Changing public policy on expenditure in Namibia after independence and its impact on healthcare and education

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Abstract: In this paper, we examined whether changes in fiscal measures through increasing government expenditure on education and healthcare services adopted after independence has made significant impact on the welfare of the Namibian people. Time series data from Ministry of Finance, Ministry of Education of Government of Namibia, Namibia Statistics Agency and World Bank during the period between 1980 and 2015 has been used for the purpose of analysis. A comparison of growth in such expenditures, GDP and other human development indicators has been made between the pre- and post-independence periods. Finally, impacts of changes in healthcare and education expenditure on reduction in mortality, increase in life expectancy at birth, rising literacy and growth of people acquiring higher/technical education, etc. have been examined by using regression analysis. It is revealed that the Namibian people are better off now as compared to the pre-independence era. However, policy changes adopted at the time of independence has not been highly successful in transforming life of the Namibian people as expected. There are still a lot of scopes for the improvement of fiscal management in the country.

Keywords: fiscal policy; public expenditure; healthcare and education expenditure; development; Namibia.

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1 Background

The economy of Namibia is highly characterised by the colonial legacy of South Africa. At the time of independence, in 1990, Namibian Government inherited a dualistic economy from South Africa (Amoo, 2008). It assumed an economy where majority of the indigenous people were subject to strategic deprivation of wealth generating resources by the white settlers and rulers. Secondly, the country faced skewed demographic development; with the native people dominating the poorly developed northern regions while the whites settled in relatively more developed south-central and western regions (Thornberry, 2004). After independence, policies to promote equality were implemented with the provision of free primary and secondary education. Further policy reforms regarding access to healthcare, social protection and land reforms were also adopted.

According to the Constitution of Namibia, primary education is compulsory for all Namibian children and it is provided free of charge in all government schools (Article 20 of 1990 Act of the Constitution). The act further stated that, children shall not be allowed to leave school until they have completed their primary education or have attained the age of 16 years (Article 20, Section 3) (see Legal Assistant Centre, 1998). Although, not compulsory like primary education, secondary education is also provided free of charge in all government schools. However, parents were expected to contribute to the school development fund (SDF) in addition to paying the other private costs of education like purchasing of study material (Ministry of Education, 2011). However, in 2013 contribution to SDF and other private costs in all government schools at primary level was scraped off, and that was extended further to secondary level in 2015 rendering basic education in Namibia totally free.

The government of independent Namibia vide new macroeconomic policies, gave more stress on education, healthcare and other social security measures in order to attain faster economic growth and reduce inequality (Sherbourne, 2016). Expenditures on human resource development (on education, healthcare and social welfare as well as protection schemes) have been expanded. Conversely, new taxes and tax rates were introduced to enhance the expenditure capability.

Following sound welfare measures the country gradually maintained an economic stability over the last two and half decades. Although, economic stability is cemented and the country recorded positive economic growth averaging 4.7% per annum between 1990 and 2016, it could not achieve the desired rate of 7% and above, as targeted in the Namibia's Vision 2030.

Despite adopting expansionary fiscal policy over the past two and half decades, the economy has still been facing serious challenges of income inequality and high unemployment. A high per capita GDP (as high as US$6,800 in 2015) as compared to

other Sub-Saharan African region, hides one of the world's most unequal income distributions, as shown by Namibia's Gini coefficient of 59.7 (Namibia Household Income and Expenditure Survey 2010). Even though, Namibia's Gini coefficient has improved gradually over the years (changed from 70 in 1993 to 63 in 2004, and further to 59.7 in 2010) the country is still ranked the most unequal country in the world, competing only with South Africa and Botswana (Namibia Statistic Agency, 2010). The Namibia labour survey report (Namibia Statistic Agency, 2016) reveals unemployment in the country to be 28% of the country's total labour force.

Apart from unemployment and inequality, the government has also been facing relentless upward pressure on government expenditures that stems from insufficient expenditure control. Issues of over-budgeting, weak cash management, overspending and over-commitment, and little spending adjustment with changing economic environment seem to have been a concern in the country. Thus, given the above weaknesses in policy and public intervention measures, the country is yet to overcome the challenges of unemployment, inequality, poor GDP growth and issues related to healthcare.

Researchers like Bauer and Yamey (1957) and Egbetunde and Fasanya (2013) cautioned about the risk of excessive government intervention though several studies have found a positive impact of government intervention on the economic growth (Ram, 1986; Chemingui, 2005; Ranjan and Sharma, 2008; Mwafaq, 2011). Hague et al. (1998) also argued that increasing budgetary allocations to social transfer like education and healthcare is unlikely to be the only effective way to raise educational and health output. Unless specific measures are implemented to correct the underlying efficiency in spending, increased budgetary allocations to these social sectors would not necessarily translate into improved social outcomes. This appears to be an area where developing countries such as Namibia should pay attention.

Thus, in this paper we tried to examine the effect of policy instruments on aspects of human development in Namibia. That is, we examined whether the policy changes on education and healthcare adopted after independence has made the life of Namibian people better than earlier.

2 Materials and methods

This study is based on secondary data, collected from the World Bank, Ministry of Finance, Ministry of Education and Bank of Namibia. The analysis is done for the period 1980 to 2015 with 1980 to 1990 as the period of pre-independence and the later part (1991–2015) is the post-independence period. Considering the availability of data, the period of study spans over 1980–2015. Apart from direct expenditure on healthcare and education of government of Namibia, there are some variables like government spending on social welfare and protection, government expenditure on transportation, research and development, power, water supply, and communication infrastructure that also affect health and educational outcome. However, due to lack of sufficient information, these variables have not been included in this analysis. All the variables are measured in dollar at constant 2010 price level.

First of all, growth of various variables like per capita GDP, GNI, healthcare and education expenditure during 1980 to 2015 has been estimated by simple regression of $LnY_t = \alpha + \beta.t + U$, where Y_t represents either per capita GDP or GNI, expenditure, etc. at time t (time in years), and α, β are the two parameters. Here β represents the annual

exponential rate of growth. U is random disturbance term with usual classical regression properties. In order to have a comparative growth picture in the pre- and post-independence period same technique has been applied for the sub-periods 1980 to 1990 and 1991 to 2015. Further, to examine the presence of a quadratic trend in the time series, a quadratic equation of the type $LnY_t = \alpha + \beta.t + \gamma.t^2 + U$ has been estimated, where the coefficient γ represent acceleration or deceleration of growth.

Also, data has been checked for any structural break present in 1990, the year of independence and reconstruction. It is done by using Chow test or using a dummy in the trend regression equation. Tabular presentation has been made to have a cursory look at the changes in public policy instrument.

The generalised Chow test as proposed by Dufour (1980, p.570) is applied. It is based on the test statistic F as follows:

$$F_{k,N_1+N_2-2k} = \frac{RSS_p - (RSS_1 + RSS_2)/K}{(RSS_1 + RSS_2)/(N_1 + N_2 - 2k)}$$

where RSS_p = pooled (combined) residual sum of squares, RSS_1 and RSS_2 are residual sum of squares for the first period and second period respectively. The hypothesis of no structural break is rejected if the calculated F is significant.

Regression method (Miller and Russek, 1997) is used to examine the impact of public policy variables on the wellbeing of Namibian people after the country's independence.

3 Observation/results and discussion

3.1 Trends and patterns of fiscal policy variables and other economic measures in Namibia

Earning or per capita GDP on an average indicates the capability of individuals to support various necessary expenditures including food, shelter, education and healthcare to mention a few. However, education and healthcare are two important aspects of human welfare and development. At the time of independence, Namibia Government inherited an education system, which was characterised by major disparities in terms of distribution of educational opportunities and facilities among different sections of the Namibian community. Provision of education and training was skewed in racial and regional terms and was largely a privilege of the few (Wallace and Kinahan, 2011). After independence, educational reform particularly basic education became one of the Namibia's top priorities. In 1990, Namibia's Education Ministry set itself five goals:

1 achievement of improved and equitable access to education

2 improvement in the quality of education system

3 enhancement of democratic participation in the education system

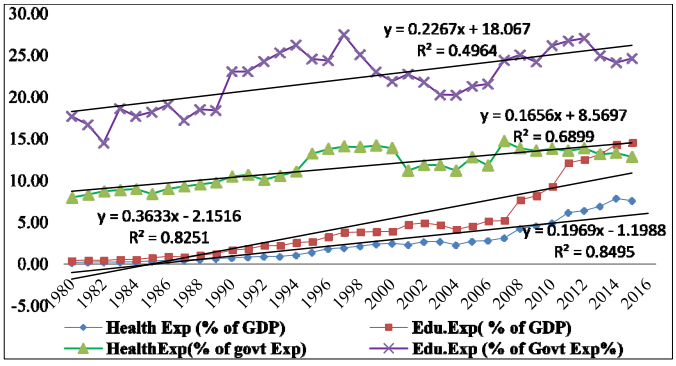
4 improvement in efficiency in the education system

5 promotion of life-long learning (Zaaruka et al., 2001).

In order to achieve the aforesaid goals, education was given the topmost priority by the government of independent Namibia. Hence, allocation for education was increased from

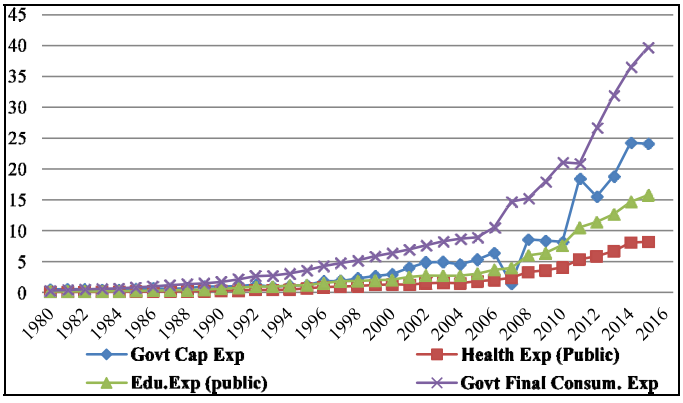
an average 18.3% of the total expenditure between 1985 and 1989 to an average of 23.5% in 1990 through 1994. This was quite a sizeable increase in allocation as compared to that of most low/middle-income countries that spent on an average only 12.8% of their national budgets on education (World Bank, 1993). At present, about 26% of total government expenditure is incurred on education. In terms of GDP, the Government of Namibia allocated about 14.6% (in 2015) to education that was a very significant growth from merely 1.7% in 1990 and 5.0% in 2002 (Figure 1).

Figure 1 Trends of government expenditure on health and education as a percentage of GDP and total government expenditures during 1980 to 2015 (see online version for colours)



Not only education, independent Namibian Government also committed to improve the quality of healthcare and social service and thus put a special thrust on it. Proportion of budget allocation to the healthcare sector has been increasing since independence. The healthcare and social services accounted for an average of 10.5% of total government expenditure at the time of independence (1990–1995), which increased to 13.4% during 2015–2016. The budget allocation to health sector increased from a meagre 0.8% of GDP in 1990 to 2.7% in 2002 and further jumped to 7.6% in 2015 (Figure 1).

Figure 2 Growth of various government expenditure at constant price (2010) during 1980 to 2015 (billion Namibian dollar) (see online version for colours)



The independent Namibian Government not only addressed the budget allocation on transfers to various human resource development programmes like education and

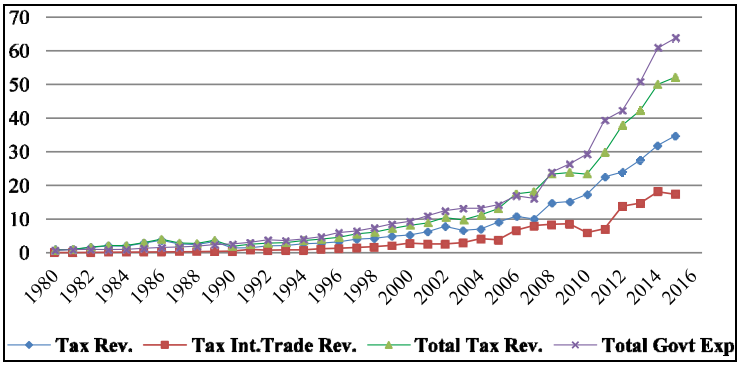
healthcare, other aspects of government expenditure also increased in absolute amount after independence. Figure 2 reveals that various aspects of government expenditures at constant price grew after the country obtained independence. However, from the figure it appears that government spending remained almost the same from 1980 to 1990 and there was slow growth during 1990 to 2001. On the contrary, during 2002 to 2015, government expenditure on various activities almost tripled.

Figure 3 Results of regression of logarithms of govt. capital (GCExp), health (HExp) and education (Ed.Exp) expenditures on time (t)

$\text{LnGCExp} = 19.740 + 0.131\ t$	$R^2 = 0.989$, Adj. $R^2 = 0.989$
[394.6] [55.5]	
$\text{LnGCExp} = 19.517 + 0.166\ t - 0.00095\ t^2$	$R^2 = 0.994$, Adj. $R^2 = 0.993$
[322.99] [22.05] [–4.83]	
$\text{LnHExp} = 17.848 + 0.1403\ t$	$R^2 = 0.991$, Adj. $R^2 = 0.991$
[365.4] [60.9]	
$\text{LnHExp} = 17.723 + 0.1602\ t - 0.00054\ t^2$	$R^2 = 0.992$, Adj. $R^2 = 0.992$
[247.64] [17.96] [–2.29]	
$\text{LnEd.Exp} = 18.580 + 0.136\ t$	$R^2 = 0.988$, Adj. $R^2 = 0.987$
[333.7] [51.89]	
$\text{LnEd.Exp} = 18.479 + 0.152\ t - 0.00043\ t^2$	$R^2 = 0.988$, Adj. $R^2 = 0.988$
[218.0] [14.41] [–1.56]	

Note: t-statistics are in parentheses.

Figure 4 Trends of government revenue and expenditure at constant price (2010) during 1980 to 2015 (billion Namibian dollar) (see online version for colours)



The regression results (Figure 3) reveal that the government expenditure on capital projects has been growing at 13.1% annual exponential rate. Also, government expenditure on healthcare including social services grew by 14.0% annual exponential rate during the period under study. In both cases, there have been acceleration in growth rates as the coefficients of t^2 are positive and significant. With regard to expenditure in education and lifelong learning, annual exponential rate of growth was 13.6%. The

coefficient of t^2 in the quadratic equation for government expenditure on education is insignificant implying that it did not have a quadratic trend during the study period.

As mentioned earlier, in order to cater to the expansionary fiscal policy arrangement, the new government needed to expand its revenue collection through introduction of new taxes and changing tax rates. Figure 4 provides a comparative picture of the growth of government revenue collection and total expenditure. Unlike expenditure, growth of revenue collection was low during the first five years after independence. However, revenue collections based on taxes on both economic activities and international trade (SACU[1] revenues as it is affectionately known), since 1995, is the key factor to the recent significant growth. The rate of growth for tax revenue has increased further from 2002. This increase in tax revenue collection could be the product of three developments,

1 increase in taxable income of the Namibian people due to rising per capita income

2 increase in effectiveness and efficiency of the tax system in the country, perhaps due to growing knowledge and experience over time

3 rise in taxable expenditure through value added tax in the country as expected.

Figure 5 Results of regression of log income tax revenue (InTR), tax on international trade (TaxITR), total tax revenue (TTR) and total govt. expenditure (TGvtXp) on time (t)

$LnTR = 20.628 + 0.092\ t$ [184.5] [17.5]	$R^2 = 0.90$, Adj. $R^2 = 0.898$
$LnTR = 21.065 + 0.024\ t + 0.0019\ t^2$ [144.4] [1.29] [3.91]	$R^2 = 0.932$, Adj. $R^2 = 0.92$
$LnTaxITR = 18.326 + 0.151\ t$ [243.7] [42.6]	$R^2 = 0.981$, Adj. $R^2 = 0.981$
$LnTaxITR = 18.050 + 0.195\ t - 0.0012\ t^2$ [179.2] [15.52] [–3.58]	$R^2 = 0.987$, Adj. $R^2 = 0.986$
$LnTTR = 20.726 + 0.104\ t$ [234.8] [24.91]	$R^2 = 0.947$, Adj. $R^2 = 0.948$
$LnTTR = 21.049 + 0.053\ t + 0.0014\ t^2$ [177.9] [3.57] [3.56]	$R^2 = 0.962$, Adj. $R^2 = 0.960$
$LnTGvtXp = 20.291 + 0.126\ t$ [597.9] [78.3]	$R^2 = 0.994$, Adj. $R^2 = 0.994$
$LnTGvtXp = 20.317 + 0.123\ t + 0.00094\ t^2$ [381.0] [18.3] [0.53]	$R^2 = 0.995$, Adj. $R^2 = 0.994$

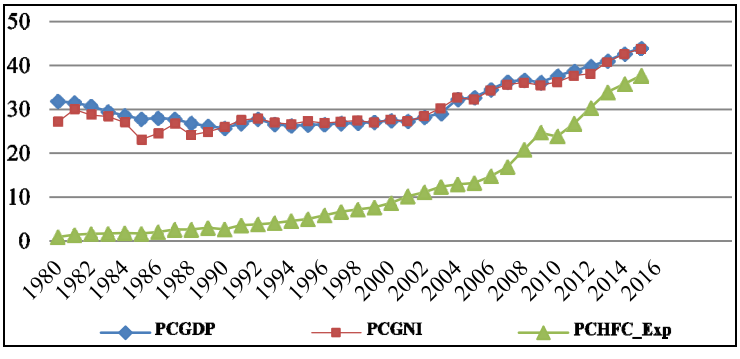
Note: t-statistics are in parentheses.

Considering government revenue collection vis-à-vis government spending, the revenue collection from income tax grew at 9.2% annual exponential rate during the period under study (Figure 5). Whereas, revenue from international trade (SACU revenue) exponentially grew by 15.1% annually during the same period. It may be noted that tax on international trade is managed by SACU even after independence. Due to the

experienced system of SACU existing since 1920 its revenue collection was not adversely affected like new government's income tax collection.

Total government revenue collection (revenue collected by government excluding grants and other non-tax related charges and penalties) grew at an exponential rate of 10.4% per annum during 1980 to 2015. However, after independence the growth in total tax revenue dropped in comparison to total government expenditure, which increased after independence (Figure 4). As mentioned above, this decline immediately after independence may be attributed to lack of efficiency in taxation management by the new domestic officials, as a result of exodus of several erstwhile white employees to South Africa. Overall, there has been acceleration in growth of income tax collection and total tax collection till 2015, but total government expenditure increased sharply after 2005. The gap between total expenditure and tax revenue increased gradually after independence and widened sharply in the last decade (as shown in Figure 4). The rise in government spending may also have a component of inefficiency in the new system of fiscal management. After independence, the excess spending over the stipulated budget has played a big role in the growth of total government expenditure as revealed from Bertelsmann Stiftung's Transformation Index (BIT) (BTI, 2016, 2018). Positive and significant coefficients of t and t^2 in the quadratic equations in case of income tax revenue and total tax revenue reveal that government revenue collected from income tax and total government tax collections had been rising at an increasing rate during the study period. On the other hand, tax revenue collected from international trade has also been rising as reflected by the positive coefficient of t. However, it grew at a declining rate as evident from the negative coefficient of t^2 in the quadratic equation.

Figure 6 Growth of per capita GDP and GNI of Namibia at constant price (2010) during 1980 to 2015 (thousand Namibian dollar) (see online version for colours)



Trends of per capita national income and national output as well per capita private consumption spending have been analysed to examine the growth in people's capability. It may be observed from Figure 6 that both the income and output per capita was decreasing in the pre-independence era. The reason behind that was the growth in population faster than the growth on GDP and GNI. In the post-independence era both per capita GDP and GNI recorded positive growths. Growth of per capita household final consumption expenditure was very low before 1990 as most of the earning was controlled by the minority white settlers and majority of Namibians had little to spend. After independence, spending capability of black Namibians has increased and the growth in

per capita expenditure has received a momentum to gradually catch up the per capita GDP in a few years (Figure 6).

On comparison of the per capita GDP and income with per capita household final consumption expenditure, it is observed that per capita household final consumption expenditure grew at faster rate than that of income and output per capita (Figure 6). With growing public expenditure, it implies that the gap between spending and earning has been reduced. In other words, nation's spending is growing faster than that of its earning and production. If a nation consumes more than what it earns, it has a direct adverse impact on the national saving. A decrease in national savings might have a direct negative impact on the country's private investment prospects.

Figure 7 Results of regression of log per capita GDP, GNI on time (t)

$LnPCGDP = 10.132 + 0.011\ t$	$R^2 = 0.503$, Adj. $R^2 = 0.49$
[258.7] [5.88]	
$LnPCGDP = 10.392 - 0.030\ t + 0.0011\ t^2$	$R^2 = 0.964$, Adj. $R^2 = 0.956$
[582.9] [-13.61] [19.07]	
$LnPCGNI = 10.063 + 0.013\ t$	$R^2 = 0.697$, Adj. $R^2 = 0.68$
[311.9] [8.69]	
$LnPCGNI = 10.258 - 0.017\ t + 0.00083\ t^2$	$R^2 = 0.923$, Adj. $R^2 = 0.919$
[405.7] [–5.54] [10.04]	

Notes: t-statistics are in parentheses, PCGDP = per capita gross domestic product, PCGNI = per capita gross national income.

Per capita gross domestic product (GDP) grew at an exponential growth rate of 1.1% per annum during the period under review (Figure 7). Also per capita gross national income (GNI) grew exponentially at 1.3% per annum during the study period. Overall, there is positive and accelerated trend on growth of per capita GDP or per capita GNI since the coefficient of t^2 is positive and significant.

3.2 Structural breaks on the trends

To examine whether there occurred significant changes in GDP per capita and other development indicators after independence, we checked the presence of structural breaks in data by using the generalised Chow (1960) test as it was used Kramer et al. (1988). We divide the series as pre-independence (1980–1990) and post-independence (1991–2015) to check for the first break F_1. Since most of the series have picked up a tremendous growth from 2002, we further divided the post-independence series into two to see if the is a structural break again in 2002 (F_2). Most of the series reject the hypothesis of no structural break at both points, except 'total government final consumption expenditure' in 1990 and 'revenue from international trade' in 2002 (Table 1).

We ran separate regressions (from 1980 to 1990, 1991 to 2001 and 2002 to 2015) to compare the growth rates in those sub-periods. It is observed that some series like gross capital formation had a negative growth in the first period, while in the second period it recorded significant growth. For all the series, the growths were higher in the last period,

2002 to 2015. This implies that the all variables had a faster growth in the last period as compared to the earlier periods. Like earlier results, per capita GDP and GNI slopes were not significant in the second period. A high growth in variables like tax revenue collections in the last decade could be associated with an increase in capacity and administrative control (Owusu-Tieku, 2014).

Table 1 Generalised Chow test results

Variable	*1980–2015*	*1980–1990*	*1991–2015*	*1991–2001*	*2002–2015*	*1990*	*2002*
	RSS_1	RSS_2	RSS_3	RSS_4	RSS_5	F_1	F_2
Per capita GDP	0.450	0.002	0.080	0.003	0.010	71.82	81.41
GDP	0.171	0.006	0.037	0.002	0.008	47.12	43.48
Gross capital formation	20.683	7.884	1.611	0.880	0.534	18.85	2.23
Per capita GNI	0.305	0.039	0.075	0.002	0.010	26.86	84.36
Govt. final consump. exp.	0.734	0.063	0.184	0.015	0.073	31.44	17.50
Total govt. expenditure	0.338	0.073	0.261	0.031	0.152	0.20	6.84
Household final consump. exp.	0.253	0.132	0.074	0.010	0.047	3.62	4.79
Revenue from income tax	3.668	1.506	0.201	0.027	0.130	18.38	4.51
Revenue from international trade	1.659	0.113	0.850	0.203	0.629	11.56	0.36

Notes: F_1 is computed by using RSS_1 and RSS_2, while F_2 computed by using RSS_3 and RSS_5.

4 Achievements

4.1 Education

Literacy rate, enrolment at tertiary education (higher level of education) revealed high growth pattern due to substantial budgetary injections into the education sector. However, the country failed to promote pre-primary education adequately. This has resulted in an abnormal gross primary enrolment ratio. Further, even though Namibia's higher (tertiary) education enrolment rate has increased from 2.88% in 1991 to 7.03% in 2001 and again jumped to over 20% in 2015, (which is the highest in the Sub-Saharan region), it is still low as compared to other developing countries such as India (at 23.6%) (Figure 8).

At primary education level, net enrolment ratio increased from 79.42% in 1990 to 87.72% in 2000 and further to 89.74% in 2013. The gross enrolment ratio has been very high (more than 100%) throughout the period under study (Education Policy and Data Center, 2015). It is beyond 100% because some children started going to school at a younger or older age rather than at the usual age of seven years. At the secondary education level, gross enrolment ratio increased from 37.97% in 1990 to 60.17% in 2000 and further to 67.48% in 2015. The net enrolment ratio also increased from 24.39% in 1990 to 42.75% in 2000 and further to 54.99% in 2015.

Figure 8 School enrolment during 1980 to 2015 as a percentage of population's age group (see online version for colours)

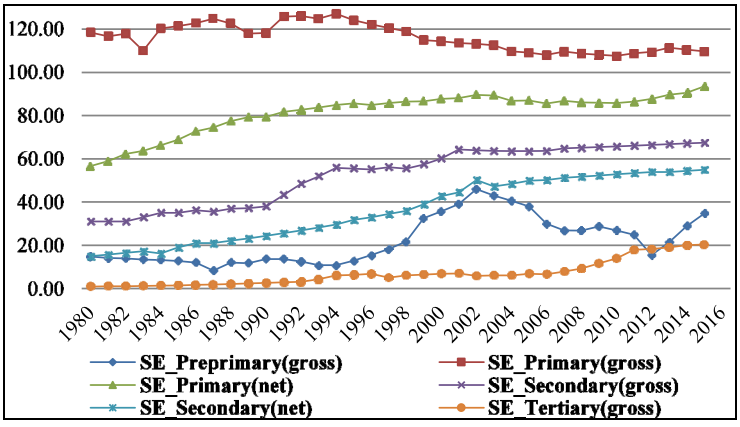


Figure 9 Results of regression of log of various enrolment rates on time (t)

Gross enrolment

LnSE_Pri = 4.8199 - 0.00359 t	$R^2 = 0.493$, Adj. $R^2 = 0.478$
[363.32] [–5.75]	
LnSE_Pri = 4.777 + 0.0032 t – 0.00018 t^2	$R^2 = 0.603$, Adj. $R^2 = 0.580$
[258.2] [1.39] [–3.041]	
LnSE_Sec = 3.464 + 0.0251 t	$R^2 = 0.883$, Adj. $R^2 = 0.877$
[104.3] [16.03]	
LnSE_Sec = 3.276 + 0.0549 t – 0.0008 t^2	$R^2 = 0.962$, Adj. $R^2 = 0.959$
[109.0] [14.67] [–8.211]	
LnSE_Ter = 0.0278 + 0.0835 t	$R^2 = 0.942$, Adj. $R^2 = 0.941$
[0.371] [23.60]	
LnSE_Ter = -0.122 + 0.107 t – 0.00064 t^2	$R^2 = 0.947$, Adj. $R^2 = 0.944$
[-1.079] [7.59] [–1.73]	

Net enrolment

LnSE_Pri = 4.202 + 0.0102 t	$R^2 = 0.699$, Adj. $R^2 = 0.690$
[172.0] [8.88]	
LnSE_Pri = 4.054 + 0.034 t – 0.00064 t^2	$R^2 = 0.931$, Adj. $R^2 = 0.927$
[220.2] [14.71] [–10.57]	
LnSE_Sec = 2.749 + 0.0409 t	$R^2 = 0.951$, Adj. $R^2 = 0.949$
[81.01] [25.58]	
LnSE_Sec = 2.55 + 0.072 t – 0.00085 t^2	$R^2 = 0.986$ Adj. $R^2 = 0.985$
[88.68] [20.16] [–9.02]	

Notes: t-statistics are in parentheses, SE_Pri = primary school enrolment rate, SE_Sec = secondary school enrolment rate, and SE_Ter = tertiary school enrolment rate.

The regression results in Figure 9 reveal that the school enrolment ratio recorded a positive (except for gross school enrolment at primary level) and significant growth at all educational level (primary, secondary and tertiary) for both gross and net enrolment. School enrolment ratio at all level had an encouraging growth, even more after independence. This ratio at primary level was the lowest while the tertiary enrolment level was the highest among others during the period under study (Figure 9).

Table 2 Trends in per-capita GDP, public expenditure on education, and literacy during 1980–2016

Period	*000 Namibian dollar*	*Expenditure on education*	*Literacy rate %*		
	Per capita GDP	*% of total govt. expenditure*	*Adult (15 and above)*	*Youth (15–24)*	*Elderly (65 and above)*
1980–1984	1.87	17.7	68.2	79.6	31.2
1985–1989	2.19	18.3	73.7	80.5	34.7
1990–1995	3.93	23.5	75.8	81.1	38.6
1995–1999	6.42	24.5	82.4	89.2	43.9
2000–2004	10.72	24.4	85.0	92.3	54.0
2005–2009	17.67	21.3	76.5	87.1	42,6
2010–2014	29.35	24.3	89.4	94.4	63.6
2015–2016	46.97	25.5	90.8	95.1	67.3

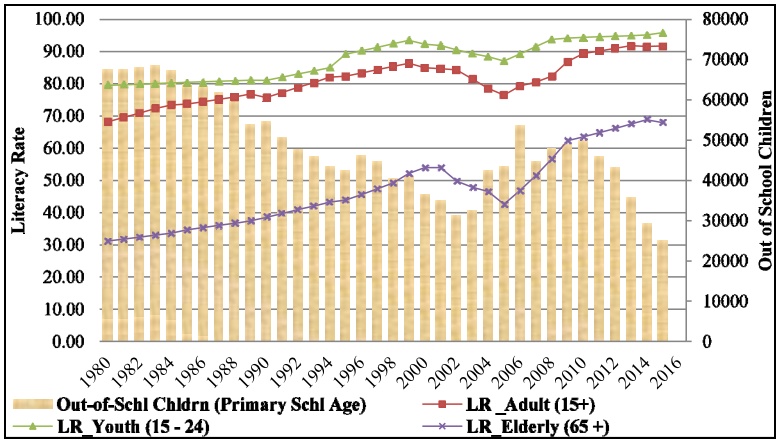
Figure 10 Results of regression of log of various literacy rates, number of children out of school on time (t)

LnLR_Adt = 4.263 + 0.0068 t	$R^2 = 0.771$, Adj. $R^2 = 0.777$
[318.9] [10.898]	
LnLR_Adt = 4.240 + 0.0104 t – 9.7E-05 t^2	$R^2 = 0.791$, Adj. $R^2 = 0.778$
[258.2] [4.10] [–1.449]	
LnLR_Yth = 4.361 + 0.0059 t	$R^2 = 0.860$, Adj. $R^2 = 0.856$
[501.1] [14.44]	
LnLR_Yth = 4.345 + 0.0084 t – 6.8E-05 t^2	$R^2 = 0.870$, Adj. $R^2 = 0.862$
[327.9] [5.105] [–1.564]	
LnLR_Eld = 3.416 + 0.022 t	$R^2 = 0.919$, Adj. $R^2 = 0.917$
[143.4] [19.62]	
LnLR_Eld = 3.425 + 0.021 t + 3.66E-05 t^2	$R^2 = 0.919$, Adj. $R^2 = 0.914$
[91.26] [4.422] [0.298]	
Out-of-school children of primary age	
LnOoS_C = 11.103 - 0.0186 t	$R^2 = 0.591$, Adj. $R^2 = 0.579$
[197.0] [–7.016]	
LnOoS_C = 11.23 - 0.038 t + 0.00055 t^2	$R^2 = 0.636$, Adj. $R^2 = 0.614$
[133.8] [–3.72] [2.001]	

Notes: t-statistics are in parentheses, LR_Adt = adult literacy rate, LR_Yth = youth literacy rate, LR_Eld = elderly literacy rate, and OoS_C = number of out of school children.

In case of literacy, the adult literacy rate increased from 78.86% in 1990 to 85.00% in 2000 and further to 91.80% in 2015. At the youth level, literacy rate increased from 81.10% in 1990 to 91.30% in 2000 and further to 95.87% in 2015. The elderly literacy rate also increased from 38.60% in 1990 to 53.98% in 2000 and further to 67.98% in 2015 (Table 2 and Figure 11). However, from 2000 the rate of literacy for all generations dropped before starting to increase again in 2005. Like school enrolment, literacy rate at all levels (adult, youth and elderly) also recorded a positive growth during the study period (Figure 10).

Figure 11 Literacy rate during 1980 to 2015 as a percentage of population's age group and out-of-school children of primary school age, during 1980 to 2015 (as an absolute number of primary school's age group) (see online version for colours)



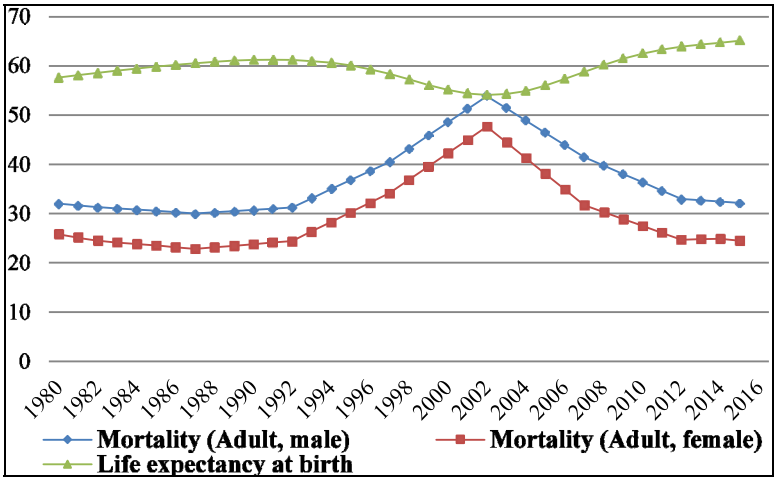
Despite the success story of a significant increase in enrolment ratio at all levels, increase in literacy rate and significant decrease in school dropouts, a number of primary school's age group were still out of school. In 2015, 25,191 children of primary school age in Namibia were out of school, which was of course a drop from 54,644 in 1990 (Ministry of Education, 2016). Most of these children were from the marginalised communities and children with special needs.

4.2 Healthcare services

Healthcare service is one of the most prioritised measures for human development and social welfare in Namibia. After education, safety and security, the government attached the third most important priority to healthcare services, in its domain of activities. However, the last two and half decades of post-independence era did not witness any significant improvement in most of the healthcare measures (Figure 12). Despite government priority as reflected in the budgetary allocation to healthcare expenditure, adult mortality rate increased significantly between 1995 and 2004 and the life expectancy decreased sharply during the same period. This was because of the emergence of new pandemic deceases in the country such as HIV-AIDS and other communicable diseases including Malaria during 1990s. Also, the newly independent country was suffering from the lack of expertise in different areas during 1990s till the early 2000; and healthcare sector also suffered from sudden deficiency of medical experts. The first

medical school in independent Namibia was established in 2011. Thus, it was not until 2016 that Namibia began to enjoy the services of its first locally trained medical expertise.

Figure 12 Motility rate (per 100 people) and life expectancy, during 1980 to 2015 (see online version for colours)



Unlike education indicators, the growth in health indicators like life expectancy and adult mortality rate for both male and female are not that favourable. All series show insignificant growth over time as shown in Figure 13.

Figure 13 Results of regression of log of life expectancy and adult mortality rates on time (t)

LnLE = 4.066 + 0.0010 t [239.05] [1.252]	$R^2 = 0.044$, Adj. $R^2 = 0.016$
LnLE = 4.127 - 0.0087 t + 0.00026 t^2 [179.9] [-3.028] [3.483]	$R^2 = 0.301$, Adj. $R^2 = 0.259$
LnMR_AM = 3.453 + 0.0079 t [60.63] [2.947]	$R^2 = 0.204$, Adj. $R^2 = 0.180$
LnMR_AM = 3.206 + 0.047 t – 0.0011 t^2 [45.71] [5.367] [–4.60]	$R^2 = 0.515$, Adj. $R^2 = 0.485$
LnMR_AF = 3.227 + 0.0078 t [44.05] [2.262]	$R^2 = 0.131$, Adj. $R^2 = 0.105$
LnMR_AF = 2.904 + 0.059 t – 0.0013 t^2 [32.55] [5.29] [4.73]	$R^2 = 0.482$, Adj. $R^2 = 0.451$

Notes: t-statistics are in parentheses, LE = life expectancy, MR_AM = adult mortality rate (male), and MR_AF = adult mortality rate (female).

Under-five mortality rate data show slightly worsening from 7.35% in 1990 to 7.57% in 2000. Thereafter, a significant improvement to 4.54% has been recorded in 2015. The infant mortality rate decreased by just 0.02 base points from 4.96% in 1990 to 4.94% in 2000 and then improved further to 3.28% in 2015 (Figure 14). Fertility rate has been decreasing during the whole period, which can be associated with an increase in adult

literacy rate. Increase in adult literacy rate has brought family planning awareness among the adult Namibians.

Regression results show that infant and under-five mortality rate follow some decreasing trend during the period under study (Figure 15). The fertility rate has however dropped by half during the study period from 6.45 children per women in 1980 to 3.25 in 2015 (Figure 14).

Figure 14 Total fertility rate (number of births per woman), infant and under-five mortality rate (per 100 births), during 1980 to 2015 (see online version for colours)

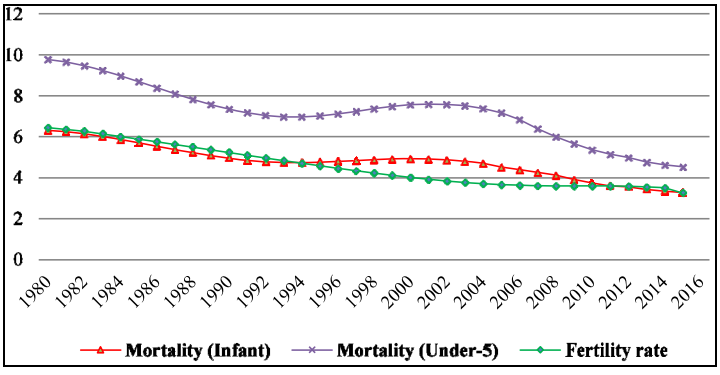


Figure 15 Results of regression of log of infant and children under five years old mortality rates on time (t)

LnMR_Infn = 1.840 - 0.016 t [87.67] [–15.80]	$R^2 = 0.880$, Adj. $R^2 = 0.877$
LnMR_Infn = 1.789 – 0.0075 t – 0.00022 t^2 [57.74] [–2.17] [–1.94]	$R^2 = 0.889$, Adj. $R^2 = 0.895$
LnMR_Un5 = 2.274 - 0.017 t [73.39] [–11.92]	$R^2 = 0.807$, Adj. $R^2 = 0.801$
LnMR_Un5 = 2.193 – 0.0046 t – 0.00035 t^2 [48.45] [–0.81] [–2.34]	$R^2 = 0.835$, Adj. $R^2 = 0.825$

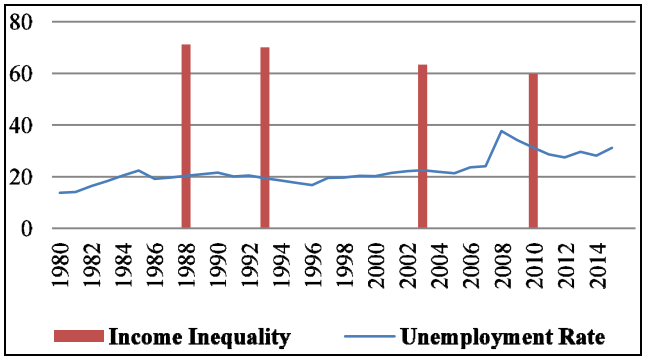
Notes: t-statistics are in parentheses, MR_Infn = infant mortality rate, and MR_Un5 = under-five mortality rate.

4.3 Weakness

4.3.1 Unemployment and income inequality

Despite massive spending on education and healthcare, the Namibian Government failed to solve the challenge of income inequality and unemployment. Notwithstanding the fact that Namibia has reduced Gini coefficient (from 70.1% in 1993 to 59.7% in 2010), it remained one of the most unequal countries in the world. In terms of unemployment, the rate keeps increasing since the country gained independence. In 2015, 28.4% of labour force was unemployed (Figure 16).

Figure 16 Income inequality (Gini coeff.) and unemployment rate during 1980 to 2015 (see online version for colours)



Of course, unemployment in Namibia could be overrated as the communal farmers who are not in search of employment are recorded as unemployed. Furthermore, large groups of self-employed small informal businessmen were registered as unemployed. However, these excuses cannot be used to ignore 28.4% of recorded unemployment in Namibia. The figure was still high for a natural resource-rich country like Namibia. Thus, there was a need to find ways to use available resources efficiently to address unemployment and inequality in the country. In order to achieve this, there was a need to spend more on research and experimental development. National Survey of Research and Experimental Development Report 2013–2014 stated that Namibia spent merely 0.16% of GDP on research and development in 2014 (National Commission on Research Science and Technology, 2014).

5 Government expenditure on healthcare and education vis-à-vis education and health status indicators

Least square regression is used to examine the influence of government healthcare expenditure on mortality rate (for both adult, infant and under-five children), life expectancy and number of deaths for infant and under-five children per year before and after independence. In the same way, influence of government expenditure on education in terms of school enrolment ratio and literacy rate, etc. during pre- and post-independence period is examined.

5.1 Government expenditure on healthcare

It is observed that there was a strong and significant impact of heath related govt expenses on life expectancy, infant mortality and under-five mortality rate during the period between 1980 and 1990 (pre-independence era). For every percentage increase in dollars spent on healthcare and social services, life expectancy increased by about 0.04% per year during this period (Table 3). Further, elasticity of infant mortality rate with respect to government expenditure on healthcare and social services is –0.17%, while that in case of under-five mortality rate is –0.2%. We also find a significant relationship between the government expenditure on healthcare and social service and adult mortality

rate and under-five number of deaths per year. However, the impact of such expenditure on the number of infant deaths was found insignificant during the period of study (Table 3).

Table 3 Results of regression of log healthcare indicators on log government expenditure on healthcare during pre- and post-independence period

Indicators name	*Pre-independence*		*Post-independence*	
	Slope	*Adj. R sq.*	*Slope*	*Adj. R sq.*
LnLifeExpectancy	0.0395**	0.913	0.0253*	0.113
LnInfantMotality (per 100 live births)	–0.1701**	0.976	–0.1269**	0.76
LnMotality under-five (per 100 live births)	–0.1999**	0.977	–0.1473**	0.675
LnMotality adult, male (per 100)	–0.0305**	0.492	–0.0181	–0.034
LnMotality adult, female (per 100)	–0.0544**	0.0479	–0.0472	0.002
LnNumber of under-five deaths	–0.0423**	0.603	–0.0671**	0.362
LnNumber of infant deaths	0.0025	–0.106	0.0421**	0.473

Notes: ** and * indicates that the coefficient is significant at 1% and 5% level of significance.

Though the impact on health outcome arising out of government healthcare and social service expenditure has been significant throughout the period, the coefficient has been relatively small during the post-independence period than that of pre-independence period in case of life expectancy at birth, adult male and female mortality, and infant mortality rate (Table 3). During the post-independence period, only impacts on under-five and infant deaths were relatively more than that of pre-independence period. An increase in government spending on healthcare and social service by 1% led to decrease in infant mortality rate and under-five mortality rate by 0.127% and 0.147% respectively during the post-independence period. These elasticities were 0.17 and about 0.20 in the pre-independence period. Since the total healthcare expenditure was less in the pre-independence period, the impact of a rise in expenditure on raising life expectancy, lowering mortality were expected to be very high. With sudden rise in such expenditure in a bigger way particularly on healthcare infrastructure in the post-independence period was not supposed to yield very high impact immediately for the expected mismatch between expenditure growth, infrastructure growth and manpower growth in the concerned sector. Availability of such data would make it clearer.

The comparative result therefore shows that the impact on healthcare parameters was significantly higher in pre-independence period than that of the post-independence period the policy was discriminatory in terms of allocation of fund for social groups in the pre-independence period. May be the amount of expenditure expanded so significantly that it was not managed properly to yield the desired result. It is however observed that with a lag of one decade, after 2001 the new policy started yielding good results as shown in the later part (Table 5).

5.2 Government expenditure on education

Most of the education indicators had been significantly improved during the period between 1980 and 1990, except pre-primary gross enrolment rate, which had an

insignificant relation with government expenditure on education. During this period, adult literacy rate grew by 0.068% only, while youth literacy rate grew by 0.13%, elderly literacy grew by 0.138% for a 1% increase in Namibian dollar (in billion) spent on education by the government (Table 4).

Again, the elasticity of primary enrolment rate with respect to government education expenditure was -0.023. This was because the gross primary enrolment rate has always been above 100% throughout the study period. Elasticity of secondary and tertiary enrolments were 0.143 and 0.646 respectively, with respect to education expenditure of the government. The elasticity of net school enrolment rate in the primary school was 0.23 and that of secondary education was 0.34. Before the period of independence, number of children who were above the age of seven but still out of school, dropped by 0.163% for each percentage increase in Namibian dollar spent on education.

Table 4 Results of regression of log of education indicators on the log of government expenditure education during pre- and post-independence period

Indicators name	*Pre-independence*		*Post-independence*	
	Slope	*Adj. R sq.*	*Slope*	*Adj. R sq.*
LN_LR_Adult (15+)	0.068**	0.765	0.045**	0.537
LN_LR_Youth (15–24)	0.013**	0.921	0.041**	0.667
LN_LR_Elderly (65+)	0.138**	0.963	0.176**	0.858
LN_SE_Preprimary (gross)	–0.127	0.157	0.212*	0.157
LN_SE_Primary (gross)	0.023	0.015	–0.051**	0.674
LN_SE_Primary (net)	0.229**	0.888	0.022**	0.477
LN_SE_Secondary (gross)	0.143**	0.842	0.105**	0.713
LN_SE_Secondary (net)	0.337**	0.953	0.244**	0.787
LN_SE_Tertiary (gross)	0.646**	0.972	0.567**	0.895
LN_Out-of-school children of primary	–0.163**	0.892	–0.074*	0.099

Notes: ** and * indicates that the coefficient is significant at 1% and 5% level of significance.

Unlike the pre-independence era, in the post-independence era (1991 to 2015) most of the education indicators had moderate to strong but significant relationship with government spending on education (Table 4). However, just like that in the pre-independence era, impact on pre-primary gross enrolment rate was insignificant during post-independence period. During this period, elasticity of adult literacy rate was 0.045, while for youth and elderly literacy rates were 0.041 and 0.176 respectively. Impacts on both youth and adult literacy rates were lower as compared to the previous period.

On the gross school enrolment rate, for each 1% increase in government spending on education, the primary enrolment rate decreased by 0.051%, while secondary enrolment increased by 0.11% and tertiary enrolment rate went up by 0.567%. In terms of the net school enrolment rate, for the primary school, it increased by 0.022%, secondary education by 0.244% per extra 1% increase in spending by the government on education. The growth rates for enrolment ratios were also lower as compared to the previous period. There was no data for net enrolment rate at pre-primary and tertiary level of education in the post-independence period. After independence, the number of

out-of-school children aged seven years and above dropped significantly by 0.074% for each percent increase in expenditure on education.

Table 5 Slope coeff. and R square of regression of log of healthcare and education indicators on the log of respective expenditures during 2002–2015

Health (2002 to 2015)	*Slope coefficient*	*Adj. R sq.*
LN_Life expectancy	0.103**	0.958
LN_Infant mortality (per 100 live births)	–0.215**	0.987
LN_Mortality under-five (per 100 live births)	–0.294**	0.990
LN_Mortality adult, male (per 100)	–0.262**	0.962
LN_Mortality adult, female (per 100)	–0.323**	0.916
LN_Number of under-five deaths	–0.166**	0.896
LN_Number of infant deaths	–0.068**	0.710
Education (2002 to 2015)	*Slope coefficient*	*Adj. R sq.*
LN_LR_Adult (15+)	0.099**	0.887
LN_LR_Youth (15–24)	0.046**	0.838
LN_LR_Elderly (65 +)	0.251**	0.904
LN_SE_Pre-primary (gross)	–0.253	0.316
LN_SE_Primary (gross)	0.000	–0.091
LN_SE_Primary (net)	0.021	0.200
LN_SE_Secondary (gross)	0.033**	0.966
LN_SE_Secondary (net)	0.068**	0.903
LN_SE_Tertiary (gross)	0.739**	0.975
LN_Out-of-school children of primary	–0.147	0.109

Notes: ** and * indicates that the coefficient is significant at 1% and 5% level of significance.

The graphical presentations earlier showed some significant changes in most of the variables after 2001 with the new policy thrust on education and healthcare. Thus, here we looked into the growth rates of health and education indicators against government spending on education and healthcare for the period between 2002 and 2015. The results show that the Namibian economy performed much better in the last decade than the pre-independence period and the decade immediately after independence. All the elasticities were much higher as compared to that of the pre-independence period for education and health indicators as shown in Table 5. Only, coefficients in case of gross school enrolment ratio at primary level and out of school children of primary age were not significant.

During the last decade (between 2002 and 2015) most of the health-related output responded well to growing government expenditure on healthcare. An extra 1% spending on healthcare by government has improved the life expectancy by 0.103% as compared to 0.039% before the country obtained independence and 0.025% for the pooled post-independence period (Tables 3 and 5). Infant mortality rate dropped by 0.215% for every percent increase in healthcare expenditure by Namibian Government. This is quite an improvement as compared to 0.17% before independence and 0.126% during the pooled post-independence period. Under-five mortality rate and adult mortality rate (both male

and female) also have recorded a significant decrease during the last decade of the study period as compared to the previous decades (Table 5).

In terms of government expenditure on education, some outputs tend to be insignificant as it was mentioned earlier. However, some of the educational outputs showed better result in the last decade as compared to the previous two decades. The elasticity of adult literacy rate was 0.099 during 2002 to 2015 period. This was an improvement from 0.068 during pre-independence period and 0.045 during the pooled post-independence period. For elderly literacy rate, the elasticity was 0.25 during the last decade, which was also a huge improvement in comparison to the first two decades of the study (Tables 4 and 5).

6 Concluding remarks

In this paper, we examined whether the policy changes in education and healthcare after independence has made the life of Namibian people better than it was before independence. For the purpose of analysis, changes in healthcare and education expenditures along with the reduction in mortality, increase in life expectancy at birth, rising literacy and growth of people acquiring higher education/technical education were checked.

The results suggested some achievement in the front of health and education. Even if the government of the independent Namibia adopted new policy changes to improve the wellbeing of the Namibian people, there was a need for an improvement in the service delivery. Although, the Namibian people were slightly better off as compared to the pre-independence era, the development indicators in terms of education and healthcare reveal a mixed result. Education is found to be more benefited and healthcare indicators started showing significant improvement only after 2001 and with sudden increase in spending the impact shows some diminishing pattern. Despite rising per capita income and spending capability of the people, the unemployment and inequality still remained a matter of concern.

Furthermore, accelerating government spending on education has not improved management of data in the country. Despite the establishment of Namibia Statistics Agency and the introduction of access to information act in 2017, it is not easy to get access to some of the data. The country does not have a single public data collection entity to disseminate information to the public for research and policy purposes.

However, with the passage of time, the government gradually managed to improve its service delivery in the previous decade in comparison to the first one and half decade of independence, although, there were lot of scopes for improvement. Studies on efficiency and effectiveness of policy changes would be encouraged to address the shortcomings and achieving accelerated growth.

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Notes

1 SACU stands for 'Southern African Custom Union' who collects the import and export revenue (duties) and distributes the same to its member countries on quarterly basis.