.

The new vehicles have restored a sense of pride to the cycle rickshaw profession. Rickshaw drivers enjoy a new economic status with improved earnings. Driving a rickshaw gives a moderately better income than day-labour jobs available to generally unskilled workers. The working conditions are healthier than alternatives such as working in unsafe, dark factories with exposure to health and safety hazards.

There were more than 25,000 of these modern vehicles on the road within 2 years of their commercial introduction, and the local industry is constantly evolving the design to suit local conditions and socio-cultural requirements.

Our survey in Agra city where the modern rickshaws were first introduced showed that 40% of the trips (up to 48% in the Taj Mahal area) were attracted away from motorised modes, making the project's greenhouse gas emission reduction impact quantifiable. Cycle rickshaw technology in India has already proven to be a more cost effective way of reducing emissions than projects promoting electric and other alternative fuel vehicles. The project cost \$300,000 as against a projected subsidy of \$2.240 million for electric buses needed for tourists to the Taj Mahal. There is no operating pollution from rickshaws compared to pollution (thermal power production) from battery buses.

It is possible to quantify the emissions reduction benefits of this type of project, and it is possible to convince open-minded funding agencies that modernising human powered vehicle technologies is a more cost effective method of reducing greenhouse gas and other emissions than electronic and alternative fuel vehicle promotion projects.

The beneficiaries of these projects are among the lowest income populations in the world, contrasting markedly with the beneficiaries of alternative fuel vehicle promotion projects, where the beneficiaries in the long run are likely to be multi-national corporations. Governments and municipal authorities prioritise expensive projects over more cost effective solutions such as busways and non-motorised transport improvements. For this reason it is critical that such projects find political support among the increasingly vocal environmental and bicycle advocacy community.

With inadequate public transport services and the daily commuting needs of millions of people, rickshaws offer affordable and clean mobility. They provide an extremely smooth sub system in the web of transportation in small and large cities, hundreds of towns and thousands of villages. Cycle Rickshaws are here to stay for a greener tomorrow.

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Join the SUSTRAN Email Discussion List

Join the worldwide debate on transport and the environment. The Sustran-Discuss email list is an email discussion list devoted to people-centred, equitable and sustainable transport with a focus on developing countries. Sustran-Discuss was established in 1996 by the SUSTRAN Resource Centre in Malaysia to provide information and networking services for the Sustainable Transport Action Network for Asia and the Pacific.

To subscribe visit: <http://www.geocities.com/sustranet/>

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and cheaper alternatives to road construction. The article on page 3 makes a comparison of the energy efficiency of water and road transport.

There is a need for the transport sector to examine environmentally sustainable transport from a rural perspective; to promote the development of improved NMT design, to transfer lessons learnt in urban areas and to lobby for the same standards in emission control that are increasingly demanded in cities. It is important that we demonstrate that prevention is as important as the cure.

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See 'About Us' box on page 4

Yogyakarta to host BAQ 2006

The 5th Better Air Quality (BAQ) workshop will be held in the third week of September in Yogyakarta in Central Java, Indonesia. The Indonesian Forum for Rural Transport and Development, an affiliated network of the IFRTD, is part of the organisational team for the event. The theme is "Celebration of Efforts" to highlight the success stories that Asian countries, cities and communities have achieved over the last years in addressing air pollution while at the same time highlighting the efforts that are still ahead in improving air quality in Asia.

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LPG Vehicles Fail to Show their Cleaner Face

When Liquefied Petroleum Gas (LPG) vehicles were first introduced to the streets of the Kathmandu Valley they failed to show the cleaner face they have revealed in other parts of the world. LPG vehicles are known as a cleaner more environmentally friendly option and recognising the need to address smog levels the Government of Nepal gave incentives to vehicles that run on alternative fuels.

In 2004 there were about 1000 LPG driven three and four wheelers, primarily used for mass transportation, in the Kathmandu Valley. These vehicles were introduced following the establishment of government incentives for vehicles running on cleaner fuels such as gas or electricity. The government also commissioned a study to monitor emissions from these vehicles and the study revealed that the vehicles were actually emitting Carbon Monoxide (CO) as high as 3.7% (The standard for petrol vehicles is 3%) This was reduced to 1.5% when the engine oil, filter, spark plug and air filter were all changed. The government then allowed the import of LPG vehicles under the tag 'clean vehicles' with a 99% custom waiver and 100% VAT exemption while importing.

Unfortunately the incentives overlooked the fact that without the proper use of engine oil, filter, spark plug and air filter the LPG vehicles were in fact worse polluters than standard vehicles. After almost 4 years of use people started questioning the financial incentives provided to LPG vehicles and the 'clean vehicle' label they had been given. A group of environmental organisations checked the tail pipe emissions from the vehicles and found that more than half of the vehicles tested could not pass the government standard. Out of 20 tested LPG four wheelers 55% did not pass the standard for CO (the standard is 3% by volume for CO for both four wheeler and three wheeler LPG vehicles). Similarly 54% of the three wheelers failed the CO test. The Hydrocarbon (HC) test for four wheelers showed that 33% failed the

emission test. The emission limit for HC is 1000ppm for four wheelers and 7800ppm for three wheelers.

Following these results there were various assumptions about the failure of LPG vehicles to provide a cleaner alternative. Experts blamed the conversion kits and composition of the LPG to be the main cause behind the failure of the vehicles to pass the emissions tests. Although the government provided incentives to these so-called cleaner vehicles it failed to monitor the activities around the vehicles. The government was not aware of the types of conversion kits being used. Another negative externality of the incentives for LPG vehicles was that they used the same LPG that is used for cooking purposes. The sudden rise in LPG vehicle use created a shortage in LPG supply and there was an outcry from household users. The LPG used for cooking has been subsidised by the government of Nepal for the general public and the vehicle owners were enjoying this subsidy for commercial purpose.

After strong lobbying from the environmental groups the government decided to remove the 'clean vehicle' tag from the LPG vehicles and abolish the incentives. Now the LPG vehicles have to pass an emission check in order to receive a green sticker. The vehicles now use original cylinders and two separate fuelling stations have been provided.

Although LPG vehicles did not originally fulfil their 'clean' potential there is still plenty of scope for them. Air pollution remains a major concern for the Kathmandu Valley and vehicles are the number one polluters. With a proper mechanism to ensure that the composition of the LPG is favourable for use in vehicles and that the original conversion kits are used, LPG vehicles can still provide an environmentally friendly alternative to polluting petrol vehicles.

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Water Transport and the Environment

Transport by water is transport in sympathy with the environment. It is a transport system which utilises the existing natural infrastructure of rivers and waterways, minimising the impact on the environment, in marked contrast to the effects of building roads. In many parts of the world people traditionally live alongside rivers, using them not only as a means of transport, but also a source of livelihood and cultural identity. Improvements in water transport can improve access for these people, who are often poor and marginalised, without the negative environmental impacts or high costs of providing road access.

Water transport can also be much more energy efficient than road transport. Figures published by Inland Navigation Europe reveal that energy use per ton-km is almost one third of that by road transport. The Asian Development Bank calculates an even greater difference of a factor of four. Comparable reductions in CO₂ emissions are achievable and as there is generally less congestion on waterways, the overall ratio may be higher still when the every day realities of transport are factored in.

These figures apply only to the actual energy use in the vessels or vehicles. When road construction (an energy intensive process) and other externalities are taken into account, the advantages of water transport are even greater. Figures published by the European Union show that the marginal external cost of road transport is six times that of water transport. When we also consider social factors such as accidents and noise, and the environmental impacts from pollution, we can see that the environmental benefits of water transport far exceed the simple comparisons given above.

Asian Development Bank figures indicate that the cost of developing inland waterways is about 5–10% of the cost of developing an equivalent four-lane expressway or railway. This difference in costs translates into differences in environmental impact

– when roads are built land has to be cleared, material quarried or brought in, all of which require energy and leave scars on the landscape. In countries such as Bangladesh, waterways frequently present a barrier to road building, and when roads are built they can obstruct waterways, not only impeding navigation, but also aggravating flooding and reducing the rate of drainage afterwards.

Roads also present barriers to wildlife and can lead to damaging environmental fragmentation, whereas waterways provide wildlife corridors and represent a habitat in themselves. To make the best out of water transport it is sometimes necessary to make changes to waterways, but these changes are generally minor and may involve actions such as localised deepening of the river bed or construction of landing facilities to provide better access to the river bank. The original environmental corridor represented by the watercourse can be maintained.

Many of the poorest people in developing countries tend to live in low-lying, flood prone areas which are environmentally fragile and particularly vulnerable to the adverse effects of road construction. For them, water transport provides a means of access to public facilities and markets, without which they will have little option but to join the drift to urban centres, with all its attendant environmental degradation. Water transport is thus a means of helping people to maintain and build sustainable lifestyles in rural areas. With minor improvements it can continue to serve their needs while remaining sensitive to the environment.

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More information about Waterways and Livelihoods is available at <http://www.ruralwaterways.org>



News and Events

Post-disaster Guidelines

The Lanka Forum for Rural Transport and Development (LFRTD) has launched the new publication 'Guidelines for Re-building the Rural Transport System Destroyed by the Tsunami'.

In tsunami ravaged Sri Lanka the initial phase of relief grants to Tsunami victims has given way to reconstruction and rehabilitation. However, there are no acceptable technical standards or approved methodologies for the local and international organisations involved in these efforts.

The Guidelines have been developed for use by organisations active in the field of post-disaster reconstruction and rehabilitation in developing countries.

The Guidelines can be downloaded as a three page document at: <http://www.ifrtd.gn.apc.org/new/lnfgs/srila01.php>

Or by contacting the LFRTD Secretariat:

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trips to waterway dependent communities put workshop discussions into context and interesting points of debate included:

- The positive and negative impacts of regulations on small boat users
- How to influence policy makers
- The context of decentralisation
- Environmentally and economically viable boat technologies. In particular the potential for introducing Longtail and diesel engines in Latin America (Longtails are already in use in Peru as the Peque Peque).

Participants made personal commitments to take the issues discussed forward in their work and to form a community of practitioners interested in issues of rural water transport in Latin America.

The workshop was co-funded by SIDA and DANIDA, and hosted and organised by the DANIDA team in Bluefields.

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The workshop report is available at <http://www.ruralwaterways.org/>

Inaugural AFCAP Meeting

On the 29th and 30th of September, the IFRTD regional co-ordinator for East and Southern Africa attended the inaugural meeting of the African Community Access Programme (AFCAP). This is an initiative that aims to improve rural access through the application of sustainable engineering solutions to local problems.

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ILO ASIST Regional Seminar

Between 3rd -7th of October, ILO ASIST Africa, together with the Kenya Roads Board, convened a very successful regional seminar on labour-based technologies for rural roads. The seminar, held in Mombasa, Kenya was attended by over 300 practitioners mainly from Anglo-phone Africa, as well as a host of participants from other parts of the world. The seminar covered such themes as community participation in works programmes, poverty and environmental impacts, policy up-scaling as well as sustainable financing.

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Waterways and Livelihoods – A Workshop for Latin America Bluefields, Nicaragua 24th–27th October 2005

This IFRTD regional workshop, initiated as part of the International Waterways and Livelihoods Programme, attracted participants from community level organisations through to local government, across the region. Unexpected participants also included the Vice-Mayor of Bluefields who stayed to join in discussions after giving his welcome speech, and the Director of the local Port Authority who joined the workshop after meeting participants on their field trip. International participants from Uganda, the UK, and Indonesia shared the findings of the IFRTD's Waterways and Livelihoods Research programme (2002–2003), which have now been fully translated into Spanish.

Over 4 days, workshop participants explored the state of rural water transport in Latin America, highlighting key issues and the potential for change. Small group work maximised opportunities for all participants to share their experiences and forge new collaborative partnerships. Field

New Web Resources:

The Rwanda National Forum Group on Rural Transport and Development has launched a new website <http://www.rwandatransport.net/>

The Waterways and Livelihoods web portal which focuses on issues relating to rural water transport in developing countries is now available in Spanish.

<http://www.ruralwaterways.org/spanish/gen/home.htm>

About Us:

The IFRTD is a global network of individuals and organisations working towards improved access and mobility for the rural poor. It provides a framework for collaboration, information sharing, debate and advocacy that bridges traditional geographic and institutional boundaries.

Membership of the IFRTD is free. All members receive Forum News and any other publications that are made available to the network. In over 20 countries autonomous networks that subscribe to the vision of the international network have become affiliated to the IFRTD as National Forum Groups (NFGs).

The IFRTD is facilitated by a small, decentralised Secretariat based in the UK, Kenya, Peru, Senegal and Sri Lanka.

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