

## Interim findings

### Feeder road development

The research project ‘Feeder road development for inclusive productive employment’ investigates specific ways in which road development in Ethiopia promotes productive employment through: direct employment in infrastructure construction, the generation of or changes to employment due to improved mobility and access, and changes to employment due to different water resource management options linked to the design of roads. The following are the interim findings and policy messages.

#### Interim findings

- While nearly everyone benefits from the development of rural roads (economically and otherwise), the long-term benefits are not necessarily distributed equally. Surveys in the study sites confirm high levels of income and wealth inequality. Different population groups benefit differently from rural roads according to their position in relation to the road, their access to markets, and the environmental and social impacts of the road. Distributional effects can be subtle, concealed and delayed, leading to ‘hidden’ dynamics, which can exacerbate, rather than reduce, social inequities.
- Land, the main form of capital, is clearly important for all income groups. The capacity of low income households to manage their land is low due to the lack of non-land resources (e.g., oxen, ploughs and irrigation pumps). The average size of managed land was found to be 0.278 hectares for poor households and 1.977 hectares for rich households. The poor can earn some of their income from rent or a share of the crop produced on land, but they remain highly dependent on wage employment to secure sufficient income. Better-off households earn a greater proportion of their income from their capital assets (95% for the richest 5% of people) than from wages.
- The severe inequality in terms of capacity to manage land is an important factor in the distribution of the benefits of rural road development. Those who rely on roads to sell surplus agricultural production seem least dependent on it to buy food and other goods. Labourers, on the other hand, can benefit from roads by seeking employment elsewhere, but can lose out due to the competition resulting from the inflow of labourers from other areas.
- The construction and maintenance of roads plays a significant role in creating employment opportunities and generating wage income for women and men in (and outside) the project areas. Small-scale mining for construction materials, for instance, with proper planning and support, could provide employment opportunities for youth in Tigray. However, the wage rates were clearly a function of time, space and gender—despite the quality and daily work volume assignment. Hence, there is a need to enforce the principle of ‘equal pay for equal work’. Moreover, the scale of such opportunities, relative to the existing levels of unemployment in the region, is low.
- The indirect impacts of road development on productive employment are likely to be more significant than the direct impacts of employment in road construction. The improved mobility and access provided by roads can generate productive employment. In addition, while feeder roads are not an essential factor in long-term labour migration, they do affect seasonal and short-term labour mobility, which is much more substantial and frequent. However, in Tigray, a significant proportion of the poorest households are female-headed and interviews have revealed impediments to their mobility due to responsibilities at home.

Nevertheless, in general, indirect employment can reduce poverty levels in the short term. Still, a long-term concern is that increased competition among a more mobile labour force can lead to severe drops in wages.

- Roads have a major influence on surface water hydrology, leading to changes in run-off patterns. They either block the flow and concentrate it in a limited number of cross drainage points or act as drains and carry the water along after heavy rainfall. These impacts can be turned around with roads acting as instruments of good water management, leading to resilience in existing and future road structures. The promotion of road water harvesting and its integration in road development programmes in Tigray and Amhara in 2015–2016 has already provided an estimated 1.2 million people with access to water. Road water harvesting activities have led to increases in family incomes of around 20–30% through increased water availability and soil moisture. Productive employment opportunities can also be generated in the construction and maintenance of these new water management structures.
- Road dust has been identified as an important hazard to human health and agricultural production. Covering all rural roads in sub-Saharan Africa with evergreen multipurpose trees can generate employment, protect crops and roadside communities from dust, and provide socio-economic benefits. Through rural development programmes, the rural poor, particularly women, the landless and the disabled, can be targeted.
- Feeder roads have contributed to the expansion of non-farm businesses in the rural areas of Tigray and created business opportunities. However, the majority of entrepreneurs acknowledge that they fail to fully utilize the opportunities the road has created: despite the improvement in rural road coverage, transportation related problems remain an important constraint on rural business growth and operation. Moreover, many of the small shops that materialize after the establishment of a road are owned by people from nearby towns who have sufficient capital to invest, bypassing the poorest local female-headed households.

## Policy messages

- Consider and counter any undesirable effects of feeder road development: Rural roads are crucial to development, as they bring with them better access to health, education and services. However, by narrowly focusing on formal employment effects we risk overlooking the effects on other forms of work and productivity. It is important for policymakers to determine whether or not the poor can compensate for these effects and what interventions may be required to ensure inclusiveness. Next to investment in feeder roads, additional interventions are needed to counter any undesirable effects of road development. Depending on the particular needs and existing (spatial) inequalities in different communities, these interventions might include affordable public transport services, local market development, or new forms of asset-building projects to assist households in regaining control over the management of their land.
- Ensure that road water harvesting is an integral part of road design guidelines and policies: The two objectives of improving road connectivity and water availability for irrigation can be served by the same infrastructure. Road water harvesting provides an extra source of water for local communities, allowing them to diversify and increase their sources of income. It can also contribute to road longevity and safety. Moreover, when properly planned, road-side planting can generate productive assets and employment, while at the same time tackling negative environmental impacts.
- Develop intermediate means of transportation: Conventional motorized vehicles are not suitable for rural conditions. It is appropriate to take a systems approach to the analysis and planning of rural transportation. The development of intermediate means of transport (IMTs) and services should be treated as equally

important as the development of road infrastructure. IMTs should be sized to transport relatively small loads cheaply over short distances. They should be able to stand up to poor roads and be able to be easily repaired locally. They should be capable of off-road use on the tracks and trails that radiate from roads to where people live. In general, IMTs sacrifice speed and the economies of scale of traditional vehicles in exchange for a low capital outlay and simplicity to repair. The example of Asia may be followed where the use of IMTs is widespread and diverse, including electric motorbike rickshaws, engine vans, three-wheeler taxis, converted tractors and more.

## Knowledge products

### Scientific articles

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- Rammelt, CF, Van Schie, M, Tegabu, F & Leung, M (submitted, 2017) 'Vaguely right or exactly wrong: measuring the (spatial) distribution of land resources, income and wealth in rural Ethiopia', *Sustainability*.
- Rammelt, CF, Leung, M & Manjur, K (under review, 2016) 'The exclusive nature of inclusive productive employment in the rural areas of Northern Ethiopia', *Work, Employment and Society*.
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- Agujetas Perez, M, Nega Tegebu, F & Van Steenberg F (2016) 'Roadside planting: turning a problem into an opportunity', *Sustainability in Environment* 1(2): 98–115.

### Book chapters

- Van Steenberg, F, Woldearegay, K, Agujetas Perez, M, Manjur, K & Alemayehu, T (under review, 2016) 'Roads: instruments for water harvesting and resilience', in Leal, W & de Trinchiera, J (eds) *Rainwater harvesting irrigation and resilience*.

### Professional publications

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- Van Steenberg, F, Agujetas Perez, M & Woldearegay, K (2015) 'Collecting water with roads', *World Water: Stormwater Management Magazine*, <http://edition.pagesuite-professional.co.uk/Launch.aspx?EID=a63faa47-b568-48a3-b6a7-087d8db5acf6>

## Publications aimed at the general public

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- Van Steenberg, F (2016) *Tesla Rickshaws*, [www.thewaterchannel.tv/thewaterblog/427-tesla-rickshaws](http://www.thewaterchannel.tv/thewaterblog/427-tesla-rickshaws)
- Rammelt, CF (2016) *Rural roads and inequality in Tigray, Ethiopia*, Presentation at internal seminar, Dutch Ministry of Foreign Affairs, 6 September 2016, organized by INCLUDE & The Broker, <http://includeplatform.net/downloads/presentation-crelis-rammelt/>
- Unlocking the Potential of Groundwater for the Poor (UPGro) (2015) *Collecting water with roads – ground-breaking research wins Global Environment Award*, <http://upgro.org/2015/07/02/road-recharge-award/>
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## Other research output

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## Weblink

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