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Planning for Sustainable Access: The Application of Integrated Rural Accessibility Planning (IRAP) in Cambodia

Key words
Integrated Rural Accessibility Planning (IRAP), Transport Infrastructure Inventory (TII), Geographical Information System (GIS), Participatory Planning.

Doekle Wielinga
International Labour Organisation
Chief Technical Advisor
ILO NRDP - IRAP Project
CMB/02/MO1/ADB
P.O Box 2642 (ILO PNP3)
Phnom Penh 3
Cambodia
Tel: (855) +12 900424
fax: (855) +23 427632
doeklew-ilo@bigpond.com.kh

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1 Summary

This paper approaches rural transport infrastructure development through the concept of accessibility. Rural access problems in developing countries are described and it is outlined how appropriate transport planning can attribute to poverty alleviation. Integrated Rural Accessibility Planning (IRAP) is identified as a planning framework which is based on the concept of accessibility and which uses indicators and participatory approaches to prioritise infrastructure projects, and therefore provide the most impact from limited donor budgets.
In this context is introduced as an appropriate participatory, holistic and integrated planning tool. A number of aspects specific to the IRAP application in Cambodia are highlighted, such as: institutional position, levels of participation, Transport Infrastructure Inventory (TII), Asset Assessment, Geographical Information System (GIS), integrated planning and Cost Effectiveness (CE) analysis. The paper concludes with recommendations to improve IRAP application worldwide.

2 The Accessibility Problem and Transport Planning

All communities require access to basic minimum needs such; as safe drinking water, fuel wood, land and food security; and services including education, health care, marketing and administration. However equitable access can be very difficult to achieve, even for the most basic of needs and services.

2.1 What is access and why is it a problem in rural areas?

The Oxford Dictionary defines access as "the opportunity to reach, use or visit". Access can be measured in travel time, travel cost and frequency (effort) and depends on the mobility of an individual and that individual's proximity to the desired destination.[1]

Different levels of access have been defined[2] and are summarised below:

No access:	no motorised access to the community possible
Partial access:	motorised access during parts of the year only (during the dry season)
Full access:	all year round motorised access
Basic access:	all season access for the prevailing means of transport

The level of accessibility required will differ according to location and local requirements. It is also important to recognise that with limited budgets, providing full access in all areas is not always feasible.

The primary difficulty in achieving better accessibility in rural areas is that they are characterised by agricultural activities and a resulting low population density. In such areas, the cost of transportation infrastructure is unusually high in comparison to the population served (particularly when costs are compared with urban areas). As a result it is difficult to attract investment in rural transport infrastructure, which in turn constrains development opportunities available to rural communities[3] and results in large areas being isolated and unable to escape poverty.

Travel and transportation therefore consumes a large portion of a rural household budget; in terms of time, money and effort[4]. And whilst rural people have a greater reliance on transport infrastructure to access basic minimum needs and services, it is urban areas which typically have better transport systems despite lesser distances to basic minimum needs and services.

One of the results of this is that rural people are forced to migrate to the urban centres, further compounding social problems in these areas.

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[1] On the move in Rural areas, an integrated and inclusive approach to rural transport operations, page 12, Starkey Paul, Simon Ellis, John Hine and Anna Ternell (World Bank Rural Transport Thematic Group) Initial Draft Paper, November 2000

[2] Design and Appraisal of Rural Transport Infrastructure, Ensuring Basic Access for Rural Communities, page 11, Lebo Jerry and Dieter Schelling (World Bank) Technical Paper No. 496, 2001

[3] Improving Access in Rural Areas, Guidelines for Integrated Rural Accessibility Planning, page 11, Donnges Chris (ILO), RATP No. 8, 2003

[4] Household Travel and Transport Analysis, Rural Transport Infrastructure Research, Rozemuller, Bas et al., (ILO Upstream Project) Socio-Economic Series # 3, Phnom Penh, September 2000.

In the rural transport debate a consensus is now emerging that improving accessibility is one of the key factors to poverty alleviation, economic growth and rural development. Additionally, with the decentralisation and de-concentration of the implementation of transport programmes to local government, it is recognised that top-down, sectoral approaches to transport planning are inefficient, and ineffective[5].

It is recommended that given the multi-sectoral nature of transport, an integrated planning approach is the most appropriate planning framework. This approach must be applied at local level, and should be participatory and holistic in the sense that it addresses the transport infrastructure and mobility as an integrated solution.

One such approach is the subject of this paper; IRAP. This framework for rural infrastructure planning is a most useful approach to achieve the integrated requirements discussed above, and attention is given to innovative aspects of IRAP as applied in Cambodia.

3 Integrated Rural Accessibility Planning

3.1 History

Over the last decade the World Bank, Department For International Development (DFID), International Forum for Rural Transport and Development (IFRTD), International Labour Organisation (ILO) and other organisations have initiated programmes to better understand the role of transport in the rural development context.

ILO has been involved in Africa and Asia in developing the IRAP planning tool. In Asia IRAP is currently used, with the support of the ILO, in the Philippines, Lao P.D.R., Cambodia, Thailand, India, Nepal and Indonesia.

3.2 Concept

IRAP is a local-level area planning tool that approaches the issue of poverty based on the concept that the lack of access of rural people to goods and services is one of the fundamental constraints to development and that improving access is a necessary step towards poverty alleviation.

IRAP works with three elements that are intimately linked:

1. The household or village;
2. The location of social and economic services
3. The transport network linking the first with the second.

Accessibility improvements may therefore involve the improvement of the road network, increased personal mobility or the improvement of the distribution and location of services.

[5] Poverty and Transport, Page 21, Hamner Lucia, Elizabeth Lovell, Robert Chapman and Tom Slaymaker (Overseas Development Institute) June 2002.

Providing the population with access to a range of goods and services and local employment creates the platform for economic and social development.

IRAP is a bottom-up planning tool that involves local population in each stage of the planning process. It is demand driven; it takes the access needs of households as a starting point; it is integrated in nature because it considers all aspects of a household's need for access and is participatory at every level so that investment priorities incorporate community perceptions. This makes IRAP both comprehensive and sustainable.

IRAP is flexible in its local application. While the concept of IRAP always will remain "accessibility", the application might differ from country to country, either in terms of sectors; administrative levels involved in the planning process or applied technology.

3.3 The Planning Process

The IRAP planning cycle can generally be divided into four steps:

1. Data gathering
2. Data analysis
3. Investment or Project Identification,
4. Monitoring and evaluation/impact assessment

During the whole process maps play a very important role.

1. Data gathering uses accessibility questionnaires or sheets that primarily focus on travel time; travel cost; frequency and route. Sectors that can be included are access to water, energy, land, agriculture, irrigation, schools, health facilities, markets, post harvest facilities, employment, etc. Accessibility Mapping, which manual and GIS based spatially referenced data on villages, routes and location of needs and services, is very important during this phase

2. During data analysis, Accessibility Indicators (AI's) are created that measure which locations are more isolated than others. Accessibility Maps are then updated and accessibility profiles for communes or districts are produced.

3. Investment, or project identification, is a process whereby the AI's, catchment area analysis and priority mapping tools are used to identify what, where and how investments can take place. The investments are generally presented in project or accessibility plans. Several sectors are considered at the same time, i.e. the approach is multi-sectoral.

4. By analysing the accessibility situation after projects have been finalised, the impact of the investments can be measured. This phase can also serve to update accessibility plans for a next round of investments.

4 IRAP application in Cambodia

For eight consecutive years the ILO has been working in Cambodia constructing and maintaining roads using Labour Based Appropriate Technology (LBAT). The activities served two important goals: employment generation to stimulate the local economy that had been devastated after thirty years of war and violence and to rehabilitate and maintain needed roads and canals. Through these activities hundreds of kilometres of roads have been reconstructed and maintained and also hundreds of engineers have been trained in LBAT infrastructure and maintenance.

In the now completed ILO Upstream Project, attention was shifted towards institutional strengthening and capacity building in the Ministry of Rural Development (MRD). One of these activities was to strengthen the planning and prioritisation of maintenance and construction of rural roads.

As a consequence, the IRAP planning tool was introduced to Cambodia in 1999, again through the ILO Upstream Project. The tool was piloted in Siem Reap Province where the IRAP procedure has been applied to all districts and in two of the eight districts in neighbouring Bantaey Meanchey Province.

The MRD has adopted IRAP as a standard planning tool, and a special mention has been made of IRAP by Prime Minister Hun Sen. He stated that the MRD has: "the responsibility to prepare local plans aimed at addressing the delivery and management of rural infrastructure through improved accessibility using the methodology of Integrated Rural Accessibility Planning as a survey instrument." (Closing speech of the annual conference at MRD, February 28, 2001)

Major donors have also become interested in the planning tool and now IRAP is being applied in two major infrastructure projects. In the North-western Rural Development Project (NRDP), financed by the Asian Development Bank (ADB) and executed by MRD, IRAP is applied to identify the rehabilitation and maintenance of rural roads, health centres, markets and schools. The Rural Roads Department within the MRD will mainstream IRAP in the remaining provinces and develop a nationwide maintenance works programme using IRAP prioritisation.

IRAP is also applied in the Provincial Rural Infrastructure Project (PRIP), a project financed by the World Bank (WB) and executed by the Ministry of Public Works and Transport (MPW&T) and MRD, to identify secondary national, provincial and tertiary roads for rehabilitation and maintenance.

4.1 Country Specific aspects

The IRAP planning tool as applied in Cambodia is based upon experiences in Lao P.D.R. and the Philippines. However a number of adaptations and improvements have been made to tailor the IRAP planning tool to the needs of Cambodia

4.1.1 Institutional Setting

At the time of introduction the current institutional framework was analysed and it was concluded that already existing planning activities took place at village and commune level. It was therefore decided to apply IRAP mainly at district level, based upon the information coming form other planning processes. This made the data gathering less intensive and cumbersome, reducing the total time needed for the planning cycle.

4.1.2 Participation

The IRAP process develops around a series of workshops which are participatory in nature. The workshops occur at both commune and district levels where a diverse group of participants, ranging from commune leaders to monks and Departmental officials, take part in an equitable process.

However different levels of participation are applied during the planning process.

At commune level stakeholders are consulted during detailed data gathering and problem and priority analysis, while at district level participants actively take part in accessibility analysis and decision making.

The rationale behind this is that the investments should benefit the entire district, rather than individual communes or villages. Past experience has shown that by involving stakeholders at commune or village level in the decision making process, misleading expectations are created, resulting in mistrust and ultimately damaging future participatory processes.

4.1.3 Transport Infrastructure Inventory

Given the information on the road network in Cambodia has not been updated since pre-war times, a complete new inventory and update is required for the efficient use of the IRAP tool. TII is a participatory and low cost approach to conduct a road inventory using a combination of workshops, interview with key persons and field verification using handheld GPS receivers.

The output is a district road inventory, detailing length, condition and classification of the road network, all displayed in updated GIS based TII maps. These maps form the basis for the prioritisation phase of the process.

4.1.4 Asset Assessment

During the TII process the location of all villages are checked, as well as the location and condition of each school, health facility and market. Using standard unit rates, maps are can then be produced which illustrate the relative wealth of areas with regard to the value of their assets.

4.1.5 Geographical Information System

IRAP traditionally uses manual mapping techniques, which are very appropriate when planning occurs at village level for example. In Cambodia however, planning teams operate at the provincial and district levels, which make the use of computer mapping software, GIS, possible.

Over time affordable and simple GIS programmes have become available that have the capacity to combine database analysis and spatial analysis, making the mapping process easy and efficient. Experience has shown that new staff does not require all phases of manual mapping training, but can "leapfrog" to contemporary GIS and still have a strong understanding of spatial analysis theory. This makes the use of GIS more cost-effective and time-effective in the production of illustrative maps, as well as spatial analysis.

4.1.6 Integrated Planning

Following the compilation of accessibility data and asset maps, communes and villages are ranked according to their levels of access to basic minimum needs and services. Poor accessibility rankings highlight areas most in need of development.

Through consultation and prioritisation, an investment framework for those most lowly ranked areas is then developed. Cross sector analysis also reveals the complementary or conflicting nature of proposed investments. The resulting Accessibility Action Plan (AAP) should not be considered in terms of individual sectors but as an integrated development plan in which the maintenance and upgrading of existing assets are considered together with the request for new assets.

The experience shows that two spatial levels of intervention are identified:

- **Within the settlement area:** Destinations usually within walking distance for the majority of the households, like potable water supplies, fuel wood sources, agricultural land and cultural and social facilities like primary schools and communal buildings.

- **Outside the settlement area:** Destinations usually requiring the use of a wide range of public and private transport modes, like secondary education facilities, health care facilities, markets and administrative centres.

IRAP usually prioritises larger infrastructure investments falling in the second category.

Now having a strategically planned multi-sectoral framework for development interventions, the districts have been able to approach different donors using the AAP as a development guideline for the area.

4.1.7 Cost Effectiveness Analysis

With regard to road transport planning, each AAP includes a list of prioritised road improvements, with differentiations made between maintenance and rehabilitation priorities.

For both types of investments, a preliminary costing is made for the 1st, 2nd and 3rd Priority investment. Pricing is based upon locally available surface treatments (including assessment of alternative treatments if available), the application of Labour Based Appropriate Technology (LBAT) and life cycle costing to determine future maintenance needs.

A Cost Effectiveness (CE) analysis is used as described below, with the outcome used to rank these priority investments as a first recommendation towards full Economic Analysis:

$$\text{CE Ratio} = \frac{\text{Cost of the investment per kilometre}}{\text{Population served per kilometre}}$$

5 Conclusions and Recommendations

Improving access of rural people to basic needs and services is a critical aspect of achieving poverty alleviation. IRAP is emerging as an appropriate local level planning tool that is able to prioritise investments through a participatory, holistic and integrated approach to rural accessibility.

The application of IRAP is based on the same concept throughout Asia and other parts of the world, the concept of improving access of people to needs and services. However, IRAP application can differ according to specific country requirement, with the flexibility of IRAP being in its ability to be applied to one sector as well as to multi-sectoral activities.

Lessons learned from the successful introduction and now mainstreaming of IRAP in Cambodia that can be used as recommendations for IRAP applications elsewhere:

- It is important to have a clear institutional position from the onset of IRAP introduction. Part of that is a careful analysis of the existing planning framework so that IRAP can complement existing planning processes and procedures

- Consultation or passive participation and active participation are applied to different stakeholders during the planning process depending on the levels of decision making. This avoids raising false expectations among participants.

- A mix of more sophisticated equipment such as GPS receivers, GIS with traditional manual mapping and workshop consultation can shorten the time of the planning process considerably without losing its nature of a participatory bottom-up planning approach.

- Accessibility Action Plans, integrating investment priorities of different sectors, function as an area development plan. District officials have taken ownership of these plans and have used it as a blue print to attract and direct funds from diverse sources to boost rural development in their area.

- Identified accessibility investments are prioritised upon a multi-criteria analysis. Utilising CE analysis to road investments makes it possible to rank the priorities as a first step toward Cost Benefit Analysis. Preliminary cost calculations should incorporate LBAT, life cycle costing and surface options analysis.

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[6] WB……..
[7] Design and Appraisal, Transport for the Poor, ……
[8] MRD Second Five Year Socio-Economic Development Plan, 2001-2005 (SEDPII)
[9] MRD Second Five Year Socio-Economic Development Plan, 2001-2005 (SEDPII)
[10] Rozemuller, et al., Household Travel and Transport Analysis, Rural Transport Infrastructure Research, ILO Upstream Project, Socio-Economic Series, Phnom Penh, September 2000.
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11
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12 Building the Foundations for Sustainable Development and Poverty Reduction, World Bank (South Asia and Mongolia Country Unit - East Asia and Pacific Regional Office), February 2000).
13
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