



Biblical Mathematics and Its Influence on Capacity Building in Africa

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Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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ABSTRACT

Africa is a resource-rich continent but many of the Africa-based scholars and the continent are confronted with many challenges, such as insufficiency of means and inadequate research collaboration. These scholars are making efforts to overcome these challenges to present Africa as part of the global solution rather than consumers of knowledge. This paper adopted a mathematical approach of 5 chasing 100 and a 100, chasing 10000 (Group 1); or 1 chasing 1000 and 2, chasing 10000 (Group 2) to aid collaborations among Africa-based scholars and institutions, as an effective means of overcoming the challenges confronting the continent. Basic mathematical approach, using the principles of directly proportional variation was used to unfold the nitty-gritty of this seemingly contradictory Biblical mathematics. The results revealed that the multiplier factor between the two groups was the same. Group performance enhanced individual's performance, but several input levels were required for Group 1 to generate equal performance level as in Group 2. Understanding this Biblical mathematics reveals that its use spans beyond religious discourse.

Keywords: Africa; Biblical contradiction; Biblical mathematics; capacity building.

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1. INTRODUCTION

Africa is faced with many challenges and Africa-based scholars, record managers and archivists were once described as consumers of research rather than the producers of new knowledge. This perception about Africa-based scholars is changing, although a lot still needs to be done in Africa. Some of the factors relegating Africa-based scholars, record managers and archivists to consumers of knowledge rather than producers have been noted to include lack of skills in scientific writing, insufficiency of financial and material means required for research and publishing, lack of institutional requirement, as well as the attitude of some international journals to Africa-based authors [1-2]. Attempt to provide a lasting solution to this challenge has necessitated the suggestion for developing a robust mutually beneficial collaborative research between academy and practice [2].

Collaboration among countries, institutions or individuals has witnessed an increase as years roll by, extending to different research areas, locations and nations [3-4], based on the belief that research collaboration across disciplines is good and should be encouraged. However, a proper understanding of the Biblical mathematics of one chasing a thousand or five chasing a hundred could greatly enhance the performance level of the scholarly collaboration.

Attempts have been made to explain some Biblical context using mathematical approach. Matiki [5] noted that the fatherhood of God to Christians is transitive. His conviction was based on the assertion that a transitive relationship exists if A, B and C are three entities, with the unique characteristics that what A is or does to B is exactly what B is or does to C. The author stated that God being his Father and also being a father to his own son, but not a grandfather to his son is an example of transitive relationship. It is also inferred from Genesis chapter 12 verse 3, that the blessing in the statement, '... I will bless you...I will bless those who bless you' is therefore transitive.

Africa is identified with climatic, ecological and cultural diversity. The description is particularly suitable for sub-Saharan Africa [6]. It is estimated that the population of the region by 2050, would be about 2 billion people [7]. The Gross Domestic Product growth was reported to increase with about 8.1% from 2012 to 2013 [8].

Poverty rate in Africa is becoming lower, although the rate observable in some parts of the continent is still very high, as many people in the region still live below the poverty line, compared with other parts of the globe [9]. Twenty-five percent of the people on the continent has been estimated to be malnourished, which consequently results in a quarter of world's malnourished people [10].

Many of the children under 5 years of age are stunted, owing to chronic hunger. The rate is gradually reducing but the continent still ranks among the top with under-5 years stunting children [11]. Agriculture is the main occupation of the people of Africa, with the sector employing about 65 percent of the continent's labour force, resulting in the increased output of the sector, owing to the increase in the agricultural land since 2000 [8]. However, the potential of the agricultural yield does not match with actual yield obtained, the potential yield is usually higher than the value achieved. The variation or reduction in actual yield has been attributed to inadequate water supply and nutrients to the crops. It is a documented fact that in this part of the world, the agricultural production is mainly rain-fed, which makes it be more affected by the influence of a change in climate [12]. Barrios et al. [13] observed that the agricultural activities in the continent, except for swine is usually cited in semiarid areas. The roles that agricultural sector plays in Africa cannot be over-emphasized. It has been documented that pastoral agriculture may represent a source of income for up to 4 out of 10 people in African countries. It also represents an essential source of well-being and status of many Africans [14]. However, it has been noted that one important risk to economic growth in Africa is the higher food prices, resulting in depreciation, conflict and emerging security threats [8].

Collaboration is called for not only among African scholars, record managers and archivists but in all of the human endeavours, but do we necessarily achieve more with more team members? This Biblical mathematics aimed to shed more light on how to achieve more with more people. This paper also used mathematical approach to clarify the seemingly contradiction between one chasing a thousand and two chasing ten thousand and five chasing a hundred and a hundred chasing ten thousand.

2. METHODOLOGY

2.1 Biblical Mathematics

2.1.1 Case one: Five chasing a hundred and a hundred chasing ten thousand

It is recorded in Leviticus chapter 26 verse 8 that five will chase a hundred while a hundred will chase ten thousand. Solving this mathematics requires that one should know the multiplier factor adopted. In this paper, 'to chase' or 'put to flight' is interpreted as performance level, while the first 'five' and the second 'hundred' were taken as input levels. Hence, the statement was re-written as 5I will produce at 100P, while 100I will produce at 10000I, where I = input level and P = performance level. Here, the higher the input, the higher the performance level. Hence, it is logical to assert that 'I' is directly proportional to 'P'. The statement can then be expressed as:

$$5I \propto 100P \text{ (for category 1)}$$

While $100I \propto 10000P$ (for category 2).

In order to introduce an equality sign as taught in basic mathematics, a constant was introduced. The constant introduced was a special constant, in that, the constant introduced differed slightly according to category. The constant was x^{n-1} , where n represents the category. For category 1, n = 1, and 2 for category 2 etc.

2.1.1.1 Category one

The derived equation for category one is $5I \propto 100P$

Introducing the constant x^{n-1} , x invariably represented the multiplier factor, the equation became:

$$5Ix^{n-1} = 100P, \text{ here } n=1, \text{ so, } x^{n-1} = x^{1-1} = x^0$$

$$5Ix^{n-1} = 100P$$

$$5Ix^0 = 100P, \text{ remember } x^0 = 1$$

$$5I = 100P$$

Dividing both sides by 5

$$I = 20P$$

2.1.1.2 Category two

The equation for category 2 is stated as $100I \propto 10000P$

Here, the constant $x^{n-1} = x^{2-1} = x$

Hence, $100I \propto 10000P \Rightarrow 100Ix = 10000P$

Remember $I = 20P$ (From 2.1.1.1)

$$100(20P)x = 10000P$$

$$2000Px = 10000P$$

Dividing both sides by 2000P

$$x = 5$$

Therefore, the multiplier factor is 5.

2.1.2 Case two: One chasing a thousand and two chasing ten thousand

It is stated in Deuteronomy chapter 32 verse 30 that one will chase a thousand and that two will chase ten thousand, while in Joshua 23 verse 10 and Isaiah 30 verse 17, it is stated that one will chase a thousand. In order to reconcile the number that one can chase when compared with Leviticus 26 verse 8, it became necessary to determine the multiplier factor for this group of one chasing a thousand too, using the same approach. The statement can, therefore, be expressed as:

$$1I \propto 1000P \text{ (for category one)}$$

$$2I \propto 10000P \text{ (for category 2)}$$

2.1.2.1 Category one

$$1I \propto 1000P, \text{ here the constant is } x^0 = 1, \text{ since } n = 1$$

Hence, we have $1I = 1000P$

So, $I = 1000P$

2.1.2.2 Category two

In this category, the constant, $x^{n-1} = x$, since $n = 2$

Then, the equation became:

$$2Ix = 10000P$$

Remember, $I = 1000P$

$$2(1000P)x = 10000P$$

$$2000Px = 10000P$$

Dividing both sides by 2000P

$$x = 5$$

Therefore, the multiplier factor in Group 2 is also 5.

2.1.3 The efficacy of the third category

2.1.3.1 Case one: Group 1

For Group 1 (that is, the 5 chasing 100 and the 100 chasing 10000 group), the next category, category 3 is probably 10000I. This is suggested based on the performance (output) level. The

output of category 1 (100P) was the input of category 2, hence the output of category 2 (10000P) is chosen as the input of category 3. Hence, the output of third category for Group 1 is calculated thus:

$$10000Ix^{n-1} = ?$$

$$10000Ix^{3-1} = ?$$

$$10000Ix^2 = ?$$

Remember, $x = 5$ and $I = 20P$ (for Group 1)
 Putting the values of x and I into the equation
 $10000(20P)5^2 = 10000(20P)25$
 $= 5,000,000P$

2.1.3.2 Case 2: Group 2

For Group 2 (that is, the one chasing one thousand and two chasing ten thousand), the next category, category 3 is probably 3I. This is suggested based on the sequential order in which the input level was chosen, 1 and 2. It is just logical to think that the next input level for the next category would be 3. Hence, the output of third category for Group 1 is calculated thus:

$$3Ix^{n-1} = ?$$

$$3Ix^{3-1} = ?$$

$$3Ix^2 = ?$$

Remember, $x = 5$ and $I = 1000P$ (for Group 2)

Putting the values of x and I into the equation
 $3(1000P)5^2$
 $= 75,000P$

3. RESULTS AND DISCUSSION

The multiplier factor for the two groups (Groups 1 and 2) was 5. Since, the multiplier factor was the same, the statements may not be said to be contradictory. That five-input level will chase a hundred and that one will chase one thousand in Group 2 is a function of the group constituents. It is obvious that different persons have different capacity. In a parable told in Matthew chapter 25

verses 15 and 16, the first and second servants made a 100% profit, while the first servant in a similar story recorded in Luke chapter 9 verses 13 and 16 made ten times profit, which is equivalent to 1000%. Man can perform at different levels but we can perform better than 100%. Samson performed at 1000 level by killing 1000 men with a jaw bone at a time, as recorded in Judges chapter 15 verse 15.

The average individual's performance increased in the two groups when efforts were combined in the team as reflected in Fig. 1. The comparative results of input and average individual's and group performance output for Groups 1 and 2 are presented in Table 1. For Group 1, the individual's performance level at category 1 is 20, 100 at category 2 and 500 at category 3. However, for Group 2, the average individual's performance at categories 1, 2 and 3 was 1000, 5000 and 25000 respectively. It can be inferred that several input levels are required for Group 1 to generate equal performance level as in Group 2. It may be correct to state that the higher the input level, the higher will be the performance level, but there are more to the statement than that. In research collaboration, as well as in other collaboration being advocated for, it is not enough to just collaborate, the team members should be carefully selected. Team members from Group 2 will generate more result at the same rate than members from Group 1. However, for the two groups, the higher the number at input level, the higher the performance level, which is an indication that two are indeed better than one from the same group (Fig. 2). Although, the multiplier factor for the two group is the same, it may be advisable to select team members from Group 2 of 1 person chasing a thousand and 2 persons chasing ten thousand (where available), than to select from Group 1 of 5 persons chasing a hundred, and a hundred chasing ten thousand, or motivate members of Group 1 to perform at higher rate.

Table 1. Comparative results of input and individual's and group performance output for Groups 1 and 2

Group	Category	Input level	Group performance level	Average individual's performance level
Group 1	1	5	100	20
	2	100	10000	100
	3	10000	5000000	500
Group 2	1	1	1000	1000
	2	2	10000	5000
	3	3	75000	25000

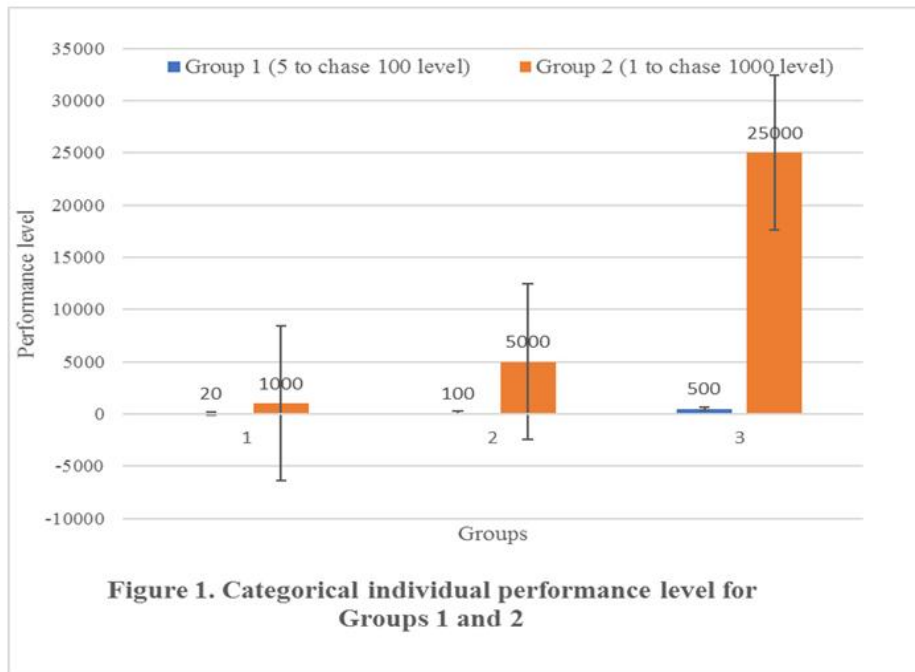


Figure 1. Categorical individual performance level for Groups 1 and 2

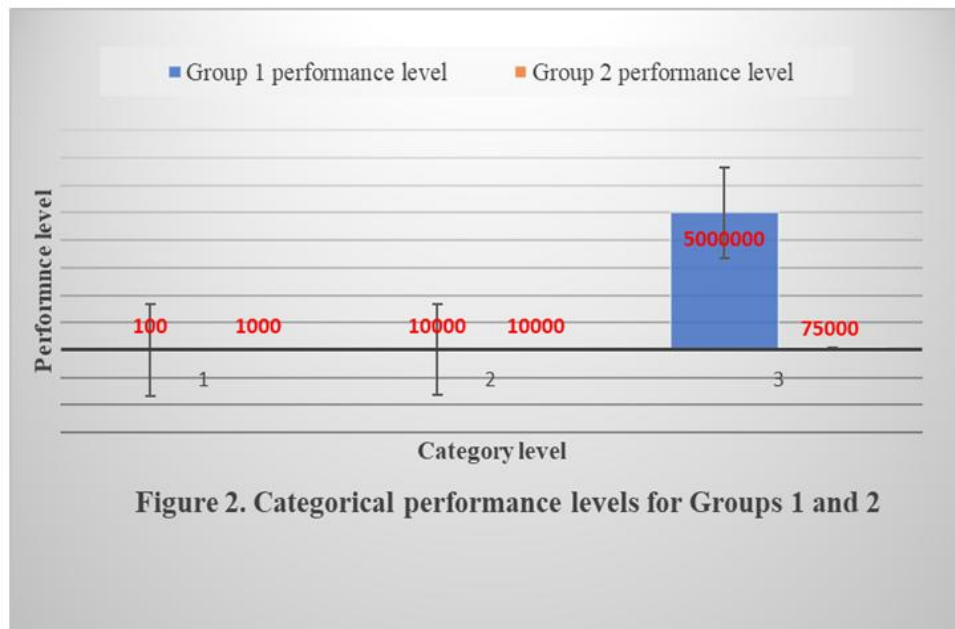


Figure 2. Categorical performance levels for Groups 1 and 2

The main challenges confronting Africa are climate change, leadership problem and poverty. Africa has been identified as one of the parts of the world most vulnerable to the impacts of climate change [15]. However, Serdeczny et al. [16] noted that effects of change in climate should be expected to affect the population of African countries in various ways. The challenges, according to the authors, may range

from flooding and concurrent health impacts and infrastructure damages, to experiencing severe impacts on food production, through declines in oceanic productivity, with severe risks for food security and negative repercussions for human health and employment. It may also result in a decrease in rainfall, resulting in droughts as well as migration crisis in already densely populated areas.

The attendant effect of climate change on food security, food safety and human health cannot be over-emphasized. It is no doubt that climate change is affecting the earth already, affecting agricultural productivity and food security. However, Shah et al. [17] have suggested that disruptions or declines in global and local food supplies due to climate change can be avoided through more efficient irrigation and watershed management among other suggested way-out.

The urgent desire for peace, unity, justice and stability among people and government throughout the world has been observed and the resurgence of this desire is not only explicable through their political policies alone; but also, it is reflected in the social and economic policies [18]. Afegbua and Adejuwon [19] noted the continuous existence of serious and deepening politico-economic crisis among most constituted governments in Africa, which is usually brought to be through socio-political and economic instability as well as the predominant occurrence crises fueled by misunderstanding tied to religion and ethnicity, pointing to the problems of leadership and governance in the continent. In simple words, the authors noted that, the insecurity, increasing crime, economic crisis and other major vices the continent is faced with can be attributed to the leadership problem in the continent.

Governance can be described as the way by which power is used by those trusted with it. Logically, governance has economic and socio-political facets [20]. It may further be defined as the ability to found and maintain enabling environments for individual stakeholders thereby leading to the achievement of a jointly-focused objective [21]. It may also be described as a means of establishing and maintaining a structure which is people's welfare-focused, leading to the provision of a workable system of law and order which is targeted at people's happiness as a result of their rights being legitimately defended [22].

Afegbua and Adejuwon [19] observed that effective leadership plays an important role in ensuring progress and development of any nation. The authors, however, noted that there is the need for improvement in the quality of leadership experienced in Africa, which calls for urgent intervention to source for quality leadership which focuses on truth, capability, and open-mindedness. The authors warn that such search may continue for as long as it takes to get

quality followership and leadership for a quality governance in the continent. The result of the study conducted by Bojang [23] revealed that 2 out of 10 and 5 out of 10 respondents believed that the main issues plaguing the continent are leadership problem, corruption and bribery respectively. However, the author linked good governance with quality education, emphasizing that African investment in education will improve governance, claiming that improvement in education is an important wheel on which successful governance and national development ride.

Poverty is another serious challenge confronting Africa. Extreme poverty has been noted as a serious challenge in Sub-Saharan Africa, particularly since the 1980s and has risen to become one of the most challenging issues confronting many countries on the sub-continent [24]. Igbiniedion and Abusomwan [25] linked the high incidence of poverty in Africa to the major development challenge facing the continent.

There are many challenges confronting Sub-Saharan African scholars and scholarly publishing, which include adequate research facilities [26], lack of well-stocked libraries [27], lack of incentives [28], language barrier [29], technological limitation [30] as well as brain drain [31]. Research output in Africa can be enhanced through research collaboration particularly with those who have access to up-to-date research facilities and well-stocked libraries in order to boost the average individual's performance in Africa.

4. CONCLUSION

This paper concluded that group performance enhanced individual's performance for both groups. However, the group performance was also a reflection of individual's performance. The multiplier factor in Groups 1 and 2 was the same, hence it could be concluded that there is no contradiction between the two case studies examined.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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