THE CONSTRUCTION INDUSTRY IN BOTSWANA: A SOCIO-ECONOMIC DEVELPOMENT PERSPECTIVE

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By the turn of the century, Botswana will be 34 years old as an independent nation. Reflecting on the past, is a background of tremendous achievements from a socio-economic development perspective. The achievements could not have been possible if it was not for the contribution from the various sectors of the economy, such as, mining, agriculture, manufacturing and of course, construction. The construction industry's (CI) contribution to socio-economic development may be viewed from many areas, among them, creating employment, wealth and demand for manufactured goods, infrastructure and producing factors of production (e.g. office space, factory shells, roads, etc) for other sectors. However, the relationship between the general economy and the CI has not been established explicitly despite numerous studies. Using Botswana's CI and the economy, some of the paradigms proposed in previous studies revisited

1   INTRODUCTION

A lot of studies have been carried out to investigate the relationship between the construction industry (CI) and the socio-economic development. Such studies include those of Turin [1], Wells [2], Ofori [3], Ruddock and Lopes [4] and Lopes [5], who have linked the role played by the CI in achieving sustained economic growth and development. This contribution is evidenced through the interdependence that exists between the economy and the CI sector, with the latter providing the infrastructure support and in some cases, factors of production for the other sectors of the former. The relationship is explored further in this paper in the context of Botswana's economy and the construction sector. Firstly, a brief look at the basis on which the CI's performance is analysed followed by a short background of the economy and the CI of Botswana. Secondly, using a number of performance areas, such as, employment, wealth creation or fixed capital formation, Gross Domestic Product (GDP) contribution, housing and income generation, the performance of the CI is reviewed. Lastly, given the past performance and the prevailing circumstances, a brief discussion of the future of the CI will ensue.

2   MEASUREMENTS USED IN THE STUDY

In order to study the performance of the CI, a suitable yardstick has to be used and statistical figures are chosen as the most suitable for the purpose. This is because the CI produces a variety of products, for example airports, roads, bridges, power stations and factory shells, to mention a few. It would be difficult to measure its performance by the number of such structures built because even the same things like airports are also different [6]. Furthermore, the use of various units for example, units, rooms and sq. m^2 built or road-kilometres or bridge-span-metres constructed, would still be futile. Therefore, the use of statistical figures in monetary terms is deemed appropriate. This is because monetary units bring a variety of measurements on level terms. This is not to say that monetary statistical figures are not flawed with problems. For example, the fact that construction costs may change due to location due to climate, soil conditions and topology may not be picked up by statistics. Secondly, statistics do not provide information on the quantity, quality and capacity of construction products and services [6]. Thirdly, monetary figures are distorted by inflation. However, to reduce the effect of inflation, the statistics used in this study are at constant prices of 1985/86 prices (unless stated) where the US$1=P2.35 [7]. Also, most of the statistical data used for the analysis is for the period 1980-97. The period is chosen because of the completeness of data, although in some instances the data for the period has been difficult to obtain.

Another aspect is that, statistics are complied according to economic sectors, one of them being the construction sector. Is the construction sector the same as the CI as understood from an engineering point of view? The Central Statistics Organisation (CSO) classifies its compilation as the 'construction of houses, buildings, roads, dams and pipelines, electrical construction and other construction and building work' [8]. However, Smith [6] defined construction as 'the sector of the economy that plans, designs, constructs, alters, refurbishes, maintains, repair and eventually demolishes buildings of all kinds. It includes civil

building works and other similar structures and their related electrical and mechanical services'. Although one definition of CI is considered, for the purpose of this paper, the definition of CSO is in line with the engineering understanding of the CI and therefore, the statistics reflect the output of the CI.

3   A BACKGROUND TO THE ECONOMY AND THE CI

Botswana is a landlocked country with an estimated 1.57 million inhabitants, living in an area of 581 730 square kilometres [9]. Botswana was listed among the 25 poorest and least developed nations in the world at its independence in 1966. However, the situation has changed over time as the UNDP report of 1995 ranked Botswana 74 out of 174 countries on the Human Development Index (HDI), making it a lower middle income nation [10].   Perhaps, Magang [11] best described the profile of Botswana's economy when he said :

> 'Botswana's economy was always based on cattle until the gift of diamonds was discovered within a decade of independence. While there has been other successful diversifications, cattle and diamonds remains the bulwark of the economy'.

The statement is reaffirmed by the statistics given in Table 1, derived from data in the Appendix. After independence, the mining sector's GDP ratio was about 1%, it then rose suddenly to levels of 45% during the subsequent decades. Indeed, the gift of diamond has been behind the driving force in transforming what was once a rural nation into a modern state. However, readings from the Bible (Luke 19:11-23) caution us that gifts are never an end themselves but a means of achieving sustained success. Hence, it was Botswana's careful planning, articulate policies and a prudent financial management regime that could have made her realise sustained development using diamond revenues. In the 1980's, Botswana's economy grew at an unprecedented average annual real rate of 9.8% [12]. The rate was however, to drop to an average of about 5.0% in the 1990's but in both decades, Botswana's economy performed better than its counterparts in sub-Saharan Africa.

While appraising the economy as a whole, we should not lose sight of its constituent parts, the economic sectors, and in particular the construction sector. The sector provided the essential infrastructure and factors

of production on which the buoyant economy functioned. As the economy developed so did the construction sector and perhaps visitors who came into the country in late 1970's and returned in the late 1990's would testify! They would be greeted by a changed skyline of Gaborone City with its increased high rise buildings, modern housing estates, industrial and commercial complexes. Elsewhere in the country, they would find increased health and educational facilities and kilometres of tarred roads. The changes would bear testimony to the CI's activity and contribution to development.

Table 1 - Average annual contribution (%) to GDP of selected sectors of the economy

	66-69	70-79	80-89	90-98
Agriculture	42.2	20.5	7.1	5.5
Mining	0.7	18.6	43.5	38.8
Manufacturing	7.2	8.6	6.0	5.4
Construction	4.7	10.3	5.1	5.6
Rest	45.3	42.0	38.8	51.2
Total	100.0	100.0	100.0	100.0

Source: CSO, 1976, 1987 and 1999.

3.1   Significant Events

While an uphill story may be told about the CI, there are two important milestones, which affected the sector that are worth mentioning to complete the picture. In the period from 1981 to 1987, Botswana experienced very severe drought [13]. It affected not only the agricultural sector, whose GDP ratio plummeted from 20.5% to an average of 7.1%, but all other sectors of the economy. In particular, the CI was slapped with a general ban on all forms of construction activity because of its need for water in the production process. As a consequence, the CI's average GDP ratio fell from 10.3% in the previous decade to 5.1% in the 1980's as illustrated in Figure1.

In 1992, another hitch hit the CI, when allegation of corruption and fraudulent dealings were levelled against Botswana Housing Corporation (BHC) after the death of its General Manager. Following these allegations, many construction projects were disrupted or cancelled [14,15] The housing sector, particularly the output of BHC, forms a very large percentage of the total output of the CI and therefore any disruption in the sub-sector sends shock waves in the industry. Following the scandal, coupled with a world recession (which saw drop in diamond revenue), construction output fell from P296.1 million in 1991 to P251.7 million in 1993 as the government suspended taking

on new projects [9,16]. Construction GDP ratio also fell from previous level of 6.5% in 1991 to 5.1% in 1992 and has remained in the band of 5.4% -5.1% since then.
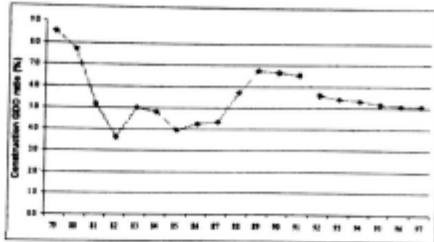

Figure 1 Construction Sector's GDP ratio

It is therefore, against this background that the CI and its role in the socio-economic development may be examined further.

4   CI's SOCIO-ECONOMIC PERFORMANCE

The following headings are used to examine the socio-economic performance of the CI: GDP contribution, employment, wealth creation or fixed capital formation, housing and income generation.

4.1   GDP Contribution

GDP is one of the main yardsticks used to measure economic development. Therefore, CI's GDP ratio is a good measure of the sector's contribution to the economic development and also its output performance. The CI share of GDP consists mainly of the value added and therefore a rise in absolute value of GDP could mean more procurement of projects since inflation is minimised by using constant prices. CI output increased, in absolute terms, from P116.4 to P300.1 million in 1980 and 1997, respectively. However, the GDP ratio fluctuated from a high of 7.7% in 1980 to a low of 3.6% in 1981 (due to drought). However, the GDP ratio has settled in the band of 5.4-5.1% in 1990's. The reason for the drop in the GDP ratio could be as a result of a relative decreased construction activity in the 1990's as compared to the 1980's. Alternatively, it could be that other sectors have increased their share of GDP. The latter could be more true as Table 1 shows that the 'rest' of the sectors increased their share from an average of 38.8% in 1980's to 51.2% in 1990's.

CI's Capacity and Output

From the studies of Turin [1] and Wells [2] and others, two propositions emerged relating to CI's capacity and output. Firstly, that for sustained growth and development, the rate of growth of CI must be higher than the GDP growth rate. The rate of growth reflects the capacity of the construction sector to sustain the needs of the economy per year, [1]. The proposition can be brought into context of Botswana's CI whose indicators are illustrated in Figure 2. It is clear that the proposal was not true all the time, as the CI's growth rate has been sometimes less than the growth rate of GDP as was in 1981, 1982 and 1992.
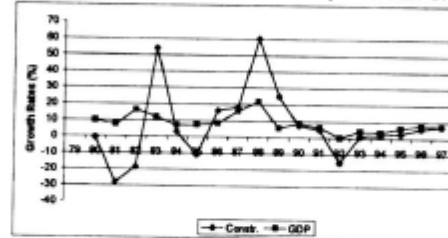

Figure 2 Growth rate of GDP and the CI

Khairuddin et al [17] contend that if the construction capacity fails to grow faster than the economy then the inadequate capacity becomes a constraint to achieving sustained socio-economic development. According to Ssegawa [18] the paradigm fits in well with an observation in Gaborone City. For over a long time, lack of proper office space has turned a large number of residential houses into offices and lodges. In addition, there are quite a number of people who commute to work from neighbouring villages situated 10-40 km from the City. This implies that the supply side of CI does not meet the demand and this is clearly evidenced in the rising rentals of office space and residential houses. The reasons behind Botswana's inadequate capacity may be numerous and may arise from both the supply and demand side. One reason on the supply side could be the ineffective structural organisation of the CI coupled with constraints such as unavailability, insufficient or inappropriate use of resources. On the demand side, it may be the cautious or erratic attitude of the investors and entrepreneurs that may influence the way capacity is developed.

However, the other side of the coin is to examine Turin's proposition and the context in which he developed it. Turin [1] carried out his studies quite a while ago, in 1973, on construction industries of developed nations. Here we are looking at Botswana's

case, a developing country, whose CI has not reached steady state. First of all, the government is the biggest client and when it decides to procure projects, the CI booms and increases capacity, perhaps abnormally. However, when the government reduces its demand the CI is left with a large amount of excess capacity. Looking at Figure 2, one notices these abnormal cycles illustrated by high growth rates in 1982, 1988 and 1992 and then followed by sudden slumps. However, the last four years (1993-97) show a cautious industry, which watches the growth of economy and aligns its capacity - exhibited by its growth trailing the economic growth.

The second proposition is that there are minimum values of CI's output as measured by its GDP ratio. Wells [2] gave the minimum values as 3.6% for less developed, 5.2-5.4% for middle developed and 7.3% for developed countries. As per the 1995 UNDP report, Botswana is a lower middle-income nation. In terms of Well's category, Botswana falls into a less developed country whose minimum size of GDP ratio should not be below 3.6% to achieve sustained development. Therefore, the second proposition seems to be in line with Botswana's indicator as Botswana's CI GDP ratio has been equal or above the threshold of 3.6% for the same period (see Figure 1). This falls within expectation, that is, for a fast growing economy, which Botswana has been in the last fifteen years, one would expect adequate output. Furthermore, Botswana is one of those countries suffering from the 'Dutch Disease', - nations where money from mineral revenue is channelled into vigorous and conspicuous infrastructure building to the extent of over heating the economy [19,20].

4.2 Employment

The CI has a special place as regards employment because while all sectors of the economy provide employment, the CI has an added benefit, in that it offers the first employment opportunity for the unskilled and the semi-skilled people. It further provides a training opportunity for these cadres creating another opportunity for absorbing them into formal labour market after training [14]. The CI has employed on average about 12% of Botswana's workforce between 1985-97. Looking at the actual employment figures, there has been a slight decline in the employment capacity of the sector over the 1990's despite the total employment remaining almost constant. For example, in 1991 the sector employed

29 300 people while in 1998 the figure declined to 22 500 representing 14.8% and 9.4% of the total employment, respectively (see Figure 3 and 4).
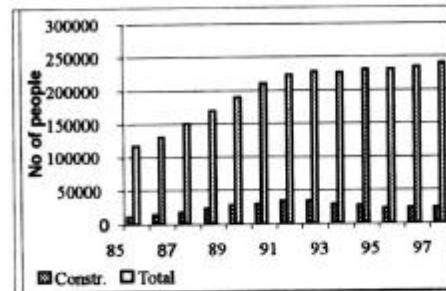

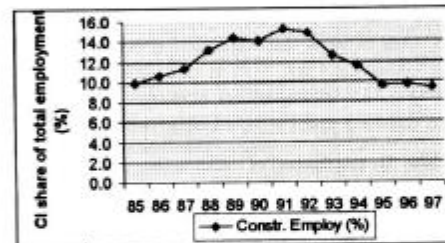**Figure   3   Total   employment   and   CI's   share   of   employment**

Figure 4 CI's percentage share of employment

It is worth mentioning that the labour force in the CI has increased its productivity over time if we use output per employee as a measurement. This indicator shows how much each construction worker contributes to CI's GDP and hence the economy. The indicator has increased from P835 to P1333 per worker in 1985 and 1997, respectively (see Figure 5). It is not clear the reason for the increased productivity while the number of people employed in the CI has declined. It may be because of increased mechanisation (employing more plant and equipment) or the labour force and the industry are at high level on the learning and experience curve respectively. Alternatively, it may be because of the increased real wage rate that could have worked as an incentive. The hourly wage rate has increased four times, in real terms, from P0.44 to P1.59 per hour in 1985 and 1997 respectively. The rate has been the highest for all the sectors in the period.
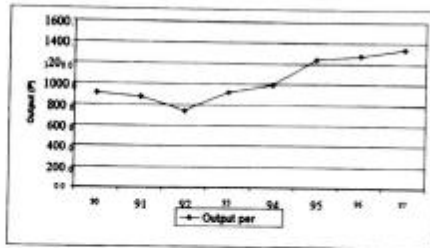
Figure 5 CI's output per employee

Available data shows that there has been an increase in the number of construction companies in Botswana, from 403 in 1990 to 787 in 1997. However, the number of registrations declined from 60 to 46 per year, respectively, corresponding with CI's decreased activity over the same period. Most of the construction companies are small companies (about 60.7%), employing between 1-30 employees (see Table 2). In addition, over 60% of the construction companies are based in Gaborone City. This is not surprising given the fact that, for example, on average, 50% of the approved building plans are for Gaborone City.

Table 2 Size (by employees) of construction companies

Size of firms (no. of employees)	1	1-4	5-29	30-49	50-99	100+	Unknown	Total
No. of firms	19	103	356	74	26	50	159	787
(%)	2.4	13.1	45.2	9.4	3.3	6.4	20.2	100
Cumulative	2.4	15.5	60.7	70.1	73.4	79.8	100	

4.3 Fixed Capital Formation

Some of the parameters used to measure economic development, in practical terms, are the quantity, quality and capacity of fixed capital goods. Fixed capital goods include construction products (buildings, roads, aerodromes, factory shells, etc), machinery and equipment. They are important because, firstly, they form a major part of the production process as factors of production of a modern state. Secondly, for the government, firms and individuals capital goods form assets of long term nature (investment).

In absolute terms and in current prices, the CI's portion of the gross fixed capital formation (GFCF) rose from P1104.2 million to P3293.7 million in 1988 and 1996 respectively (see Figure 6). The figures

represent 65% and 79% of the total GFCF respectively. On average, CI's GFCF has formed an average of 20.4% of GDP in the same period. This implies that for every P100 produced in the economy, P20 goes to construction related investment. As already noted, there has been a large amount of capital injections introduced in the economy by the government and both the public and private firms in the last two decades evidenced by the changes in infrastructure developments. For example, the government has spent on average between 10-14% of the GDP on development projects.
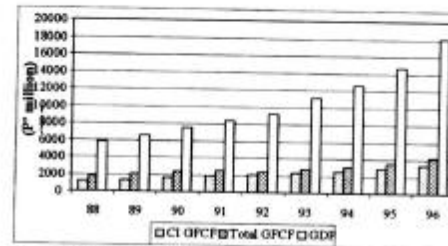

Figure 6 CI's GFCF as a proportion of Total GFCF and GDP

4.4 Housing

The CI satisfies one of the basic human need of housing and in Botswana, the growth of formal housing has been significant. There is no accurate data as to the total number of houses built in the period. However, the number of plans approved provide a clue in this regard though not all plans translate into actual houses. Figure 7 shows that number of plans approved in Gaborone increased from 580 in 1990 to 1315 in 1991 and then dropped in 1994 to 520. The reason was that in 1990 investors in residential property cashed on the boom and the high rentals to make orders, hence the hike in 1991. However, the recession in 1992 coupled with a saturated market led to the slowing down of orders in 1994.
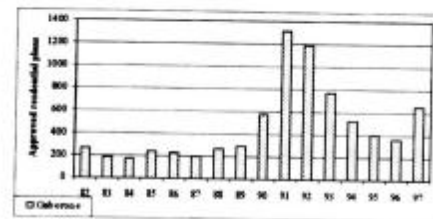

Figure 7 Approved residential plans

Some estimates put the number of modern units constructed to date at 34, 255 units with 12 640 having been built in the urban centres [14]. Of the number built in the urban centres, Botswana Housing Corporation (BHC) built a total of 8367 units representing 60% of the total [21]. This makes BHC the leading player in house construction. However, there are other developers such as Time Projects, BDC, insurance companies, banks and individuals. Furthermore, looking at the number of houses built during this period, a number of points may be noted. The number built per year by BHC declined from 1691 to 783 units in 1991 and 1997, respectively. This was due to a number of factors such as the already mentioned BHC corruption allegations, which led to the cancellation of a number of housing projects. The other factor was that land became more expensive, the cost increasing from 3% to 20% of the value of the house in 1991 and 1997, respectively. Furthermore, the interest rates for loans increased in the same period, increasing the cost of production. The last two aspects affected every other developer which, suggests that the rate of residential building construction could have slowed down in the country, an aspect supported by the observed increase in rentals in the 1990's.

4.5   Income Generation

Income generation by the construction sector arises from profits made from projects, which accrue, to the owners of capital. In addition, interest on loans taken for execution of projects, mortgages for building of houses, income earned from hiring and leasing of construction plant and equipment, provide another way of income generation associated with the CI. Economists view another indirect but significant way of income generation by using the concept of the multiplier effect. They contend that, construction projects act like 'economic seeds', which increase (multiply) economic activity as a result of their implementation. The result is to increase aggregate demand for services and products in the sectors of the economy that may be directly or indirectly related to the project. The overall effect is not only to increase income levels but also to spread it to a wider population [22].

The 1998/99 Budget provided a clue to the value of projects carried out by the Government during the National Development Plan (NDP) 7 and 8 as illustrated in Table 3 [23]. P5.803 billion was spent on various projects between 1991-97 (while almost twice

the amount will be spent in NDP 8). However, no studies have been carried out specifically to evaluate the multiplier effect of projects on the incomes in the economy as a result of their implementation. In addition, no data is available to show the profitability of projects, as contractors are never willing to divulge such information [15]. As a result income accruing to entrepreneurs from the projects is not known.

Table 3 Value of NDP 7 and NDP 8 Projects

	NDP 7 (1991-97)	NDP 8 (1997-03)
Budget (P' million)	6 827	11 783
Implemented (P' million)	5 803	176
Implementation capacity	0.85	

Loans for construction averaged 6% of the total loans provided to the economy by commercial banks between 1990-97 as illustrated in Figure 8. However, the percentage declined from a high of 7.2% in 1994 to 3.6% in 1997! The reasons for the decline may be that the CI's activities contracted or the banks could have found more lucrative or less risky sectors than the CI or both. In the period 1990-98, both the loans and mortgages totalled over P2 099 million [24,25]. The loans and mortgages could have provided an income of about P293 million in form of interest to the financial institutions- if an average interest rate of 14% is used for both loans and mortgages.
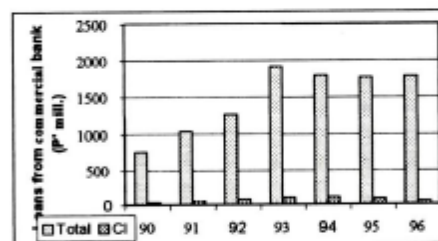
Figure 8 Loans extended to the CI from Banks

4.6   Import Substitution

The backward linkage of the CI has played an important role in supporting the local manufacturing sector of construction materials. Many aggregate and sand quarries have sprung up in the country, while the last ten years have seen the commissioning of a cement and a brick factory, to name a few developments. The developments have lessened the need to import building materials. Despite the local industries, Botswana still imports a number of construction materials from South Africa and

Zimbabwe. Strengthening the local industries could help in substituting for imports and saving foreign exchange. For example, the BOCCIM study calculated the value of imported construction materials to be P336 million for projects worth P1000 million. If we assume that 50% of the project cost goes to materials then the figure represents over 67% by value of materials (BOCCIM, 1992 and Yahya, 1992).

5   THE FUTURE OF CI

A decline has been registered in most of the areas (housing, income generation employment, GCFC and contribution to GDP) used to analyse the performance of the CI. While the past may not necessarily be related to the future, it is worthwhile projecting and if possible influence the future. The future of the CI depends on two broad factors, the internal and external factors. The former refers to the structural organisation of the industry which is not considered here, while the latter refers to CI's environment - legal, political, social, cultural and economic, to mention a few. The economic environment has been the subject of discussion and is explored further.

The 1998 and 1999 Budget Speeches [23,26] provided an insight about the past and the future and provided clues to the economy and hence the CI. The blink picture, particularly in 1992, was blamed on global recession. In addition, the recent Asian crisis was blamed for poor performance of both the world and developing economies in 1997-98 - the world's growth rate declined from 4.1% to 2.0% while for developing economies, the decline was 5.8% to 2.3%, respectively. The advent of globalisation implies that any economy, such as Botswana's economy, is vulnerable to global economic turbulence. As already noted an average of 34% of the GDP comes from exports. It is through these revenues that, the country has been able to achieve appreciable growth. However, fluctuations from the sales of minerals (diamonds) render the economy very fragile [26] and grossly affects construction activity. Therefore, from an economic point of view, the future of Botswana's CI depends on a prosperous world economic order which will encourage a high consumption of diamonds. This will in turn lead to a buoyant Botswana economy which in turn demand construction services.

5.1   Forecasts

Despite all the uncertainties, the government has set a number of targets and planned for a number of development projects. If there are no substantial changes, the construction industry is bound to benefit from the plans, for example, as already noted, the value of development projects in NDP 8 is twice as much as it was in NDP 7 (see Table 3). It is anticipated that the economy will grow at an average rate of 5.2% while per capita will grow at 4.8% in NDP 8 (see Table 4). Despite the implicit relationship between CI and the economy already explored, one can get a clue of the likely performance of the CI.

Table 4 Vision 2016 and NDP targets

	Vision 2016[1]	NDP 8 (1997-2003)
GDP Per Capita (US $)	8 500	
GDP growth rate (%)	8	5.2
Per Capital growth rate (%)	6	4.8
Investment level (% of GDP)	41	
Unemployment level	0%	

Sources: [1]PTG (1996)

A further source of forecast is the Macro Economic Model of Botswana (MEMBOT) managed by the macro unit [15]. The model was developed in the 1970's and for period between 1991-97 the CI's average annual growth rate was forecast to be -7.9 but it turned out to be 5.3%. The model is only predictive if its assumptions remain unchanged but there is no way it can predict acts of God like drought (1981-87) or disruptions in the industry like the BHC problems (1992) or global recessions (1992 and 1997/8).

Another document which sheds light on the future is the Botswana's Vision 2016 (PTG, 1996), which forecasts the desired position of Botswana on various aspects and targets of nation building - cultural, legal, political, technological and economic, to mention a few. Some of the targets are shown in Table 4 and include an 8% and 6% growth rate for economy and per capita, respectively. It is also anticipated that the per capita income will be US$8 5000 and a zero unemployment rate. It difficult to gauge the effect of the plans in the document on the economy and hence the CI, especially when there is no identifiable relationship on how the subsequent NDP's will lead to achieving the Vision 2016. What is clear is that if the targets are to be realised, the construction sector will have to play a significant role during their pursuit.

6   CONCLUSION

This study has shown that the Botswana's CI has been experiencing a decline in the various areas used for the analysis of performance. The analysis was based on the fact that there is a casual relationship between construction and development. However, because of the instability of this relationship due to other factors, some of which have been identified, the study could not give an accurate picture of the future of the industry. However, what is clear is that if the economy performs well, the industry will perform well. The performance of the economy was very much related to diamond sales and diamond sales are related to the state of the global economy

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APPENDIX

Table 1A - GDP and Per capita

	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
Total GDP (P' Million)	1379.8	1511.1	1623.8	1884.1	2101.2	2251.9	2420.6	2626.1	3058.7	3702.5	3911.3	4252.4	4521.9	4516	4700.5	4847.5	5144.8	5544.3	5928.9
Constr. (P' Million)	117.4	116.4	83.7	68.3	105.1	108.1	96.0	111.4	131.6	210.9	263.9	283.2	296.1	251.7	254.2	258.3	265.3	280.2	300.1
per capita	1578.8	1651.5	1702.0	1905.0	204.0	2118.0	2195.0	2306.0	2564.0	3011.0	3070.0	3222.0	3343.0	3259.0	3310.0	3331.0	3475.0	3623.0	3787.2

Table 2A - Employment

	85	86	87	88	89	90	91	92	93	94	95	96	97
Total employed persons	116800	130000	150200	169500	189500	209000	222800	227500	226200	231200	231400	234100	239500
Construction sector	11500	13700	16900	22200	27200	29300	33800	33800	28300	26700	22100	22600	22500

Table 3A - Capital Formation current prices

	88	89	90	91	92	93	94	95	96
Value added	319	427.7	551.6	645.4	609.5	694.5	757.1	858.4	988.1
Gross output of CI	1104.2	1309.2	1565.6	1880.3	2038.2	2314.9	2523.7	2861.3	3293.7
Total GFCF	1692.9	2080.9	2365.3	2473.4	2388.3	2731	3053.4	3522.8	4148.7
GDP (P million)	5837	6537	7475	8372	9126	11115	12530	14631	18015