

EVALUATION OF NATIONAL ROAD NETWORK FUNDING IN NAMIBIA: THE CURSE OF EFFICIENT ROAD USER CHARGES

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ABSTRACT

Infrastructure development, including roads, requires large capital investments coupled with proper financial administration to ensure sufficient financing and funding. Insufficient or uncertain budget allocation undermines the planning and execution of road maintenance, which results in deterioration. The search for stable funding solutions for road maintenance and rehabilitation reinforces the establishment of second-generation road funds. Namibia established the Road Fund Administration (RFA) in 2000 to manage the Road User Charging System (RUCS) and the Road Fund. Although Namibia has established a Road Fund and implemented the RUCS, the current funding system appears to have run into serious problems. Revenue generated by the current RUCS presents limited capacity to meet the required demands of roads expenditure. This paper sought to evaluate the relationship between the road-generated revenue and its allocation towards national road network expenditure in Namibia. The research utilised data from the road agencies to evaluate road revenue generated from the RUCS. The evaluation shows that financial deficits occur on funds generated from the RUCS and the government must thus subsidise the road sector. This finding may indicate the dilemma facing many developing countries, where revenue from road users does not cover total road costs due to limited capacity and economy of use. Additional funding sources are therefore required to fund these deficits.

1. INTRODUCTION

Road infrastructure is critical for economic development, reducing poverty and inequality, creating jobs, and ensuring environmental sustainability (Carter et al., 2017). Investing in new roads and maintaining the existing road network is therefore an important policy for any national development. Road infrastructure requires large capital investments coupled with proper financial administration to ensure sufficient financing and funding in order to meet developmental objectives, specifically of developing countries. Insufficient budget allocation undermines road authorities' planning and execution of road maintenance and expansion of the road network. This results in the deterioration of the road network, which leads to higher transport costs and a negative impact on economic development (Gwilliam & Shalizi, 1999).

Most countries commit substantial resources to the road sub-sector. Road sector spending can absorb as much as 5 to 10% of governments' recurrent expenses and roughly 10 to 20% of their development budget (Heggie & Vickers, 1998). Several policies, legal frameworks, and funding schemes to address the demands for road maintenance, rehabilitation, and new development have been drafted. The general theme of these policies seems to be the belief in the 'user-pay principle' as the best option to fund roads. For example, the Namibian White Paper on Transport Policy (1995) recommends the implementation of the user-pay principle in order to promote economic efficiency and equity. The efficiency principle entails that road user charges (RUCs) should be set to fully recover associated costs from road users. Economists refer to the efficient price of transportation as the one set at the marginal social costs (MSC) associated with road use. The equity criterion implies that capital costs not recovered through marginal cost principles should be proportionally recovered from the road users that stand to benefit from the road system (Ministry of Works, Transport and Communication [MWTC], 2000). User-pay is therefore an umbrella term for efficient and equitable RUCs, guiding the setting of road pricing that is economically justifiable.

The Namibian White Paper on Transport Policy (1995) also supported the creation of the Road Fund, into which revenue generated from RUCs should be deposited. Somewhat implicit in these policies and documents is the confidence that the user-pay principle will deliver sufficient funding for the road sector. The challenge with efficient prices, set at short-term marginal cost (SRMC), is that under circumstances of low demand and excess capacity these prices do not cover fixed costs (notably return on capital investments) that must be earned by the road agency (Kahn, 1988).

Economic theory suggests that prices set to reflect MSC comprise the optimal pricing for charging for the use of transport infrastructure (Stewart-Ladewig & Link, 2005). RUCs that reflect the additional infrastructure and external costs signal to road users and the authority the appropriate road prices drivers ought to pay. The social costs associated with road users travelling include operating costs of the road infrastructure, traffic congestion they impose on other users, as well as the impact on the environment and society that arises from undertaking a journey (Rouhani, 2016). It is therefore essential to place monetary value upon externalities arising from the use of roads and incorporating them into price mechanisms by directly charging the road users or when subsidising the road sector. In so doing, externalities costs will be taken into account by all stakeholders.

Governments or road agencies, in particular the so-called second-generation road funds, are responsible for determining the RUCs and managing revenue generated from them (Heggie, 1995). Second-generation road funds are supported by earmarked revenue. Earmarking refers to the pre-commitment of taxes and levies to support or fully fund specified roads expenditures (Rusbintardio, 2015). Second-generation road funds differ from the first-generation road funds, which typically relied on extra-budget arrangements through earmarked stream revenues at the disposal of the road department or agency (Rusbintardio, 2015). These first-generation road funds were founded in the 1960s and 1970s, based on extra budget arrangements through which earmarked tax revenue from consolidated funds were channelled to a road agency or department (Rusbintardio, 2015). Road agencies or departments operating as first-generation road funds receive allocation from the consolidated budget. The government budget is limited, therefore the road sector competes with social sectors such as health and education (Asian Development Bank, 2003). In addition, many developing countries have expansive roads network, thus the growing financial needs of the road sector make it difficult to finance roads through general tax revenues (Heggie, 2000). Addressing road maintenance expenses remains a challenge

in many developing countries. The search for more sustainable funds therefore prompted many developing countries to establish second-generation road funds in the 1990s (Heggie, 1995). Second-generation road funds serve as a departure from using the earmarked tax revenue in the 1990s. The main underlying principle that guides the second-generation road funds emphasises that road users (consumers of the scarce resources) should pay for their consumption (Freeman, 1982) through RUCs (levies or surcharges), separate from general taxation. Revenue generated from the RUCs are designated to the Road Fund, managed by the Road Board, with a specific member chosen to represent road users. The establishment of a second-generation road fund is justifiable based on the argument that it could improve the allocation of resources through the implementation of the RUCS (Gwilliam & Shalizi, 1999). Gwilliam and Shalizi (1999) posit that the introduction of the RUCs, directed to a road fund, instead of relying on the consolidation budget, would increase efficiency allocations.

The Namibian road fund is a second-generation road fund and is supported by earmarking revenue generated from the implemented RUCS. The common problem with second-generation road funds is that they create the impression that all the revenue generated from the RUCs should be sufficient to cover the road network expenditures. The Namibian road fund approach differs from those found in other countries in that the legislation states that RUCs should fully recover costs to also include or to cover the expenditure to be incurred when undertaking justified new investments in the road sector (Bruzelius, 2000). The current RUCS based on the stated principles of economic efficiency appears to have run into some problems and has proven to generate insufficient revenue to meet the investment needs of the current national road network. The aim of the paper is to offer an overview of the Namibian road-funding trajectory after the sector reform. The paper evaluates the road revenue generated from RUCs, the allocation thereof towards road expenditure by the RFA, and the funding shortfalls experienced by the Road Authority (RA). The paper also discusses the ignored dilemma facing many developing countries with road funds, namely the inability of RUCs to meet expenditure needs. The rest of the paper is organised as follows: Firstly, it highlights Namibian road sector reform, and then evaluates the road-funding scheme in Namibia, focusing on road revenue generation, allocation, and its expenditures. This is followed by a deliberate discussion on allocation of funds to the RA towards the preservation of the national road network and finally the conclusion.

2. NAMIBIAN ROAD SECTOR REFORM

The Namibian government inherited a good road network at independence in 1990. During the South African regime, in particular the 1970s until mid-1980s, infrastructure, including roads, was developed with the motive to strengthen the ties between Namibia and South Africa, as well as to promote the apartheid policy (Bruzelius, 2000). Although road taxation was in place, the revenue from the road taxation was in no way earmarked for road maintenance (Runji, 2003). Therefore, the government department responsible for road projects and programmes would receive its annual budget allocations through general budget processes via parliamentary debate and approval. Namibia has some of the best roads in Africa; very extensive, of high standard, and generally well maintained. The government of the Republic of Namibia therefore treasures the asset (roads infrastructure) at hand and in a fundamental way thought of reforming the institutional arrangements in the road sector in order to earmark the road charges and implement proper road network management. In light of this, the government commenced with a road sector restructuring in 1995 to ensure more sustainable funding and implementation of proper road network management (MWTC, 2000).

On 1 April 2000, the reform resulted in the formation of three state-owned enterprises (SOEs):

- (i) The RFA, to manage the RUCS based on the user-pay principle and the road fund with the view to secure and allocate sufficient funding for roads. The RFA imposes direct charges on motor vehicle owners using Namibian roads. The RFA collects revenue through the RUCs and allocates these funds toward road maintenance, rehabilitation, and to some extent new road developments.
- (ii) The RA, to manage the national road network. Legislation prohibits the RA from carrying out road maintenance, rehabilitation, or construction, but to assign road works to service providers.
- (iii) The Roads Contractor Company (RCC), to undertake road maintenance based on commercial principles. The RCC (a public entity) and private companies may tender for road works on a competitive basis.

The RFA was established according to the principles of the second-generation road funds. These principles are discussed by Gwilliam and Kumar (2003), and entail:

- a road fund managed through the RFA entity, responsible for managing the RUCS and channelling funds to the road authorities;
- an independent board member comprising public-private nominees to oversee the Road Fund; and
- generating revenue through RUCs mainly from fuel levies, licence and registration fees, abnormal load fees, mass distance charges (MDCs), and cross-border charges (CBCs).

Regional councils and municipalities manage the urban roads and they receive funding from the State Revenue Fund (SRF) (for developmental projects) and from the Road Fund (for road maintenance and rehabilitation). The Namibian road institutional and funding model seems to work admirably, as reflected by the country's road quality ranking. Namibia has continuously ranked as one of the best countries in terms of its road infrastructure (Schwab, 2018). *The Global Competitiveness Report for 2017/18* ranked Namibia 31st (5.0 score out of 7) for the quality of roads infrastructure out of 137 countries assessed (Schwab, 2017).

Despite this performance and the well-functioning institutional framework, the country and the road sector face challenges in securing funding for the preservation of the road network. The Medium to Long-term Road Master Plan (MLTRMP) of 2012 advocated for the optimal funding for the road infrastructure within the RUCS during the financial year 2014/2015 at N\$2.87 billion. However, the Road Fund could only avail N\$1.676 billion. This has resulted in a funding gap of about N\$1.194 billion initially required to cover the backlog in road preservation (RFA, 2015). This implies a shortfall of N\$1.194 billion to be financed by exploring other means, including general taxes, loans, and donor contributions (Bruzelius, 2010). Insufficient funding, driven by the current RUCs, may influence the ability to fund the road network.

3. CRITICAL EVALUATION OF THE NATIONAL ROAD NETWORK AND ITS FUNDING SOURCES

Despite implementing a seemingly sound institutional framework and having sound policy on how to secure funding through the various RUCs, the Namibian road sector is quite extensive and serves a small vehicle population of 374 710 registered vehicles (RA, 2017), which creates a difficult position for the Road Fund to fully recover the road expenses from road users. The focus of this section is to critically evaluate the revenue generated from the RUCs and their allocation to the national road network managed by the RA. Available secondary data were utilised for the period 2011 to 2016, obtained mainly from annual financial reports and budget documents from road agencies such as the RFA and the RA.

3.1 Components of the national road network

The road network in Namibia comprises proclaimed roads; municipal roads; minor roads, which entail corridor roads (linking Namibia with its neighbouring countries); inter-urban roads (connecting major centres); district roads (carrying reasonable traffic volumes); and farm roads (connecting farming areas) (Runji, 2003). The RA is responsible for managing the national road network in Namibia, which comprises roughly 48 400 km (RA, 2016). For the 2016 fiscal year, the majority (80.6%) of the 48 400 km national roads were unpaved (gravel, earth, and salt), approximately 7 568 km (15.6%) were paved roads (bitumen and low volume), and about 1 829 km or 3.8% were proclaimed roads.

3.2 Road funding sources

Road funding sources in Namibia can be divided into two categories, namely (1) allocation from the Road Fund (revenue generated from the RUCs) and (2) allocation from the SRF (revenue generated from general government taxes). Revenue from the RUCs relates to the actual use of the road network by different vehicle types and varies with road use. All revenue generated from RUCs accrues to the Road Fund. Revenue allocation from the SRF comprises the national government funds mainly generated from general taxes, which are not associated with the vehicle use of roads and thus are not earmarked for a specific sector.

Namibia generates revenue from various sources such as personal income tax, value-added tax (VAT), company tax, property tax, and trade tax (on goods imported into Namibia), as well as income from the Southern African Customs Union (SACU), of which Namibia is a member state. During the 2016 fiscal year, government revenue amounted to N\$55 440 billion (Ministry of Finance [MOF], 2016). Income from international trade and transactions, individual tax income, domestic taxes on goods and services, company taxes, and fuel levies contributed 31%, 23%, 19%, 14%, and 5% respectively to total government revenue (MOF, 2016). The government also collects revenue from other sources such as royalties from minerals (like diamonds and copper), as well as dividends from SOEs and various administrative fees, fines, permits, and charges. In addition, the government also raises funds by selling T-Bills and bonds to the domestic market and borrowing money from international financial markets.

All income collected by the national government accrues to the SRF, a department within the MOF. The state budget is allocated to various implementing agencies, including government offices, ministries, or agencies (OMAs). In addition to the funds allocated from the state budget, municipalities and councils can mobilise funding through various charges such as tariffs, property rates, and taxes. Road users pay charges and fees for owning and operating a vehicle on the national road network and other roads. The RUCS instruments in

place include the fuel levy, Vehicle Registration and Licences Fees (VRLF), MDCs, CBCs, and Abnormal Load Fees (ALFs). The fuel levy dominated the revenue generated from the RUCS for the period between 2007 and 2017. During the 2016/2017 fiscal year, the fuel levy (consisting of N\$1.22 per litre for both diesel and petrol) contributed N\$1 341 million (61%) to the total RUC revenue, vehicle licences and abnormal loads N\$634 000 (29%), CBCs N\$125 000 (6%), and MDCs N\$98 000 (4%) (RFA, 2017). Figure 1 illustrates the trend of revenue generated from the RUCS from 2006/2007 to 2016/2017.

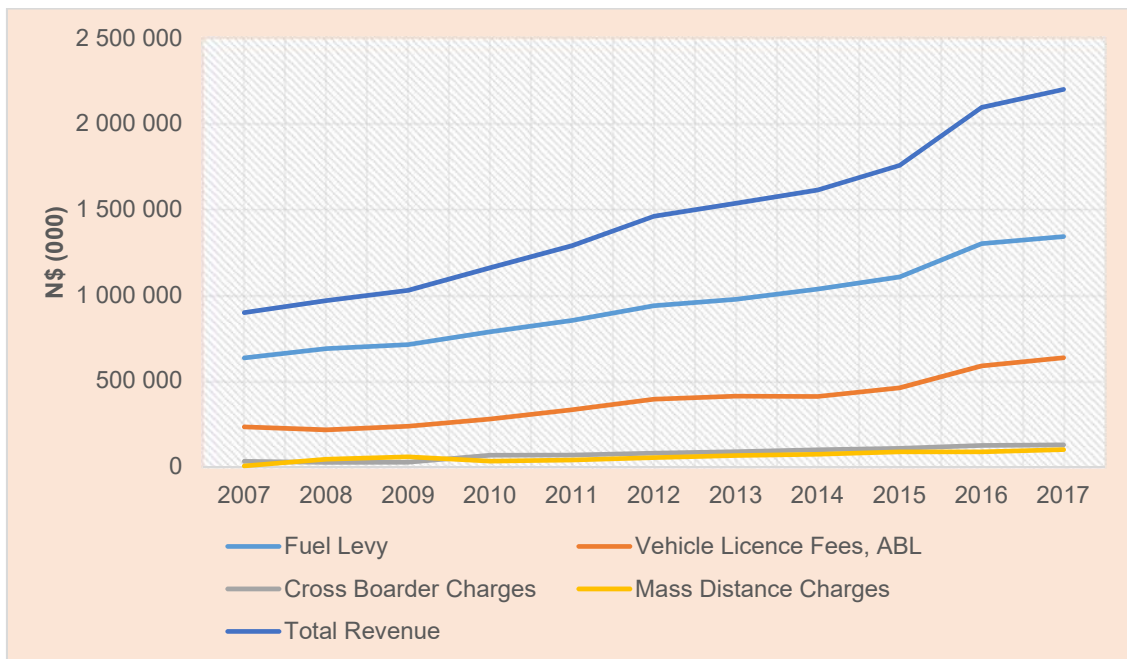


Figure 1 Revenue collected through charging instruments
Source: RFA (2017)

For the 2007 fiscal year, the RFA generated an amount of N\$897 million, which gradually increased to N\$2.1 billion by 2017. Revenue generated from the RUCS recorded a steady nominal growth of 5% during the 2016/2017 fiscal year. From 2016/2017, the Namibian economy registered a contraction of 0.8% in real value, with average inflation recorded at 6.1% (Namibia Statistics Agency [NSA], 2017). The real RUCS revenue allocated towards the national road network registered a moderate growth of 5.4% (RA, 2017).

The growth in revenue was deflated to real revenue, using the Namibia consumer price index (CPI). Although Figure 1 shows information for the revenue growth for the 2006/2007 to the 2016/2017 fiscal year, the real growth comparison was only compiled for the 2011/2012 to 2015/2016 financial years (see Figure 2).

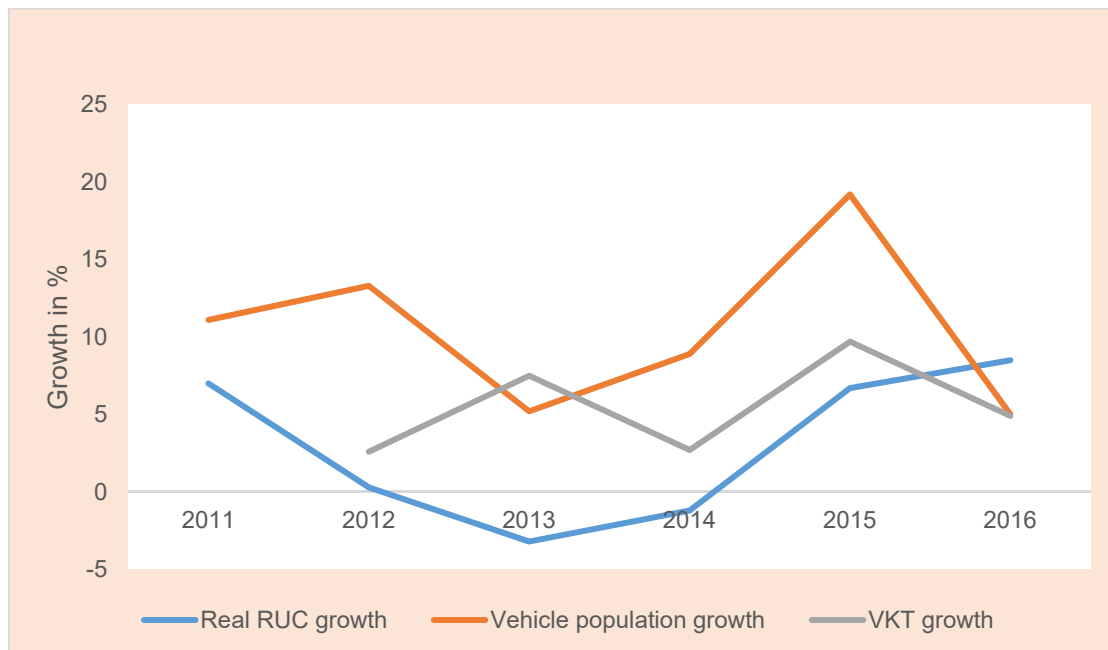


Figure 2 Real RUC revenue growth compared to vehicle population and vehicle kilometre travelled (VKT)

Source: Authors' calculations (based on various RA and RFA publications)

During the 2011 financial year, the fuel levy (largest contributor to the RUCS revenue) was charged at N\$0.99 (petrol) and N\$1.4 (diesel), and only increased to N\$1.14 for both petrol and diesel during the 2015 fiscal year. It appears that both the VKT and the vehicle population growth are above the real RUCs revenue growth. The RFA (2015) stated that RUCs, in particular the fuel levy (main contributor), have not kept up with inflation. The RFA (2015) argued that compensation for inflation since 2001 to the 2015 financial year would have been above N\$1.65/l as opposed to the N\$1.14/l rate charged during the 2015 financial year (RFA, 2015).

3.3 Revenue allocation to the approved authorities

Approximately 80% of the income collected from the RUCs is allocated to the RA towards national road network maintenance and rehabilitation. In addition, an allocation is also made towards maintenance of major urban and arterial roads, traffic-related maintenance of urban roads and streets, traffic law enforcement, the traffic information system, and the administration costs associated with the RA and the RFA. Figure 3 shows the total revenue collected through the RUCs and the allocation thereof to the relevant authorities. During the 2016 fiscal year, the RA received N\$1 467 102 000 or 80% from the RFA of the total revenue generated by RUCs. The fuel levy refund constituted the second largest portion of N\$209 084 000 (11.4%), the Local Authorities received N\$68 470 000 (3.7%), the RFA was allocated N\$65 945 000 (3.6%) for administration, and regulatory authorities received N\$28 990 000 (1.6%) towards traffic law enforcement (see Figure 3).

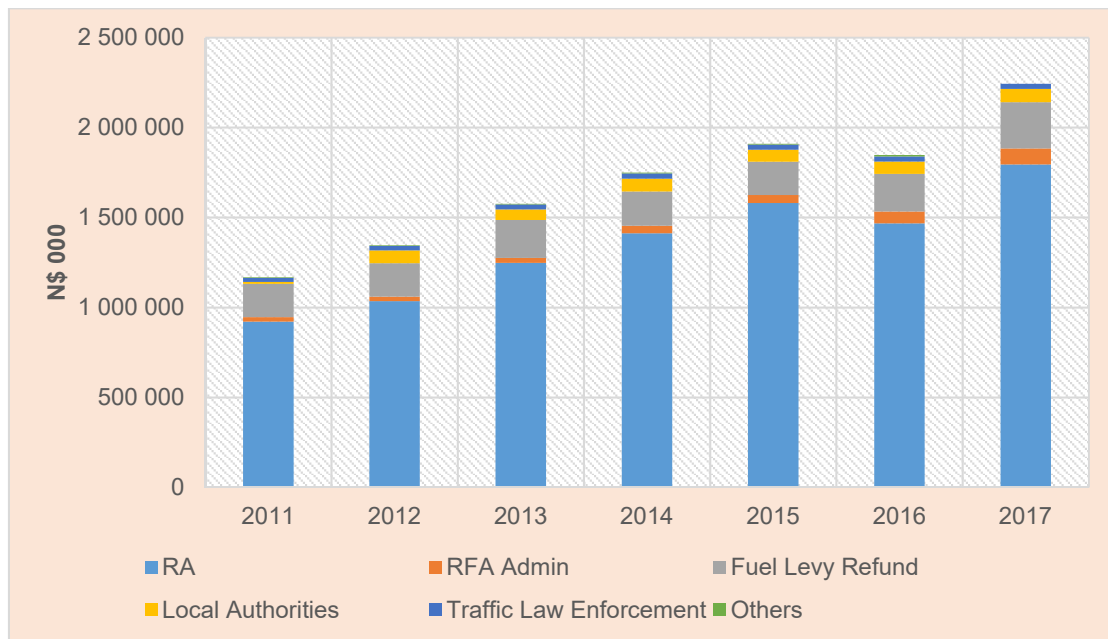


Figure 3 RUCs revenue allocation for the financial years 2011/2012 to 2016/2017

Source: *RFA Financial Report 2011-2017* (RFA, 2011-2017)

The paper now turns to an assessment of the funds allocated to the RA towards the preservation of the national road network.

4. ALLOCATION OF FUNDS TO THE ROAD AUTHORITY (RA)

The RA prepares a five-year budget, guided by key planning documents such as the MLTRMP, the National Development Plans (NDPs), and the RA Strategic Plan. The MLTRMP outlines the medium- (2012-2016) and long-term (2016-2030) programmes based on justifiable, economically optimal operation levels for road preservation and development. The RA budget for maintenance and rehabilitation is submitted to the RFA for funding. After a further optimal budget rationale, the RFA accepts and provides the necessary funds. In addition, the RA, through the MWTC, submits a budget for new road development to the MOF through the National Planning Commission (NPC). The government revenue is allocated through a structured budgetary process, which is subject to parliamentary debate and approval. The availability of funds determines the proportion each department receives and the amount the RA would receive from the SRF. Figure 4 depicts the total contribution from the two funding sources for the period 2012/2013 to 2017/2018.

During the 2012/2013 and 2014/2015 financial years, the government allocated N\$1 315 million (52%) and N\$1 960 million (55%) respectively of the revenue generated from general taxes. In contrast, the RFA in the same period allocated N\$1 239 million (48%) and N\$1 629 million (44%) towards national road expenditure from the revenue generated by the RUCs. The budget allocated from both sources to the RA shows that there is a shortfall on funds required by the RA to meet the demand of national road network expenses and the allocation from the two sources, mainly the SRF and the Road Fund.

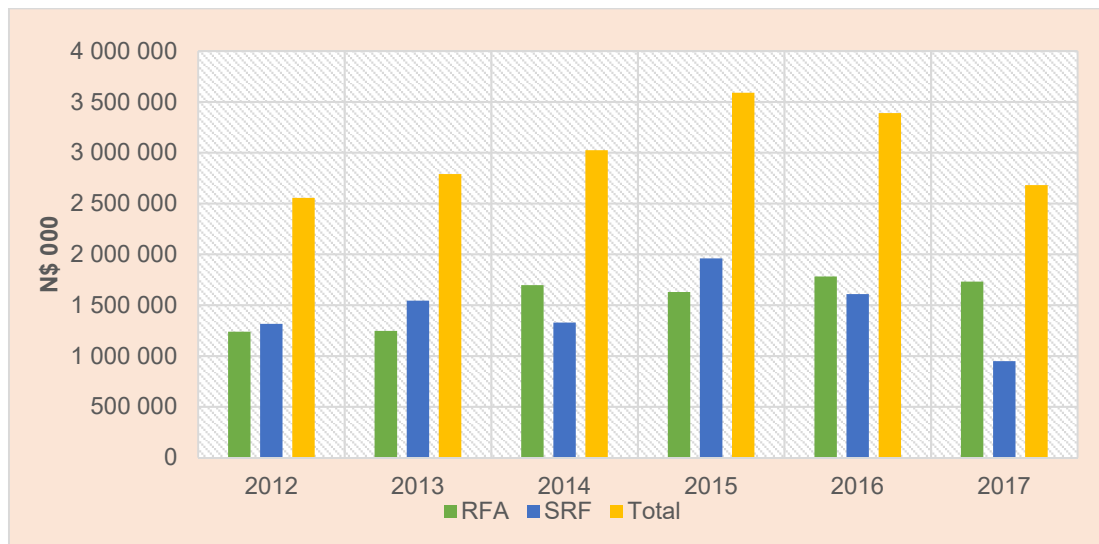


Figure 4 Total contributions from the RFA and SRF towards the road network
 Source: RA budget reports for the period 2012/2013 to 2017/2018

During the 2015/2016 fiscal year, the road sector absorbed approximately 3% of the government operations and about 18% of its development budget (METF, 2015). The results are in agreement with Heggie and Vickers' (1998) statement that the road sector could absorb as much as 5 to 10% of government recurrent expenses and about 10 to 20% of the development budget. The percentage share of funding provided by the government towards the development of the national road network is reasonable (18%) compared to international standards, which range between 10 to 20% of the government development budget.

Figure 5 presents the RA budgetary allocation towards national road development (construction) and preservation (maintenance and rehabilitation) projects in real terms, for the period 2011/2012 to 2016/2017.

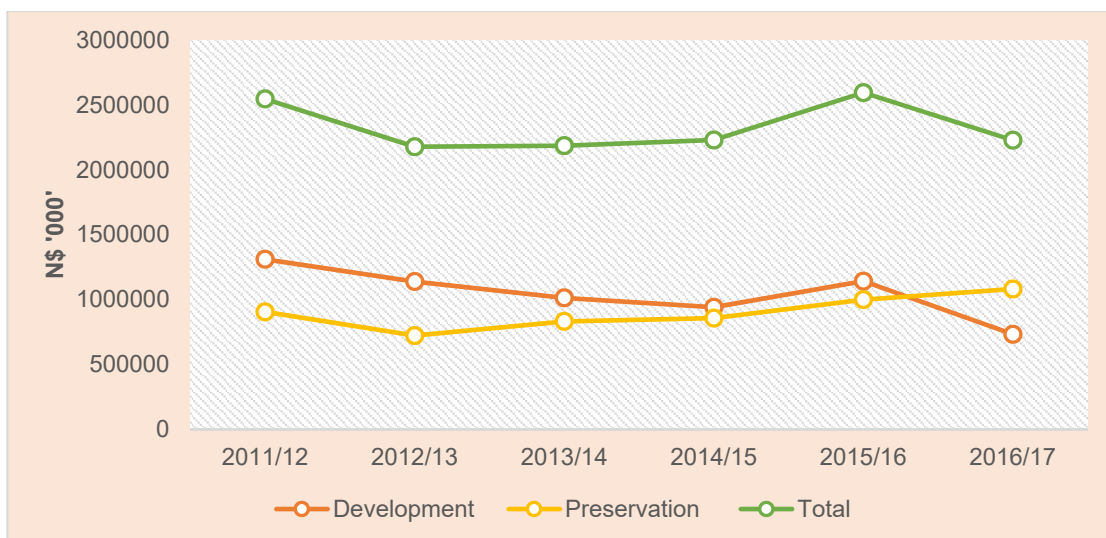


Figure 5 National road network expenditure in 2010 prices (N\$000)
 Source: RA (2016)

Resources in real amounts made available for construction (development) of new roads and maintenance of existing roads show a flat trend, which is proportional to the total budget allocated to the RA towards the national road network. In terms of administration versus the operation budget, the overall RA administration expenses decreased to 48% since

2011/2012 to 2015/2016, corresponding to 15% of the RA total expenditure (operation and administration) for the national road network budget.

The evaluation demonstrates a fiscal squeeze in the revenue generated from the RUCs that resulted in limited resources available for the preservation of the national road network. The road budget for preservation and development shows a total increase in allocation, although uneven (see Figure 4). On average, 80% of the revenue generated from the RUCs has been allocated to the RA for the preservation of the national road network. A shortage of funding to meet the required demand cannot be explained as a result of insufficient allocation towards the national road expenses. The RFA can only allocate funds to the road sector, which are generated by RUCs. The road users' base, their travel behaviours, and the level of RUCs therefore determine the income to be generated from the roads, whereas the size of the road network and the standards determine the demand for road funding. Getting the price right is therefore an important policy objective and can have a big impact on the available resources for road maintenance, rehabilitation, and construction. Although the RFA legislation is clear on the user-pay principle, the theory is yet to be modelled into practice.

5. CONCLUDING REMARKS

This study unpacked the funding of roads for Namibia. The RFA Act (No. 18 of 1999) is clear on the user-pay principle as the economic efficiency price. The user-pay principle, however, seems to be more of a popular policy statement and very little research has investigated what it means in practice. The RFA funding model, based on current road user prices, has shown limited capacity in meeting the increased demand for roads expenditure. There is a need for the government, through allocation from the SRF, to continue supporting the road sector based on the justification of the expected positive spillovers to the economy from overall road infrastructure development.

The RFA Act is clear on maintaining the economic efficiency pricing and, despite the funding shortfall for the national road network expenditure, the RFA must comply with the RFA Act and avoid unsubstantiated increases in the RUC rates. A dilemma the Namibian road sector is facing is the inability of RUCs to meet the national road expenditure needs. Namibia's expansive road network and small vehicle population cause the inherent dilemma of spreading the costs of maintaining a large road network with few road users. The nature of roads within the country includes the indivisibility of road infrastructure, large capital costs, and low variable costs, will cause, RUCs set at theoretical efficient prices of MSC not to guarantee sufficient revenue to meet roads expenditure needs. The RUCs should be re-assessed to determine whether current RUCs are in fact set at efficient prices.

A clear argument can still be made to recoup the costs of road infrastructure investment from those who benefit and Namibia may consider introducing alternative forms of road users fees, for example toll roads to source additional income. Namibia's traffic on the national road network remains a constraint to introducing toll roads. Alternative schemes such as MDCs, already introduced, may be more feasible with advanced technologies and automated systems to secure income from those who benefit the most from road infrastructure.

Spatially expansive developing countries with relatively small populations and a small vehicle fleet may face difficulties in applying the concept of efficient prices for road transport. Marginal costs will not exceed total costs, leaving these countries with road budget deficits. This may lead to pressure on authorities to increase road user tariffs to unacceptable levels,

which may ultimately erode the developmental benefits of roads. Future research should be directed towards unpacking the MSC pricing for Namibia and assessing the user-pay principle's budgetary implications.

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