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Rural Access Programme 3 (RAP-3)
Monitoring, Evaluation and Learning Component

Endline Impact Assessment Report 2019

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Itad in association with Statistics for Sustainable Development (Stats4SD)

Results in development

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DFID Nepal have played a valuable role throughout the duration of the project in providing advice and support to the impact assessment team.

Finally, particular thanks are due to the many families in the western Nepal for taking the time to participate in the survey and study over the last five years. We hope that the findings of this report help others better understand their environment and lives for the future betterment of the people in that region and across Nepal.

Contents

List of acronyms

CBS	Central Bureau of Statistics
DFID	Department for International Development
FCS	Food consumption score
GoN	Government of Nepal
HH	Households
km	Kilometre
MEL	Monitoring, Evaluation and Learning
NLSS	Nepal Living Standard Survey
NPR	Nepali Rupee
PMT	Proxy Means Test
PPI	Poverty Probability Index
RAP-3	Rural Access Programme 3
RBG	Road Building Group
RMG	Road Maintenance Group
SED	Social and Economic Development
ToC	Theory of Change
UK	United Kingdom
WFP	World Food Programme

Currency exchange rate

1000 Nepalese rupees = £6.88 pounds sterling / $8.98 US dollars (May 2019)

Executive summary

1. Introduction

The independent Monitoring, Evaluation and Learning component of the third phase of DFID Nepal's Rural Access Programme (RAP-3) generated knowledge and facilitated learning for the programme and its partners. A significant part of its work was a mixed-methods longitudinal impact assessment of RAP-3, which ran from 2014 to 2019. This report presents the results of the endline impact assessment, undertaken in 2019.

The main quantitative element of the impact assessment included a panel survey of around 3,000 households across the eight districts in western Nepal. This constitutes the largest household survey ever undertaken in this understudied region of the country and as such includes a detailed dataset on the drivers of poverty specific to western Nepal. The qualitative element included participatory interviews and discussions with communities to provide an interpretive lens to the quantitative findings.

The UK Department for International Development (DFID) has been funding the RAP for the past 15 years. The third phase of implementation – the Rural Access Programme Phase 3 (RAP-3) – ended in June 2019. It was designed to contribute to DFID Nepal's twin objectives of delivering local economic growth and ensuring no-one is left behind- mainly through building and maintaining local roads and creating employment to the poor and disadvantaged communities in most remote parts of Nepal.

The impact assessment is focused on the impact on poverty in this region of Nepal. It therefore assesses the achievement of RAP-3's two main objectives: (i) improved rural access through new road construction and road maintenance; and (ii) the employment of poor communities to carry out these road-based activities.

2. RAP's contribution to poverty reduction in western Nepal

Although poverty rates remain high in western Nepal, they have declined since the start of RAP-3 across all communities in the region.

RAP-3 has contributed to poverty reduction in both build and maintenance regions. This is most evident in the new build areas, where poverty rates have declined at a faster rate for communities close to the new RAP roads – confirming the view that improved access contributes to poverty reduction.

RAP-3's direct beneficiaries, the members of waged Road Building Groups and Road Maintenance Groups (RBGs or RMGs), are less poor than other groups after RAP, but the difference between these and non-beneficiaries, also in close proximity to the RAP roads, is relatively small.

Hence, the impact of the RAP paid employment makes a weak contribution to poverty reduction. However, paid employment contributes to improved resilience and increased consumption, and provides a 'cushioning' effect during periods of acute stress if wages are paid with regularity.

In the district of Humla, there has been no impact on poverty for communities either close to or far from the RAP road. This is unsurprising as the community under assessment in Humla remains, at the time of the endline survey, unconnected to other road networks connected with the rest of Nepal.

3. Indicators of poverty

Food security is one of the most important indicators of poverty in western Nepal. Communities across western Nepal have recovered significantly at endline from the effects of an acute drought at midline, which had pushed poverty up.

Food consumption has recovered since the midline and now surpasses levels at the baseline.

Incomes (adjusted for inflation) for most groups in the maintenance districts has increased, with members of RMGs seeing the biggest increase as

many are likely to still be employed under government funding of RMGs.

However, incomes in the build districts at endline, with the exception of Bajura, have reverted close to baseline levels. There is a lack of other wage-earning opportunities, meaning that the impact of the wage-transfers has been short-lived for all groups, particularly RBGs. There appears to be little sustainability of income gains for RBGs at the end of the programme.

Additional spending as a result of RAP wages is focused on housing material, food consumption, children's education and the purchase of certain assets (mostly what are generally considered non-productive assets, such as television sets).

The significance of women being paid for work in RBGs and RMGs is important as this was the main source of wage labour for the overwhelming majority of women in RAP. However, this needs to be weighed against the issue that the burden of unpaid care work still falls disproportionately on these women.

Savings at the endline are higher for RBG and RMGs after the exit of RAP activities. However, some RBG members voiced concerns about their ability to access accumulated savings, despite RAP-3's provision of support to the settlement of group saving amounts and credit to disbanded RBGs.

It is important to remember that the PMT is based on national data for 2010/11, and its shelf life is increasingly limited as evidenced by certain indicators no longer being as relevant in poverty measures.

4. RAP's effect on access

Most people feel less remote and isolated as a result of RAP-3 and there has been a very significant reduction in travel time for those living near to newly constructed roads.

Most people indicate that there are now more goods available owing to the presence of roads and that they feel less remote or isolated. This is more marked in the new build districts where road density is lower.

In Humla, which is still fully unconnected (at the time of the endline survey), it is unsurprising that there has been little impact on the availability of goods or on people's perceptions of remoteness.

The use of motorised transport (i.e. vehicles) has increased since baseline although not all services require the use of motorised transport.

Most people still walk, but vehicles are used for certain types of journeys – for example returning with a load from distant markets or accessing hospitals in an emergency. Better and safer roads for walking on are valued as much as vehicular traffic.

The main service people use via vehicles is accessing district headquarters. Under new devolved governance arrangements from 2017 when Nepal transitioned to federalism, not all district headquarters will play as relevant a role as they used to. It will be important to consider how access to key administrative centres will change over time.

Mobile phone penetration (as evidenced by over 90% adoption) is changing the interpretation of access: more people (shopkeepers and customers) can make purchases by phone leading to less frequency of personal journeys.

5. Moving beyond RAP

Labour-based road construction is regarded as high quality and has the added value of communities feeling ownership and stewardship. But these jobs are short-term unless supported and continued by government.

When considering waged jobs, construction-related jobs dominate the local economy. There has been a small increase in non-construction related jobs but this still accounts for a small proportion of total jobs available. There are still limited options for income-earning opportunities for communities in western Nepal.

Hence, migration for work outside of Nepal is still a dominating factor in western Nepal. Mugu has seen static migration levels and this is partly reflected in the continuation of work opportunities available via RAP (from RAP-3 and the RAP Mugu-Humla Link Road).

Certain districts (like Kalikot and Bajura) appear to have more dynamic local economic activity whereas others do not. As a general trend,

districts with greater densities of road networks appear to be more dynamic.

The overwhelming majority of respondents surveyed believe that road maintenance responsibility lies with the local communities (at community and ward levels) reflected by the high feeling of ownership of community assets like roads.

Road Maintenance Groups (RMGs) appear to be working well as a model for routine maintenance but the lack of supervision apparent since handover to the government is worrying.

Federalism brings new challenges and opportunities to local governments in the management of local infrastructure such as roads. This is important to consider as development partners and the Government of Nepal at the national level consider how they tailor support in the future, likely requiring that support is more focused at the Province and Municipality level.

1. Introduction

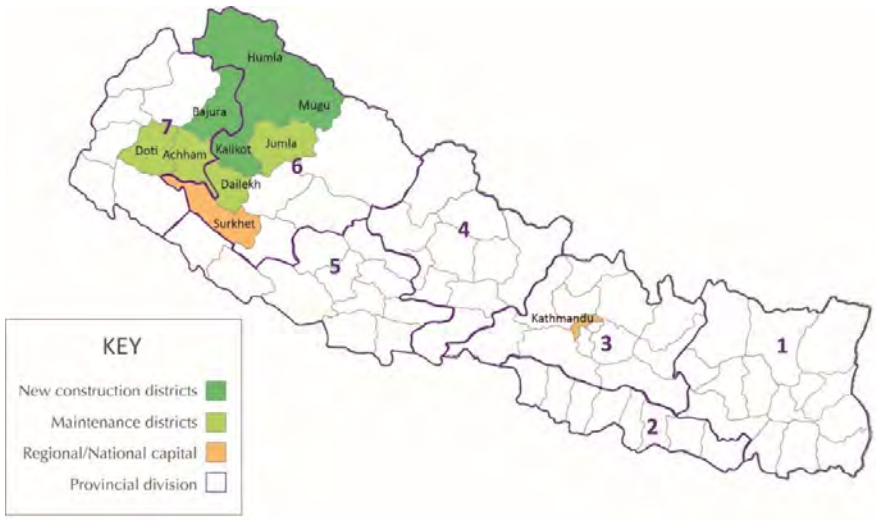
1.1 Background to the impact assessment of RAP-3

The independent Monitoring, Evaluation and Learning (MEL) component of the third phase of DFID Nepal's Rural Access Programme (RAP-3) generated knowledge and facilitated learning for the programme and its partners. A significant part of its work was a mixed-methods longitudinal impact assessment of RAP-3, which ran from 2014 to 2019. The main quantitative element of the impact assessment included a panel survey of around 3,000 households across the eight districts in western Nepal. This constitutes the largest household survey ever undertaken in this understudied region of the country and as such includes a detailed dataset on the drivers of poverty specific to western Nepal. The qualitative element included participatory interviews and discussions with communities to provide an interpretive lens to the quantitative findings. This report presents the results of the endline impact assessment, undertaken in 2019.

The UK Department for International Development (DFID) has been funding the RAP for the past 15 years. The third phase of implementation – the Rural Access Programme Phase 3 (RAP-3) – ended in June 2019. It was designed to contribute to DFID Nepal's twin objectives of delivering local economic growth and ensuring no-one is left behind - mainly through building and maintaining local roads and creating employment to the poor and disadvantaged communities in most remote parts of Nepal.

The programme delivered 97 kilometres (km) of new rural roads and the maintenance of several thousand kilometres of existing rural roads. It employed a labour-based approach to roadwork and construction activities by targeting poor and vulnerable households for short-term employment in groups called Road Building Groups (RBGs) and Road Maintenance Groups (RMGs).[1] This approach of improving road access via the use of pro-poor targeted labour employment aimed to maximise benefits accrued to one of the poorest regions of Nepal – eight districts covering Karnali Province and Sudurpashchim Province (Provinces 6 and 7 in Figure 1).[2]

Figure 1: Map of RAP intervention areas under MEL assessment



[1] RAP-3 acknowledged that it would allow the use of '*appropriate equipment where this can overcome localised difficulties and accelerate access to other income generation opportunities*', especially to drill and break hard and massive rock (RAP-3 Information Leaflet, May 2013).

[2] RAP-3 worked in a total of 14 districts across Nepal, with 9 districts covering Provinces 6 and 7 (Karnali and Sudurpashchim Provinces, respectively). The original 'main' districts are the eight covered by the independent MEL since 2014.

1.2 What are we assessing?

The full methodology for the impact assessment is presented in the separate Endline Annex Report.

As Table 1 and Figure 2 shows, three main groups (populations) of households were tracked over time. Two of these groups – the 'non-beneficiary inner' and 'beneficiary inner (RBG/RMG)' groups – were clustered in the inner domain, representing households living within a 1.5 hour walk from the planned or existing road. The 'non-beneficiary outer' groups were made up of households clustered in the outer domain representing households living 1.5–3 hours' walk from the road.

Figure 2: RAP groups

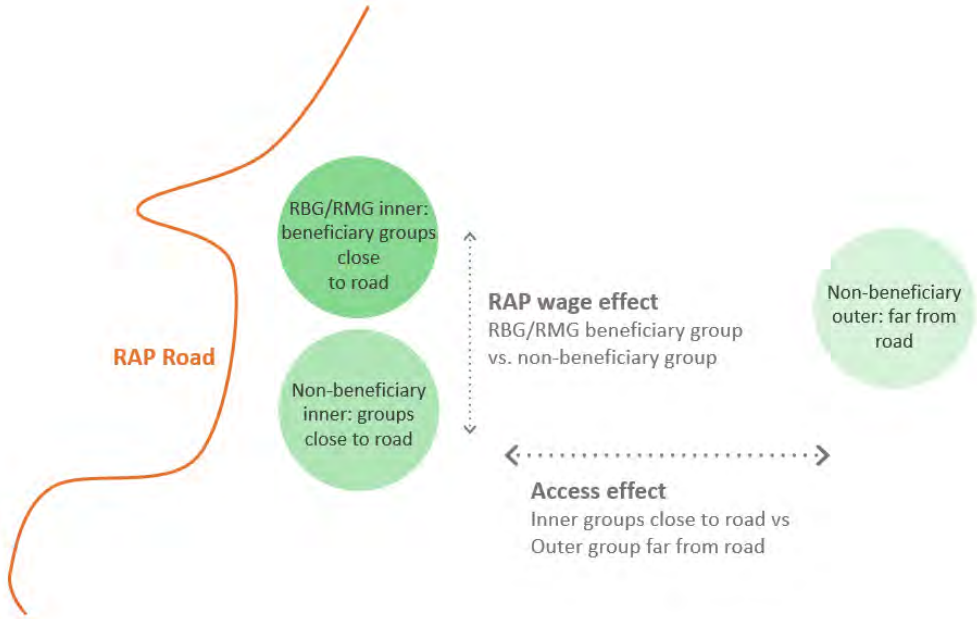


Table 1: Characteristics of different groups

Group	Proximity to road	Beneficiary of direct RAP employment (waged work)?
RBG/ RMG	Living within 1.5-hour walk from RAP road	Yes
Inner (close to road)	Living within 1.5-hour walk from RAP road	No
Outer (far from road)	Living 1.5–3 hours' walk from RAP road	No

Tracking households across these three groups enabled MEL to detect:

1. Whether poverty had reduced over time among households in the areas covered by RAP-3.
2. Whether poverty had reduced more for direct beneficiaries (RBGs/RMGs) than for non-beneficiaries in the inner domain.
3. Whether poverty had reduced more for those living nearer to the road (both inner domain groups) than those living further from the road (outer domain).

In short, the impact assessment has been designed to track the difference-in-difference between groups over three points in time: baseline (2014), midline (2016) and endline (2019).[3] This sampling strategy allows us to compare the differential impact of wage labour and of improved road access between remote and non-remote populations.

The impact assessment is focused on the impact on poverty in this region of Nepal. It therefore assesses the achievement of RAP-3's two main objectives: (i) improved rural access through new road construction and road maintenance; and (ii) the employment of poor communities to carry out these road-based activities.

RAP-3 also engaged in providing technical support to the Government of Nepal (GoN) as well as other direct market-based interventions. The impact assessment was not designed to assess RAP-3's technical assistance in these areas.

1.3 How to read this report

This report provides a non-technical summary of the results of the impact assessment. A separate Endline Annex Report has been produced and should be referred to for a full and detailed breakdown of the methodology, statistical design and qualitative design, and the full set of findings from both the quantitative and the qualitative components of the impact assessment.

The report has been written to aid the reader in absorbing the most relevant areas from the impact assessment. The report is structured as follows: Section 2 provides an overview of the impact of RAP-3 on wellbeing (i.e. poverty and vulnerability); Section 3 unpacks the findings related to key indicators of poverty and changes over time; Section 4 covers changes in terms of accessing key services as a result of the RAP roads; Section 5 provides some evidence that has bearing on issues beyond RAP. A summary of key findings is presented at the start of each section of this report.

1.4 Learning from this report

The original DFID Business Case for RAP-3 contained a theory of change (ToC). This was revised with support from a MEL-led workshop in 2016.[4] This report assesses RAP-3's theory of change. It has been produced through critical engagement with the data and cross-triangulation from qualitative methods as well as other reports, for example the MEL Market and Transport Study. The report references RAP and DFID's own reports where relevant in highlighting historical programme or design aspects as they relate to the statements of expected impact of the programme.

MEL hopes that DFID and other stakeholders take stock of the lessons from the impact assessment and other evidence generated across the timeframe of the programme. As DFID looks to a new portfolio of programmes in Nepal, taking into account huge historical changes in the country such as the shift to federalism, it should refresh its own understanding of the strengths and limitations of its infrastructure programming approaches. The evidence base generated by the impact assessment can provide a foundation on which to do so. DFID should consider a post-RAP assessment to assess change (and sustainability) some years after the project.

[3] Each of the three rounds of surveys was enumerated in the same seasonal window, between early May and mid-June, in each respective year. This was done to neutralise seasonality distortions between the survey rounds.

[4] MEL Review of the RAP-3 Theory of Change (2016)

2. RAP's contribution to poverty reduction in western Nepal

This section shows how wellbeing has changed across the RAP-3 working regions by the groups outlined in the introduction.

Key findings

- Although poverty rates remain high in western Nepal, they have declined since the start of RAP-3 across all communities in the region.
- RAP-3 has contributed to poverty reduction in both build and maintenance regions. This is most evident in the new build areas, where poverty rates have declined at a faster rate for communities close to the new RAP roads – confirming the view that improved access contributes to poverty reduction.
- RAP-3's direct beneficiaries, the members of waged Road Building Groups and Road Maintenance Groups (RBGs or RMGs), are less poor than other groups after RAP, but the difference between these and non-beneficiaries, also in close proximity to the RAP roads, is relatively small.
- Hence, the impact of the RAP paid employment makes a weak contribution to poverty reduction. However, paid employment contributes to improved resilience and increased consumption, and provides a 'cushioning' effect during periods of acute stress if wages are paid with regularity.
- In the district of Humla, there has been no impact on poverty for communities either close to or far from the RAP road. This is unsurprising as the community under assessment in Humla remains, at the time of the endline survey, unconnected to other road networks connected with the rest of Nepal.

2.1 What are we measuring?

Three overlapping yet distinct factors affect wellbeing in rural Nepal and underpin the rationale for RAP-3 and the overall intended impact as stated in the programme's ToC:[5] poverty, vulnerability and exclusion:

1. **Poverty** in the context of western Nepal is linked to a number of factors related to food security, lack of employment and income, assets and remoteness. Over the life of the programme, there have been several attempts to define this intention more clearly and to identify appropriate metrics.[6]
2. **Vulnerability** refers to the likelihood (actual and perceived) that individuals, households or communities will be in a situation in which they are no longer able to cope.[7] Vulnerability combines exposure to external risk and shocks (e.g. drought, earthquakes, conflict, national economic and market crises) with people's own sense of insecurity and powerlessness. Reducing vulnerability or strengthening resilience ('coping strategies') can often include: (i) diversification of income, (ii) asset accumulation and savings and (iii) building social capital.
3. **Exclusion** in the RAP-3 context was framed primarily in terms of geographic exclusion and a purposeful focus on western Nepal, where communities are remote and where road networks are sparse or non-existent. However, there were other efforts to address exclusion by RAP-3, which used pro-poor selection criteria in forming RBGs and RMGs. DFID Nepal (2012)[8] noted that Dalits in western Nepal are

[5] This version added the element of '*reduction in vulnerability*' to the original ToC. which stated the intended impact as *'reduction in poverty and exclusion in the RAP 3 Road Transport Infrastructure Area (RTIA)'* (RAP-3 Inception Milestone 3, August 2013).

[6] The original impact indicator used was '*number of people lifted out of short-term poverty by 2017*' where a target of 20,000 was set (DFID RAP-3 Business Case, 2013).

[7] DFID Nepal: An Inclusive Growth Strategy for the Mid-West and Far-West Regions of Nepal that Delivers on Poverty, Vulnerability, Food Security and Nutritional Outcomes, September 2012

[8] DFID Nepal An Inclusive Growth Strategy for the Mid-West and Far-West Regions of Nepal that Delivers on Poverty, Vulnerability, Food Security and Nutritional Outcomes, September 2012

significantly more likely to be poor than others and consequently RAP-3 took affirmative action to include Dalits in RBGs and RMGs. As per GoN guidelines, it also pledged to employ women as one third of the workforce.

The impact assessment used the following metrics to examine poverty reduction, vulnerability and exclusion (Table 2).

Table 2: Measures used by MEL to examine the multi-dimensions of poverty expressed in the overall impact statement – 'reduction in poverty, vulnerability and exclusion in western Nepal'

Element of impact statement	Metric or index used
Poverty	• Proxy means testing (PMT) • Progress out of poverty (PPI)
Vulnerability	• Income diversification • Asset and savings accumulation • Food consumption score (part of PMT)
Exclusion	• Gender and caste-disaggregated household survey data

2.2 What do poverty measures tell us about RAP-3's impact?

The impact assessment MEL used two composite measures to track poverty over the life of RAP-3: (i) proxy means testing (PMT) and (ii) Poverty Probability Index (PPI)[9]. MEL adapted the PMT model for the concerned districts in western Nepal[10] developed by the Nepal Bureau of Statistics and the World Bank,[11] which was based on data from the Nepal Living Standards Survey (NLSS) III (2010–2011).[12] In adapting the PMT, multivariate regression was used to correlate a selection of proxies (e.g. assets and household features) with poverty and income. The Endline Annex Report (page 76) provides details of the adapted PMT model. It includes indicators that were strongly correlated with poverty and its multiple dimensions and that might have been expected to change over the life of RAP-3.

2.3 Poverty assessment

The **endline PMT scores indicate that the region as a whole** has **demonstrated a substantial decrease in poverty since baseline, although its incidence is still high.** This indicates strongly that the entire region has experienced rapid, mostly positive, change (Figure 3): poverty incidence across the three surveyed groups fell from 56-70% at baseline to 26-54% at endline. The rate of decline in poverty incidence was greater for those involved in RAP's RMG and RBG groups ('Build: RBG' and 'Maintain: RMG') and for those living in close proximity to RAP roads ('Build: Inner' and 'Maintain: Inner') than those living further from the roads ('Maintain: Outer' and 'Build: Outer'). Further detail on poverty trends by province is provided below in Section 2.4.

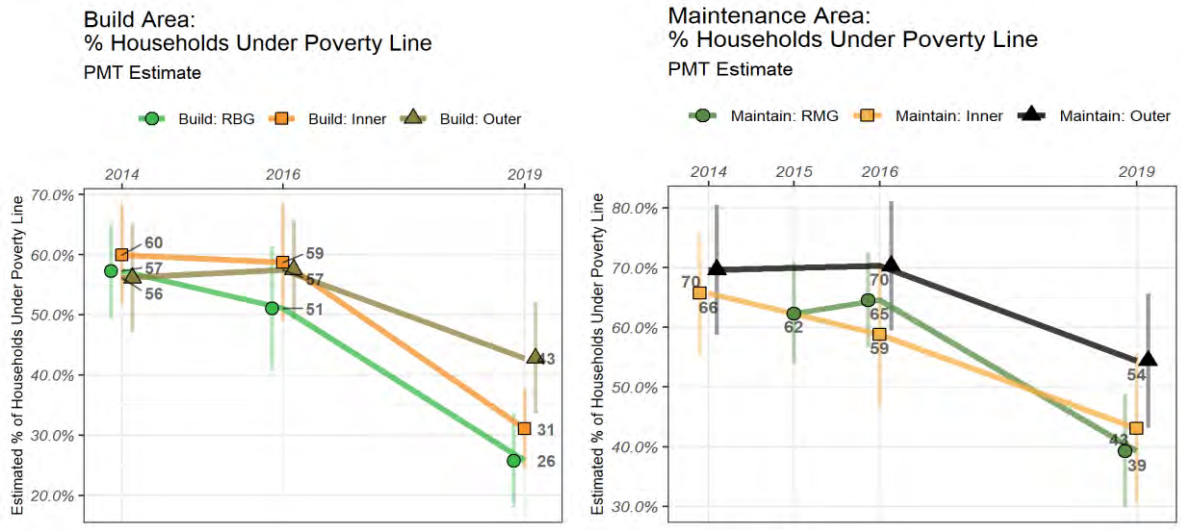
[9] This used to be called the Progress-out-of-poverty Index, but was rebranded in 2017.

[10] Removing the data for the low-lying Terai (lowlands), which was deemed to have a significantly different agri-ecological and livelihood context from the rest of the mid hills and mountain region that make up the western region of Nepal that we are studying.

[11] GoN National Planning Commission Secretariat, Central Bureau of Statistics and World Bank (2013) Small Area Estimation of Poverty 2011.

[12] These variables purposely did not include access indicators, as these would have automatically affected the composite index.

Figure 3: Households under poverty line



2.4 Poverty and remoteness

The endline survey strongly corroborates the theory that reducing remoteness through improved access has a positive impact on poverty reduction. This is particularly significant in the new build areas, where at baseline the sampled populations experienced similar poverty rates and all lived far from existing roads (before the RAP roads were planned and built). As the RAP roads began construction, the populations that lived closer to the new roads (inner) showed a much greater reduction in poverty over time. Hence, the correlation between road access and poverty reduction (other things being equal) is strong.

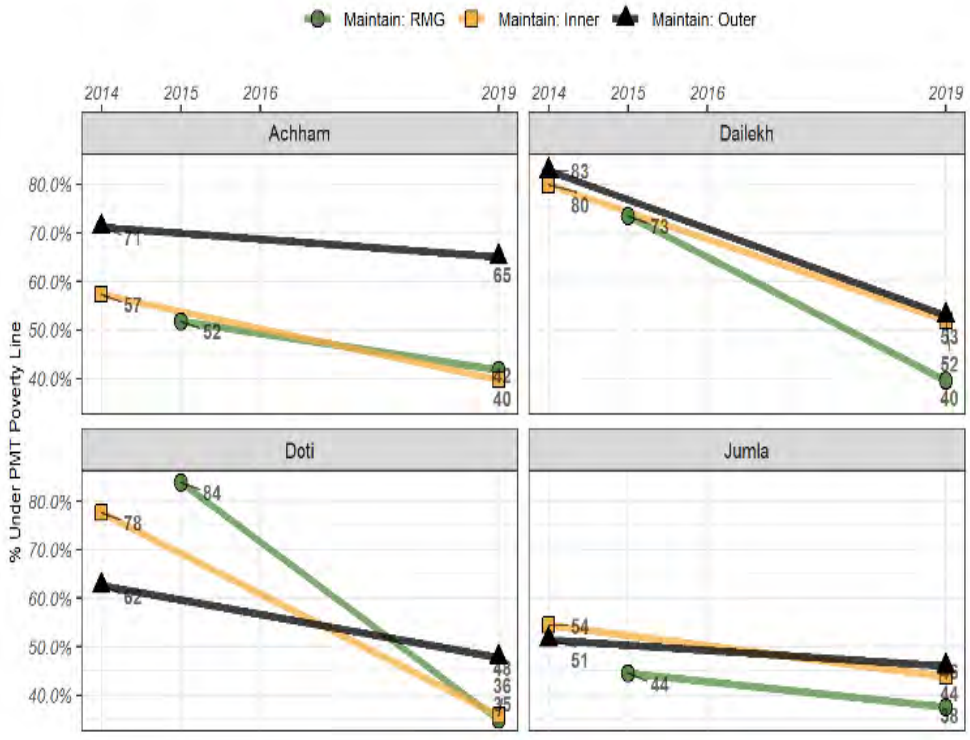
The reduction in poverty rates was concentrated in the period between the midline and endline survey (i.e. in the last three years of RAP-3). This is primarily because communities recovered from a severe drought at midline. The overall percentage of the population estimated to be below the poverty line has dropped by 20% since 2014, which represents a reduction from approximately 89,223 households living below the poverty line at baseline to approximately 60,005 households at endline, based on the population estimates of the region.[13]

The same pattern of sharper poverty reduction exists between inner areas compared with outer areas by district. In Humla, the inner groups and outer groups have experienced the same level of decline in poverty, which indicates that improved access has made no difference in this district. This tallies with the fact that, at the time of the survey, Humla was yet to be fully connected to a road network.

[13] This refers to the specific population of settlements that fall into the inner and outer areas of each district that was calculated at baseline.

Figure 4: Build area – households under poverty line by district, PMT estimate (%)

Figure 5: Maintenance area – households under poverty line by district, PMT estimate (%)



2.5 Poverty and the labour-based approach to road construction

Among households living close to the RAP roads (inner), **poverty reduction has been greater for RAP direct beneficiary groups (the RBGs and RMGs) compared with non-beneficiary groups**. **However, this difference is relatively small** (a difference of approximately 5% higher poverty reduction).

This is not to say that wage labour from RAP-3 has failed to benefit RBG and RMG members. However, evidence from the impact assessment challenges the narrative that providing around 80 days employment per year per household (as a minimum) is sufficient for households to '*graduate from poverty rather than simply pay off accumulated debts'*.[14] There is **no significant indication of an increase in *productive* assets or investment in assets** (such as land and livestock) among RBG and RMG members. But many direct beneficiary households have invested cash earned from wages in children's education and non-productive assets (e.g. housing material).

Wage labour has contributed more to resilience and coping (reducing vulnerability) than to long-term poverty reduction. A major finding at the midline was that RAP beneficiaries (RBG/RMG members) were more resilient to the effects of severe drought – using the regularity of cash from RAP works to purchase food items.[15] Households that participated in road-building and maintenance managed to maintain a more diverse diet than other groups. **At endline, all groups across the region had recovered (or 'bounced back') from the severe negative impact of the drought reported at midline, and surpassed their poverty status at baseline.**

The impact assessment demonstrates that the manifestation of poverty in western Nepal is highly context-specific. Humla is a significant outlier, where personal income poverty,[16] food security and family asset-holdings are high but where **remoteness** results in very poor access to services and institutions and antiquated social norms that reinforce ethnic and caste divisions. Humla villagers regard themselves as neglected by the state. Bajura, Accham and Doti are more similar in terms of personal poverty (defined by people themselves mostly in terms of **food security** and **household income**).[17] Manifestations of **public poverty** (such as access to health facilities, schools and market hubs) vary greatly between districts, as we explore further in the next section.

[14] Based on experience from social protection programmes in India (RAP- 3 Project Completion Report, June 2019).

[15] One of the most significant issues picked up over the course of the impact assessment of RAP-3 was the impact of a severe drought that affected all groups across the region in late 2015/early 2016, at the time of the midline survey. This resulted in all groups being negatively impacted across all indicators, particularly in relation food security as measured by the food consumption score (FCS).

[16] Most families have good cash incomes from cross-border trade with China, particularly for medicinal herbs.

[17] Often framed in terms of their ability to afford to pay education costs.

3. Indicators of poverty

This section explores in detail the **individual indicators** within the PMT and PPI models, with a focus on the former, based on tailoring the PMT from the NLSS.[18] The two different measures illuminate different factors affecting poverty.

Key findings

- Food security is one of the most important indicators of poverty in western Nepal. Communities across western Nepal have recovered significantly at endline from the effects of an acute drought at midline, which had pushed poverty up.
- Food consumption has recovered since the midline and now surpasses levels at the baseline.
- Incomes (adjusted for inflation) for most groups in the maintenance districts has increased, with members of RMGs seeing the biggest increase as many are likely to still be employed under government funding of RMGs.
- However, incomes in the build districts at endline, with the exception of Bajura, have reverted close to baseline levels. There is a lack of other wage-earning opportunities, meaning that the impact of the wage-transfers has been short-lived for all groups, particularly RBGs. There appears to be little sustainability of income gains for RBGs at the end of the programme.
- Additional spending as a result of RAP wages is focused on housing material, food consumption, children's education and the purchase of certain assets (mostly what are generally considered non-productive assets, such as television sets).
- The significance of women being paid for work in RBGs and RMGs is important as this was the main source of wage labour for the overwhelming majority of women in RAP. However, this needs to be weighed against the issue that the burden of unpaid care work still falls disproportionately on these women.
- Savings at the endline are higher for RBG and RMGs after the exit of RAP activities. However, some RBG members voiced concerns about their ability to access accumulated savings, despite RAP-3's provision of support to the settlement of group saving amounts and credit to disbanded RBGs.
- It is important to remember that the PMT is based on national data for 2010/11, and its shelf life is increasingly limited as evidenced by certain indicators no longer being as relevant in poverty measures.

3.1 Key elements of positive change in the PMT

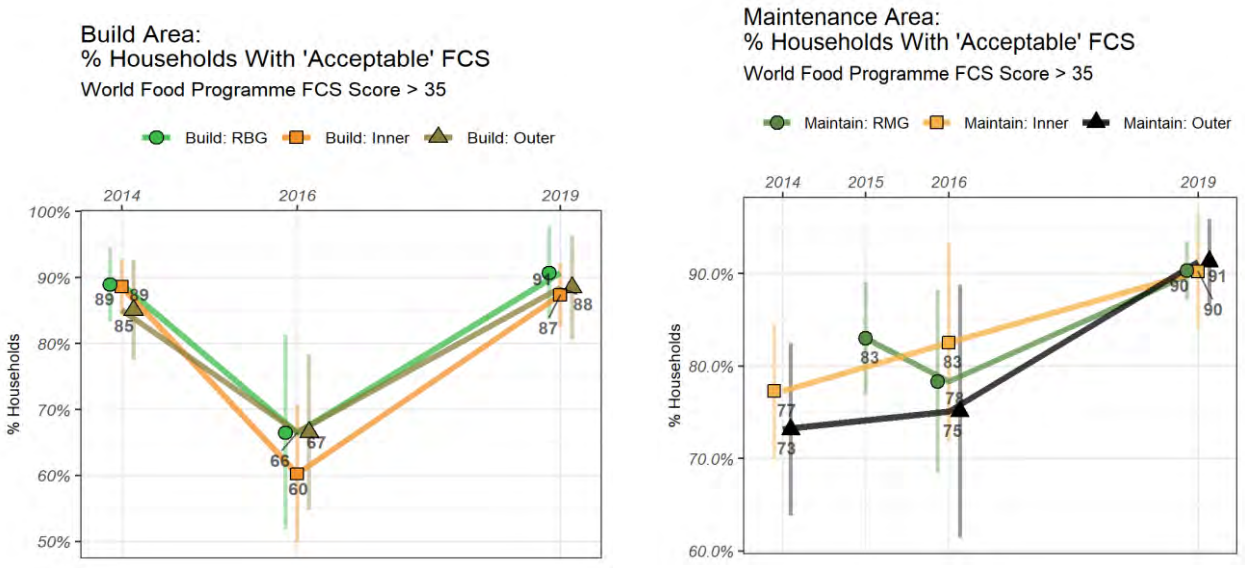
The PMT is more sensitive to changes in poverty over the shorter term, largely because of the significance of food consumption in the indicator, whereas changes in the PPI are more influenced by longer-term changes, such as the availability of cooking and toilet facilities (see section 3.2). Because the PMT has been modelled specifically for the western region of Nepal, we can identify some interesting patterns that have been caused by RAP-3.

3.1.1 Food consumption score

The food consumption score (FCS) is the most significant variable in the PMT and a key indicator of poverty in the region. It is a measure of the diversity and frequency of food intake over a seven-day recall period. The endline survey found that the **FCS had recovered since the 2015/16 drought to higher levels than at baseline** for all populations.

[18] A full breakdown of the indicators in the PMT and PPI is provided in the Endline Annex Report (pages 74-88).

Figure 6: Food consumption score



At midline, we found that many households were unable to meet minimum dietary diversity criteria. They have bounced back since then and their overall dietary diversity is now higher than at baseline. The frequency of **meat and dairy[19] consumption has increased** across all populations and an increase in dairy consumption is the main reason the FCS has increased[20] (although dairy consumption remains low in Humla and Jumla). The qualitative studies found that dairy consumption tended to be sourced mainly from households' own livestock.[21] In Bajura, discussions with communities in the qualitative research, stressed they had mostly used their RAP wages on buying food like rice[22], cooking oil, sugar, salt, meat, snacks for children during road construction. A few people recalled the drought in 2015/2016 and explained that RAP wages had helped them to buy food for their families during that period.

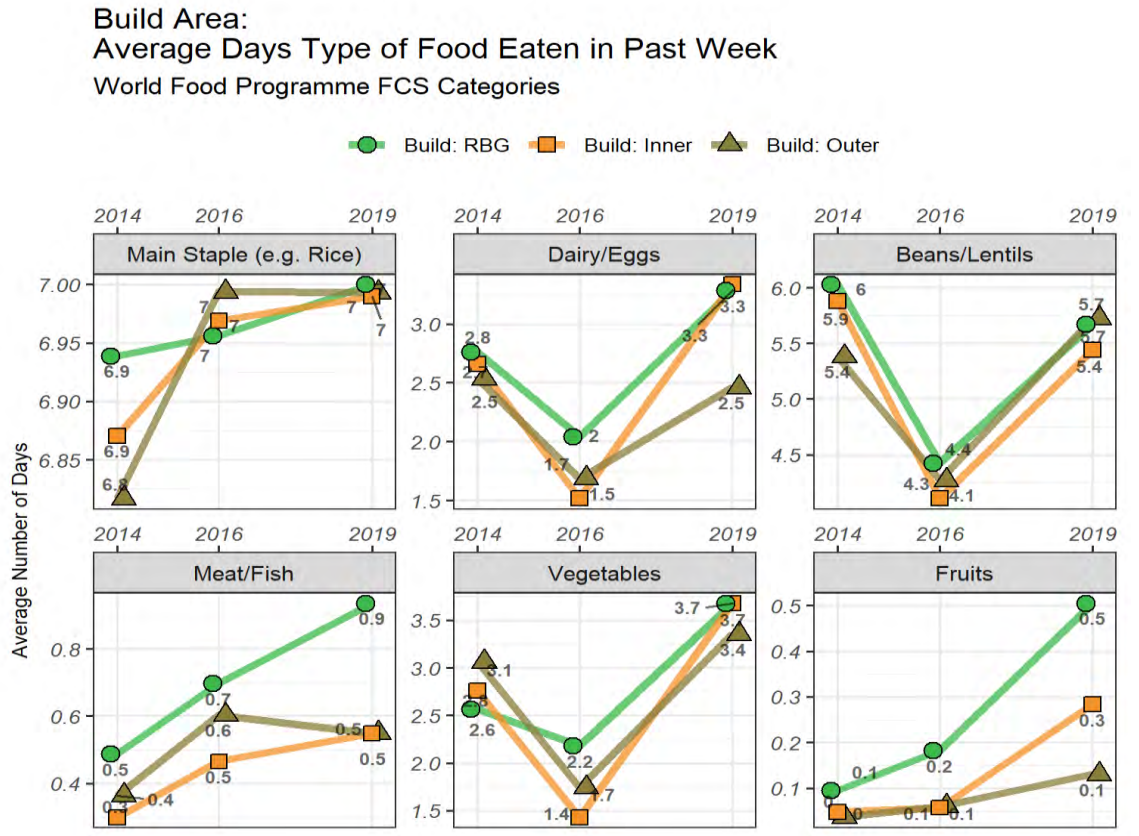
[19] Meat and dairy consumption have high weightings in the FCS.

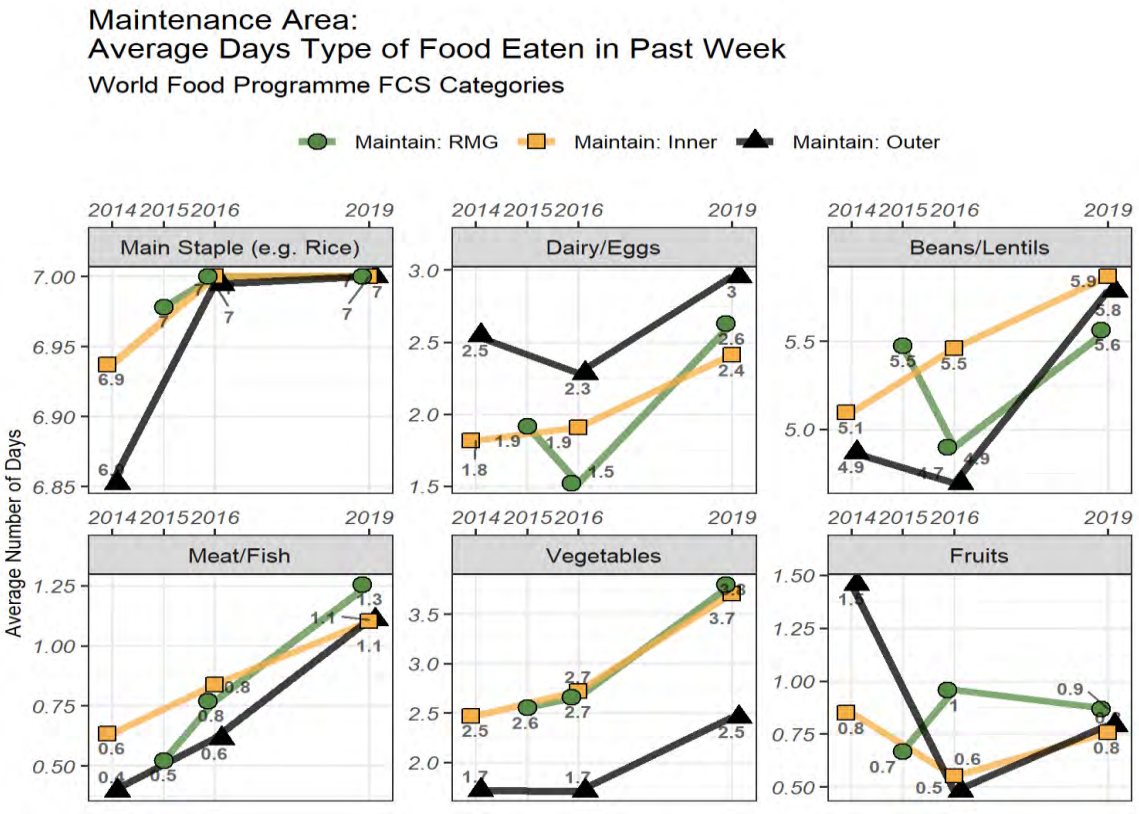
[20] Dairy consumption at endline averages three days per week compared with two days per week at baseline.

[21] It was noted that various other programmes seem to have promoted improved dairy cow breeds with subsidies

[22] Although families have paddy fields with thrice-a-year yields people explained that this was not enough yield to last a year. As a result many families have to buy rice.

Figure 7: Type of food eaten in past week





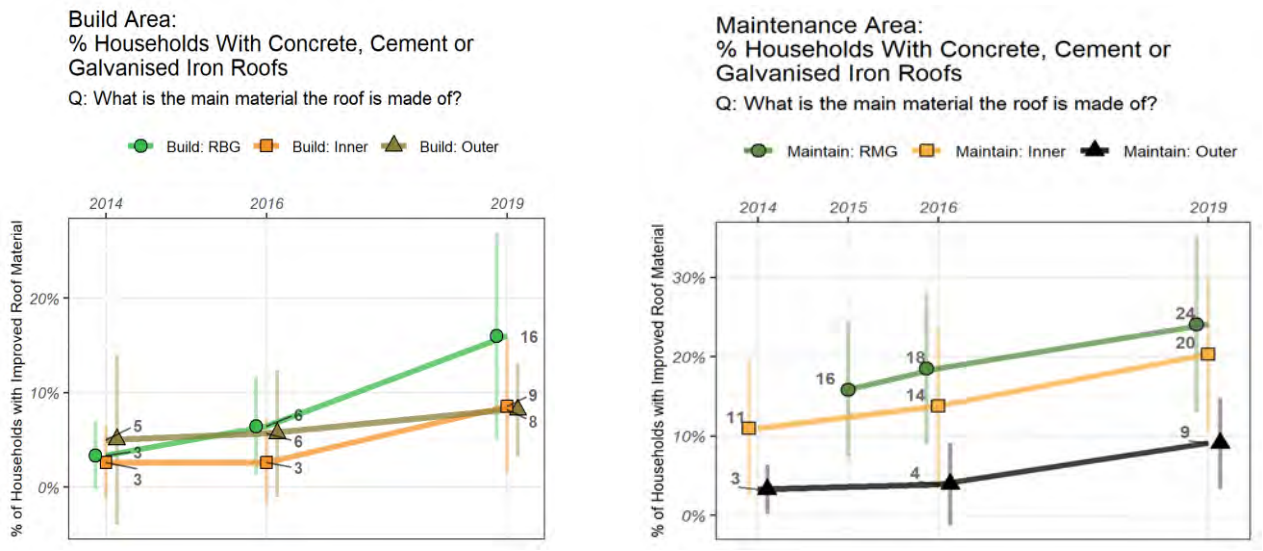
The data suggests that the eating of meat in the household is related to road activities and is associated with having men working in construction living in the household[23,24] (the green line under meat/fish in Figure 7).

Through discussions in the qualitative research, people indicated that the heavy roadwork had led them to eat more and spend more money on food. In Bajura, it was noted through participatory discussion across groups that people ate less meat than when they were working on the road as members of RBGs. This was framed in terms of not having the regularity of cash since the end of RAP waged work to purchase meat as often, and also the presence of heavy work requiring more sustenance and therefore eating more meat. Households in Kalikot seemed to eat meat regularly and a number of meat shops and poultry farms have opened along the new road.

3.1.2 Household roofing material

The PMT indicator that shows the greatest change for RBG households since baseline is **house roofing material**. The survey assessed whether households had used traditional thatch/mud or improved material (primarily galvanised iron or corrugated iron sheets). **Households that participated in RAP-3 road construction are twice as likely to have improved their roofs that those not involved.** The qualitative endline study confirmed that people aspired to replace roofs as it '*shows you are modern'* and is less of a fire risk and some have been motivated to use corrugated iron since the earthquake of April 2015 as a safer roof option. People shared that the new and improved roads had made the transportation of corrugated iron cheaper than before, when porters were often used.

Figure 8: Roof materials



[23] The high level of out-migration of men in Bajura means households are less likely to eat meat.

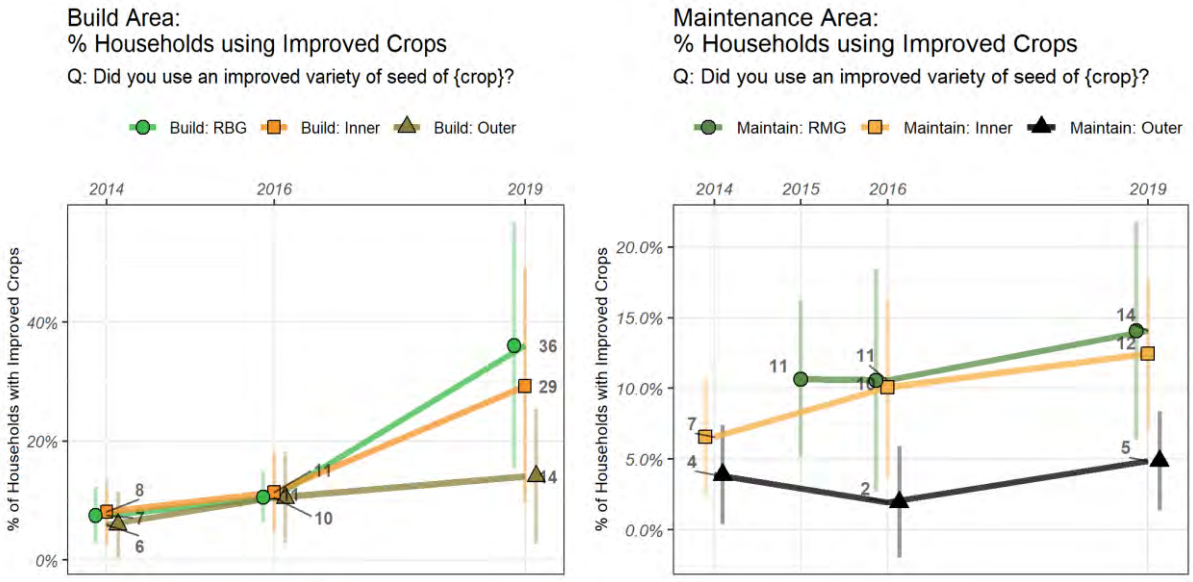
[24] Meat-eating in rural Nepal is also strongly correlated with special events. April to June, when the survey was conducted, is one of the peak seasons for weddings. This is also the time when land is ploughed, work traditionally reserved for men, which means they are more likely to have taken leave from work in India to help. When men are not at home, meat is less often consumed.

Photos 1 and 2: Many new blue corrugated iron roofs along the new RAP-3 roads in Kalikot and Humla

3.1.3 Crop variety

The endline survey shows the **use of improved crop varieties** (particularly vegetable seeds, onion and potato) has substantially increased (>30%) since midline among households living close to new roads. Households in other areas have shown very modest increases, if any. This is one of the clearest differences between inner and outer populations, suggesting a RAP-3 impact.

Figure 9: Use of improved crops



The qualitative endline study found that new agri-vet shops had been established along new roads (e.g. the Kalikot road had four new agri-vet shops). However, people (including agri-vet shop owners) indicated that the main reason for increased use of improved varieties was **free vegetable seeds distribution** by GoN, which is likely to have been concentrated along road corridors. There may also be some residual effect from the Social and Economic Development (SED) component of RAP-3, as the most often cited result of SED activities was vegetable seed distribution, which stopped at the end of 2015.[25]

[25] Midline Impact Assessment Report 2016

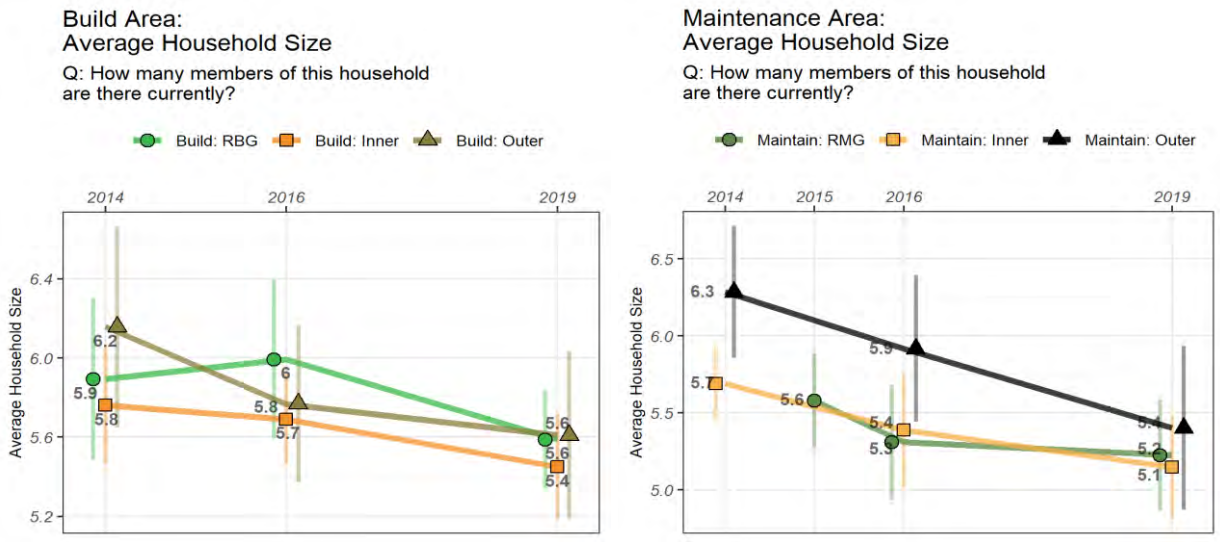
[25] Household size has a strong weighting in the PMT measure so can potentially have a significant affect on the PMT scores.

[25] Inflation calculated over the period 2014-2019 for baseline (+39.8%), 2015-2019 for RMG baseline (+28.2%), and 2016-2019 for midline (+19.6%). The inflation figures are specific to the hill and mountain regions in our impact assessment and therefore representative of this part of Nepal.Midline Impact Assessment Report 2016

3.1.4 Household size

The endline survey indicates that **household sizes[26] decreased** across all populations over the period of the programme, with a small increase among households participating in road construction at midline. The qualitative studies indicate that this increase at midline was likely to owe to migrant workers returning home in order to participate in road-building and who had, by endline, returned to migrant work. However, the endline survey shows there are fewer current migrant household members in Kalikot and Mugu than at baseline, **most notably among households who participated in RAP-3 road-building**. **This is providing continuing employment for 35% of Mugu households previously working on the RAP-3 road** (see Section 5 on employment beyond RAP).

Figure 10: Average household size



3.1.5 Income

There are two income metrics in the PMT: (i) income from employment or sales; and (ii) income from remittances. The monetary values have been adjusted from previous surveys to 2019 values.[27] The income data did not significantly impact the overall poverty measurement in the PMT model (i.e. little impact on poverty).

When assessing incomes at an aggregate at the endline, it appears that median income for all groups in the build districts have increased substantially since the baseline, with RBGs earning more than others. The same assessment appears true in the maintenance areas with the exception of the outer areas that saw a decline (see Endline Annex Report page 35). The endline survey found that the number of households with one or more wage earners has remained static in road construction areas. The number of households with one or more wage earners has increased from nearly 30% at baseline to 50% at endline in road maintenance areas for households living near the maintained roads.

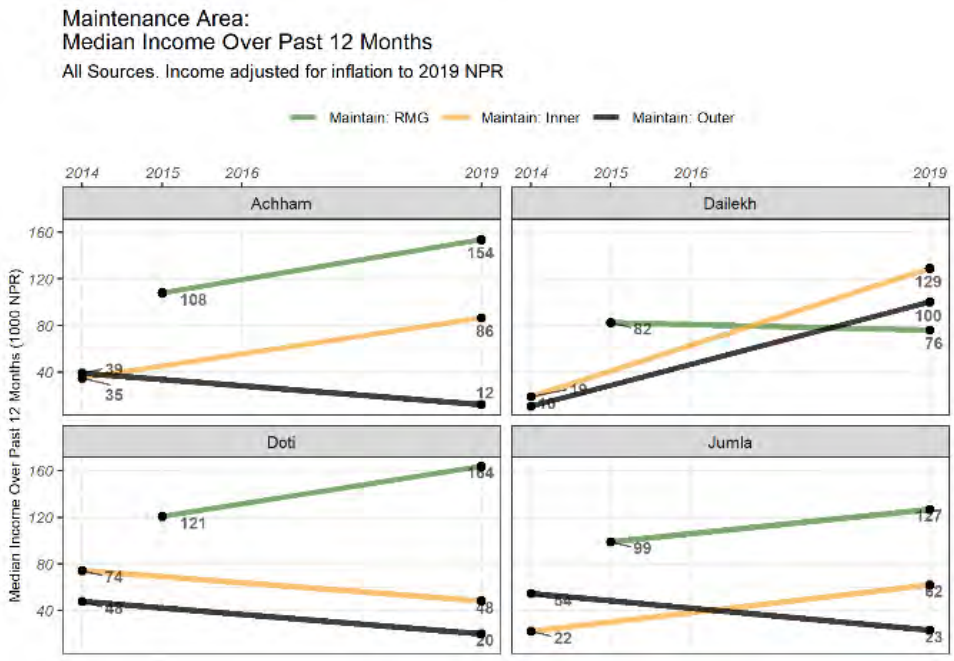
However, when disaggregating by district, a very different and telling picture emerges (see Figures 11 and 12).

[26] Household size has a strong weighting in the PMT measure so can potentially have a significant affect on the PMT scores.

[27] Inflation calculated over the period 2014-2019 for baseline (+39.8%), 2015-2019 for RMG baseline (+28.2%), and 2016-2019 for midline (+19.6%). The inflation figures are specific to the hill and mountain regions in our impact assessment and therefore representative of this part of Nepal. This is based on consumer price index rates from Nepal Rastra Bank: https://www.nrb.org.np/ofg/macroeconomic.php?tp=current_macroeconomic&vw=15

Figure 11: Build area – median income over past five months

Figure 12: Maintenance area – median income over past five months



The analysis shows that Bajura is driving the overall median income up at the endline. The data indicates that in Bajura there is a high-level of non-RAP jobs and income from this. Remittances also account for high income levels in Bajura across all groups. The qualitative endline found that this is possibly due to

employment on a new micro-hydro scheme[28] and gabion basket construction work for new small non-RAP roads. This largely explains the wage increases seen among households living far from the road and accounts for the continuity of relatively higher wage earnings for those who previously worked on the Bajura RAP-3 road.

The income level between the different groups in Humla, Kalikot and Mugu returned to a similar level as at baseline for each district. Further, in Kalikot and Humla, almost no respondents noted any RAP income at endline, whilst in Mugu around 35% of respondents are beneficiaries of the MHLR, hence a slight rise in median income in Mugu. In the maintenance districts there is a more positive picture of incomes rising broadly, with RMGs reporting higher incomes than all except in Dailekh. In all cases RAP was still a dominant income source, due to the on-going use of RMGs by government.

There is some crucial post-RAP learning that can be taken away from Kalikot, as well as Humla and Mugu. In Kalikot, road construction was completed two years before the endline survey.[29] The endline data shows that there is no difference between the number of jobs (per household) between RBG and inner groups, nor any difference in the value of jobs between the two groups. The lack of paid income opportunities after the completion of work gives some early indication of the potential post-RAP direction for former RBGs. However, there is some evidence of paid jobs for former RBGs, although these opportunities are relatively few.

3.1.6 Other PMT indicators are less useful

The remaining PMT variables are less useful in assessing changes in poverty in the region, but still their trajectory remains of interest. For example, ownership of mobile phones was a key predictor of poverty in 2010 but rapid changes in the context mean it is now far less useful as a predicator of poverty.

Ownership of phones is a highly weighted PMT indicator and may have been significant when the PMT correlations were based on data collected in 2010-11. A PMT of five years was tested in three countries by the World Bank and found to be robust at predicting subnational poverty rates but no such study has tested longer PMT durations[30]. But, since the baseline, mobile phone ownership has become a weak indicator, with **>90% of households with mobile phones**. In Dailekh, during the qualitative endline, people said, '*Every single person has a mobile phone'*, and just about every small shop along new and maintained roads sells phone credit. Mobile phone ownership is also included within another PMT indicator: 'number of assets owned' (also including jewellery, which, like phones, is no longer useful as 90% across all populations own jewellery).

The only element of asset ownership that may have been influenced by RAP-3 is **ownership of TVs** among households participating in road construction, which has increased by 9% since baseline while comparators have shown little change. Most of this change is accounted for in Mugu (29%).[31] Qualitative studies suggest the decision to buy a TV is made by men and so it makes sense that ownership has increased in Mugu where less migration has taken place. Furthermore, Mugu is the only district where respondents (60%) indicated that the cost of electronics had decreased or stayed the same.

[28] Where wages are NPR 500-900 per day and therefore higher than agricultural day wages

[29] The Sannighat-Sipkhana road was completed June 2017, the first road completed, whilst all other RAP roads completed in 2019.

[30] World Bank analysis in the three countries indicated that at subnational levels, PMTs based upon quality consumption data was still robust predictors of subnational poverty rates five years after the initial data collection. (Policy Research Working Paper 5683: small area estimation-based prediction methods to track poverty; validation and applications, 2011 http://documents.worldbank.org/curated/en/211731468326995187/Small-area-estimation-based-prediction-methods-to-track-poverty-validation-and-applications)

[31] Having sufficient electric power to operate a TV is a prerequisite for TV ownership. 77% of households in Mugu participating in road construction have grid or hydroelectric power connections compared with none in Humla and only 48% in Kalikot. As Humla has no such electricity connections, unsurprisingly TV ownership is zero.

Another PMT indicator is 'health facilities perceived to be less than adequate', which presents an inverse relationship with poverty – that is, the less poor having more dissatisfaction. Across all populations, people **expressed more satisfaction with health services**.

Other indicators, such as **amount of land owned**, **number of rooms in the house**[32] and **use of private tutor,**[33] which were predicted to increase with reducing poverty, show little change and no RAP-3 effect. **Use of firewood** as a primary cooking fuel was predicted to decrease with reducing poverty but has also stayed the same. The qualitative study found firewood was preferred even when liquefied petroleum gas was available and that the latter was used only as a standby cooking fuel source.

Land purchase: contrasting stories in two road construction areas
The new road corridor in Kalikot is creating rapid change. There is much buying and selling of land along the road, including purchase by outsiders. The land is said to have increased in value and much of this activity is speculative based on returns anticipated with the completion of the Mugu–Humla link road. By contrast, there is no change in land values along the newly constructed Bajura roads and no interest in buying land or speculation.
Qualitative endline study notes, September 2019

Village-level PMT variables include 'unsafe deliveries', measles vaccination and completion of secondary education. The recently introduced government incentives for institutionalised births and the comprehensive programme for measles vaccinations make these two indicators less sensitive to household poverty than predicted

3.2 Poverty Probability Index

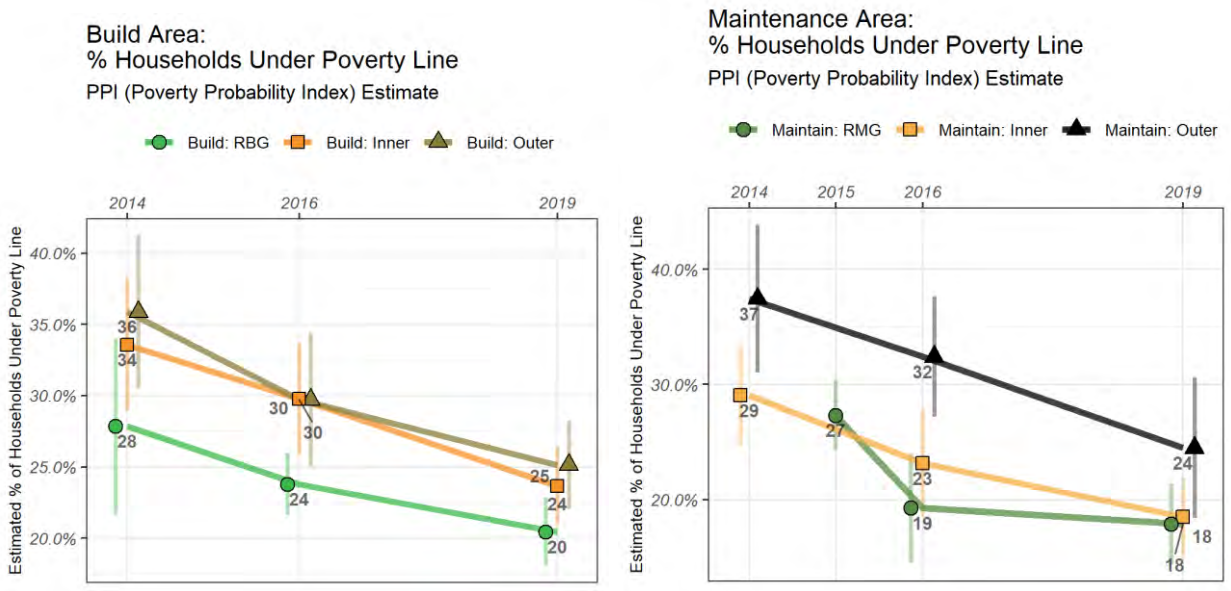
The second composite measure used to assess poverty is the PPI, which provides a score that predicts the likelihood of a household being below the poverty line. The latest version for Nepal was created in October 2013 and is based on data from the 2010-11 NLSS.[34] It has a number of indicators that overlap with the PMT (e.g. household size, number of rooms, roof material, cooking fuel, phone and land ownership) but also includes employment of the male head of household, wall materials, toilet type and having a separate kitchen. Unlike the PMT, this method is based on national poverty estimates, rather than being specifically calibrated to the RAP implementation region.

Like in the PMT, phone ownership and household size are heavily weighted. Nearly all of the reduction in poverty estimated by the PPI is a result of significantly increased mobile phone ownership and slightly decreased average household size within the region.

Like the PMT measure, the endline PPI measures show positive improvements across all populations (road construction, road maintenance and comparators) compared with baseline, but do not show the marked improvements since midline that PMT demonstrates, or any evidence at all of any difference-in-difference since baseline. This is likely to be because, unlike PMT, it **does not** contain a food consumption indicator (FCS), which provides strong evidence of the drought effect at midline in the PMT measure. **This is important, because if we measure poverty using only the PPI, we would not detect the food insecurity experienced by nearly all households at midline owing to the severe drought at that time.**

[32] Land ownership and number of rooms in the house are weighted such that they would have had a big influence on the PMT model to calculate poverty.
[33] Although increase in attendance in private schools has increased and is discussed under people's expectation of impact.
[34] Microfinance Risk Management, 2013

Figure 13: Households under the poverty line



Like the PMT, indicators included in the PPI that are now unlikely to be useful are mobile phone ownership, type of toilet (as toilet construction has been heavily promoted by local government with conditionalities for local government funds based on proof of communities being open defecation-free)[35] and use of improved stoves (as these are actively promoted and subsidised by various government and non-government programmes). Another heavily weighted indicator in the Nepal PPI is number of bedrooms[36] but qualitative research questions the definition of a bedroom and the efficacy of this metric. Having a separate kitchen[37] is an indicator that has slightly increased across all populations. However, given that household size has decreased and, consistent with qualitative research insights, there is less pressure on rooms within houses and more chance that the kitchen area is not also used for sleeping. House wall materials have not changed at all in any populations and remain mud-bonded bricks or stone.

3.3 Other indicators

3.3.1 RBG Savings

As soon as RBGs were formed, members were required to establish self-managed group saving schemes. Initially, mandatory savings of 10% of wages were required, and RAP-3 noted that an average of £139 per worker was saved and redistributed on completion of the roadwork or encouraged to be formalised into community savings and credit groups. MEL's Beneficiary Feedback Report (2017) noted that road workers felt that they did not have enough waged days per month to make savings a possibility (they said that 25 days covered their living expenses and 27 days would enable them to save).[38] Nevertheless, endline survey data shows that around two thirds of RBG members had saved money, compared with less than half of non-RBG households, and that RBG households had accumulated more savings between baseline and endline than non-RBG households. The median amount of money saved by RBG households is NPR10,000.

The endline qualitative study indicated that there was **mixed practice in distributing or reallocating accumulated savings** after RBG savings groups were dissolved after the programme was closed**.** All the

[35] The share of households reporting no toilet has decreased from 13% at baseline to 3% at endline.

[36] Not in the PMT.

[37] Defined as a room with walls and ceiling used for cooking but which is not used for sleeping.

[38] Table 7, Beneficiary Feedback Report 2017

former RBG workers that researchers met in Bajura and Kalikot had been part of RBG savings groups. While some groups in Kalikot have continued to save,[39] the situation in Bajura is more worrying. Researchers met people from four different RBG savings groups and were told that, once the roadwork had ended, RAP had told them that the savings groups could be continued, or the actual total savings split depending on what the group chose. However, this had not happened in all cases at the time of the research. Women from one savings group explained that only those with clout had been able to get a share while they (one single woman, one person with a disability and one whose husband is bed-ridden) had not been able to ask for their share of the money. The issue of the amount of savings is less of a concern than the understanding **around the access to, and control over, savings** with RAP now phased out of day-to-day support in these groups.[40]

3.3.2 Priority expenditure: children's education

People often cited **being able to pay for education** as an indicator of being less poor. The MEL Midline Report noted that households that had participated in road construction '*spent 1.5 times as much on their children's education per annum in 2016 compared to 2014'* and qualitative insights indicated that families were sending their children to private schools '*in preference to state schools… as they had the RAP wages to do so'* (p.65). **At endline, the average total spent on education per child[41] has increased well beyond inflation for families of RAP workers and households living close to newly constructed roads.**

For former RAP worker families, there is a demonstrable **increase in use of private schools** (from 6.6% at baseline to 13.1% at endline), with households incurring education costs of on average NPR10,000 more per child per year than for those households whose children are educated at state schools (see Endline Annex Report page 42-44). This increase has been concentrated in **RAP construction worker families in Kalikot and Mugu (especially boys).** The continuing opportunities for wage employment in both areas and, in Kalikot, higher levels of migration to countries other than India may explain why families can continue to support these costs.

Similar increases in education spend were found in road maintenance areas but were significantly higher in Jumla. However, this is the only area where households far from the RAP-3 maintained road also have higher levels of children who are privately educated. The qualitative endline found many examples of families working with the primary aspiration of sending their children to private schools. For example, one RMG mother met in Dailekh shared that her husband had recently migrated to South Korea for work. He sends money for their three children to attend private school. Her RMG wages support her own day-to-day costs.

3.3.3 Exclusion: gender, women's empowerment and caste

Women's empowerment can be measured in a number of different ways, including, but not limited to: (i) increased self-confidence and self-esteem, (ii) increased ability to earn cash income independently and to have control over these earnings and (iii) increased ability to make decisions in the family and public sphere.

The household survey did not include any measures of women's self-confidence or self-esteem. The Beneficiaries Feedback Study (2017), however, noted that a majority of road workers '*felt proud or recognised by the community for their work'* (p.13) and liked to be connected to roadwork by wearing

[39] Some women who were part of the RBG savings in Kalikot explained that they had continued to save NPR100/month on the 15th of every month. They were, however, not certain about how much the group had in savings.

[40] It should be noted that the RAP-3 Project Completion Report states that "Support on settlement of group saving amounts and credit to disbanded RBGs were provided to ensure safe exit of wage saving schemes. Options were explored for the establishment and operation of agro-based producer groups and Cooperatives at the community level through group consultative exercises. RBG's wage savings, based on choice of members, were either redistributed or transferred to group saving accounts managed, operated and owned by the group." However our qualitative findings suggest that this had not occurred as planned in all cases at the time that the endline fieldwork was undertaken.

[41] The data examines spend only for children living permanently in the household and not those living away from home for education.

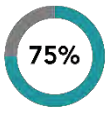
their jackets and helmets. The endline qualitative research found that female road maintenance workers felt that their work was **contributing to the community** and **was valued** and referred to the road as '*our road*'. Transport providers and other road users felt that it was acceptable that women worked on the roads.

> *These road groups are poor people getting money. Poor women need the job and they get cash* (jeep driver, Dailekh).

The recruitment of RMG members explicitly sought to include women from female-headed households.[42] Qualitative studies noted that earning cash was hugely significant for women whose husbands were working abroad, improving relationships with in-laws, because they could contribute cash to the family, and, for those living on their own, allowing them to be less worried about the timeliness of remittances and to manage household finances more easily. It also noted that employment in maintenance work was significant, mainly because this is targeted on those who are needy and for a variety of reasons have constrained options for earning income. These comprise widows, divorcees and others living in difficult circumstances or unable to participate in work abroad.

RAP women workers say RAP wages were the first cash payments ever received[43]

The endline survey asked a number of questions regarding women's involvement in family decision-making. At endline, more women are not involved or only partially involved in decisions on spending on food and household items, seeking healthcare, and what grade children should start attending school than at baseline across all groups. The qualitative research findings suggest strongly that women have traditionally, over several generations, made many of the household and family decisions simply because their husbands have been working abroad. Only larger financial decisions (e.g. purchase of land or livestock) normally require involvement of other male members of the family. Despite the apparent trend to be less involved in decision-making, a comparison of the RBG and RMG groups with the rest of the population indicates that women in these groups are less likely to indicate that they are not involved in decision-making (10% of RBG women compared with 34% in comparison households saying they did not participate in decision-making and 62% of RBG women that final decisions on healthcare are joint compared with only 46% in comparison households who said this).



However, women RAP workers said they were not able to spend enough time on their household chores

Despite the apparent benefits from working on roads, and the fact that RAP labour was not full time, RAP-3 work **extended the working day, particularly for women**. The Beneficiary Feedback Study (2017) noted that women had to wake earlier in order to complete household chores (notably preparing food, feeding animals and collecting water) before going to work for RAP. A total of 75% of RAP women workers said they were not able to spend the same amount of time on chores as they had before working for RAP[44] and this raises questions about potential impacts on childcare as well as women's own wellbeing. This trade-off in balancing time between paid labour and unpaid household work is of course not unique to RAP-3 and is an issue that needs to be considered for any programme that provides waged labour opportunities in the region.

[42] RAP-3 adopted GoN guidelines to ensure at least 30% of employment days were allocated to women workers. According to its own monitoring and evaluation cited in the Project Completion Report, June 2019, RAP-3 provided 44% of road construction days and 45% maintenance work days for women and 40% of the 9,000 employees were women.

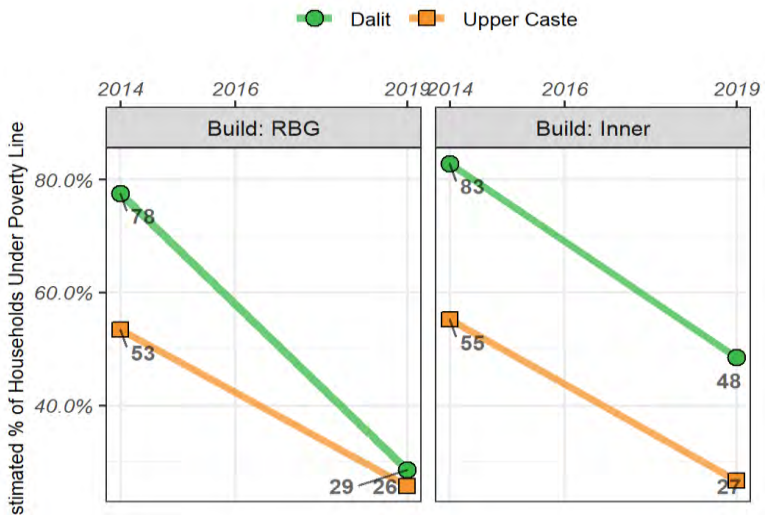
[43] The Beneficiaries Feedback Study (2017) noted that nearly 90% of RAP women workers indicated that this employment **was the first time they had been paid cash for work** (compared with 53% of men). The qualitative endline study found that the significance of this was noted in particular by wives of migrant workers, who feel they can maintain a cash flow between remittance payments.

[44] Beneficiary Feedback Report 2017 p15

The division of labour in both RBGs and RMGs was clearly gendered, with women undertaking soil excavation, clearing small landslides and removing broken stones while men were involved in stone breaking and gabion weaving. Despite the difference in level of effort, workers met in both the Beneficiary Feedback Study and the **endline qualitative study rarely complained about women and men being paid the same.**

The difference in the percentage of households below the poverty line between Dalits and upper castes shows that being in an RBG had a greater poverty-reducing effect on Dalits than on non-beneficiaries (Figure 14). As Dalits are less likely to have access to paid employment, this is a positive impact.

Figure 14: **Build area** – households **under** the poverty **line** by **caste of** household **head** at **endline (%)**



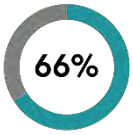
4. RAP's effect on access

This section provides a summary of the effect of RAP-3 on access. The results come from households' perspectives of change included in the survey. Access here means the use of roads (RAP and in general) as well as access to a number of different services.

Key findings

- Most people feel less remote and isolated as a result of RAP-3 and there has been a very significant reduction in travel time for those living near to newly constructed roads.
- Most people indicate that there are now more goods available owing to the presence of roads and that they feel less remote or isolated. This is more marked in the new build districts where road density is lower.
- In Humla, which is still fully unconnected (at the time of the endline survey), it is unsurprising that there has been little impact on the availability of goods or on people's perceptions of remoteness.
- The use of motorised transport (i.e. vehicles) has increased since baseline although not all services require the use of motorised transport.
- Most people still walk, but vehicles are used for certain types of journeys – for example returning with a load from distant markets or accessing hospitals in an emergency. Better and safer roads for walking on are valued as much as vehicular traffic.
- The main service people use via vehicles is accessing district headquarters. Under new devolved governance arrangements from 2017 when Nepal transitioned to federalism, not all district headquarters will play as relevant a role as they used to. It will be important to consider how access to key administrative centres will change over time.
- Mobile phone penetration (as evidenced by over 90% adoption) is changing the interpretation of access: more people (shopkeepers and customers) can make purchases by phone leading to less frequency of personal journeys.

4.1 Ease of access



of households felt less remote and isolated at endline

Across road construction areas, people indicated that the key significance of the new roads was that they **felt less remote and isolated** (excluding Humla).[45] As qualitative studies indicate that this is a highly valued impact of roads, this is hugely significant.

of households indicated at endline that goods and services were more available as a result of the new or maintained roads[46]

Access to goods and services and feelings of optimism about living in the community were also cited as significant impacts of the roads. At endline, 50% of households (including in Humla) **felt more optimistic about living in their community as a result of the road construction.** Similarly, 64% of households in road maintenance areas **felt less remote and isolated.** This includes 83%

[45] Unsurprisingly this was less in Humla (33%), where the RAP road currently does not yet connect to key centres or other road networks.

[46] Excluding Humla, as the RAP road would not be expected to achieve this currently as it is not yet connected to key centres or other road networks.

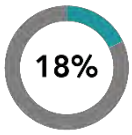
of households in Jumla. Slightly fewer households (40%) in road maintenance areas felt more optimistic about living in the community.

Improved access to the nearest town and/or district town was a key aim of RAP road construction. At endline, 89% of households in road construction areas, excluding Humla,[47] indicated that **they had changed the way of accessing the district town.** The main explanation given was that it was easier and quicker than before. In Bajura, 70% also noted that they could now travel by vehicle. A lower share said this in Kalikot and Mugu (39% and 48%, respectively) but nevertheless noted that the route was quicker.

Photos 3 and 4: The route in Kalikot before and after road construction. MEL researchers experienced a six-hour precipitous walk to the community in 2014 and were able to use the new earthen road in 2019

The endline survey data shows that, in road maintenance areas, ease and speed of the route were also given as main reasons for better access. However, in Dailekh, the opportunity to be able to travel the route by vehicle was given particular significance (75% households noted this compared with 36% across the other three road maintenance districts) – see Endline Annex Report pages 49-55.

4.2 Use of motorised vehicles and passenger fares



of journeys made at endline used motorised vehicles

The fact that vehicles ply roads does not mean motorised transport is used for journeys. The endline survey indicates there has been **a modest increase in the use of motorised transport for journeys, from 7% at baseline to 18%**. The qualitative endline research and the MEL Market and Transport Study found that there were **generally few vehicles on RAP-3 roads.** For example, an average of seven jeeps[48] ply the newly constructed Kalikot road per day, just one jeep makes two journeys per day on the newly constructed Bajura road[49] and three jeeps make two journeys per day on the Dailekh[50] maintained road.

[47] As expected this was lower in Humla (34%).

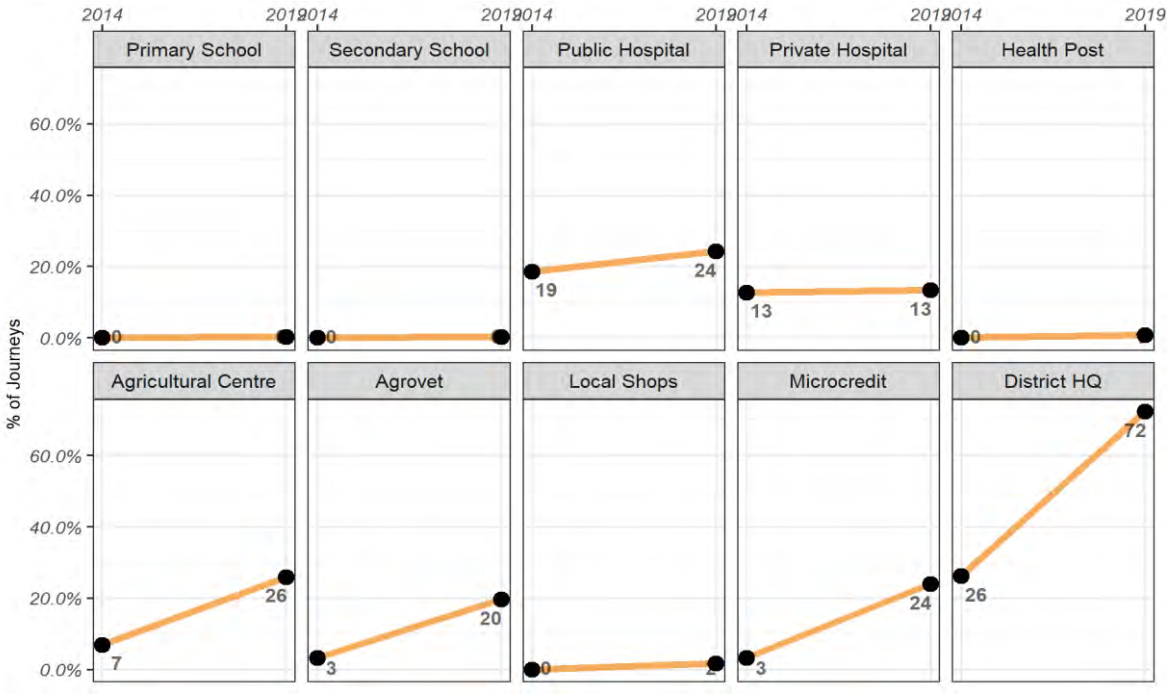
[48] As jeeps carry on average 10 persons this is equivalent to 70 passengers compared with an average of 83 people walking the road (Itad RAP-3 and RAP-3 MHLR Market and Transport Study, 2019).

[49] Qualitative endline

[50] Qualitative endline

Figure 15 shows the percentage of all regular (i.e. non-emergency) journeys involving motorised transport. There is no change in access to a number of services (e.g. in education, which we refer to later in this section). The major use of vehicles is to access the district headquarters.

Figure 15: Build and maintenance combined – share of all journeys made involving motorised transport (%)



Unpredictability and long waiting times[51] for transport make walking a more convenient option. Time loss rather than cost was the main factor for not using vehicles. Average speeds are limited to 5–15kph given the earthen nature of the RAP-3 road surface. Researchers' own experience of these journeys during the qualitative endline study found that a combination of waiting time, slow vehicle speeds and frequent stops to pick up or drop passengers or to navigate difficult patches of the road made for journey times that were not necessarily much faster than brisk walking.[52]

[51] As they usually wait until full before starting the journey.

[52] The endline qualitative study found that people often share that they prefer not to use public transport because it is extremely uncomfortable on poor roads *('it takes the same time to walk or take transport, but if you take a car you will have pain for three days* '). In order to optimise incomes, jeep drivers like to fill their vehicles, disregarding traffic laws which stipulate that no more people should travel than number of seats provided, and this means squeezing 12-15 people into the vehicle.

Photo 5: Vehicle stuck for some time on maintained road before being pushed, September 2019 (pre-monsoon conditions)

> The *[*jeep*]* drivers look at the customers and decide what to charge, it's about bargaining *(*teachers, Dailekh).

Comparing costs of carrying goods in Kalikot before the construction of the road and after, the qualitative studies found that, in 2013[53] mule porterage cost NPR 15/kg, increasing to NPR 25/kg in 2017; at endline, it has been replaced by jeep transport at NPR 4/kg[54]. Passenger fares in Kalikot started at NPR 500 when the road was first opened but by 2019 had reduced to between NPR 330 and NPR 350[55] per passenger as a result of competition.

FOUR HOURS: average time taken to reach district headquarters at endline (one day at baseline)

The very significant reduction in travel time reported by those living near to newly constructed roads (one day to just four hours) and for those more remote (average of two days to eight hours) is due to the RAP-3 roads and is a dual result of the use of vehicular transport and improved walking conditions. During the qualitative endline study, people indicated that they increasingly like to take transport rather than walk.

Sometimes, this was couched in terms of giving people an opportunity to rest and to catch up on local gossip and information while they travelled together in jeeps. However, a significant qualitative insight shows that the **main saving from using transport is on return trips from markets**, which used to take four to six hours carrying heavy loads and walking. In Bajura, discussions with people indicated that they preferred to walk one way to local markets as fares are high, and they are in any case unburdened with heavy loads. However, transport is useful for what used to be very long walks back. This has significant time and monetary cost savings according to people interviewed.

[53] 2013 Scoping Qualitative Study

[54] The RAP-3 Market and Transport Study found this transport cost to be NPR4/kg, whereas the qualitative endline researchers were told this was about NPR3/kg, hence the findings are consistent within a range we would expect to see and validate each other.

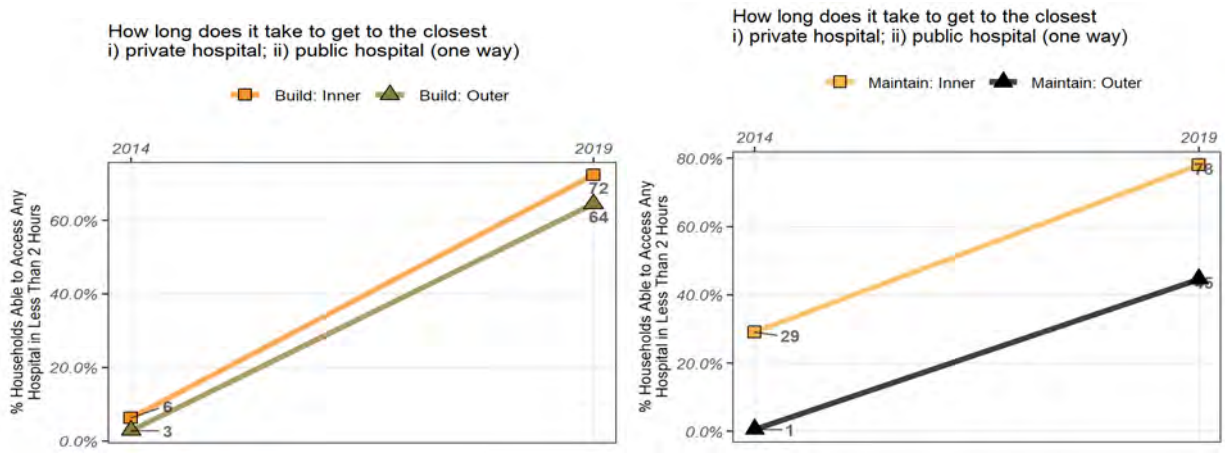
[55] The RAP-3 Market and Transport Study found the per passenger fare along the road was NPR330 per passenger, whereas the qualitative endline 2019 found this to be around NPR350 per passenger, hence the findings are consistent within a range we would expect to see and validate each other.

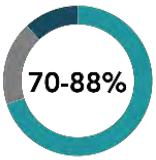
> I like the fact we can go in a vehicle because I thought I would spend my entire life going up and down to Dailekh carrying loads… but it isn't like that now (woman, 6km from Dailekh).

4.3 Access in emergency scenarios – how roads can make a difference

Qualitative research consistently found **that access to hospitals was a major concern for families** and that motorable roads were considered key in improving both journey times and the convenience of transporting patients. **The endline household survey** shows that, in both road construction and road maintenance areas, the **proportion of households able to access hospital in *less than* two hours has increased phenomenally** since baseline.

Figure 16: Households able to access any hospital in less than two hours (%)





of households were highly confident at endline that they can reach hospital in an emergency in less than two hours

With the exception of Humla, in all the new road construction areas there was high confidence in the ability to access hospitals in emergencies, although confidence levels fell for the wet season (~55%) and at night (~ 53%). The main reasons given are **better roads**, **quicker travel** and **more frequent transport options** now being available (see Endline Annex Report page 57). The qualitative endline study noted in Kalikot that, since the road had been completed in 2017, every village had motorbikes and *'in an emergency two people can bring a sick person'* (municipality health coordinator) and five communities along the road have jeeps available 24/7 to transport sick people.

In road maintenance areas, confidence levels with regard to reaching hospital in an emergency are even higher (around 80%), dropping to 58% in the wet season and 63% at night. Similar to the case in road construction areas, this confidence has increased between 2016 and 2019 and is also attributed to better road conditions and more frequent transport options. Hugely significant in these areas is the **ability to phone for a vehicle** (four times as many households gave this as a reason for confidence compared with road construction areas). This suggests a sophistication of transport provision in areas where roads have been constructed for much longer. Although ambulances can ply these roads, hospitals typically are poorly resourced and the qualitative research indicated that transport to hospital was usually by jeep on a private hire basis.

> It is easier going to the hospital after the construction of the road. In an emergency, we can call the 'ambulance' or even use a motorcycle for reaching nearby hospitals (woman, Kalikot).[56]

Medicine shops are opening up on RAP-3 roads[57] and there has been increased use of local shops to purchase medicines as an alternative to obtaining treatment from healthcare facilities. These shops also sell contraceptives. Although the qualitative endline study noted that some shops had closed since the road construction period in many locations (see section 4.4.2), the **medicine shops have remained.** Another noted impact of road construction is the safe transportation of medicines and vaccines and, in particular, the temperature-controlled and speedy transportation of vaccines[58].

4.4 Access to other services

4.4.1 Remittances

The collection of remittance money is more secure because of improved transport availability. As mobile banking apps and the establishment of local bank branches have yet to substantially penetrate western Nepal, physical access to banks and international money transfer (IMT) companies in towns is important for families with migrant workers. Although frequent travel to and from India often means remittance money is carried by relatives and neighbours, this is becoming less common with remittances from other countries increasingly being made through banks and IMT companies, with recipients collecting the money in person. Women in Dailekh, like others met during the qualitative endline research, indicated that this was one of the main reasons they need to go to town. They shared that they prefer to travel by jeep for this purpose as they feel safer.

4.4.2 Local shops

Access to local shops has decreased in all the road construction areas, particularly since midline (see Endline Annex Report page 51). This is consistent with the change in the percentage of households that live close to newly constructed roads running an enterprise (which has more than halved since baseline). Endline qualitative research suggests that shops were opened during road construction to meet the needs of construction workers.[59] These shops were often opened by former migrant workers, who returned to migrant work following the completion of road construction.

> I opened my small grocery business 10 years ago beside the road as it was being constructed. More shops opened, and we would be out of stock in 15 days. But now the stock lasts *five to six* months (*w*oman shopkeeper half way along Dailekh road, 2019).

> Parents used to send kids out to buy snacks with NPR 100/day in RAP time. Now they only give them NPR 5–10 – so less kids buy snacks and less shops are doing well (*w*omen, Bajura, 2019).

The endline survey found that enterprises that had remained open on the newly constructed roads had nearly doubled their (adjusted for inflation) incomes (i.e. fewer shops doing better) while those operating

[56] Itad RAP-3 and RAP-3 MHLR Market and Transport Study, September 2019

[57] Even in 2014 the qualitative studies noted that people expected that '*roads bring medicine shops'.*

[58] Health staff in Kalikot specifically mentioned this during the qualitative endline study in 2019.

[59] There would have been 1,000 or more road construction workers on all the new roads, working in groups of about 20.

on maintained roads had remained moribund, with more than 80% of business owners complaining about their business. The main reason given was **capital and credit problems**. Former shopkeepers explained that they were always asked to provide credit – '*you have to do this otherwise no business'* – and yet needed to pay for stock with cash. During RAP construction periods, credit was repaid regularly but, as local wage-earning ceased or **became less predictable**, credit periods were extended beyond viability for the business.

Another emerging reason for the closure of local shops is the rise in the number of families making orders from shops in town by phone[60] and organising delivery through jeep drivers or asking friends to pick up the orders when they go to town. The shops operating along the roads are generally benefiting from the **delivery of goods** rather than having to collect stock themselves.

Photo 6: Woman who lives about 10 km from Dailekh town explains how she uses her mobile to order clothes and shoes from shops in town and has them delivered – 'I hardly ever need to go into town nowadays'

4.4.3 Schools

The endline survey found that access to primary schools had not changed (see Figure 15)**,** and this was validated through the endline qualitative research, which found that most primary school children continue to walk to local schools and often use small trails.

Photo 7: Most primary school children continue to walk to school using trails (Dailekh)

[60] This new trend was triangulated with shopkeepers in town.

However, the endline survey also found that the perceived quality of primary schools had improved and this was primarily because schools had a full complement of teachers, less teacher absenteeism and improved punctuality**.** The endline survey revealed that teachers were perceived to have benefited significantly from the newly constructed or maintained roads compared with other users (see Endline Annex Report page 60). This was triangulated through the qualitative studies: for example, in Dailekh, all teachers at the primary school located about 10 km along the RAP-3 maintained road reside in Dailekh and commute daily using a specially reserved vehicle or by motorbike, reducing their journey time from three hours walk to about one and a half hours. They also shared that it was easier to travel in bad weather than it was before the tempo arrangement began two years ago.[61] There is little advantage of the roads for most secondary school students. Qualitative studies showed that there was a preference to send children to secondary schools in towns where the quality was deemed better.

4.4.4 Markets

Roads are often justified on the basis of improving **market linkages,** especially for agricultural produce. The qualitative studies found that people nearly always framed market linkage in terms of **access to consumer goods rather than opportunities to sell produce.** Most of those who grow surplus crops **do not send them into town** to market but sell locally only. In the larger market towns, insights from the qualitative endline showed that produce from other parts of Nepal (especially Nepalganj) was sold more cheaply than was possible for produce from the areas connected by RAP-3 roads. This suggests that despite improved access as a result of RAP-3 roads, local producers often struggle to compete with goods imported into the region from other parts of the country.

The MEL Market and Transport Study shows that markets along certain corridors have indeed thrived. For example at the previously unconnected market towards the end of the newly built road in Kalikot, there was previously only a handful of shops but at the endline there are now more than 40 shops.[62] The availability of liquid petroleum gas (LPG) cylinders has grown due to the road and use of jeeps to transport these items to this market in Kalikot. As the road in Kalikot was completed around two years earlier than the other RAP-3 roads, this particular corridor has seen significant market-related impacts due to the road corridor. It is expected that the other RAP-3 roads will induce a similar effect with time.

[61] A visit to this school in 2013 noted, *'Teachers are often late, leave early, [are] 'at meetings', [the school is] severely understaffed and [there is] reliance on deployed teachers.'* Now it is fully staffed and two younger members of staff indicated that they would not have taken the job if there had been no transport.

[62] MEL Market and Transport Study (2019), p.25. Conducted in the same month as the household endline survey

5. Moving beyond RAP

Previous sections of the report have identified benefits of RAP-3 to households and communities during the lifetime of the programme. This final section considers broader trends that will affect people's lives after the programme closes, including availability of alternative waged-labour in the region, the continuing issue and importance of migration, the culture of maintenance and the value of roads as a public good.

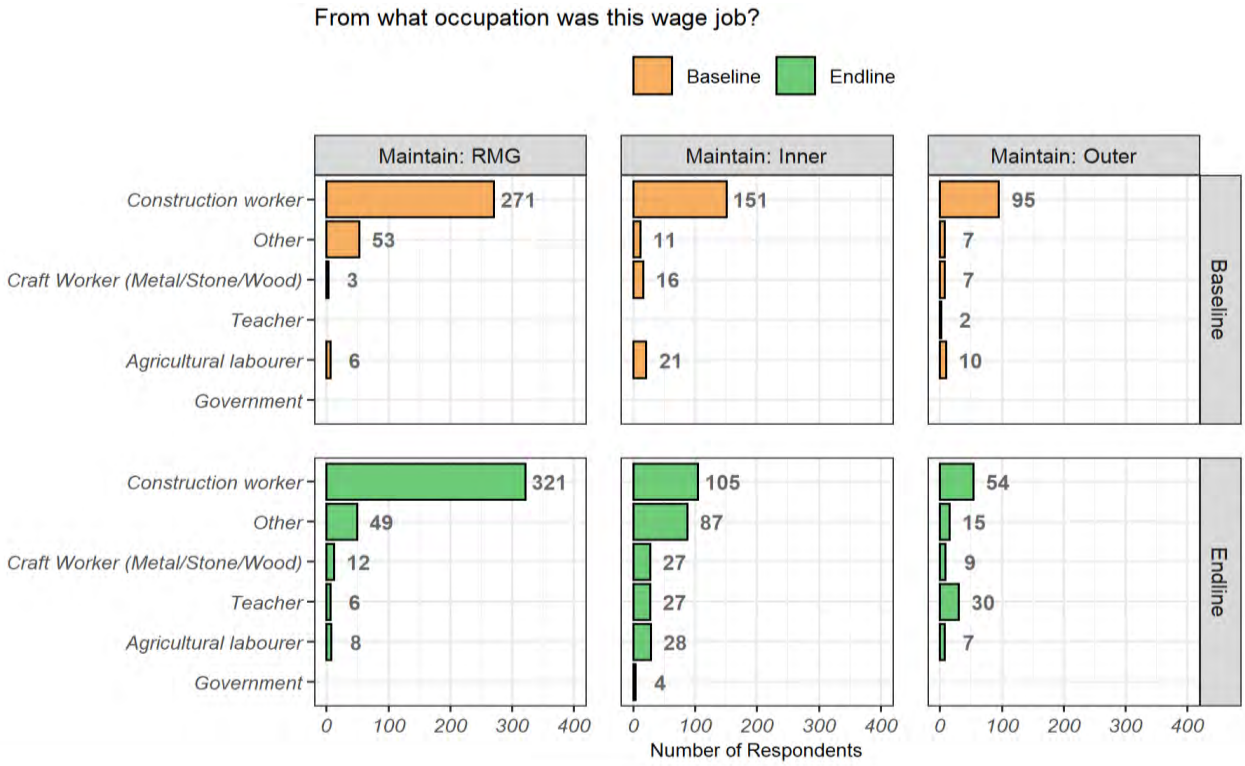
Key findings

- Labour-based road construction is regarded as high quality and has the added value of communities feeling ownership and stewardship. But these jobs are short-term unless supported and continued by government.
- When considering waged jobs, construction-related jobs dominate the local economy. There has been a small increase in non-construction related jobs but this still accounts for a small proportion of total jobs available. There are still limited options for income-earning opportunities for communities in western Nepal.
- Hence, migration for work outside of Nepal is still a dominating factor in western Nepal. Mugu has seen static migration levels and this is partly reflected in the continuation of work opportunities available via RAP (from RAP-3 and the RAP Mugu-Humla Link Road).
- Certain districts (like Kalikot and Bajura) appear to have more dynamic local economic activity whereas others do not. As a general trend, districts with greater densities of road networks appear to be more dynamic.
- The overwhelming majority of respondents surveyed believe that road maintenance responsibility lies with the local communities (at community and ward levels) reflected by the high feeling of ownership of community assets like roads.
- Road Maintenance Groups (RMGs) appear to be working well as a model for routine maintenance but the lack of supervision apparent since handover to the government is worrying.
- Federalism brings new challenges and opportunities to local governments in the management of local infrastructure such as roads. This is important to consider as development partners and the Government of Nepal at the national level consider how they tailor support in the future, likely requiring that support is more focused at the Province and Municipality level.

5.1 Skills and jobs in the local economy

While construction work has always been a dominant source of waged work in the region, the percentage of households with any waged jobs has increased significantly, particularly in the inner regions close to the road, and may be indicative of more jobs overall (see Figure 17). The endline survey notes that increase in waged labour across locations includes payment for agricultural labour which was formerly based on reciprocal labour arrangements. Qualitative insights indicate that people increasingly expect to be paid wages rather than accept these reciprocal arrangements.

Figure 17: Maintenance area – occupation of wage holders



The qualitative endline study found that the granting of urban municipality status to Kalikot had led to the local government investing extensively in further roads. It has established construction 'brigades', which build the gabion baskets, construct retaining walls and install culverts. This means there **is plentiful work for former RAP road construction workers** in this area, if local and province governments plan and design infrastructure projects properly.[63] In Bajura, a new micro-hydro plant being constructed **employs former RAP-3 workers including women.** Those with skills are getting NPR 900/day and women say they are paid NPR 500/day for work such as ground clearing.

5.2 Migration and the local economy

Those who feel they have no local employment options often see creating decent job opportunities in rural areas as crucial to reducing migration – a phenomenon known as 'distress migration'.[64] The political upheaval in Nepal has been blamed for increasing migration for work. However, qualitative studies indicate that **migration for work is not perceived as a new response, nor is it framed in terms of 'distress'.** Working on construction of RAP-3 roads was largely seen as a substitution for a season of work in India and an opportunity to remain at home with the family. India is seen as having work opportunities that pay relatively better than equivalent work in Nepal, and young men are increasingly seeking to work in other countries. Interestingly, the numbers migrating from Mugu are currently lower than at baseline and significantly different from in all other road construction districts (see Endline Annex Report page 17). Some of this is explained by their continuing employment on the Mugu–Humla link road.

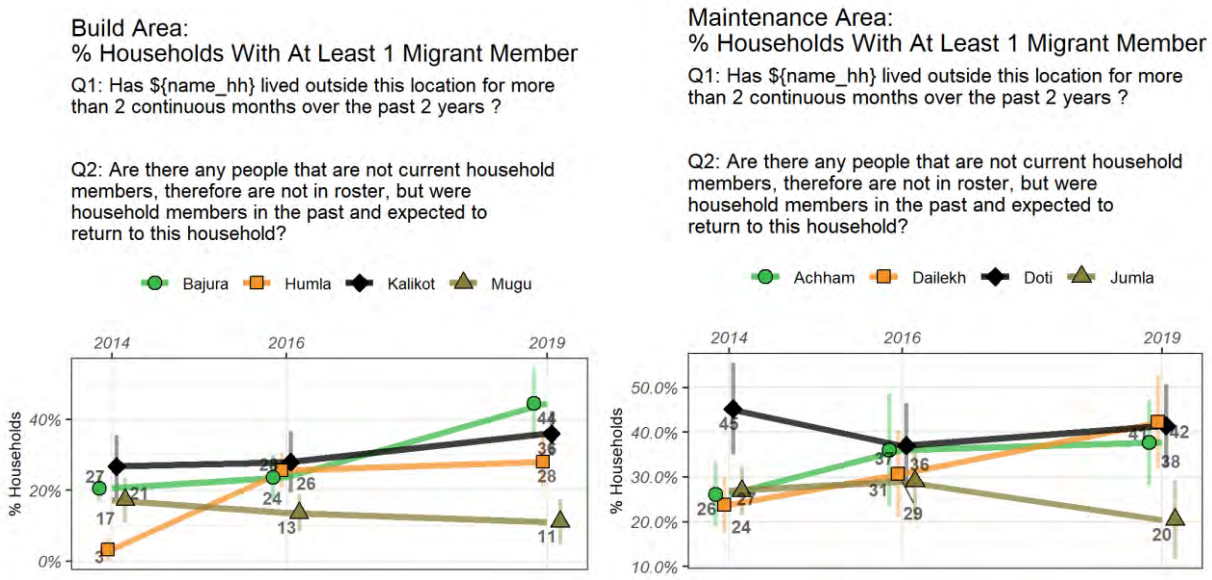
The endline survey data indicates a **massive increase (doubling) in labour migration** from Accham, Bajura, Dailekh and Kalikot since baseline, which indicates that **RAP-3 employment has not affected labour migration** (see Figure 18). This is cross-validated in the endline data on receipt of remittance (see Endline

[63] Although there are also special employment schemes to provide work specifically for the poor.

[64] This notion underpinned much of the original justification for road construction in western Nepal. However, migration from Nepal to India for work has a history stretching back more than 200 years. India and Nepal share an open border and there are no official documents required by Nepali workers to work in India. As much as three quarters of Nepal's labour migration is estimated to be to India. The proximity of the western Nepal districts facilitates migration, often with regular home visits.

Annex Report pages 37-38), especially in Bajura and Dailekh: the median value of remittances has increased since baseline, outstripping inflation rates, which reinforces the view that people **choose to work abroad for better wages**. A total of 4% of households in road construction areas and about 8% households in road maintenance areas have permanently migrated (albeit very few in Mugu, Jumla and Humla).[65]

Figure 18: Migrants



There is a possibility that the current investment in the development of Kalikot will provide new economic opportunities. Although endline survey data suggests that 43.5% households in Kalikot include at least one migrant (compared with around 27% at baseline), remittance receipts have not increased concomitantly. Proportionally more of those working abroad are not in India, suggesting that they have higher-paying work. Qualitative research indicates that these workers may be saving their wages in order to participate in the future in the burgeoning economic development of this district.[66]

As noted previously, the Mugu–Humla link road **is providing continuing employment for 35% of Mugu households previously working on the RAP-3** road. This partially explains why the rate of migration in Mugu has remained static over the period.

It is worth noting that DFID Nepal noted in 2012 – around the time RAP-3 was designed – that 'graduating out of poverty was associated with internal migration and receipt of remittance',[67] thereby recognising this as a key livelihood strategy. **The aspiration to reverse this generations-long tradition through road-building and envisioned economic growth is both ambitious and unlikely in the short term.** Only major economic growth with concomitant increased local job opportunities would affect long-established migration patterns. The positive outlook in Kalikot provides some evidence of this emerging trend.

5.3 Culture of maintenance

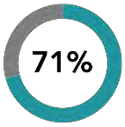
RAP-3 intended to support the GoN 'maintenance-first' policy by encouraging routine maintenance and care of roads by RMGs. RAP-3 recognised this was more efficient than maintenance undertaken through

[65] This was also picked up by enumerators returning to households for the endline survey, who found that significant numbers of entire households had permanently migrated (e.g., in Accham, 20 of 27 of RMG families that could not be found had permanently migrated to India; in Bajura, 6 of 14 RBG families had permanently migrated to India). Full details are in the Endline Annex Report (page 87).

[66] It is worth noting that before RAP-3 began in 2013, there was hardly any functioning local road in Kalikot.

[67] DFID Nepal: An Inclusive Growth Strategy for the Mid-West and Far-West Regions of Nepal that Delivers on Poverty, Vulnerability, Food Security and Nutritional Outcomes, September 2012

ad hoc employment schemes as the RMGs become familiar with the road they are maintaining and plan its maintenance on an annual basis. In preparation for RAP-3 closure, responsibility for maintenance (including payment and supervision of RMGs) had been gradually devolved to local government.



of households said the condition of maintained roads had improved by endline

The endline survey indicated that people living along the RAP maintained roads had **seen maintenance activities,** with the share highest in Jumla (75%) and lowest in Doti (19%). Across all road maintenance areas, 71% indicated that the **condition of the roads had improved** and none anywhere said it had deteriorated.[68] The qualitative endline study noted that 'groups of road workers in yellow jackets' were a common sight in both Bajura and Dailekh and road users acknowledged their work.

RMGs beyond RAP
During the qualitative fieldwork, researchers observed an RMG comprising 14 workers on one of the Dailekh roads that seemed self-motivated and completed seven hours of work every day. They shared, like those in Bajura, that they did not get supervision visits any more as they had done during RAP '*but we prefer this'.* One RMG in Bajura has decided to work alternate days as its members feel this is a better way to assure vehicular movement.

The endline survey found very differing responses regarding who should be responsible for road maintenance. **Most believe that responsibility should lie with the local community and the ward.** However, in Dailekh, only 44% indicated that the responsibility should lie here and 37% said it was a provincial responsibility. This may represent a difference in the political make-up of local government bodies. **This ties into important considerations around the federalisation process, starting in 2017, which has changed the governance context and consequently may affect future change.** For example, the significance of the roads in Dailekh may have been diluted by the shift of the administration centre from Dailekh to Surkhet as part of the federalisation process. By contrast, Kalikot has been declared an urban municipality[69] and therefore benefits from a larger local government budget and newly formulated urbanisation plans.

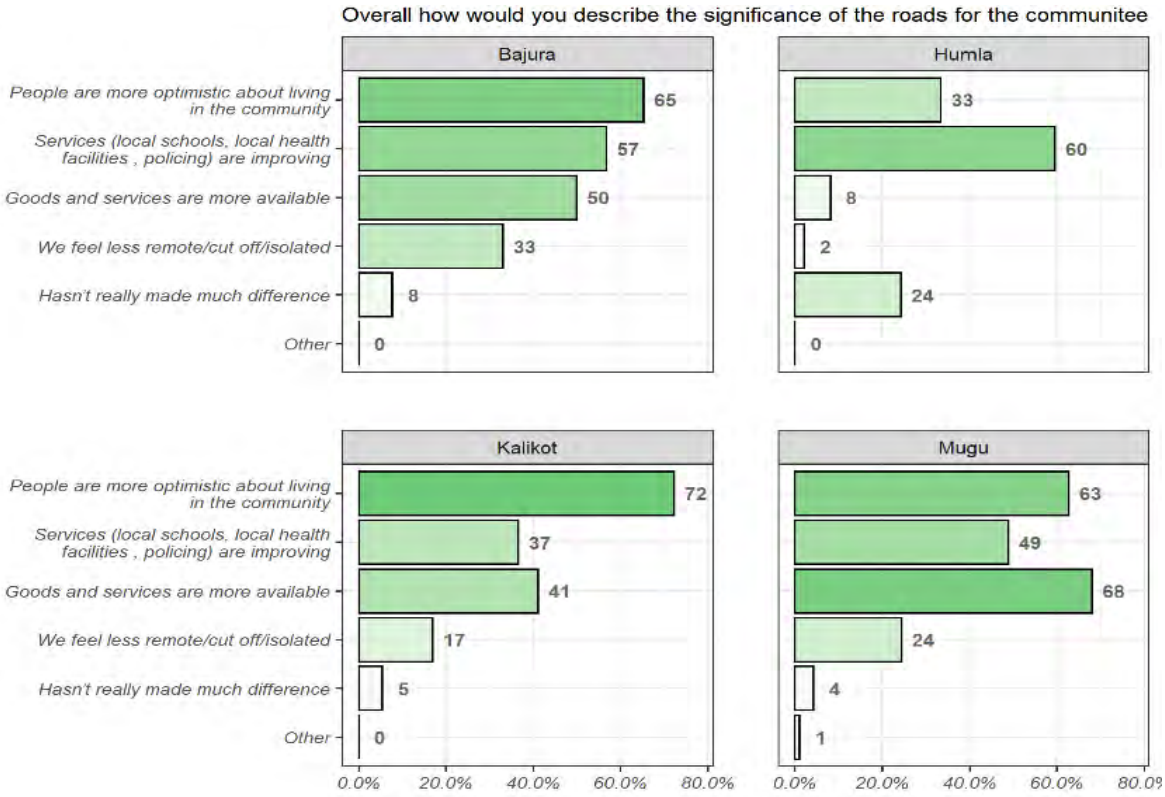
5.4 The value of roads

While roads nearly always serve a public good purpose, the **nature of the public good varies considerably.** Traditional justifications for rural road construction focus on economic gains, especially highlighting decreased transport costs, which in turn lead to increased income and consumption. The quantitative evidence from the endline survey of people living in the communities where RAP-3 is concentrated on why the roads were significant to them bears out many of the qualitative insights gained over the programme lifespan – that the significance of roads for people lies more in '*bringing hope*', '*time and physical effort saving*' and '*reducing remoteness*'.

[68] It should be noted that views on road conditions are strongly related to seasons and the survey was conducted at the end of the dry season. Many mud- and heavy rain-related problems were directly experienced by MEL researchers in September 2019 (end of the rainy season). In road construction areas, the endline survey noted that visibility of maintenance also varied, with 66% and 51% in Bajura and Mugu, respectively, and only 12% in Kalikot.

[69] It has 2,700 households and a population of more than 25,000

Figure 19: Build area – significance of roads

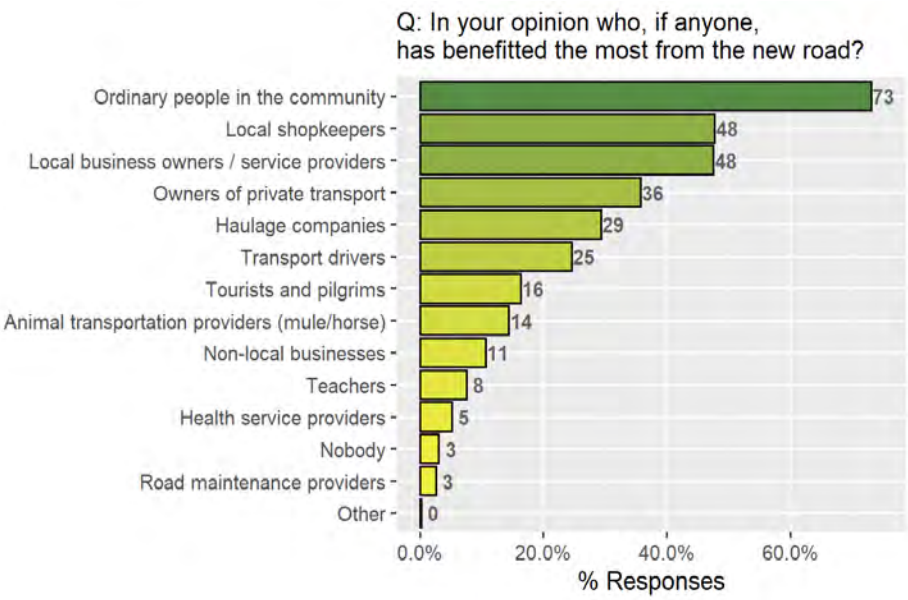


Humla is the district in Nepal still to be connected to a wider national road network. The newly constructed RAP road is currently isolated and does not serve any connectivity purpose as yet (until the Mugu–Humla link road is constructed). Very few respondents surveyed had experienced greater availability of goods and services or felt less remote. However, a significant portion of respondents (over 30%) feel optimistic about living in the community because of the road, despite almost none reporting confidence in being able to access the nearest hospital in an emergency (a proxy for access to a critical service).[70]

Beyond economic concerns, a number of roads are important for other reasons, including pilgrimage and/or tourism: 39% of respondents in Bajura and 29% in Dailekh felt that tourists and pilgrims benefited most from the new road (Endline Annex Report page 52). In the qualitative endline, community members in Dailekh noted that one particular RAP-3 maintained road was primarily an access road to two key pilgrimage sites. The road is sparsely populated with traffic during pilgrimage months, many thousands of visitors go to the pilgrimage sites and the road fulfils an essential function for those who cannot trek to them.

[70] Household Survey Endline, June 2019. See Endline Annex Report pages 56-59 for the share of households with increased confidence that they can access the nearest hospital in an emergency compared with two years ago.

Figure 20: Build area – who has benefited?



5.5 Road safety

The endline qualitative study found that **RAP-3 maintained roads were seen as safer and easier to traverse than before.** For example, in Dailekh at baseline, most people used local trails rather than walking along the RAP road because they said these were faster. However, at endline people are more likely to **walk on the road** because it is now safer and easier. The trails have since deteriorated and walking along the road provides a possibility of hitching a lift from a passing vehicle. Elderly people felt safer using these roads and often mentioned how this had enabled them to visit relatives more frequently. They appreciated being able to attend events such as weddings and funerals. From talking with animal herders in Dailekh and Bajura, the wider and less precipitous RAP roads are much appreciated compared with trails, as their cows and goats move more safely.

We want the resources invested in international development to have the greatest possible impact on people's lives. We provide the insight and ideas to ensure that they do.

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