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OF THE PROBLEMATICS ON THE FIDELITY AND PRECISION OF THE AREA OF A STRETCH. (Case of the concession under S.R not registered at pk8 of the locality Maleke ON THE RN4 A KISANGANI IN THE PROVINCE OF TSHOPO, IN DR CONGO.

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ABSTRACT

The purpose of this research is to provide the technical cadastre data with precision and precision sought in topography and its related disciplines. In particular: the area of an area lifted as an indication as it appears on the parcel plan and more or less real (tolerable) land concessions following the update.

With this, the following specific objectives have been assigned:

- Rationally evaluate the area of the area;
- Develop the sketch so that it reflects more than 90 percent of the terrain;
- Measure the perimeter in compliance with planimetry operating procedures.

To get there; We used the main method of topographic survey of closed polygons, which was certainly supported by direct observation, interview or direct interview techniques as well as documentation.

After analysis of the data, this research points out that the areas found after evaluation by methods of topography and surveying, the inferiority of the area of this area to one hectare of capacity, and these results are respectively 9953 m² or 99 ares 53 Ca 00% and 9952.94m² or 99 ares 52 Ca 94%. Hence a difference of 0.06 square meters or 00 ca 06 percent superiority of the topography method to the surveying method. What is insignificant and tolerable; difficult to make believe to an amateur because, it is generally known that a concession of 100 m by 100m gives an area of 10,000 m² or 01 Ha.

KEYWORDS: problematic, fidelity, precision, area, maleke, Tshopo, DR Congo.

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INTRODUCTION

The springboard on which we based ourselves to win our case is at the level of the fidelity and precision of the area of an extent in relation to the measurements of its sides, because it seems to be understood that angular elements win more over linear elements in the definition or better the precise and faithful determination of the area of an extent.

Being a matter already regulated Law No. 73-021 of 20 July 1973 known as the Land Law, on the general regime of property, land and immovable regime and security regime, as amended and supplemented by Law No. 80-008 of 18 July 1980 and its implementing measure including Interministerial Order number 0100/CAB/MIN/AFF. FONC/2020 and number/CAB/MIN/FINANCES/2020/068 of 02 June 2020 the most recent fixing the rates of duties, taxes and fees to be collected at the initiative of the Ministry of Land Affairs link the areas of the areas to the financial envelope of the applicants of the funds according to the ranks occupied by the provinces and their administrative entities; Hence the erroneous provision of areas of concessible areas may prejudice or benefit on the one hand the basket of the housewife of the applicant generally living in the informal sector and the tax base of the conceding power in search of funding to relieve the ills that gnaw at Congolese society on the other hand.

The Congolese Land Law stipulates: "the area and boundaries of the lots on the plot plans are given only as an indication, where applicable, the rent and the fee are due on the area recorded by the official measurement and provided that the difference of its actual measure to that expressed in the contract, is less than one-twentieth more or less (Article 66 of the Land Law). This provision seems to support our expertise in supporting this.

We understand through the preceding lines that the Congolese legislator recognizes the notions of errors that are tainted in any human work and tolerance; Bearing in mind that land concessions generally do not follow the geometric shapes of particular cases, whose definitions, lines, properties and formulas for assessing their capacities are known. This plunges so many concessionaires into a bath of gaps to digest the expression in units of measurement of area of the area of their land concessions that they assimilate to these polygons when it is in units of agrarian measurement with the resulting decimal numbers.

The site that is the subject of this study is a quadrilateral previously delimited by amateurs (holders of customary land rights) recognized by the current Land Law who, unfortunately, do not master the topography to circumscribe the survey in the fidelity and precision sought in topography and its related disciplines resulting in a range of tolerance.

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The real problem found is that the area found after evaluating the capacity of the area of our study environment quadrilateral of its state, seems absurd as to the lengths actually measured of the sides that constitute its perimeter on the ground, having found that none of the sides of its perimeter measures less than one hundred meters in length; But the area found is less than ten thousand square meters or better a hectare. This creates a grey area for dealers who are not educated in this area and require expertise from a qualified and experienced workforce.

Indeed, for a land concession (quadrilateral) of which all the sides constituting the perimeter measure one hundred meters in length point is not necessary for the general opinion to believe that the latter can have an area of less than ten thousand square meters or one hectare.

Not being hostile to this issue, we line up behind Professor ESSISO's advice that "in case of compliance with the methodology, one should not be disoriented if the expected result is not found; we are scholars," he concludes (ESSISO A., 2019).

A complex study as to the objective assigned, that of exhuming and substantiating in the light of scientific knowledge acquired at the National School of Cadastre and Real Estate Titles of Kisangani in the Democratic Republic of Congo, the inferiority of the surface of this concession to ten thousand square meters or one hectare of capacity.

On this, we will use the methods of topography and surveying for more assurance and objectivity assimilating the surveying method to that of the subdivision of space into simple geometric figures including non-particular triangles and that of topography to the evaluation of the area based on rectangular coordinates without the subdivision of said space, for the purpose of carrying out our research. The method designating the rational approach of the mind to arrive at the knowledge or demonstration of the truth about the object studied (MUHINDO M., Média Kinshasa, 2009), it should be specified that both methods proceeded by analytical methods for the different evaluations of distances, angles and areas; the graphical method for the transfer of ground on the plan; the exegetical method for the provisions and regulatory texts consulted; Finally, the genetic method for the search for the genesis of the facts.

. These methods have been strongly supported by direct observation, open interviewing, documentation and documentary techniques.

As said, our study has three fundamental points as follows:

- Definition of concepts;
- Calculation of areas;
- Problem of fidelity and precision of the area of an extent.

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1. DEFINITION OF THE CONCEPT

1°) Problematic

According to Théodore CAPLOW the problem is defined as a description of fields of theoretical knowledge in which the problem is posed, followed by the implementation of a series of questions that directly or indirectly lead to hypotheses. (Théodore CAPLOW quoted by Marie Claire ZUENA, 2018, p.3).

Research always arises from a problem that exists and that we want to solve or clarify. There is a problem when we feel the need to bridge a conscious gap between what we know and what we should know. It is a way to cancel or significantly reduce this gap. In other words, there is no research where there are no problems (Théodore CAPLOW quoted by ESSISSO, 2013, p.18)

2°) Fidelity

The attitude and behaviour of the person who refrains, over time, from betraying an oath or betraying the trust of another person.

3°) Air

It is an area, a positive quantity associated with a bounded surface, flat or in three-dimensional space.

4°) Extent

It is a dimension of a thing in length, breadth and depth.

5°) S.R

Rural section.

2. AREA CALCULATION

Areas are evaluated in topography using four methods:

2.1. Double area method: which requires the determination of rectangular coordinates at the vertices of the polygonal and the application of the double area formula (SIKUMBILI B., 2013, p.26)

$$2s = \left| \sum Xn(Yn - 1 - Yn + 1) \right|$$

$$2s = \left| \sum Xn(Yn + 1 - Yn - 1) \right|$$

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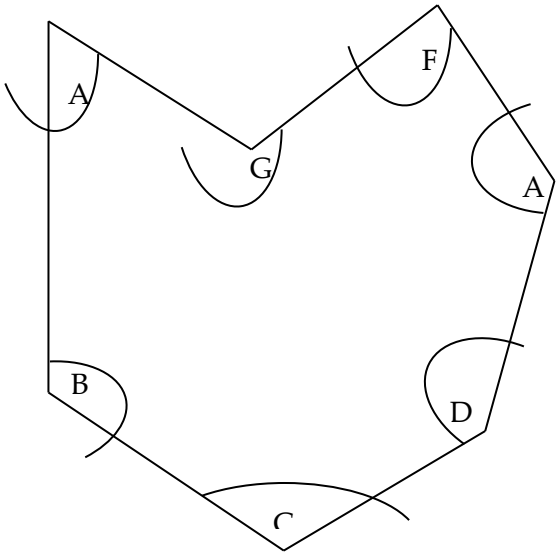
$$2s = \left| \sum Yn(Xn - 1 - Xn + 1) \right|$$

$$2s = \left| \sum Yn(Xn + 1 - Xn - 1) \right|$$

Sketch n°1

Example:



2.2. Method of subdividing space into simple geometric figures (triangles) called triangulation. Which requires knowledge of the general formulas of planar geometric figures for the case of assimilations to special cases; the sine or trigonometric method and the half-perimeter or geometric method for more accuracy because the demarcated terrain generally does not follow the geometric shapes of particular cases and their boundaries are often sources of land conflicts (MOSUANDOLE N., 2021, p.23).

2.2.1. General formulas:

square: S=CC×

- rectangle: S=Ll×
- triangle: S= Bh /2×
- trapeze: S= B+bh /2×
- parallelogram: Bh; ×

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2.2.2. Trigonometric method or sine method

Requires knowledge of the length measurements of the adjacent sides that form the angle at the vertex and possibly its material value to evaluate the area of the triangle (TONDOZI, 2021, p. 24).

General formula: $\frac{a}{\sin \tilde{A}} = \frac{b}{\sin B} = \frac{c}{\sin \hat{c}} \frac{a.b.c}{2\ S}$

→ If $\hat{A}$ is known and lengths b and c, the area (S) is evaluated by the sine method.

S = $\left|\frac{1}{2}\mathbf{bc} * \mathbf{sin}\hat{A}\right|$

→ Si is known and lengths a and c; $\tilde{B}$

S = $\left|\frac{1}{2}\mathbf{ac} * \mathbf{sin}\tilde{B}\right|$

→ If $\hat{C}$ is known and lengths a and b;

S = $\left|\frac{1}{2}\mathbf{ab} * \mathbf{sin}\hat{C}\right|$

2.2.3. Geometric method or half-perimeter method

Requires knowledge of the perimeter, the half perimeter as well as measurements of the three sides of the perimeter of the triangle (SOLIA S., 2014, p.38).

S=$\sqrt{p(p-a)(p-b)(p-c)}$

2.3. The method of calculating the area with the planimeter

Which is a device currently not found on the market (SIKUMBILI B., 2013, p.26).

2.4. The method of calculating the area with GPS.

It is a question here of choosing the zone calculation page of the GPS device, being parked at the starting point, we choose the "start" menu and then browse the perimeter of the concession to evaluate the area. The origin being at the same time the end, we finally choose the menu "calculate" (MOSUANDOLE N, 2021, 37).

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3. FIDELITY PROBLEM AND EXTENT AREA ACCURACY

3.1. Field work

As the site had been the subject of prior recognition, the evaluation of the survey equipment and accessories was a small matter; otherwise, we had seen fit to raise with the Global Positioning System as sampling equipment technical elements of cadastral data whose office work will be sanctioned by two methods in particular, the topography method and the surveying method to better reassure ourselves of the reliability of our results.

The collection of field data should normally go through the following topographic survey steps:

- Site recognition;
- Picketing and tracking;
- Freehand sketch with respect for conventional signs;
- Linear measurement;
- Angular measurement;
- Detailed survey (NOF M., 2017, p.4)

Being already delimited in a simple way and whose boundaries remain maintained and visible, the second stage did not take place.

With GPS, the sampling of planimetric coordinates was carried out according to the method of surveying a quadrilateral, as follows:

1) Measure the perimeter of the plot;
2) Measure the equipment implanted;
3) Measure at least one angle at the vertices,
4) Take at least three attachments of the constructions to at least two sides of the plot if necessary;
5) Measure apparent easements and topographic features.
6) Orient the plot; But before leaving the site, also take the ins and outs (MOSUANDOLE N., 2021, p.38).

It should be noted that our site was a fallow; hence the second and third stages had not taken place.

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3.1.1. Presentation of the study environment.

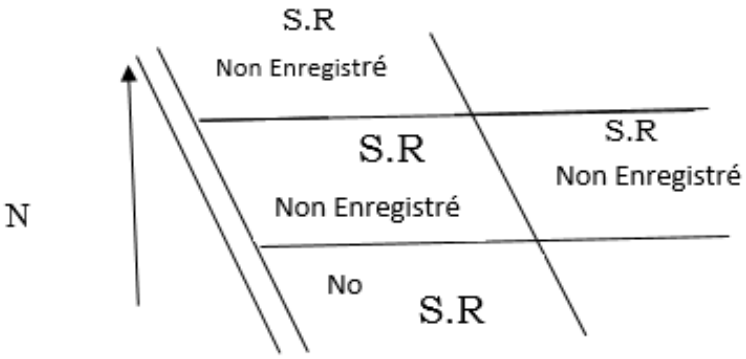
3.1.1.1. Location of the site and period of the experiment.

Our experiment was carried out in Kisangani in the land concession of Mr. Oscar LIOFO located at kilometer point eight on National Road number 4, locality MALEKE located on the road Maleke not far from the road called elephants.

The geodetic coordinates of the city of Kisangani are 0°31' North latitude and 25°11' East longitude. Its elevation varies from 400 to 496m altitude (MBUYU B., 2004, p.8).

The site is limited:
In the North: by an unregistered concession
In the South: by an unregistered concession
In the East: by an unregistered concession
To the West: by an easement of three meters of right-of-way

Croquis n°2



3.1.1.2. Rectangular coordinates of our site

(a) Geographical coordinates

x: 00,55215 °

and: 025.26751°

(b) Planimetric coordinates

x: 0307196 m

and: 0061057 m

(c) Vertical coordinate:

of: 390 m

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(d) Rectangular coordinate system: Zone 35 N; WGS 84

3.2. Office work

3.2.1. Surveying method

Using the topography method below, we have found it reasonable to also use the survey method to inform the opinion as to the problem situation raised prior to the introduction of this modest study.

The question here is whether the two methods would yield corollary results that would confirm in the light of science that the problem situation is rationally justifiable.

3.2.1.1. Distance assessment

Since all the sides constituting the perimeter of our study environment are evaluated in the office work of the topographic method in the following lines, precisely in point 3.3.1.2 we evaluate here one of the diagonals by the Pythagorean theorem to subdivide our space into any two triangles; This is the surveying method.

Knowing that $\overline{AB}$ = 103, 24m; = 102.84m; = 100.18m and = 101.20m then, the diagonal of our choice for the triangulation of our quadrilateral is the line segment to be evaluated by the Pythagorean theorem knowing the planimetric or rectangular coordinates at vertices B and D; Where from:$\overline{BCCDDABD}$

B (0307189; 0060954) B (189; 954) ⇒

D (0307295; 0061078) ⇒ D (295; 1078)

$$\overline{BD}^2 = \Delta x_{\overline{BD}}^2 + \Delta y_{\overline{BD}}^2$$

$$\overline{BD}^2 = (x_D - x_B)^2 + (y_D - y_B)^2$$

$$\overline{BD}^2 = (295m - 189m)^2 + (1078m - 0954m^2)$$

$$\overline{BD}^2 = (106m)^2 + (124m)^2$$

$$\overline{BD}^2 = 11236m^2 + 15376m^2$$

$$\overline{BD}^2 = \sqrt{26612m^2}$$

$$\overline{BD}^2 = 163,13\text{m}$$

In view of the above, our triangulation of space results in the sketch below:

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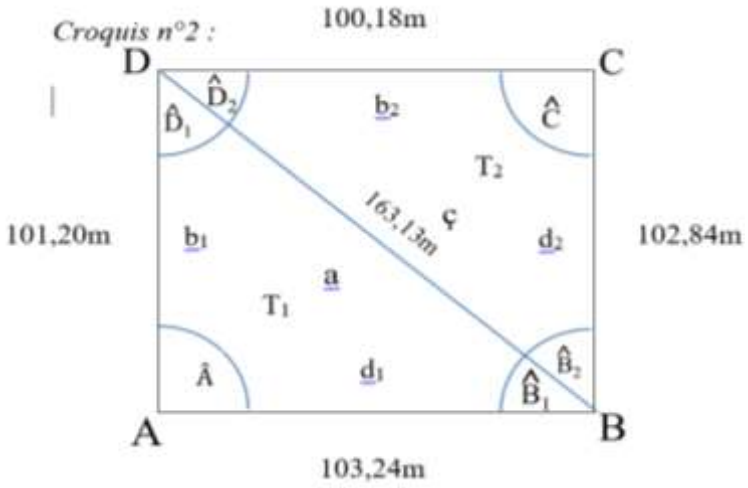

3.2.1.2. Calculations of angles

a) $\hat{A}$ =? by the cosine relation

$$a^2 = b_1^2 + d_1^2 - 2b_1 d_1 \cos\hat{A}$$

body = $\hat{A}\frac{b_1^2 + d_1^2 - a^2}{2b_1 d_1}$

body = $\hat{A}\frac{(101{,}20m)^2 + (103{,}24m)^2 - (163{,}13m)^2}{2\,(101{,}20m)(103{,}24m)}$

body = $\hat{A}\frac{10241{,}44m^2 + 10658{,}4976m^2 - 26611{,}3969m^2}{20895{,}776m^2}$

body = $\hat{A}\frac{-5711{,}4593m^2}{20895{,}776m^2}$

$\hat{A}$ = body arc – 0.273330806

$\hat{A} = 117^{v}62'51''$

b) $\hat{B}_1$ =? by the Sine relation

$\frac{a}{\sin A}$ = = considering the first equality, we have: $\frac{b_1}{\sin\hat{B}_1}\frac{d_1}{\sin\hat{D}_1}$

$\Rightarrow \frac{a}{\sin\hat{A}} = \frac{b_1}{\sin\hat{B}_1}$

$\Rightarrow \frac{163{,}13m}{\sin 117^{v}62'51''} = \frac{101{,}20m}{\sin\hat{B}_1}$

$\Rightarrow$sin = $\hat{B}_1\frac{101{,}20m\ x\sin 117^{v}62'51''}{163{,}13m}$

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$\Rightarrow \hat{B}_1$= ARC SIN 0.596740648

$$\Rightarrow \hat{B}_1 = 40^v 70' 76''$$

$c) \hat{D}_1$ = ? by incorporation

$\hat{A}$ + + = $\hat{B}_1 \hat{D}_1 200^v$

$\hat{D}_1$ = - - $200^v 117^v 62' 51'' 40^v 70' 76''$

$\hat{D}_1 = 41^v 66' 73''$

It is here that we close the evaluations of the angles of the first triangle noted TA and start with the angles of the second triangle that we note T$B_1 D_1 B_2 C D_2$

c) $\hat{C}$ =? by the cosine relation

Ç² = body $b_2^2 + d_2^2 - 2b_2 d_2 \hat{C}$

Body = $\hat{C} \frac{b_2^2 + d_2^2 - Ç^2}{2b_2 d_2}$

Body = $\hat{C} \frac{(100,18m)^2 + (102,84m)^2 - (163,13m)^2}{2(100,18m)(102,84m)}$

Body = $\hat{C} \frac{10036,0324m^2 + 10576,0656m^2 - 26611,3969m^2}{20605,0224m^2}$

Body = $\hat{C} \frac{-5999,2989m^2}{20605,0224m^2}$

$\hat{C}$ = body arc – 0.291157116

$\hat{C} \approx 118^v 80' 80''$

d) $\hat{B}_2$ =? by the sine relation

$\Rightarrow \frac{b_2}{\sin \hat{B}_2}$= = considering the first equality, we have $\frac{ç}{sin\hat{C}} \frac{d_2}{\sin \hat{D}_2}$

$\Rightarrow \frac{b_2}{\sin \hat{B}_2} = \frac{ç}{sin\hat{C}}$

$\Rightarrow \frac{100,18m}{\sin \hat{B}_2} = \frac{163,13m}{\sin 118^v 80' 80''}$

$\Rightarrow \sin \hat{B}_2 = \frac{100,18m \; x \; 118^v 80' 80''}{163,13m}$

$\Rightarrow \hat{B}_2$ = Arc SIN 0.587505365

$\Rightarrow \hat{B}_2 \approx 39^v 97' 80''$

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e) $\hat{D}_2$ = ? by incorporation

$\hat{B}_2$++= $\hat{C}\hat{D}_2 200^v$

$\hat{D}_2$ = - - $200^v 118^v 80' 80'' 39^v 97' 80''$

$\hat{D}_2 = 41^v 21' 40''$

f) Verification of the angular closure of our polygon knowing that the real sum of the interior angles (Sr) is valid for any quadrilateral.400^v

Following our triangulation, we then have:

$\hat{A} = 117^v 62' 51''$

$\hat{B}$ = = + = $\hat{B}_1 + \hat{B}_2 40^v 70' 76'' 39^v 97' 80'' 80^v 68' 56''$

$\hat{C} \approx 118^v 80' 80''$

$\hat{D}$ = = + = $\hat{D}_1 + \hat{D}_2 41^v 66' 73'' 41^v 21' 40'' 82^v 88' 13''$

So + + + = ?$\hat{A}\hat{B}\hat{C}\hat{D}$

$117^v 62' 51''$ + + + = from where the polygonal closed $80^v 68' 56'' 118^v 80' 80'' 82^v 88' 13'' 400^v$

3.2.1.3. Area calculations

Here we use the half-perimeter method which is one of the methods of subdividing space into simple geometric figures (triangles)

How to proceed:

- Calculate the perimeter;
- Calculate the half-perimeter;
- Apply the formula.

a) Area of the first triangle

- P_1 = a + + = = 163,13m + 101,20m +103,24m = 367,57m$b_1 d_1$
- p_1 = = 183,79m$\frac{P_1}{2} \frac{367,57m}{2} \approx$
- Area $T_1 = \sqrt{p1(p1-a)(p1-b1)(p1-d_1)}$

S_1=)$\sqrt{183,79m(183,79m-163,13m)(183,79m-101,20m)(183,79m-103,24m}$

$S_1 = \sqrt{183,79m\ (20,66m)(82,59m)(80,55m)}$

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$S_1 = \sqrt{25260689,80m^4}$

$S_1 \approx 5026,00m^2$

b) Area of the second triangle

- P_2 = + Ç + = 100.18m + 163.13m + 102.84m = 366.15m$b_2 d_2$
- p_2 = = 183,08m$\frac{P_2}{2} \frac{366,15m}{2} \approx$
- $S_2 = \sqrt{P_2(P_2 - b_2)(P_2 - ç)(P_2 - d_2)}$

$S_2 =)\sqrt{183,08m(183,08m - 100,18m)(183,08m - 163,13m)(183,08m - 102,84m}$

$S_2 = \sqrt{183,08m\ (82,90m)(19,95m)(80,24m)}$

$S_2 = \sqrt{24295690,94m^2}$

$S_2 \approx 4929,07m^2$

c) Total Area

$ST = S_1 + S_2 = 5026,00 + 4929,07 = 9955,07m^2m^2m^2$

ST = 99 ares 55 Ca 00%

3.3. Office work

3.3.1. Topography method

3.3.1.1. Cartesian coordinates at the vertices of the Polygonal

A (0307196; 0061057) A (196; 1057)

B (0307189; 0060954) B (189; 0954)

C (0307289; 0060978) C (289; 0978)

D (0307295; 0061078) D (295; 1078)

3.3.1.2. Evaluation of lengths by the Pythagorean theorem

a. $\overline{\mathbf{AB}}^{\mathbf{2}} = \Delta \mathbf{x}_{\overline{\mathbf{AB}}}^{\mathbf{2}} + \Delta \mathbf{y}_{\overline{\mathbf{AB}}}^{\mathbf{2}}$

$\overline{AB}^2 = (189\text{m} - 196\text{m})^2 + (0954\text{m} - 1057\text{m})^2$

$\overline{AB}^2 = (-7\text{m})^2 + (-103\text{m})^2$

$\overline{AB}^2 = 49\text{m}^2 + 10609\text{m}^2$

$\overline{AB} = \sqrt{10658\text{m}^2}$

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$\overline{AB} = 103{,}24\text{m}$

b. $\mathbf{\overline{BC}^2 = \Delta x_{\overline{BC}}^2 + \Delta y_{\overline{BC}}^2}$

$\overline{AB}^2 = (289\text{m} - 189\text{m})^2 + (0978\text{m} - 0954\text{m})^2$

$\overline{AB}^2 = (100\text{m})^2 + (24\text{m})^2$

$\overline{AB}^2 = 10.000\text{m}^2 + 576\text{m}^2$

$\overline{AB} = \sqrt{10576\text{m}^2}$

$\overline{AB} = 102{,}84\text{m}$

c. $\mathbf{\overline{CD}^2 = \Delta x_{\overline{CD}}^2 + \Delta y_{\overline{CD}}^2}$

$\overline{CD}^2 = (295\text{m} - 289\text{m})^2 + (1078\text{m} - 0978\text{m})^2$

$\overline{CD}^2 = (6\text{m})^2 + (100\text{m})^2$

$\overline{CD}^2 = 36\text{m}^2 + 10.000\text{m}^2$

$\overline{CD} = \sqrt{10036\text{m}^2}$

$\overline{CD} = 100{,}18\text{m}$

d. $\mathbf{\overline{DA}^2 = \Delta x_{\overline{DA}}^2 + \Delta y_{\overline{DA}}^2}$

$\overline{DA}^2 = (196\text{m} - 295\text{m})^2 + (1057\text{m} - 1078\text{m})^2$

$\overline{DA}^2 = (-99\text{m})^2 + (-21\text{m})^2$

$\overline{DA}^2 = 9801\text{m}^2 + 441\text{m}^2$

$\overline{DA} = \sqrt{10242\text{m}^2}$

$\overline{DA} = 101{,}20\text{m}$

3.3.1.3. Calculations of internal angles in reservoirs

3.3.1.3.1. Reservoir calculations

$$a.\ V_{\overline{AB}} = ?$$

$$\text{tg}\theta = \frac{|\Delta Y_{\overline{AB}}|}{|\Delta x_{\overline{AB}}|} = \frac{7\text{m}}{103\text{m}} = 0{,}067961165$$

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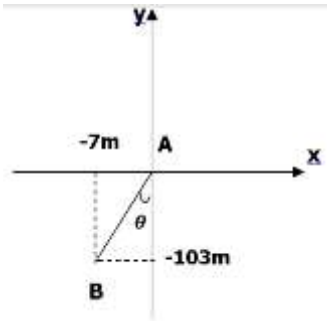
$$\theta = \text{arc tg } 0{,}067961165$$

$$\theta = 04^{v}31'99''$$



The variations of the coordinates on the side place it at the first part of the third quadrant, attaches to the y-axis (y-axis).$\overline{AB}\theta$

$$V_{\overline{AB}} = 200^{v} + \theta$$

$$V_{\overline{AB}} = 200^{v} + 04^{v}31'99''$$

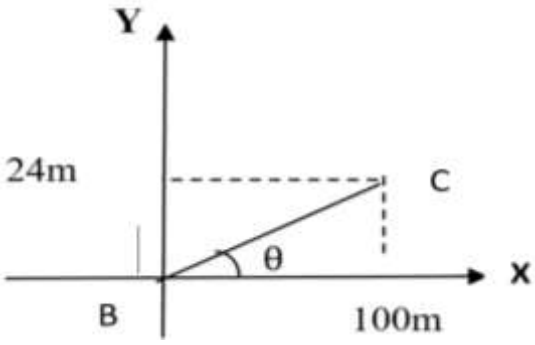
$$V_{\overline{AB}} = 204^{v}31'99''$$

$$b)\ V_{\overline{BC}} = ?$$

$$\text{tg}\theta = \frac{|\Delta Y_{\overline{BC}}|}{|\Delta x_{\overline{BC}}|} = \frac{24\text{m}}{100\text{m}} = 0{,}24$$

$$\theta = \text{arc tg } 0{,}24$$

$$\theta = 14^{v}99'53''$$



The variations of the coordinates of the side place it at the second part of the first quadrant, attaches to the X axis (x-axis).$\overline{BC}\ \theta$

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$V_{\overline{BC}} = 100^{v} - \theta$

$V_{\overline{BC}} = 100^{v} - 14^{v}99'53''$

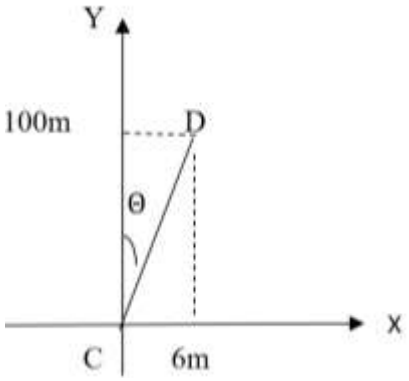
$V_{\overline{BC}} = 85^{v}00'47''$

c. = ? $V_{\overline{CD}}$

$$tg\theta = \frac{|\Delta X_{\overline{CD}}|}{|\Delta Y_{\overline{CD}}|} = \frac{6m}{100m} = 0{,}06$$

$\theta = \text{arc tg } 0{,}06$

$\theta = 03^{v}81'51''$



variations in

The variations of the coordinates on the side place it at the first part of the first quadrant, attaches to the Y axis (y-axis).$\overline{CD}\theta$

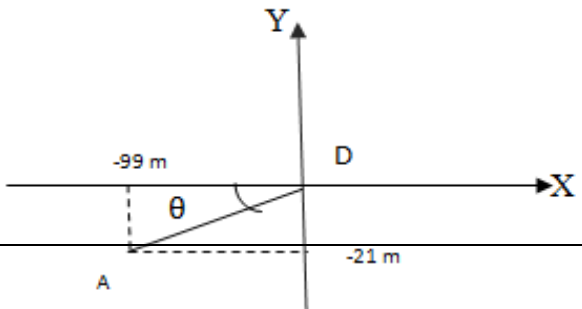
$V_{\overline{CD}} = 0^{v} + \theta \Rightarrow V_{\overline{CD}} = 0^{v} + 03^{v}81'51'' \Rightarrow V_{\overline{CD}} = 03^{v}81'51''$

d. $\mathbf{V_{\overline{DA}}}$ **= ?**

$$tg\theta = \frac{|\Delta Y_{\overline{DA}}|}{|\Delta X_{\overline{DA}}|} = \frac{21m}{99m} = 0{,}212121212$$

$\theta = \text{arc tg } 0{,}212121212$

$\theta = 13^{v}30'68''$



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The variations of the coordinates of the side place it at the second part of the third quadrant, $\overline{DA}$ attaches to the X axis (x-axis).θ

$V_{\overline{DA}} = 300^{v} - \theta$

$V_{\overline{DA}} = 300^{v} - 13^{v}30'68''$

$V_{\overline{DA}} = 286^{v}69'32''$

3.3.1.3.2. Calculations of the internal angles themselves

a) $\hat{A}$ = gold is inverse of $>V_{\overline{AB}} - V_{\overline{AD}}V_{\overline{AD}}V_{\overline{DA}}200^{v}$

$\hat{A}$ = - $V_{\overline{AB}} - (V_{\overline{DA}}200^{v})$

$\hat{A} = 204^{v}31'99'' - (286^{v}69'32'' - 200^{v})$

$\hat{A} = 204^{v}31'99'' - 86^{v}69'32''$

$\hat{A} = 117^{v}62'67''$

b) $\hat{B}$= gold is inverse of $>V_{\overline{BC}} - V_{\overline{BA}}V_{\overline{BA}}V_{\overline{AB}}200^{v}$

$\hat{B}$=- $85^{v}00'47'' - (V_{\overline{AB}}200^{v})$

$\hat{B}$=$85^{v}00'47'' - (204^{v}31'99'')$

$\hat{B}$=$85^{v}00'47'' - 04^{v}31'99''$

$\hat{B}$=$80^{v}68'48''$

c) $\hat{C}$ = gold is inverse of $< 400^{v} - (V_{\overline{CB}} - V_{CD})V_{\overline{CB}}V_{\overline{BC}}200^{v}$

$\hat{C}$ = (+ -)$400^{v} - V_{\overline{BC}}200^{v}V_{\overline{CD}}$

$\hat{C}$ = (+ -)$400^{v} - 85^{v}00'47''200^{v}03^{v}81'51''$

$\hat{C}$ = (-)$400^{v} - 285^{v}00'47''03^{v}81'51''$

$\hat{C}$ = 2+$400^{v} - 81^{v}18'96''200^{v}$

$\hat{C} = 118^{v}81'04''$

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d) $\widehat{D}$ =) or is the inverse of < ($V_{\overline{DA}} - V_{\overline{DC}} V_{\overline{DC}} V_{\overline{CD}} 200^{v}$

$\widehat{D}$ = +($V_{\overline{DA}} - V_{CD} 200^{v}$)

$\widehat{D}$ =)][$286^{v}69'32'' - (03^{v}81'51'' + 200^{v}$

$\widehat{D}$ = [$286^{v}69'32'' - 203^{v}81'51''$]

$\widehat{D}$ = $82^{v}87'81''$

e) Checking the angular closure of the polygonal Â+++= ?$\widehat{B}\widehat{C}\widehat{D}$

$$\begin{array}{r} 117^{v}62'67'' \\ 80^{v}68'48'' \\ 118^{v}81'04'' \\ \underline{82^{v}87'81''} \\ 400^{v}00'00'' \end{array}$$

Hence the polygonal closed

3.3.1.3. Area calculation

2S = $\left|\sum x_n \, (y_{n-1} - y_{n+1)}\right|$

2S = I$|x_B(y_A - y_c) + x_C(y_B - y_D) + x_D(y_C - y_A) + x_A|(y_D - y_B)$

2S=$|189m(1057m - 978m) + 298m(954m - 1078m) + 295m(978m - 1057m) + 196m|(1078m - 954m)$

2S=$|189m(79m) + 298m(-124m) + 295m\,(-79m) + 196m|(124m)$

2S = $|14931m^2 - 35836m^2 - 23305m^2 + 24304\,m^2|$

S = $\frac{19906m^2}{2}$

S = 9953 m²

S= 99 ares 53 Ca 00%

3.4. Interpretation of results

The areas found after evaluation by the two methods whose methods of topography and surveying prove the inferiority of the area of this extent to less than ten thousand square meters or one hectare. The acute angles at vertices B and D probably influenced them.

CONCLUSION AND SUGGESTIONS

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At the end of this study which focused on the problem of the fidelity of the area of an extent "case of the concession not yet registered at PK 8 locality Maleke in the province of Tshopo".

Our main concern was to build opinion on the area found after assessing the capacity of our study environment.

Indeed, for an area or concession which is a quadrilateral having dimensions of one hundred meters by a hundred, there is generally no need to imagine that the area of this space is less than one hectare regardless of whether the latter is a geometric figure of particular or any case.

In view of the above, our attention is focused on the fact that no side of the perimeter of our site has less than one hundred meters of measurement, but the area evaluated for the latter is less than one hectare of capacity, hence a problematic situation that has required a careful examination that can exhume in the light of common mortal the reasons that support it. Considering what the Land Law states in its sixty-sixth article: "the area and boundaries of the lots on the plot plans are given only as an indication, where applicable, the rent and the fee are due on the area recorded by the official measurement and provided that the difference of its actual measure to that expressed in the contract is less than one-twentieth more or less. This provision seems to support our expertise as experienced and qualified in this area. This proves that the Congolese legislator recognizes the imperfections of human works which, together with external circumstances, are the source of various errors and mistakes.

It should be noted that the areas found after evaluation by the methods of topography and surveying, the inferiority of the area of this area to one hectare of capacity, and these results are respectively 9953 m² or 99 ares 53 Ca 00% and 9952.94m² or 99 ares 52 Ca 94 %. Hence a difference of 0.06 square meters or 00 ca 06 percent superiority of the topography method to the surveying method. What is insignificant and tolerable; difficult to make an amateur believe this because generally we know that a concession of 100m by 100m gives an area of 10,000 m² or 01 Ha.

This space would have an area greater than ten thousand square meters if it were the quadrilaterals of special cases such as the square and rectangle only quadrilaterals whose all angles at the vertices measure ninety degrees or one hundred grades; But the measurements on its sides do not correspond to the linear properties of the latter. This even justifies the difference in the material values of the angles at the vertices of said polygon because the two diagonals opposing two by two its four vertices do not and can not have the same measurement.

Without pretending to exhaust everything in this matter, we suggest the following:

- Land custodians: to use the expertise of the State's technical services (Urban Planning and Land Cadastre) for any operation relating to land to ensure viability; the State being the owner of the land according to Article 53 of the Congolese Land Law;

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- To the technicians of the technical services: to always show professional conscience to help the customary power to respect the urban planning standards in order to avoid the future development of the land ceded likely to make changes of stratospheric scale and to lose the occupants of the portions of land.;
- To the heads of technical services: to equip their technical offices with topographical and other equipment (milestones, steel and plastic tapes without the tape being and remains the only equipment for measuring lengths according to the spirit of the decree of 20 June 1960, even if the latter does not affirm it without any form of trial;
- To the Congolese State owner of the land: to extend its management throughout the national territory, to popularize the Land Law and to impose order by setting the rules in any operation relating to land its heritage

BIBLIOGRAPHY

1. ESSISO A.; interview during the doctoral thesis defense of the MALALA Head of Works on 17/08/2019.

2. FONO M., professional practice, course (unpublished), G1 Surveyor, ENAC & TI/ Kisangani, 2016-2017.

3. Land Law of the Democratic Republic of Congo

4. MOSUANDOLE N: - Surveying, course(unpublished), G1 Surveyor, ENAC &TI/Kisangani, 2020-2021.

- topo II, unpublished course, G2 surveyor, ENAC &TI/ Kisangani, 2020-2021.
- Technical drawing, course (unpublished), G1 Surveyor, ENAC&TI/Kisangani, 2020-2021.

5. MUHINDO M., Media Kinshasa; 2009

6. MBUYU B., Preliminary observations on disease resistance in strips of three commonly grown maize types, unpublished TFC, IFA/Yangambi, 2003-2004.

7. SIKUMBILI B., Topography-topometry I, course (unpublished), G1 GT, IBTP/Kisangani, 2012-2013.

8. SOLIA S., Topography and cartography, course (unpublished), UMC/Kisangani, 2013-2014.

9. Théodore CAPLOW: - quoted by Marie Claire ZUENA, Critical analysis of the development plan in rural areas, TFC (unpublished), ENAC&TI/Kisangani, 2017- 2018.

- quoted by ESSISSO, Méthodes de science sociale, cours (unpublished), G2 FSSAP, UNIKIS, 2012-2013, p.18

10. TONDOZI, Topography, course (unpublished), G2 Geology, UNIKIS, 2020-2021.