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THE WORLD BANK GROUP WASHINGTON, D.C.

TRANSPORT PAPERS TP-10 MARCH 2006

Rural Access Index: A Key Development Indicator

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TRANSPORT SECTOR BOARD

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Published March 2006

This paper has been produced in part with the financial assistance of a grant from TRISP, a partnership between the UK Department for International Development and the World Bank, for learning and sharing of knowledge in the fields of transport and rural infrastructure services.

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TABLE OF CONTENTS

LIST OF ANNEXES

LIST OF FIGURES

LIST OF TABLES

ACKNOWLEDGMENTS

This Technical Paper has been prepared as part of the World Bank's Transport Results Initiative. This is led by the central Transport Unit (TUDTR) and is supported through the trust fund provided by the United Kingdom's Department for International Development under the Transport and Rural Infrastructure Partnership (TRISP) with the Bank.

Access to the results of the many household surveys which were examined from IDA and non-IDA countries was made possible through contact in the respective country teams. We are grateful to them all, too many to be individually mentioned here. However, special note must be given to the extensive assistance given by Pascal Heus and his team working in the Africa Household Survey Databank: Christophe Rockmore, Zena Angesom and Rose Mungai who undertook the major part of the analysis for the countries in Sub-Saharan Africa. Much of the analysis for other countries was carried out by Anuja Saukar.

The modeling to establish estimates of the RAI on the basis of data on rural population, available land area and road network length was carried out by Shyam KC, one of the authors. This work benefited from advice given by John Hine.

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EXECUTIVE SUMMARY

This paper describes the Rural Access Index (RAI), a headline transport indicator which highlights the critical role of access and mobility in reducing poverty in poor countries. The Index is part of the Results Measurement System for IDA 14. It is defined together with the official method of measurement which is on the basis of locally representative household surveys.

Current estimates of the Index indicate that some 900 million rural dwellers world wide do not have adequate access to the formal transport system. Initial values for more than 30 IDA countries show the overall level of access for their rural population to be 57 percent. Within the IDA group access is worst for the Sub-Saharan Africa countries for which the average RAI is 30 percent. For a selection of non-IDA countries the average value of access is nearly 90 percent.

The preferred measurement of RAI is from household survey results. A draft transport questionnaire module is proposed for new household surveys with estimates of the relatively modest resources required to establish and update the measurement. Alternative methods of measurement and estimating techniques are described in case there is no ready prospect of undertaking a suitable household survey.

The challenges for extending and updating the Index are described, together with the resources which have been developed to tackle these. Links are provided to those resources.

RURAL ACCESS INDEX: A KEY DEVELOPMENT INDICATOR

1 INTRODUCTION

1.1 Purpose of the Rural Access Index

The World Bank Infrastructure Action Plan (World Bank July 2003) emphasises the importance of helping borrowing countries to strengthen the collection and use of data in their infrastructure sectors. The World Bank Transport Sector has responded through the Transport Results Initiative [1]. This includes identifying a small number of key diagnostic measures which have particular significance for the sector in contributing to the wider development process. These are considered to be headline transport indicators.

This paper describes the establishment of the Rural Access Index, one of several Transport Headline Indicators endorsed by the World Bank Transport Sector Board in 2003. The index has been adopted for the Results Measurement System (RMS)[2] of the 14th round of the International Development Association (IDA-14) which was launched in July, 2005. The Index was developed in response to the consensus led by borrowers that it identifies an important priority for poverty reduction strategies in view of the established links between physical isolation and poverty. This provides stronger linkage to the Millennium Development Goals (MDG) and better assesses the contribution of IDA assistance to the sustainable development of the beneficiary countries.

The Rural Access Index provides a consistent basis for estimating the proportion of the rural population which has adequate access to the transport system. It can help to inform policies and strategies which ensure that the rewards of development are distributed more equitably to the rural population

1.2 Poverty and Isolation

Physical isolation is a strong contributor to poverty. Populations without reliable access to social and economic services are poorer than those with reliable access. Problems of access are particularly severe in those rural areas which are distant from roads that carry motorized transport services on a regular basis. Roughly half of the world population, and 70 percent in the IDA countries, are rural dwellers (World Bank 2005). On the basis of current values of RAI it is estimated that about 900 million rural dwellers in developing countries, the great majority of them living in IDA countries, are without reliable transport access. The large majority of these people are poor as defined for the MDGs. The lack of reliable transport systems in IDA countries, mainly in rural areas, has compelled household members to spend significant time traveling in order to meet basic needs. Studies in two areas of Tanzania, for example, revealed that a major portion (on average 40 to 50 hours) of the total weekly time available to each household was spent on transport (World Bank 2003). Usually this time burden is distributed inequitably within the household. In this case, women were particularly overburdened, taking responsibility for about 80 percent of the time cost (World Bank 2003)

1.3 Rural Access Index and MDG

Transport is not specifically identified in Millennium Development Goal targets, but it makes key contributions to achieving many of the Goals—underpinning pro-poor growth and improving social inclusion. Surveys show that poor people recognize isolation as a major contributor to their poverty and marginalization. In practice, improving access to transport for rural men and women in low income countries is considered essential to promote rural development, to increase uptake of human development services (educational and health), to facilitate inclusion of different ethnic and other groups, to improve employment opportunities, and to stimulate growth for poverty reduction. Fan and Chan-Kang (2005) examined the factors which contributed to the exceptional growth and to the reduction of poverty in China during the past thirty years. They concluded that, whilst the rapid introduction of the expressway network did play a part, the much shorter lengths of low standard feeder roads made an even more important contribution to growth and poverty reduction, achieving about four times greater benefit/cost ratio than did the expressways. Similarly Gannon and Liu

[1] www.worldbank.org > topics in development > transport > transport results measurement

[2] The RMS involves measuring a set of indicators which capture key aspects of the development of 81 countries which receive IDA concessional assistance (IDA, 2004).

(1997:11) contend that improved transport contributes not only through enabling better access to services and opportunities, but also by lowering the transport costs incurred in delivering and/or accessing such services and opportunities.

1.4 Equity and Development

The Rural Access Index also helps to address the issue of equity which is an increasing focus of the international development community. The World Development Report (World Bank 2005) explores the relationship between equity and development strategy and makes the issue of equity central to "poverty-reducing" development. A previous World Development Report points out that the affordable access to services is especially low in many of the poorest countries, with poor people needing to travel much further to reach basic services such as health and education, than richer people in the same country (World Bank 2003) As an example, the Report notes that in rural Nigeria, children from the poorest quintile of the population need to travel more than five times farther than the children in the richest quintile to reach the nearest primary school.

1.5 Impacts of Rural Access

Change in rural access has differing impacts on various sections of the population. In particular, the socioeconomic impact of increased access differs by gender, by age groups, by different caste/ethnic groups, and by income. For example, improved access potentially increases men's migration, and may result to increased workload on women in the farm and household. Similarly improved motor access brings consumption goods nearer to households, but affects rural artisans and those residents whose livelihoods depend upon portering. For policy makers, this underlines that transport interventions often need to be coupled with complementary policies if all socially and economically disadvantaged households are also to reap the benefits of improved access.

1.6 Conceptual Shifts

The Rural Access Index helps to address the issues mentioned above by changing the way the outputs of investment in the rural transport sector are measured. The shift in the form of measurement is threefold—what to measure, where to measure and how to define what is being measured. The indicators which have been generally used to report progress in the transport sector have been based on characteristics of the road network such as the length or density of different categories of roads (paved and gravel roads, urban, feeder roads and national highways, etc). Such measures do not give a clear picture of the transport access level available to the rural population since they do not relate the provision of transport facilities to the location of the target population. Thus the first important conceptual shift has been to measure the accessibility of the target population to the road network, rather than simply some aspect of network size.

Corresponding to this has been the second conceptual shift, which is in the measurement units used to study the impacts of changes in transport infrastructure. Thus, rather than focusing on an administrative unit and assuming that all households within the unit have the same level of access to the transport network, the definition of RAI enables more detailed measurement - that is, at the household level. This approach can capture how access to transport services relates to household characteristics.

The third shift is that the definition of the index provides a common international basis for understanding rural access as it relates to transport. However, detailed interpretation of the RAI for any country must be set in the local context.

Further, by providing information on rural residents' differential access to the all-season road network, the RAI helps planners to devise policies and programmes to meet specific rural access objectives. RAI thus provides an objective basis for governments to set transport sector goals, and to establish investment priorities for improving rural access.

1.7 Definition of RAI

In practice the RAI measures the number of rural people who live within two kilometers (typically equivalent to a walk of 20-25 minutes) of an all-season road as a proportion of the total rural population. An "all-season road" is a road that is motorable all year round by the prevailing means of rural transport (typically a pick-up or a truck which does not have four-wheel-drive). Occasional interruptions of short duration during inclement weather (e.g. heavy rainfall) are accepted, particularly on lightly trafficked roads.

Some sections of the population (the elderly, the disabled or those carrying heavy burdens) may find that even distances of less than one kilometer present a significant barrier to access, particularly under extreme conditions of terrain or climate. On the other hand, in many remote situations (such as the hills of Nepal or remote areas of rural Africa) people may be accustomed to walking many kilometers in order to reach formal transport services. Alternatively they may manage without using such transport at all. The choice of two kilometers as the defining distance for 'adequate access' is a compromise between these extremes. This establishes a consistent definition of the Index, enabling comparison and aggregation (on the basis of population weight) of the values for target populations.

The specific emphasis given to roads in the definition of the index reflects the importance of road transport for improving rural access for the great majority of rural people in most low income countries. In those situations where another mode, such as water transport is dominant the definition can be modified to reflect that. If this is done, then the fact should be explicitly recorded against the resulting RAI value.

2 RURAL ACCESS INDEX

2.1 Values and Aggregates

Results for 32 IDA countries,[3] representing 88 percent of the total rural population in all IDA countries, show that on average 57 percent of rural dwellers has access to the transport network. The graph also shows a significant difference between 'IDA' and 'IBRD' countries. For ten non-IDA countries (for which suitable household survey results are available) the RAI value is much higher at 93 percent (Figure 1).

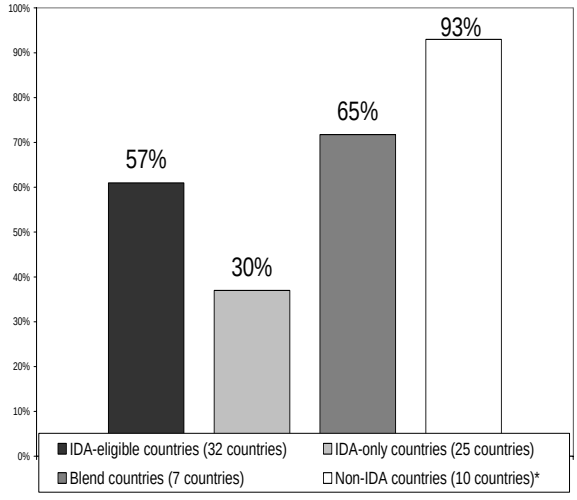
For sixteen IDA countries in the African region, representing 58 percent of the total rural population of the region, the aggregate RAI is 30 percent. For four IDA countries in the South Asia region, representing 96 percent of the total rural population of the region, access is 65 percent.

[3] Albania, Azerbaijan, Bangladesh, Benin, Burkina Faso, Burundi, Cambodia, Cameroon, Chad, Ethiopia, Gambia, Ghana, India, Indonesia, Kenya, Lao PDR, Madagascar, Malawi, Mali, Mongolia, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Papua New Guinea, Tajikistan, Tanzania, Uzbekistan, Vietnam, Yemen, Zambia.

Amongst the IDA countries there is also a significant difference between those which receive blended assistance (aggregate average of 65 percent) and those which do not (aggregate average of 30 percent). Thus, increasing the number of rural people with sustainable access to rural transport is expected to be very significant for the development of lower income countries.

The Rural Access Index is designed to respond to borrowers' priorities and to be measurable for a 'critical mass' of IDA countries. In establishing this indicator, therefore, priority has been given to the countries with the highest populations so that the 32 countries for which RAI has been established represent 88 percent of the total rural population of IDA countries. Priority has also been given to those countries with the larger land areas for which rural access is likely to be particularly relevant. A two page summary of the RAI is presented in Annex I, and the current, endorsed values of Rural Access Index by country, showing the source and year of survey with the current rural population are given in Annex II.

Figure 1. Rural Access Index: Aggregate Average for IDA Countries.



*Including estimate of 97 percent for RAI from Government of People's Republic of China.

2.2 Sensitivity to Change

The RAI is designed to capture changes in rural access as a result of development in the transport sector. Relatively small improvements in access to an all-season road have marked impacts in terms of improving the overall indicator results. However, to date there are only a few countries for which we

have for more than one set of household data results to determine in detail how the RAI changes over time.

An analysis of preliminary measures for Vietnam with time-series data (during the period of 1997-2002) indicates the sensitivity of the indicator to change over time. In Vietnam, RAI has increased from 73 percent in 1997 to 76 percent in 2002. Both figures are based on data from the Vietnam Living Standards Survey (VLSS) which is modeled on the LSMS. They indicate a clear increase in rural access equivalent to an average rate of improvement of about half a percent per year. This reflects the development activity which responded to the government's priority. Limited time series data from two other countries shows slower rates of change. However, relatively small improvements in access to an all-season road have marked impacts in terms of improving the overall indicator results.

2.3 Measurement and Reporting

The preferred approach to measuring this indicator is by analysis of household surveys that include appropriate questions about access to transport. The aim is to integrate this with the measurement of household characteristics such as income and access to services such as education, health and clean water supply. All of these surveys completed to date which include a suitable question on access to rural transport have been analyzed for the current values of RAI. The design and conduct of such surveys is costly and time consuming. Thus, although this is actively encouraged as an important requirement for all borrowing countries to monitor their progress in poverty reduction, it will take at least two or three years before the results of any new survey will be available. However, there are a number of surveys already established in which a question or short module on access to transport could be incorporated at a modest marginal cost.

Where suitable surveys of households and individuals exist, these are the most cost-effective way of obtaining information on rural access (IDA 2004). The majority of the 32 available IDA country indicators have been established using this approach. Information from Living Standard Measurement Surveys (LSMS) and similar household surveys carried out between 1994 to 2003 has been used for the calculation. Specifically these surveys are Living Standard Measurement Survey (LSMS), Income/Expenditure Household Survey (IES), Poverty Survey (PS) and Core Welfare Indicators Questionnaires (CWIQ). The surveys are designed to produce high-quality data on a variety of key topics and be representative for the main segments of population. Thus, the main subgroup 'rural population' is adequately covered.

With the establishment of the Rural Access Index, there are several key challenges for extending and maintaining measurement of this headline indicator over the coming two to three years.

- Updating the value of the index at intervals of not more than three years or so in each country for which the RAI has been established;
- Establishing a current value for those countries for which the index has not yet been derived;
- Complementing the index with related information which enhances under-standing of its significance.

2.4 Updating

Updates of the indicator will largely depend on the frequency of household surveys. However, only a few of the surveys are carried out on a regular basis. Of the 30 countries where LSMS surveys had been carried out by 2003, for example, 19 countries had only one survey completed until then (World Bank 2003). Even with the emphasis which the IDA-14 RMS and other initiatives place on strengthening data collection in low income countries it will be a slow process initially to increase the number of countries for which the RAI can be based on household surveys.

For this to be done on a sustainable basis, national institutions must be involved and encouraged to take ownership of the processes to measure RAI. In this regard, the Bank is raising awareness in beneficiary countries of the significance of the index for capturing differences in performance between countries. The central Transport Unit is contributing guidance on relevant rural access questions for household surveys to strengthen the effectiveness of the responses. Three consultation workshops on Transport Results held in Nairobi (2004), Washington DC (2004) and Colombo (2005) were able to draw valuable participation from a wide range of governmental, civil and bilateral organizations. These workshops reviewed current experience in collecting and applying core measures and exchanged interim findings in collecting data

and formulating indicators. The overall approach was endorsed in these workshops, including the value of headline transport indicators in general and of the RAI in particular.

Along with involving stakeholders, there is the need to "intensify support within Country Assistance Strategies (CASs) and IDA projects for improving the statistical capacity of member countries and to work in partnership with other agencies to strengthen the international statistics system" (IDA 2004). This includes helping beneficiary countries to develop the capacity to conduct, analyze and report such surveys on a regular basis. It is planned that the Rural Access Index will be reported in the 2006 edition of World Development Indicators.

2.5 Costs to Establish and Maintain the RAI

For countries with national household surveys which include questions that permit RAI to be calculated, the marginal cost of producing the indicator is generally up to one day of experienced statistical input. Where there is a suitable survey which does not include a relevant question, there will be a one-off cost to negotiate, design, test and incorporate such a question. This cost is estimated to be up to a week of technical input (which will probably be spread over a much longer period of elapsed time) in addition to the cost of analysis. Where there is not yet a suitable household survey it will be necessary to estimate the RAI in the first instance by a sample mapping technique as described above. The input for this is estimated to be about one month of analysis for each estimate of the indicator, provided that the necessary data on the location of roads and of the rural population is available. The latter costs may be significantly reduced if suitable data is available in a Geographic Information System.

2.6 Alternate Procedures to Estimate RAI

As the Rural Access Index is incorporated in the IDA 14 Results Measurement System it is important to establish initial values of the RAI for all IDA countries for which no relevant household survey based data are yet available. Where the necessary geographic information system (GIS) or other map data is available this can provide a good estimate of the RAI.

The values of RAI estimated from national household survey results have been supplemented by estimates for some other countries which have been derived by different methods. These essentially involve working with representative sample area data with layers of the road network map and the population map to determine how many people live within the specified catchment of the road network. Sometimes the data is available within a GIS and may be processed electronically. In other cases all or some of the data (usually the location of the roads) may only be available from graphic maps or aerial photographs.

2.7 Estimating Models

In the absence of such data a 'best estimate' of the Index can be made in consultation with specialists having the necessary country experience. In this regard, two methods, namely 'Network Models' and 'Quick Accessibility Mapping', are proposed to arrive at some broad estimates of the Rural Access Index for a given rural population, land area and length of road network. These estimates are provisional and must be replaced once measures are calculated based on household survey results (or GIS data).

2.8 Network Models

Two network models—namely the Random Road Network Model (Hine 1984) and the Square-Grid Model—are proposed to arrive at broad estimates for Rural Access Index. For those countries where we do not know precisely how roads are located in relation to the people, we need to make assumptions about the road network and population distribution patterns. Both models calculate access as a function of the length of road network, habitable land area, distribution pattern of roads and the distribution of population as follows:

$$Access = \mathbf{f}\,[(length\ of\ road\ network) * (habitable\ land\ area) * (distribution\ of\ roads) * (distribution\ of\ population)]$$

The models utilize two of the variables which are most readily available in time series for many countries—the road length and the arable land area. Some assumptions are made about the habitable areas of a country and distribution of roads within the habitable and non-habitable areas. The results of calculations based on these models are given in Annex III.

2.9 Quick Accessibility Mapping

This is a simplified version of a full GIS-based measure. The "quick map" is prepared by overlaying the road map on the topographical country map. The RAI is determined on the basis of an informed approximation for the population distribution of the country in question. One example of such an exercise was carried out in Nepal by overlaying, the all-weather Road Map and Village Development Committee[4] (VDC) map on the Topographical Map of Nepal (Shah, 2004). The population of a whole VDC was assumed to be concentrated at its center on the basis that more than 50 percent of the population is concentrated at the VDC center. Obstacles in the form of hills and rivers, necessary relief for contour and detour distance for river crossings were taken into consideration.

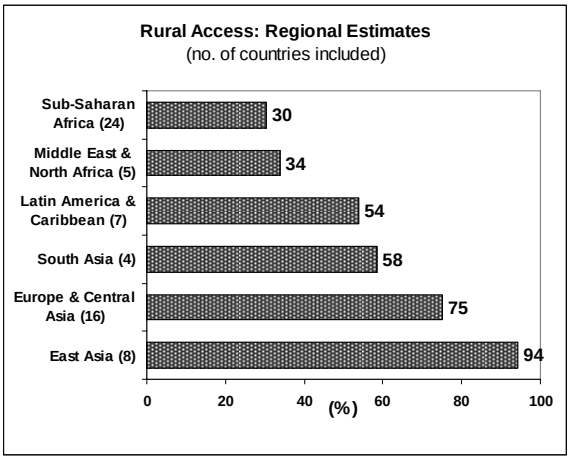
Thus was calculated the percentage of population having accessibility to nearest all-weather road in terms of walking time. Based on this procedure, it was estimated for 2004 that on average 41 percent of the overall population had access to the nearest all-season road within 30 minutes. This compares reasonably with LSMS (2003/2004) estimates of 37 percent of the overall population having access within 30 minutes of paved roads. The quick mapping procedure also showed variation between the access level in the Mountains/Hilly and Terai (flat) regions where this ratio was found to be 28 percent and 56 percent respectively.

2.10 Regional Variations in Rural Access

The RAI values calculated for 32 IDA countries (tabulated in Annex II) together with values calculated or estimated for a further 32 countries by the methods described in this chapter give a good basis for assessing the variations between regions (tabulated in Annex III). Overall these countries account for some 82% of the total rural population (2003 data) of the six regions. The regions of Middle East and North Africa (MNA) and Latin America and the Caribbean (LAC) are rather weakly represented but values for the other four regions cover more than two-thirds of the regional population in each case.

The regions are compared in Figure 2. Sub-Saharan Africa (AFR) has the poorest level of rural access at only 30 percent. MNA is only slightly better at 34 percent but this is based on less than a quarter of the region's rural population. South Asia (at 58 percent) and LAC (at 54 percent) have nearly twice the level of rural access as does AFR. Rural access is even better for Europe and Central Asia (75 percent) and for East Asia and the Pacific (94 percent) – the latter is reduced to 86 percent if the figure of 97 percent provided by the Peoples Republic of China is omitted.

Figure 2. Rural Access: Regional Estimates



3 HOUSEHOLD SURVEY OF ACCESS TO TRANSPORT

3.1 Proposed Transport Survey Module

While some information on household accessibility is available, review of existing multi-topic household surveys reveals the lack of a consistent transportation questionnaire module in these surveys. Often any questions related to rural access are included under the community module. Such inquiries treat the community being surveyed as a single unit, which does not allow measurements of variations among households. This generally results in an overestimation of access. There is also a lack of uniformity in rural access questions across various surveys.

A Transport and Access Module has been prepared for field testing to be included in multi-topic household surveys of the LSMS type. This module builds on substantial background work by Baker and Denning (2005), as well as on the community transport module developed by Frankenberg (2000), and on some specific transport modules such as those included in the Guatemala Living Standard Survey (2002). The proposed module is based on an accessibility framework adopted by ILO (ILO/HMGN 2003). It will bring

[4] The VDC is the lowest political unit in Nepal with a population numbering about 4000.

transport and access related questions into a single module which is currently planned to have three sections: 'Road infrastructure', 'Transport services' and 'Other'. The current draft of the 'Road infrastructure' section is presented in Annex IV.

3.2 Essential Question

There is often strong resistance to incorporating an additional module or several questions on account of the practical survey constraints and resource costs. At the very least all IDA countries should be willing to include a single question about the distance or time to walk to an all-season road. This will enable them to meet their responsibility to the IDA-14 RMS.

If at all possible, a second question should be included to ask about access to a reliable, all-season 'transport service'. In the medium-term it is likely that the focus will shift to assessing the level of access to transport services rather than access to the road network, since not all sections of the network necessarily carry satisfactory services.

Field studies described in this paper indicate that questions about access to a road or other facility are probably best based on the 'time taken' – unless there are strong reasons locally to base them on 'distance'. Where possible respondents' replies should be checked against objective measures. The increasing user-friendliness and reduced cost of global positioning system equipment can offer practical ways of doing this.

3.3 Measuring Time and Distance

In household surveys, data on travel time and distance is usually collected through face-to-face interviews of randomly selected households (or individual members of households). This data is influenced by a variety of factors, such as travel purpose, transport mode used, trip route, characteristics of terrain, etc. Moreover, the data collected is susceptible to subjective variation, as it is based on reports of perceptions rather than on observations of events.

Furthermore the accuracy of these surveys depends on the memory of the respondents. There are various considerations such as deterioration of recall over time, the tendency to 'round up' responses and variation in recall with personal characteristics of respondents (such as age). Additionally, estimates of time and distance and the relationship between these are likely to be influenced by individual and cultural factors. This may be particularly significant in those areas of developing countries where time measurement devices and measures of distance are not commonly used or comprehended by rural dwellers.

A field survey exercise has been designed to improve the understanding of people's responses to questions about the time or distance of their travel. This will contribute to practical guidance for the designers of household and similar surveys who wish to include questions on individuals' travel time and/or distance.

A field survey compares subjective reports by individuals of their travel time and distance with the corresponding objective measures. Initial surveys for this exercise have been carried out in rural Albania (in cooperation with the government survey department INSTAT) and Tanzania.

The initial field work verified the survey procedure. It showed that, with practical calibration and supervision processes, pedometers could be used to measure the actual distance and time between the household and the destination, and to gain some information on the quality of data collected through household surveys as it relates to time and distance traveled.

The results from Albania showed quite close correlation between the reports of time and distance as well as between the reports and objective measurements of both. The expected variations in relation to age and terrain were confirmed to a limited extent.

A second time and distance survey was completed in Bukoba, Tanzania in July 2005. The results of this survey indicate a weak correlation between estimated time and measured time, but a very weak correlation in case of distance. In addition, a high degree of over-estimating was observed for both time and distance. This over-estimating was particularly pronounced for distance, with over 60 percent of the estimates being more than twice the actual distance.

In both Albania and Tanzania, the measured time and measured distance correlated strongly, indicating the reliability of the pedometers used to measure the time and distance in these surveys. Similar surveys are planned for other countries (including in

Vietnam, Laos and Cambodia with the financial support of DFID). The sample terms of reference for the survey, together with examples of the procedures and survey forms are presented in Annex V.

Initial indications from these surveys are that questions about 'time' rather than 'distance' may generally be more reliable and informative in respect of physical access. However, in each case this should be verified in relation to local experience. Preference should be given to established local practice where this is proven to be working well.

Similar surveys to compare time and distance perceptions are planned for other countries (including Vietnam, Laos and Cambodia with the financial support of DFID). When designing a new survey or if improvement may be required, reference should be made to the format of the sample questions for the Tanzania study, in Annex V.

4 APPLICATIONS OF THE INDEX

Some countries and regions have started to extend use of the RAI beyond its function as a headline indicator which focuses on a key development issue and being incorporated in the IDA-14 RMS. Three cases are described below.

4.1 Regional Rural Access Targets

The Rural Access Index has been used, together with other headline transport indicators to strengthen the relationship between the Millennium Development Goals and the broad response of the Transport Sector in Africa. This is set out in a report prepared for a meeting of the Africa Transport Ministers (Africa Union April 2005) and is summarized in the Table which is reproduced in Annex VI. The headline indicators constitute high level targets for the transport sector which link the direct interventions of the sector to their significant impacts on the MDGs.

The Table shows that, for Africa, improvement in rural access is a key requirement for achieving a number of the Goals—in particular: halving poverty and hunger, increasing access to education (especially for girls), reducing maternal mortality and improving child health.

4.2 Sub National Analysis

The Vietnam Living Standards Survey (VLSS) was carried out in 1998 and repeated in 2002. The General Office of Statistics is now required to repeat the VLSS every two years to monitor progress in implementing the national Comprehensive Poverty Reduction and Growth Strategy (CPRGS). The VLSS was conducted again in 2004 and the results have recently become available. The survey is designed to be representative at the Provincial level – there are 67 provinces in Vietnam. On the basis of the 2002 survey the Rural Access Index has been estimated for each Province. These estimates show a close correlation between the lack of rural access and the level of poverty in each province.

The Government is working with the World Bank and DFID to establish a protocol for allocating national resources amongst the provinces with the poorest basic access in support of the national CPRGS. The algorithm for this protocol is shown below.

$$allocation = base + \mathbf{f}(poverty\ rate)*$$

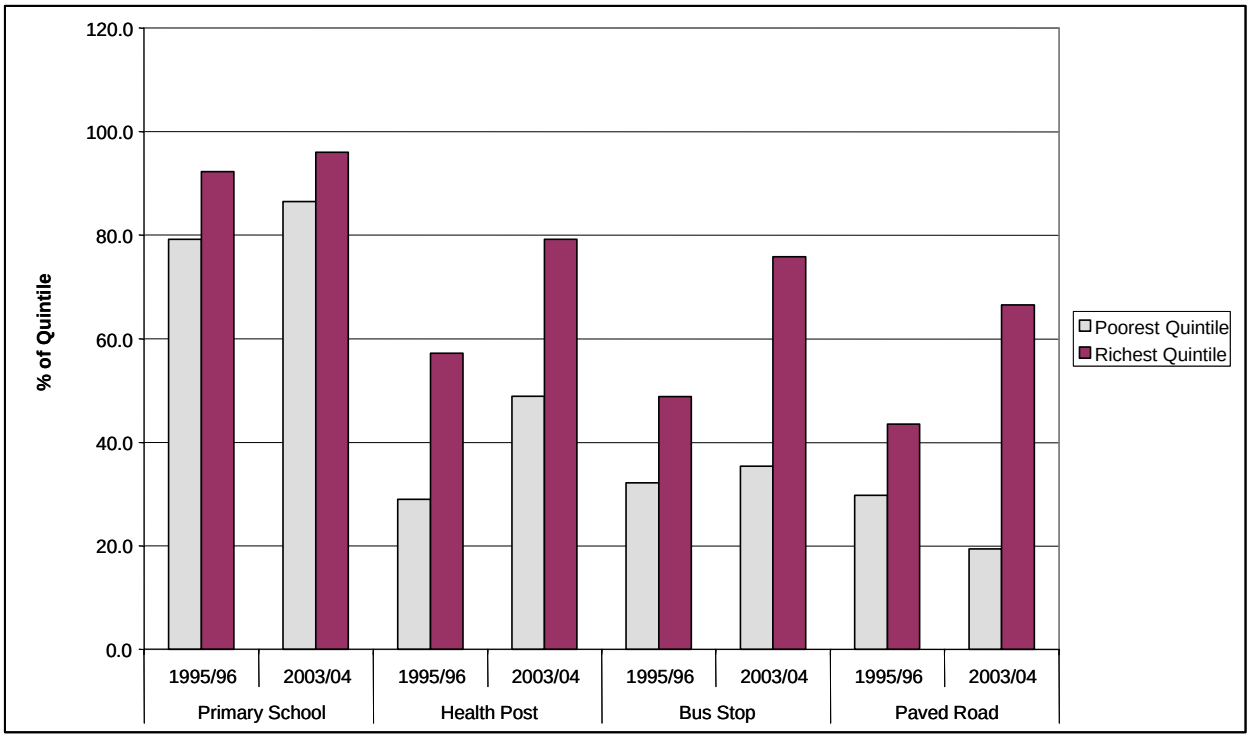
$$(rural\ population)*(lack\ of\ access)$$

In Annex VII there is an illustration of the protocol being applied to the 33 provinces in Vietnam having poor levels of basic access.

4.3 Equity in Change of Access

An example from Nepal demonstrates how improvement in access to basic facilities over the past decade has favored the non-poor. Although households' overall access to basic services in terms of time required to reach the service-points has improved for all services between 1996 and 2003, the proportion of households in the richest quintile with access to key facilities within 30 minutes exceeded those in the poorest quintile by from 11 percent to 28 percent in 1996, and from 10 percent to 47 percent in 2003 (Figure 3, Nepal CBS 2005).

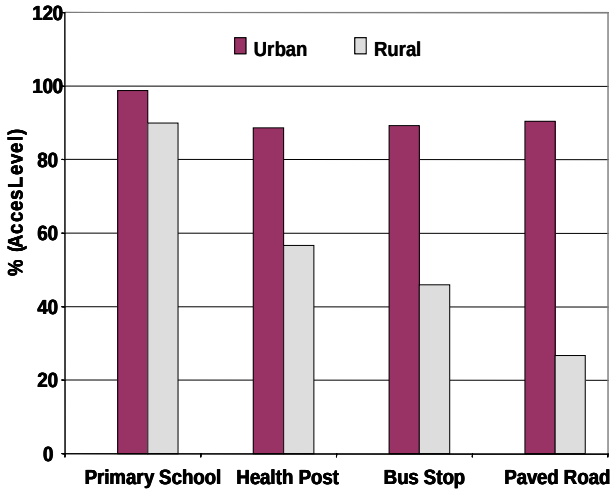
Figure 3. Households' Level of Access to Nearest Basic Services (0-30 minutes*) by Consumption Quintile Nepal (1995/1996 and 2003/2004).



**The threshold of 30 minutes walking time is longer than that currently indicated in the definition of the RAI but is appropriate for the difficult access conditions in Nepal. Source. Nepal Census Bureau.*

Similarly, urban dwellers have far better access to basic services than do rural households, with the difference ranging from 10 percent to 60 percent (Figure 4).

Figure 4. Rural-Urban Variation in Level of Access to Basic Services (Nepal 2003/2004).



Source. Nepal Census Bureau.

It is evident from these observations that there is considerable inequality in the level of access to the transport system amongst different groups of people, and that a large portion of the world's population is still excluded from such services and opportunities. In this context, the RAI shows the very low levels of effective access to the transport system for rural residents in the poorest countries and regions. By doing so, it points to the need to ensure that the rewards of development are more equitably available to the rural population.

5 PRIORITIES FOR ACTION

Now the primary challenge is for countries to mainstream and sustain the Rural Access Index in routine monitoring at the national and sub-national levels. Some priorities are summarized below. TUDTR is ready to assist such activity through the Transport Results Initiative. Specialists supporting country programmes or their partners may make contact through the appropriate World Bank regional Transport Sector Manager or directly with the Transport Results Initiative (proberts@worldbank.org).

5.1 Ensure that the RAI Is Monitored

Countries which receive IDA assistance will be required to report changes in the value of the Rural Access Index as part of the IDA-14 Results Measurement System. The responsibility for this in each country will fall to the National Statistics Office which has to ensure that there is an up to date value of the Index by including the appropriate question in a national LSMS-type survey. Where it is impractical for this to be done before the end of 2006, a 'current value' should be estimated by one of the methods described in this Paper on the basis of available data for the all-season road network and for the location of the rural population.

The RAI value or estimate should be determined in consultation with the relevant departments of the Ministries of Transport and of Agriculture and/or Rural Development to ensure that it is integrated with the plans of those ministries. The aim should be to establish a data framework which is sufficiently detailed to determine the Index for different income categories of the population and for sub-national planning units of the country.

Measurement of the RAI value should be updated at least every three years, together with those other indices which are based on household survey data.

5.2 Extended Ownership of RAI

Those non-IDA countries which recognise that improving physical access and mobility is an important priority for the rural population can also use the RAI as a tool for informing policy and guiding resource allocation. This should be encouraged. The Index offers the advantages of having an internationally established definition, which is supported by a standard measurement process with related protocols and benchmark values.

5.3 Implement Applications and Studies for RAI

International reporting of the Index needs to be complemented locally by established applications for analysis with related measures to set it in the context of prevailing national and sub-national priorities and constraints.

Further studies of individual perceptions of walking time and distance will enable improved design of all household survey modules which are concerned with access (eg. to health or education services). This will help to improve the interpretation of the data and will contribute to better understanding of local priorities for household travel and mobility.

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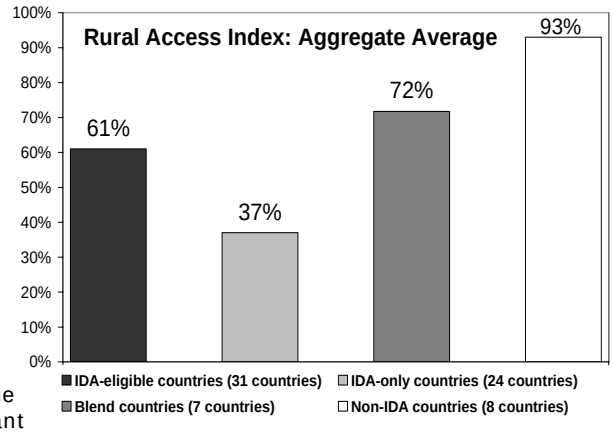
LIST OF ANNEXES

ANNEX I:
RURAL ACCESS INDEX: SUMMARY SHEET

Definition

'Rural Access Index' is the percentage of rural people who live within 2 km (typically equivalent to a walk of 20 minutes) of an all-season road as a proportion of the total rural population. An "all-season road" is a road that is motorable all year round by the prevailing means of rural transport (often a pick-up or a truck which does not have four-wheel-drive). Predictable interruptions of short duration during inclement weather (e.g. heavy rainfall) are accepted, particularly on low volume roads.



Aggregation

Results for 32 IDA countries (representing 83% of the total rural population in all IDA countries) show that on average 61% of rural dwellers have access to the transport network. The graph also shows a significant difference between 'IDA only' and 'blend' countries. A sample of 10 IBRD countries has much better access (93%) on average. Individual country data was weighted by population.

IDA Countries Included: Albania, Azerbaijan, Bangladesh, Benin, Burkina Faso, Burundi, Cambodia, Cameroon, Chad, Ethiopia, Gambia, Ghana, India, Indonesia, Kenya, Lao PDR, Madagascar, Malawi, Mali, Mongolia, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Papua New Guinea, Tajikistan, Tanzania, Uzbekistan, Vietnam, Yemen, Zambia.

IBRD Countries: Belarus, Brazil, Bulgaria, China, Latvia, Namibia, Peru, Romania, Russia, South Africa

Relevance to Poverty Reduction and MDGs

Physical isolation is a strong contributor to poverty. Populations without reliable access to social and economic services are poorer than those with reliable access. Problems of access are particularly severe in those rural areas which are distant from roads that carry motorized transport services on a regular basis. It is estimated that about 700 million rural dwellers in developing countries (the great majority of them living in IDA countries) are without reliable access. The large majority of these people are poor and they include most of those who are extremely.

Sustainable access to rural transport is not an indicator for the Millennium Development Goals, but it is a key contribution to achieving many of the Goals - underpinning pro-poor growth and improving social inclusion. Surveys have shown that poor people view isolation as a major contributor to their poverty and marginalization. Therefore, improving access to roads for rural dwellers is considered essential to promote rural development, to improve access to human development services, to raise incomes and to stimulate growth for poverty reduction.

While sustainable access to rural transport is a good indication of the shortfall in rural access, the full picture requires more detailed information. Before upgrading tracks or paths to motorable condition, the availability of affordable transport services that will be operated on the new road should be confirmed.

Sensitivity to Change

The Rural Access Index adequately captures changes in performance over time – usually a period of three years or so. An analysis of preliminary measures for two countries with time-series data (during the period of 1997-2002) confirms that the rate of change in the index is likely to be less than 1% in a year for a large country. In small countries or sub-national areas widespread investment in or neglect of the rural network can result in more rapid change. Relatively small improvements in access to an all-season road have marked impact in terms of improving the Index value on a local basis.

Current measures of this indicator show a significant difference between IDA (aggregate average of 64%) and IBRD countries (aggregate average of 93%). Amongst the IDA countries there is also a significant difference between those which receive blended assistance (aggregate average of 72%) and those which do not (aggregate average of 45%). Thus, increasing the number of rural people with sustainable access to rural transport is expected to have high and sustainable impact.

Measurability and Reporting

There are two main approaches to the measurement of this index, by using: (a) household surveys that include information about access to transport, or (b) map data to determine how many people live within the specified catchments of the road network. Including appropriate questions in a broader survey of households is usually the most informative and cost-effective way of obtaining information on rural access. The majority of the 32 RAIs which are available for IDA countries have been established using the results of household surveys which already included questions on access. These surveys are designed to produce high-quality data and be representative for the main segments of population (thus, the 'rural population' is adequately covered).

In establishing this new index, priority has been given to the countries with the highest populations so that the 32 countries already covered represent 83% of the total rural population of IDA countries. Priority has also been given to those countries with larger land areas for which rural access is likely to be particularly relevant.

Updates of the index will essentially depend on the frequency of household surveys. These are usually expected to be carried out on a three-year cycle. In collaboration with partner organizations, the World Bank is developing a work program to ensure the sustainability of this and other IDA indicators through regular updating of surveys and expansion of coverage to additional countries. It is planned to establish this indicator for an additional 20 IDA countries so it will be available for over 50 IDA countries. A time series will be established for several countries and there will be further benchmarking against 'non-IDA' countries.

Costs (implication for IDA borrowers and the Bank)

The Bank is raising awareness of the significance of the indicator for capturing differences in performance between countries. It is expected that this initiative will help to 'harmonize' rural access questions across household surveys (both for government and donor sponsored surveys) to encourage efficient use of resources by linking with the proposed global household survey network. The inclusion of the rural access index in the 2006 edition of World Development Indicators also is being considered.

About 38 IDA countries already have completed national household surveys which include questions that permit this indicator to be estimated. In these cases the marginal cost of producing the indicator is generally up to one day of experienced statistical input. Where there is a suitable survey which does not include a relevant question, there will be a one-off cost to negotiate, design, test and incorporate the question. This cost is estimated to be in the order of three days in addition to the cost of analysis. Where there is no household survey it will be necessary to estimate the indicator by the mapping technique described above. The input for this is estimated to be about one month of analysis for each estimate of the indicator, provided that the necessary data on the location of roads and of the rural population is available.

Application of the Rural Access Index

Currently the primary application of the Index is as a component of the IDA -14 Results Measurement System on the lines described above. Various countries are also extending the application of the Index in different ways.

In Vietnam the index is being updated every two years on the basis of data from the Vietnam Living Standards Survey. The VLSS is representative at the Provincial level so the index provides a basis for comparing the degree of rural accessibility enjoyed by the Rural population in each province. Procedures are being examined for using the Rural Access index together with the Poverty Rate for allocating central government resources between provinces in response to the national Comprehensive Poverty Reduction and Growth Strategy.

As a headline transport indicator the Rural Access Index also has significance at both the national and the wider Regional level. The Africa Transport Ministers prepared a Declaration in 2005 showing the key targets, such as improving rural accessibility and urban mobility, for the transport sector to contribute to achieving the Millennium Development Goals.

This note was updated by Peter Roberts (TUDTR): September 2005.

ANNEX II:
RURAL ACCESS INDEX BY REGION: IDA COUNTRIES

Country	Region	IDA/ Blend	Survey	Year (1994-2004)	Rural access indicator	Total population	Rural population	Rural population with access	Rural population without access
Benin	AFR	IDA	CWI	2003	32%	6,720,250	3,726,916	1,192,613	2,534,303
Burkina Faso	AFR	IDA	SSATP	2003	25%	12,109,229	9,976,140	2,494,035	7,482,105
Burundi	AFR	IDA	PS	1998	19%	7,205,982	6,489,290	1,232,965	5,256,325
Cameroon	AFR	IDA	PS	2001	20%	16,087,472	7,851,330	1,570,266	6,281,064
Chad	AFR	IDA	**	2001	5%	8,581,741	6,439,945	321,997	6,117,948
Congo, DR* **	AFR	IDA	SSATP	2003	26%	53,153,360	53,153,360	13,819,874	39,333,486
Ethiopia	AFR	IDA	SSATP	2003	17%	68,613,472	57,215,536	9,726,641	47,488,895
Gambia	AFR	IDA	PS	1994	77%	1,420,895	958,183	737,801	220,382
Ghana	AFR	IDA	CWI	1997	44%	20,669,260	13,004,106	5,721,807	7,282,299
Guinea	AFR	IDA	SSATP	2004	22%	7,908,905	5,621,270	1,236,679	4,384,591
Kenya	AFR	IDA	PS	1997	44%	31,915,850	20,328,672	8,944,616	11,384,056
Madagascar	AFR	IDA	PS	1997	25%	16,893,904	11,583,474	2,895,869	8,687,606
Malawi	AFR	IDA	IS	1997	38%	10,962,012	9,222,363	3,504,498	5,717,865
Niger	AFR	IDA	SSATP	2003	37%	11,762,251	9,157,618	3,388,319	5,769,299
Nigeria - 8 states	AFR	Blend	CWI ++	2002	47%	43,335,868	34,742,392	16,328,924	18,413,468
Tanzania	AFR	IDA	PS	2000	38%	35,888,960	23,197,834	8,815,177	14,382,657
						353,229,411	**272,668,429**	**81,932,080**	**190,736,349**
						Tot rur_ pop ->	**466,938,656**	**30**	
							58		
Cambodia	EAP	IDA	IES	1999	87%	13,403,644	10,909,333	9,491,120	1,418,213
Indonesia	EAP	Blend	PODES	2003	94%	214,674,160	119,999,424	112,799,459	7,199,965
Laos, PDR	EAP	IDA	**	2003	59%	5,659,834	4,489,460	2,648,781	1,840,679
Mongolia	EAP	IDA	**	2003	36%	2,479,568	1,070,593	385,413	685,180
Papua New Guinea	EAP	Blend	IS	1996	68%	5,501,871	4,501,895	3,061,289	1,440,606
Vietnam	EAP	IDA	IS	2002	76%	81,314,240	60,654,244	46,097,225	14,557,019
						323,033,317	**201,624,949**	**174,483,287**	**27,141,662**
						Tot rur_ pop ->	**1,129,089,024**	**87**	
							18		

ANNEX II (continued)
RURAL ACCESS INDEX BY REGION: IDA COUNTRIES

Country	Region	IDA/ Blend	Survey	Year (1994-2004)	Rural access indicator	Total population	Rural population	Rural population with access	Rural population without access
Albania	ECA	IDA	IS	2002	31%	3,169,064	1,767,102	547,802	1,219,300
Azerbaijan	ECA	Blend	IES	2002	67%	8,233,000	3,960,320	2,653,414	1,306,906
Tajikistan	ECA	IDA	IS	1999	74%	6,304,700	4,563,922	3,377,302	1,186,620
Uzbekistan	ECA	Blend	IES	2000	57%	25,590,000	16,189,002	9,227,731	6,961,271
Nicaragua	LAC	IDA	IS	2000	28%	5,480,000	2,339,664	655,106	1,684,558
						48,776,764	**28,820,010**	**16,461,355**	**12,358,655**
						Tot rur_ pop ->	**171,153,088**	**57**	
							17		
Yemen, Republic of	MENA	IDA	IES	1999	21%	19,173,160	14,248,802	2,992,248	11,256,554
Bangladesh	SA	IDA	IES	2000	37%	138,066,368	101,101,584	37,407,686	63,693,998
India	SA	Blend	**	2001	60%	1,064,398,592	763,082,240	457,849,344	305,232,896
Nepal	SA	IDA	IS	1995	15%	24,659,962	21,476,558	3,221,484	18,255,074
Pakistan	SA	Blend	IS	1998	77%	148,438,768	97,790,864	75,298,965	22,491,899
						1,375,563,690	**983,451,246**	**573,777,379**	**409,673,867**
						Tot rur_ pop ->	**1,021,185,216**	**58**	
							96		
Notes						Except Africa	1,228,145,007.0	767,714,270	63
	All population figures for 2003								
***	Total population taken as rural population (data unavailable)								
++	The Nigeria CWI is based on an eight state sample which represents 34,742,392 of the rural population. Thus, the rural access indicator refers to the portion of the rural population represented in the survey.								
**	The rural access indicator has been established using mapped information and GIS information.								
Abbreviations:									
IS	Integrated/Living Standard Measurement Survey (World Bank)								
IES	Income/Expenditure/Household Survey								
PS	Priority Survey (World Bank)								
CWI	Core Welfare Indicators Questionnaire								
CSES	Income/Expenditure/Household Survey								
PODES	Village Potential Statistics Survey								
SSATP	SSATP/World Bank provided data								

ANNEX II (CONTINUED)
RURAL ACCESS INDEX BY REGION: IBRD COUNTRIES

Country	Survey	Year	Rural access indicator	Total population	Rural population	Rural population with access	Rural population without access
Belarus	IES	2001	**64%**	9,880,963	2,973,617	1,903,115	1,070,502
Brazil	**	2001	**53%**	176,596,256	30,377,382	16,100,012	14,277,370
Bulgaria	IES	2001	**98%**	7,823,000	2,540,144	2,489,341	50,803
China	*	2003	**97%**	1,288,400,000	790,410,240	766,697,933	23,712,307
Latvia	**	2001	**90%**	2,321,000	918,071	826,264	91,807
Namibia	**	2001	**57%**	2,014,546	1,361,398	775,997	585,401
Peru	**	2001	**43%**	27,148,000	7,097,953	3,052,120	4,045,833
Romania	**	2001	**89%**	21,744,000	9,643,160	8,582,412	1,060,748
Russian Federation	**	2001	**81%**	143,424,992	38,868,200	31,483,242	7,384,958
South Africa	IS	1993	**21%**	45,828,700	18,699,392	3,926,872	14,772,520
Total average (including China)			**93%**	1,725,181,457	902,889,557	835,837,309	67,052,248
Total average (excluding China)			**61%**	436,781,457	112,479,317	69,139,376	43,339,941
Notes	All population figures for 2003.						
*	Based on the Poverty Monitoring Report for Rural China, 2003, a publication by the Chinese Government. The figures represents that 97% of Chinese villages (which include rural townships & administrative villages) are accessible by road.						
**	The rural access indicator has been established using mapped information and GIS information.						
Abbreviations:							
IES	Income/Expenditure/Household Survey						
IS	Integrated/Living Standard Measurement Survey (World Bank)						

ANNEX III:
RURAL ACCESS INDEX BY REGION: IDA AND NON-IDA COUNTRIES
(INCLUDING ESTIMATES FOR 32 COUNTRIES)

Country	Region	IDA/ Blend	Survey	Year (1994-2004)	Rural access indicator	Total population	Rural population	Rural population with access	Rural population without access
Angola	AFR	IDA	model	2003	42%	13,522,112	8,696,070	3,652,349	5,043,721
Benin	AFR	**IDA**	**CWI**	**2003**	**32%**	6,720,250	3,726,916	1,192,613	2,534,303
Burkina Faso	AFR	**IDA**	**SSATP**	**2003**	**25%**	12,109,229	9,976,140	2,494,035	7,482,105
Burundi	AFR	**IDA**	**PS**	**1998**	**19%**	7,205,982	6,489,290	1,232,965	5,256,325
Cameroon	AFR	**IDA**	**PS**	**2001**	**20%**	16,087,472	7,851,330	1,570,266	6,281,064
Chad	AFR	IDA	**	2001	**5%**	8,581,741	6,439,945	321,997	6,117,948
Congo, DR* **	AFR	**IDA**	**SSATP**	**2003**	**26%**	53,153,360	53,153,360	13,819,874	39,333,486
Ethiopia	AFR	**IDA**	**SSATP**	**2003**	**17%**	68,613,472	57,215,536	9,726,641	47,488,895
Gambia	AFR	**IDA**	**PS**	**1994**	**77%**	1,420,895	958,183	737,801	220,382
Ghana	AFR	**IDA**	**CWI**	**1997**	**44%**	20,669,260	13,004,106	5,721,807	7,282,299
Guinea	AFR	**IDA**	**SSATP**	**2004**	**22%**	7,908,905	5,621,270	1,236,679	4,384,591
Kenya	AFR	**IDA**	**PS**	**1997**	**44%**	31,915,850	20,328,672	8,944,616	11,384,056
Madagascar	AFR	**IDA**	**PS**	**1997**	**25%**	16,893,904	11,583,474	2,895,869	8,687,606
Malawi	AFR	**IDA**	**IS**	**1997**	**38%**	10,962,012	9,222,363	3,504,498	5,717,865
Mali	AFR	IDA	model	2003	14%	11,651,502	7,891,563	1,104,819	6,786,744
Maurtius	AFR	IBRD	model	2003	70%	1,222,188	692,614	484,830	207,784
Namibia	AFR	IBRD	**	2001	**57%**	2,014,546	1,361,398	775,997	585,401
Niger	AFR	**IDA**	**SSATP**	**2003**	**37%**	11,762,251	9,157,618	3,388,319	5,769,299
Nigeria - 8 states	AFR	**Blend**	**CWI ++**	**2002**	**47%**	43,335,868	34,742,392	16,328,924	18,413,468
Sierra Leone	AFR	IDA	model	2003	65%	5,336,568	3,265,446	2,122,540	1,142,906
South Africa	AFR		IS	1993	**21%**	45,828,700	18,699,392	3,926,872	14,772,520
Tanzania	AFR	**IDA**	**PS**	**2000**	**38%**	35,888,960	23,197,834	8,815,177	14,382,657
Uganda	AFR	IDA	model	2003	27%	25,280,000	22,178,144	5,988,099	16,190,045
Zambia	AFR	IDA	model	2003	64%	10,402,959	6,663,095	4,264,381	2,398,714
AFR Total	**24**					**468,487,986**	**342,116,151**	**104,251,967**	**237,864,184**
						Tot rur_ pop ->	**466,938,656**	**30**	
							73		

ANNEX III (continued)
RURAL ACCESS INDEX BY REGION: IDA AND NON-IDA COUNTRIES
(INCLUDING ESTIMATES FOR 32 COUNTRIES)

Country	Region	IDA/ Blend	Survey	Year (1994-2004)	Rural access indicator	Total population	Rural population	Rural population with access	Rural population without access
Cambodia	EAP	IDA	IES	1999	**87%**	13,403,644	10,909,333	9,491,120	1,418,213
China	EAP	IBRD	*	2003	**97%**	1,288,400,000	790,410,240	766,697,933	23,712,307
Indonesia	EAP	Blend	PODES	2003	**94%**	214,674,160	119,999,424	112,799,459	7,199,965
Laos, PDR	EAP	IDA	**	2003	**59%**	5,659,834	4,489,460	2,648,781	1,840,679
Mongolia	EAP	IDA	**	2003	**36%**	2,479,568	1,070,593	385,413	685,180
Papua New Guinea	EAP	Blend	IS	1996	**68%**	5,501,871	4,501,895	3,061,289	1,440,606
Philippines	EAP	IBRD	model	2003	80%	81,502,616	31,810,472	25,448,378	6,362,094
Vietnam	EAP	IDA	IS	2002	**76%**	81,314,240	60,654,244	46,097,225	14,557,019
EAP Total	**8**					**1,692,935,933**	**1,023,845,661**	**966,629,598**	**57,216,063**
						Tot rur_ pop ->	**1,129,089,024**	**94**	
							91		
Albania	ECA	**IDA**	**IS**	**2002**	**31%**	3,169,064	1,767,102	547,802	1,219,300
Armenia	ECA	IDA	model	2003	80%	3,055,630	1,085,971	868,777	217,194
Azerbaijan	ECA	**Blend**	**IES**	**2002**	**67%**	8,233,000	3,960,320	2,653,414	1,306,906
Belarus	ECA	IBRD	IES	2001	**64%**	9,880,963	2,973,617	1,903,115	1,070,502
Bulgaria	ECA	IBRD	IES	2001	**98%**	7,823,000	2,540,144	2,489,341	50,803
Croatia	ECA	IBRD	model	2003	84%	4,444,653	1,821,863	1,530,365	291,498
Czech Republic	ECA	IBRD	model	2003	97%	10,202,000	2,616,813	2,538,309	78,504
Estonia	ECA	IBRD	model	2003	86%	1,353,000	412,530	354,776	57,754
Georgia	ECA	IBRD	model	2003	82%	4,568,000	2,194,924	1,799,838	395,086
Latvia	ECA	IBRD	**	2001	**90%**	2,321,000	918,071	826,264	91,807
Lithuania	ECA	IBRD	model	2003	97%	3,454,000	1,148,455	1,114,001	34,454
Romania	ECA	IBRD	**	2001	**89%**	21,744,000	9,643,160	8,582,412	1,060,748
Russian Federation	ECA	IBRD	**	2001	**81%**	143,424,992	38,868,200	31,483,242	7,384,958
Tajikistan	ECA	**IDA**	**IS**	**1999**	**74%**	6,304,700	4,563,922	3,377,302	1,186,620
Turkey	ECA	IBRD	model	2003	69%	70,712,000	23,858,228	16,462,177	7,396,051
Uzbekistan	ECA	**Blend**	**IES**	**2000**	**57%**	25,590,000	16,189,002	9,227,731	6,961,271
ECA Total	**16**					**326,280,002**	**114,562,322**	**85,758,866**	**28,803,456**
						Tot rur_ pop ->	**171,153,088**	**75**	
							67		

ANNEX III (continued)
RURAL ACCESS INDEX BY REGION: IDA AND NON-IDA COUNTRIES
(INCLUDING ESTIMATES FOR 32 COUNTRIES)

Country	Region	IDA/ Blend	Survey	Year (1994-2004)	Rural access indicator	Total population	Rural population	Rural population with access	Rural population without access
Bolivia	LAC	blend	model	2003	48%	8,814,158	3,227,745	1,549,317	1,678,427
Brazil	LAC	IBRD	**	2001	**53%**	176,596,256	30,377,382	16,100,012	14,277,370
Chile	LAC	IBRD	model	2003	76%	15,774,000	2,053,775	1,560,869	492,906
Costa Rica	LAC	IBRD	model	2003	82%	4,004,680	1,577,043	1,293,175	283,868
Ecuador	LAC	IBRD	model	2003	73%	13,007,942	4,970,335	3,628,344	1,341,990
Nicaragua	LAC	**IDA**	**IS**	**2000**	**28%**	5,480,000	2,339,664	655,106	1,684,558
Peru	LAC	IBRD	**	2001	**43%**	27,148,000	7,097,953	3,052,120	4,045,833
LAC Total	**7**					**250,825,036**	**51,643,896**	**27,838,944**	**23,804,952**
						Tot rur_ pop ->	**171,153,088**	**54**	
							30		
Bahrain	MNA		model	2003	99%	711,662	71,237	70,525	712
Morocco	MNA	IBRD	model	2003	36%	30,112,644	12,815,941	4,613,739	8,202,202
Syria	MNA	IBRD	model	2003	49%	17,384,492	8,659,215	4,243,015	4,416,200
Tunisia	MNA	IBRD	model	2003	39%	9,895,201	3,588,990	1,399,706	2,189,284
Yemen, Republic	MNA	**IDA**	**IES**	**1999**	**21%**	19,173,160	14,248,802	2,992,248	11,256,554
MENA Total	**5**					**77,277,159**	**39,384,185**	**13,319,233**	**26,064,951**
						Tot rur_ pop ->	**171,153,088**	**34**	
							23		
Bangladesh	SA	IDA	**IES**	**2000**	**37%**	138,066,368	101,101,584	37,407,586	63,693,998
India	SA	Blend	**	2001	**60%**	1,064,398,592	763,082,240	457,849,344	305,232,896
Nepal	SA	IDA	**IS**	**1995**	**15%**	24,659,962	21,476,558	3,221,484	18,255,074
Pakistan	SA	Blend	**IS**	**1998**	**77%**	148,438,768	97,790,864	75,298,965	22,491,899
SAR Total	**4**					**1,375,563,690**	**983,451,246**	**573,777,379**	**409,673,867**
						Tot rur_ pop ->	**1,021,185,216**	**58**	
							96		
Overall Total	**64**					**4,191,369,806**	**2,555,003,460**	**1,771,575,987**	**783,427,473**
							3,130,672,160	**69**	
							82		

ANNEX III (continued)
RURAL ACCESS INDEX BY REGION: IDA AND NON-IDA COUNTRIES
(INCLUDING ESTIMATES FOR 32 COUNTRIES)

Notes	
	All population figures for 2003
	Figures in 'bold' have been provided by the respective government or are based on government survey data.
***	Total population taken as rural population (data unavailable)
++	The Nigeria CWI is based on an eight state sample which represents 34,742,392 of the rural population. Thus, the rural access indicator refers to the portion of the rural population represented in the survey.
**	The rural access indicator has been established using mapped information and GIS information.

Abbreviations:	
IS	Integrated/Living Standard Measurement Survey (World Bank)
IES	Income/Expenditure/Household Survey
PS	Priority Survey (World Bank)
CWI	Core Welfare Indicators Questionnaire
CSES	Income/Expenditure/Household Survey
PODES	Village Potential Statistics Survey
SSATP	SSATP/World Bank provided data

ANNEX IV:
HOUSEHOLD LEVEL TRANSPORT AND ACCESS MODULE
ROADS COMPONENT (DRAFT)

TRANSPORT AND ACCESS MODULE : ROADS

Q. No. >>>	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
We would like to ask you about the roads nearest to your home.	How far is nearest [---] from your home?	How long does it take you to reach the nearest [---] from your home?	Of the total travel time to the nearest [---], how much do you spend on walking?	Apart from walking, which is the main common mode of transport for members of your household to reach the nearest [---]?	If you pay for the transport to reach this facility, how much do you pay for a one way trip?	Have you or members of your household faced any of the difficulties listed below in reaching to the nearest [----] in the past one year?	What kind of road is it?	How many months was the road closed in the last one year?	What was the main reason for closure?	Which of the activites of your household were most adversely affected due to the closure?
Complete asking questions on row A before proceeding to Row B.	**Units:** **Kilometers .....1** **Others .....2** **specify unit/conversion factor here** _____		**If the answer is same as for that of Q. 2 (that is, if walking is the only mode) >> 6.**	**Animals (horse, etc.) .....1** **Boat, canoe .....2** **Bicycle/rickshaw .....3** **Others, specify .....4** _____		**Yes=1; No=2** **Lack of footbridge .....1** **No proper trail .....2** **Need to stay overnight .....3** **Facility too far to walk .....4** **Weakness/disability .....5** **Others, specify** _____ **.....6**	**Paved .....1** **Gravel .....2** **Earthen 3**	**For less than 2 weeks, enter 0** **if 0, >> next page**	**Yes=1; No=2** **Landslide .....1** **Flood .....2** **Snow .....3** **Road conditions (pothole, gaps) .....4** **Others, specify** _____ **.....5**	**Yes=1; No=2** **Work .....1** **Access to markets .....2** **Going to school .....3** **Access to health centre .....4** **Others, specify** _____ **.....5**

	Distance	Unit	Hrs	Min	Hrs	Min	CODE	[currency]	1	2	3	4	5	6	CODE	Months	1	2	3		5	1	2	3	4	5
Motorable road	.																									
All-season motorable road	.																									

Please enter 9 for don't know responses **August, 2005**

ANNEX V:
TIME-DISTANCE SURVEY: SAMPLE DOCUMENTS

1. Questionnaire administered
2. Enumerator instructions
3. Information for respondents

1. QUESTIONNAIRE ADMINISTERED

TIME-DISTANCE MODULE - SCHOOL

HOUSHOLD ID | | | | | | |

(1) HOW MANY MEMBERS IN THE HOUSEHOLD WALK TO SCHOOL? ☐

(2) HOUSEHOLD MEMBER CHOSEN FOR THIS MODULE ☐☐

PERSON ID

FIRST NAME _____ LAST NAME _____

(3) NAME OF SCHOOL CHILD IS CURRENTLY ATTENDING _____

(4) IS THIS THE SAME SCHOOL AS REPORTED IN KHDS QUESTIONNAIRE (1=yes, 2=no) ☐

(5) SEX (1= Male, 2= female) ☐

(6) AGE (years) ☐☐

(7) IS THIS PERSON 1. THE DESIGNATED RESPONDENT ☐

2. A REPLACEMENT

(8) RESPONDENT'S ESTIMATE OF DISTANCE TO SCHOOL FROM HOME* ☐☐.☐ Km
(also equal to distance estimated back to home)

(9) RESPONDENT'S ESTIMATE OF TIME TO WALK TO SCHOOL FROM HOME* ☐☐☐☐
HRS MINS

(10) RESPONDENT'S ESTIMATE OF TIME TO WALK TO HOME FROM SCHOOL* ☐☐☐☐
HRS MINS

* new estimates, DO NOT copy from questionnaire

CALCULATING AVERAGE STEP LENGTH

	ENUMERATOR COUNTED STEPS	PEDOMETER STEPS MINUS 1	IF AN "ACCEPTABLE" READING, COPY THE NUMBER OF PEDOMETER STEPS BELOW.
(11) FIRST WALK			
SECOND			
THIRD			
FOURTH			
FIFTH			
SIXTH			

(12) TOTAL OF THREE ACCEPTABLE READINGS ☐ STEPS

(13) CALCULATE THE AVERAGE STEP LENGTH: 15000/TOTAL IN QUESTION 15 ☐ CM
ROUND TO NEAREST WHOLE NUMBER

INSERT THIS AVERAGE STEP LENGTH IN THE PEDOMETER

RECORDING THE DATA FROM THE RESPONDENT AFTER THE PEDOMETER USE

(14) DATE OF WALK FROM THE RESPONDENT SHEET

DAY MONTH YEAR

(15)

	To school	Back to home
Line 1. STEP (steps)		
Line 2. DIST (distance)	. Kms	. Kms
Line 3. TIMER	__ . __ __ . __ __	__ . __ __ . __ __ [HR. MIN.SEC]

(16) CHECKING THE PEDOMETER AFTER USE

FROM PEDOMETER AFTER USE: WITH MODE ARROW ON DIST, PRESS THE "SET" BUTTON AND RECORD THE NUMBER ON THE SCREEN

(17) DESCRIPTION OF THE TERRAIN OF THE PATH WALKED
(PLAINS=1, UPHILL/DOWNHILL =2)

2: TIME-DISTANCE MODULE: RECORDING DISTANCE AND TIME

Enumerator Instructions

Choosing a respondent from the household members (TO BE DONE BEFORE ARRIVING AT HOUSEHOLD):

Here we describe the way sampling of respondents was done in the Tanzanian time-distance survey. There respondents who traveled to the school, and who collected water were sampled for the survey. Here is the sampling procedure adopted in the survey.

(1) The Kagera Health and Development Survey (KHDS) was used to sample 9 clusters. Clusters were chosen purposively to provide geographical and ethnographical mix of data observations, as well as maximum number of questionnaires within the given time-frame.

(2) Within these clusters all households with at least one non-boarding, school-going child above 12 years old (at the time of survey) were selected.

(3) For households with multiple respondents fitting the criteria simple random sampling was used to select one respondent that should be interviewed. If this respondent was found to be no longer living in the household, deceased, traveling, or unavailable for other reasons, then a randomly (but still pre-determined) replacement was interviewed if available.

A second respondent within these households was then chosen to conduct the water-source survey with, provided they were at least 12 years of age.

Now we will prepare the pedometer to give to the respondent.

Operating instructions
(SPORTLINE 350 PROLINE PEDOMETER)

What is a pedometer?

The basic function of pedometer is to count steps. A liver which is inside the pedometer gets activated with the walker's every hip movements, counting each movement as one step. When you wear the pedometer and walk from one place to another, it counts the number of steps that you have taken in traveling this distance. The total number of steps that you have taken is then multiplied by the average length of your step to arrive at the overall distance between any two points. The machine also records the time taken by you in traveling the distance.

General information before you begin

1. To open the cover of the pedometer, gently lift and push the plastic lip that we have painted red.

2. There are 5 blue buttons across the bottom part of the pedometer. The larger blue button on the right (marked E in the sketch) is the MODE button. Pressing the mode button moves a small black arrow in the screen to point to one of 5 functions.

3. Press the MODE button and watch the arrow point to the functions: STEP (counts the steps), DIST (distance – calculates the distance), KCAL (we will not use), CLOCK (we will not use) and TIMER (measures the elapsed time).

4. Push the MODE button until the small arrow points to DIST. On the left part of the screen you should see written KM (meaning kilometers). If you see written ML, you must hold down the RESET key (marked A in the sketch) for 5 seconds until the "ML" disappears and "KM" is displayed.

5. Press the TOTAL button (marked D on the sketch) several times. Each time the TOTAL button is pressed, you will see a small word "TOTAL" come on or disappear at the top right of the screen above the numbers. You want the "TOTAL" word to not be displayed, so if it is written on the screen press the TOTAL button (marked D) to make it disappear.

To calculate the average step length of the respondent

In order for the pedometer to correctly calculate distance, we have to figure out the average length of the respondent's stride (step) and then enter it in the pedometer.

1. Use the 10 meter rope to mark out a length of track of 50 meters (5 lengths of rope) on a fairly straight and level road or path. Mark the start line and the finish line.
2. You are going to have the respondent walk the length of track several times to count the number of steps the respondent takes and compare it to the pedometer. You will continue until you have enough acceptable readings to calculate the respondent's step length.
3. Hold down the RESET button for two seconds to put all the values for STEP, DIST and TIMER back to zero.
4. Position the respondent on the starting line, with the toe of his or her right foot just behind and touching the start line. Close the pedometer and have the respondent put it in the correct place on the belt or waistband, near the hip but still on the front. The pedometer must be level.
5. Ask the respondent to walk the length of the track in his or her normal walking manner, and to take one step beyond the finish line, then stop and stand still. You should count the steps as the respondent walks to the finish line.
6. Record the number of steps you counted: write it in Question 7 on the first line, called "First walk" in the column for "ENUMERATOR COUNTED STEPS".
7. Go to the end of the track and show the respondent how to open the pedometer (preferably while the respondent is still wearing the pedometer) and show the respondent how to look at the STEP, DIST and TIMER.
8. Look at the number of steps recorded by the pedometer (press the MODE button until the arrow points to STEP). Record this on Line 1 below under "PEDOMETER STEPS minus 1", but subtract one from the number because of the extra step taken after the finish line.
9. Press the RESET button for two seconds to put the pedometer count back to zero, and have the respondent walk the track again, with you counting. Record the number of steps you counted and the number of steps (with one subtracted) from the pedometer count on the second line.
10. Press the RESET button and have the respondent walk for a third time and put the number of steps you count and the pedometer count (with one subtracted) on the third line.
11. Look at the first line: called "first walk". If the difference between your enumerator count and the pedometer steps is less than 4, the count is "acceptable". If the value is acceptable, put the pedometer step number in Column 3. If it is not "acceptable" do not write anything in Col 3.
12. Look at the second line. If the difference between your enumerator count and the pedometer steps is less than 4, the count is "acceptable". If the value is "acceptable", put the pedometer step number in Column 3. If it is not "acceptable" do not write anything in Col 3.
13. Look at the third line. If the difference between your enumerator count and the pedometer steps is less than 4, the count is "acceptable". If the value is acceptable, put the pedometer step number in Column 3. If it is not "acceptable" do not write anything in Col 3.
14. If you have three acceptable counts, you do not have to have the respondent walk the track again. If you do not have three acceptable counts, adjust the pedometer by shifting it slightly right or left of by placing it on the opposite side near the hip, and try some more times. You must have three "acceptable" measurements in all.
15. Once you have three acceptable measurements, you have to add them up and put the total as indicated.

16. Now we have to calculate the average step length. The respondent has walked 150 meters for the three acceptable measurements. This is 15000 centimeters. We divide 15000 by the total steps calculated in 14, and this is the **average step length**. Round this number to the nearest whole number. This step length should be between approximately 50 and 100 centimeters. If it is not, check all your calculations.

EXAMPLE:

CALCULATING AVERAGE STEP LENGTH

	ENUMERATOR COUNTED STEPS	PEDOMETER STEPS minus 1	IF AN "ACCEPTABLE" READING, COPY THE "PEDOMETER STEPS minus 1" BELOW.
(7) FIRST WALK	78	84	
SECOND	79	81	81
THIRD	78	78	78
FOURTH	80	84	84
FIFTH			
SIXTH			

(8) TOTAL OF THREE ACCEPTABLE READINGS= 243 STEPS

CALCULATION

(9) CALCULATE THE AVERAGE STEP LENGTH: 15000/TOTAL IN QUESTION 8= 62 CM 15000/243=61.73
ROUND TO NEAREST WHOLE NUMBER

(INSERT THIS AVERAGE STEP LENGTH IN THE PEDOMETER)

In the above example, in the first walk of 50 meters, the enumerator counted 78 steps and the pedometer recorded 85 steps. We subtract one from the pedometer reading because we have asked the respondent to take one step beyond the end, so we put in 84 for the pedometer steps.

If we take the difference of the two readings: 84-78 the answer is 6, which makes these readings not “acceptable” since there must be a difference of 4 or less to be acceptable. So we cannot put the pedometer count in the third column, and we leave it blank.

But the next three readings are acceptable, and for each acceptable reading we put the pedometer step count in column 3.

Once we have three acceptable readings we add the three counts in Column 3, so we add 81+78+84 to get a total of 243.

Now we make the calculation of 15000 divided by 243: 15000/243=61.73. This is the average step length in centimeters. We round it to the nearest whole number which is 62. This is the number we must put in the pedometer. (This is quite a small step length, probably associated with a person who is short. The step length of the average person is about 75 cm.)

To put the average step length into the pedometer:

1. Press the ‘MODE’ button until the arrow reaches the ‘DIST’ display and check that this shows ‘KM’ on the left of the screen (if not, then refer above to “general information before you begin”, number 4 to see how to change to KM.)

2. Press the ‘SET’ button (marked B on the sketch) once. The reading which flashes is the current ‘step length’. If this has to be increased a little that can be done one digit at a time by repeatedly pressing the ‘SET’ button. For instance if the current step length is 75 and you wish to set a step length of 88 cm you can press the SET button once to get to 76, again to get to 77, again to get to 78, etc. until you get to 88.

3. If you have to set a number that is LESS than the current 'step length' you must hold down the SET button to make the numbers go by more quickly – the reading will go up until 240 and then will return to the minimum of 30 and begin going up from 30. For example, if the current step length is 75 and you wish to record 62, you hold the SET button down while it goes all the way up to 240 then once it reaches 240 it goes down to 30 and begins going up from there. Once you get to about 55 you should stop holding down the SET button, and instead just press it time by time to go to 56, 57, 58, and so on to 62.

4. Once you are at the correct number you want to input for the step length, press the MODE button to get out of the average step setting. (If you want to check that the step length is properly input, put the MODE arrow on DIST, press the set button once, and you should see the number you have put in flashing. Press MODE again to make sure you do not change the step length.)

Giving instructions to the respondent

1. Give the two page information sheet/form to the respondent.
2. Put in the Issued Panel Household ID number and the name of the respondent on the form.
3. Go over the instructions on the information sheet to ensure the respondent understands what to do.
4. Arrange for a time to return to pick up the information sheet/form and the pedometer.
5. Once you pick up the pedometer, press the MODE button until the arrow is on DIST, and press the SET key once. Record the number on the screen in Question 12 on the Module 14 form.

3: TIME-DISTANCE MODULE: RECORDING DISTANCE AND TIME

Pedometer information for respondents

Thank you for agreeing to record the distance you walk to school or water source.

What is a pedometer?

The basic function of pedometer is to count steps. A liver which is inside the pedometer gets activated with the walker's every hip movements, counting each movement as one step. When you wear the pedometer and walk from one place to another, it counts the number of steps that you have taken in traveling this distance. The total number of steps that you have taken is then multiplied by the average length of your step to arrive at the overall distance between any two points. The machine also records the time taken by you in traveling the distance.

General information before you begin
(Sportline 350 Model)

1. To open the cover of the pedometer, gently lift and push the plastic lip that we have painted red.

2. There are 5 blue buttons across the bottom part of the pedometer. The larger blue button on the right (marked E in the sketch) is the MODE button. Pressing the mode button moves a small black arrow in the screen to point to one of 5 functions.

3. Press the MODE button and watch the arrow point to the functions: STEP (counts the steps), DIST (distance – calculates the distance), KCAL (we will not use), CLOCK (we will not use) and TIMER (measures the elapsed time).

4. Push the MODE button until the small arrow points to DIST. On the left part of the screen you should see written KM (meaning kilometers). If you see written ML, you must hold down the RESET key (marked A in the sketch) for <u>5 seconds</u> until the "ML" disappears and "KM" is displayed.

5. Press the TOTAL button (marked D on the sketch) several times. Each time the TOTAL button is pressed, you will see a small word "TOTAL" come on or disappear at the top right of the screen above the numbers. You want the "TOTAL" word to <u>not be displayed</u>, so if it is written on the screen press the TOTAL button (marked D) to make it disappear.

6. We will <u>not</u> use the SET button (marked B on the sketch) or the SCAN button (marked C on the sketch).

When you are ready to record your walk:

1. Press the MODE button (marked E) until the small arrow is pointing to DIST. If the number on the screen is not zero, press the RESET button (marked A) for two seconds until the number resets to zero.

2. Check that KM is displayed on the left side of the screen. (if it says ML, refer to number 4 above.)

3. Close the pedometer and use the hinge to put it on your belt or waistband in the correct position shown to you, in line with the crease on the left or right front, and level.

4. Place the pedometer on your belt, always in a vertical position. Do not hang it on the side of the belt or waist band. Keep in mind that movements such as pulling up pants, bending over to tie your shoe can register a step.

5. Walk to school or waters source trying to keep the same regular pace you used when the enumerator measured your steps. You can stop on the way and the pedometer will stop

recording. It will start recording again when you start walking again. If you want to check the readings on the way, you can open the cover and see the readings, but you must close the cover again before continuing to walk, or the machine will not record.

6. When you get to school or waters source, you must stop, stand still, open the pedometer cover and press the MODE button to show the readings:
    - First press the MODE button until the arrow is on STEP and record the number of steps on Line 1.
    - Second, press the MODE button again until the arrow is on DIST and record the distance in kilometers. Please write all 4 or 5 digits on Line 2.
    - Third, press the MODE button twice more until the arrow is on TIMER, and record the time, writing all the 5 digits displayed, on Line 3.

7. The pedometer cannot be turned off. Just keep it in a safe place until you are ready to return home.

8. When you are ready to return home check that you have this recording sheet.

9. Open the pedometer cover and press the MODE button until the small arrow is pointing to DIST. Press the RESET button (marked A) for two seconds until the number resets to zero.

10. Close the cover and put the pedometer in the correct position on the belt or waistband.

11. Return by the same route that you took to get to school or waters source.

12. When you get home, stop, open the cover and record the readings “to home” in the same way as described in Number 5 above. Do not worry if the numbers are different.

13. Put the recoding sheet and the pedometer together for pick-up by the enumerator.

ISSUED PANEL HOUSEHOLD ID_____

NAME:_____Date of walk:_____
Day Month Year

WALKING TO (underline one): 1. WATERS SOURCE or 2. SCHOOL

	To waters source or school	Back to home
Line 1. STEP (steps)	_____	_____
Line 2. DIST (distance)	_____ . __ __ __	_____ . __ __ __
Line 3. TIMER (minutes)	__ . __ __ . __ __	__ . __ __ . __ __

ANNEX VI:
AFRICA: TRANSPORT TARGETS AND INDICATORS RELATED TO THE MILLENNIUM DEVELOPMENT GOALS (MDGS)

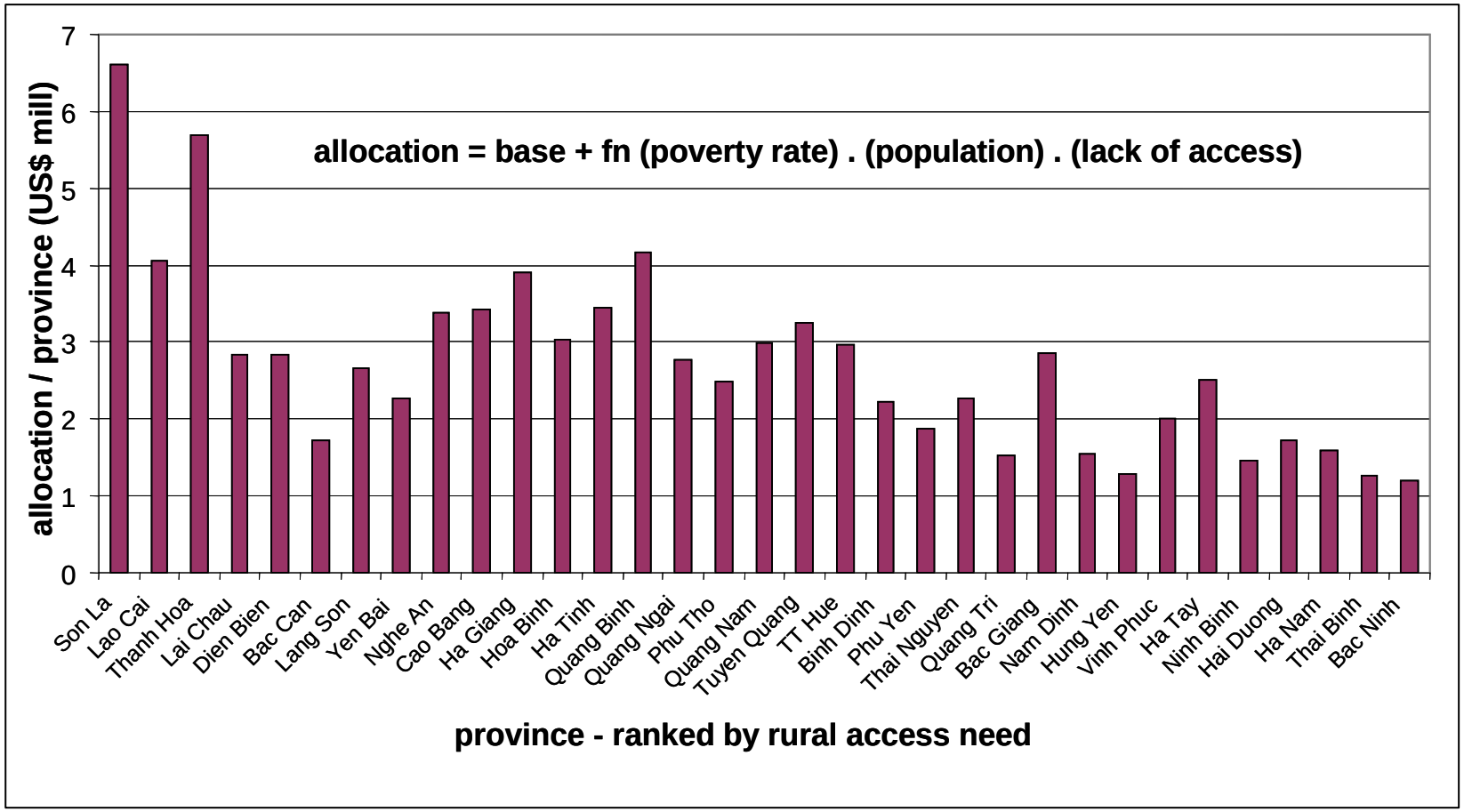
MDG	Targets	Indicators
MDG 1 Eradication of extreme poverty and hunger	**Access** to inputs and markets, and generation of employment opportunities, improved by **halving the proportion of rural population living beyond 2 km of an all-season road**	Proportion of rural population within 2 km of an all season road % Reduction of travel and vehicle turnaround time % Increased productivity in agriculture and economic activities % Increase in employment opportunities and income generation from transport related activities
	The difference in average **transport cost** between Africa and Asia narrowed down by 50%	% Reduction in passenger fares (passenger kilometer) % Reduction in unit goods transport cost (ton kilometer) Level of affordability of transport cost by the urban and rural poor % Increase in the use of intermediate means of transport (IMT) Existence of sustainable financing mechanisms like Road Funds… % Increase in the proportion of roads in good and fair condition
MDG 2 + 3 Universal primary education and gender equality	**Rural access** and **urban mobility** improved to eliminate constraints on the time which all children have to participate in education and to enable effective education to be delivered and reached safely	% of schools which have reliable access % of households which report constraints on education due to: Lack of girls time for school Difficulty (cost) of access Poor quality of education service Lack of safe access to school
MDG 4 + 5 Child Health and Maternal Mortality	**Rural access** and **urban mobility** improved for reliable supply of inputs to health facilities, to provide affordable access for all households and to enable cost effective outreach health activities	% Health centers, clinics etc with reliable rural access. % of households reporting constraints on access to health services because of: Distance Cost / difficulty of travel Poor quality health service Unit cost immunization / capita Unit cost / coverage of outreach services / capita
	Emergency transport response for medical crisis in rural communities improved through community communications facilities linked to improved transport services	% Emergency patients unable to reach health care in time: Expectant or postnatal mothers Children under 5 years

ANNEX VI (continued)
AFRICA: TRANSPORT TARGETS AND INDICATORS RELATED TO THE MILLENNIUM DEVELOPMENT GOALS (MDGS)

MDG	Targets	Indicators
MDG 6 HIV/AIDS, malaria and other diseases	Ensure **transport sector ceases to be an agent for spreading HIV/AIDS**	HIV/AIDS Prevalence among transport sector workers (public and private) HIV/AIDS prevalence rate in transport affected communities Inter-country coordination of actions relating to AIDS in transport sector
	Rate **of road accident fatalities** reduced by half by 2015	Rate of fatality (per million vehicles-km) Number of countries adopting road safety strategies
MDG 7 Environmental sustainability	Share of urban residents for whom **mobility** problems severely constrain access to employment and essential services halved	% of households (in the various urban living environments) which report transport costs and time as major obstacles to employment
		% of households which report access as a major obstacle for essential services
	Environmental sustainability promoted in all transport operations and development programs	Environmental impact identified by audits of programs undertaken
	Production of **leaded petrol** ceased by 2010	Number of countries banning sale of leaded petrol
MDG 8 Global partnership for development	**Transport cost** for landlocked countries reduced by half and their access to global markets improved, all TAH missing links completed and existing portions of regional transport corridors maintained by 2015	Percentage reduction of missing links of the Trans-African Highways (TAH) network and transit corridors. % reduction in transport cost for landlocked countries
	All non-physical transport barriers that increase **journey time**, customs clearance, border delay and impede the flow of goods and services dismantled by 2015	Proportion of countries that have reduced checkpoints along their main transit corridors to a maximum of 3 (between port and border of land-locked country). Proportion of countries that have reduced their border crossing time to OECD average. Proportion of countries that have reduced their port clearing time to OECD average.
	Axle load limits, vehicle and **road technical standards** harmonized between RECs by 2015	Proportion of RECs with harmonized axle load limits Proportion of RECs with harmonized standards for vehicles Proportion of RECs that have harmonized road design standards
	Air transport services improved **fares reduced**, and **movement of goods and services** facilitated in all African countries by 2015	Number of new connections between African countries established. Number of products and volume of traffic of products transported by air. Percentage reduction in air transport fares.

Source: AU / AfDB / UNECA / ECOWAS / WB, April 2005.

ANNEX VII:
VIETNAM – PROVINCIAL ALLOCATION TO IMPROVE RURAL ACCESS



Note: This illustrates a possible allocation of US$ 90 million between the 33 Provinces identified to most require support for improving Basic Rural Access.
Source: Peter Roberts's working draft of March 2005