African Journal of Social Issues 6(1): 2023
Available online at https://ajosing.com;
https://www.ajol.info/index.php/ajosi

DOI: https://dx.doi.org/10.4314/ajosi.vol6i1.2

p-ISSN 2672 – 5142; e-ISSN 2734 – 3324
Original Research

ANALYSIS OF THE KNOWLEDGE, ATTITUDES AND PRACTICES OF THE POPULATION OF THE MOKAMBO CHIEFDOM ON THE THERMAL WATERS OF KASWA/MAHAGI (ITURI, D.R. CONGO)

[1]RICHARD Budju Lotsima, [2]YVONNE Ibebeke Bomangwa, [3]THIERRY Tangou Tabou, [4]JEAN-BAPTISTE Dhetchuvi Matchu et and [5]CÉLINE Sikulisimwa Pole

[1&3]Chef de Travaux, Department of Biology-Chemistry, High Pedagogical Institute of Bunia, DR Congo., [2]Professor, Department of Chemistry, Faculty of Sciences, National Pedagogical University, Kinshasa, DR Congo., [4 & 5]Professor, Faculty of Sciences and Technology, University of Kinshasa, DR Congo;

[1]E-mail: riclem@gmail.com, **[2]E-mail:** yibebeke@hotmail.com

[3]E-mail: jbdhetchuvi@gmail.com, **[4]E-mail:** thierrytangou@yahoo.fr

[5]E-mail: Sikulisimwa.cp@gmail.com

ABSTRACT

Since ancestral times, farmers have used the thermal waters of Kaswa/Mahagi for hygienic and sanitary practices. The present study is aimed at evaluating the knowledge, attitudes and practices of the indigenous people with regards to these waters. It was carried out from 15th January to 12th April 2022 and focused on a sample of 323 adult people obtained using the Schwartz formula. The descriptive study shows that almost all of the farmers knew the location of the thermal springs had an indigenous name which meant their hyperthermia or their therapeutic virtue. 68.89% of respondents suggested volcanic or geothermal origin of the heat of these waters, the information being transmitted mainly from parents to members of their families. The practices highlighted are frequenting thermal waters for curiosity, natural hot baths, for the relief of muscular fatigue and dermatoses including wounds and scabies according to 41.13% and 39.18% of respondents respectively. The attitude highlighted is the belief in divine and ancestral power transmitted through these waters accompanied by rituals at the hot springs. Certain knowledge, attitudes and practices were dependent on the sex, age and occupation of users. These results constitute essential basic information for future multidisciplinary research with a view to enlightening the population.

Keywords: Thermal waters, Kaswa, Mahagi, CAP, hot springs.

1.0 INTRODUCTION

Thermal waters have been known and used by man since antiquity, recognising their particular values including hydrotherapy and the manifestation of divinity (Duriez, 2006). They are distributed all over the planet, the most abundant being found in America, Europe and Africa (Madigan and Martinko, 2007). Thermal waters are groundwater whose emerging temperature is

higher than that of other groundwater in the region. In the Democratic Republic of Congo, they are present, most of them being located in the eastern part of the country, a region forming the western branch of the African Rift and characterized by intense volcanic activities (Bagalwa, Karume, Iragi, Kubisimbwa, Burume, Ndahama and Bayongwa, 2015; Luse and Makonga, 2019). These thermal waters constitute a geothermal potential that is unfortunately less exploited (Esseqat, 2011; UNDP, 2016). The Kaswa/Mahagi hot springs in Ituri Province emerge from the Monts-Bleus, near Lake Albert located in the Albertine Rift (Mbuluyo and Faidance, 2018). The temperature of the thermal waters of Kaswa/Mahagi varies between 42°C and 59°C (Budju et al., 2023). These waters attract the curiosity of many people, both visitors and natives, and have been used by natives since ancestral times, attaching particular value to them, including the virtue of curing certain pathologies. Due to their cost-free accessibility, the native people there have developed personal initiatives to relieve their pains, which are passed down through the generations.

Following the trend of results obtained previously in the work carried out within our research team and especially in order to verify the presumptions on the use of these waters by the natives, it proved essential to carry out the present study. Thus, the lack of in-depth information on this subject raised questions from both users and fans of these thermal waters. What then is the more or less complete information available to the population which would explain the behaviour displayed and the practical skills of the local population in relation to the thermal waters of Kaswa/Mahagi?

The objective of this study is to evaluate the level of Knowledge, Attitudes and Practices (KAP) of the inhabitants of the villages close to the thermal springs of Kaswa/Mahagi with a view to better guiding them in the exploitation of this potential. Such an evaluation is carried out in the holistic approach, taking into consideration three of these known aspects and focusing on the problem to be solved within the targeted community as suggested by Essi and Njoya (2013).

The evaluation of knowledge is of interest in identifying areas of capacity building for this targeted population, means that can facilitate understanding and action on what constitute the obstacle to the reduction of bad practices (Sparks, Guthrie, and Shepherd,1997; UNAIDS, 2011). The study of practices will make it possible to prepare better guidance for this population and constitutes the main indicator of social and economic promotion of these thermal waters within the community concerned (Guerin-Beauvois, 2000; Cressier, 2002; Goutille, 2009). The evaluation of attitudes will lead to the highlighting of behaviours relating to perceptions, beliefs, representations and motivations regarding the thermal waters of Kaswa/Mahagi and will make it possible to take into account the socio-cultural specificities which influence the adoption of good practices within this community (Laurencelle, 1998; Kibora, 2022). Finally, this evaluation is an important step allowing the definition of a communication strategy for the population benefiting from the thermal waters of Kaswa/Mahagi.

2.0 MATERIAL AND METHOD

This study took place in the Ituri Province in Mahagi territory in the Mokambo Chiefdom, near Lake Albert. Its surface area is 470 km² and its capital is located in Apala (Omasombo, 2021). Fourteen (14) villages near the Lake Albert and not far from the thermal springs were targeted for the surveys according to their accessibility. These villages as well as the number of respondents transcribed in parentheses are as follows: Awasi-Juparawang' (14), Jupamaa (60), Anju (9), Kagondo (26), Jupajok (39), Lalimbi-Kaswa (56), Pawang' (12), Kwakelo (10), Ramogi (13), Kwai-Akelo (9) Jupulobo (24), Jupudok (14), Jupasonga (11) and Pachira (26). Figure 1 shows the mapping of the study sites. The coordinates of the different villages were taken using the GARMIN brand "eTrex®10" GPS (global positioning system) device, its accuracy being 10 m.

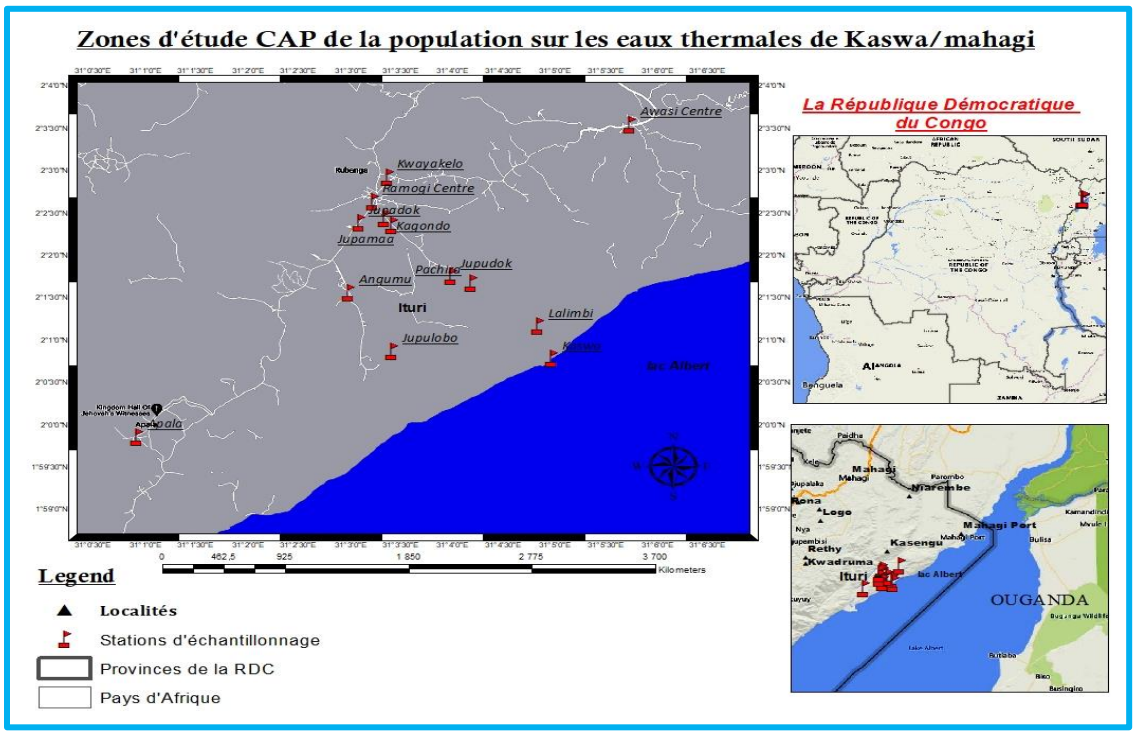

Figure 1: *The KAP study areas of the population of the Mokambo chiefdom on the thermal waters of Kaswa/Mahagi (Ituri, D.R. Congo.*

The study carried out is transversal and participatory with communities and was carried out according to the KAP (Knowledge, Attitudes and Practices) approach (WHO, 2008; Seck, Fall, Faye and Ba, 2008). An in-depth interview based on a pre-validated questionnaire as guide was conducted within the target population, over a period of three months, from 15th January to 12th April 2022. The sampling carried out was of the random type during which a sample of 323 individuals was formed by the application of the Schwartz formula: $N = t^2 \times p\,(1-p)/ p\alpha^2$ (where N is sample size, t is the 95% confidence level, l the corresponding standard deviation being 1.96, p is the rate of the population estimated to have already visited the thermal springs, 1-p is the complementary percentage and α is the margin of error at 5%, its standard value being 0.05)

(Schwartz, 1998). The survey was carried out as recommended by Tillé (2019). The people eligible for interviews were those met in the selected households and available for the interview, adult men or women (≥ 18 years old), users or enthusiasts of these thermal waters likely to provide the necessary information, orally or by completing the questionnaire investigation, according to his free consent and in anonymity.

The independent variables retained are the sociodemographic characteristics of the targeted population, in particular sex, age and occupation. The dependent variables are the knowledge, attitudes and practices of the population regarding the thermal waters of Kaswa/Mahagi. The statistical parameters calculated are the simple and percentage frequencies, the Chi-square (χ^2) test with the Yates correction if necessary (at the significance level α=0.05) for comparison of frequencies, contingency coefficient (C) in order to evaluate the intensity of the statistical link between two variables. Calculations and graphs were carried out using SPSS, Excel and PAST software.

3.0 RESULTS

3.1 Descriptive Studies

3.1.1 Sociodemographic Characteristics.

Considering the gender variable, men were in the majority (83.19%) compared to a minority of women (16.81%) (Figure 2). The age of the respondents was between 20 and 86, respondents in the age group 40-69 represented 62.54%. According to their occupations, most of the people interviewed were farmers (59.44%), followed by fishermen (20.74%), civil servants (10%), local leaders (5%) and economic operators (4.82%).

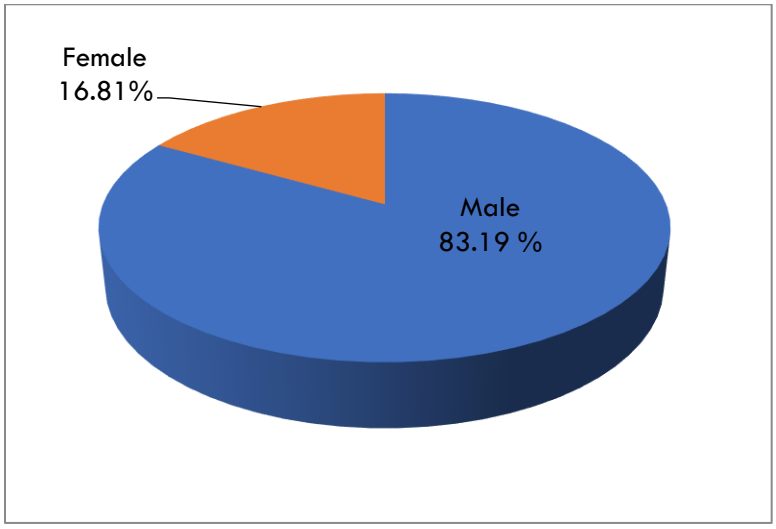

Figure 2: *Distribution of respondents by gender.*

3.1.2 Knowledge of the Natives About Thermal Waters

a) Knowledge of the Existence and Location of Thermal Waters

The people interviewed all (100%) affirm the presence and location of thermal springs in their environment**.**

b) Knowledge of Indigenous Names of the Thermal Waters and Their Meanings

The study shows that all respondents knew at least one indigenous name attributed to thermal waters but were unaware of the meaning of certain names (Table 1).

Table 1*: Names given to the thermal waters of Kaswa/Mahagi according to respondents.*

N°	Local name	Meaning	Frequency (%)	
			Yes	No
1	*Avuka (Alur language)*	« who heals wounds »	50.77	49.23
2	*Lilida (Lendu)*	« hot water »	100	0
3	M*ayi moto (Swahili)*	« hot water »	100	0
4	*Mayi baraka (Swahili)*	« holy water »	12.44	87.56
5.	*Pi malieth (Alur)*	« hot water »	100	0

We note that 50.77% of people surveyed affirmed knowledge of the meaning of the indigenous name "Avuka" attributed to thermal springs referring to the healing of wounds, while 49.23% of the respondents did not know. The meaning of the name "Mayi baraka" was known by 12.44% of respondents against 87.56% did not know it.

c) Knowledge of the Origin of the Heat of Thermal Waters

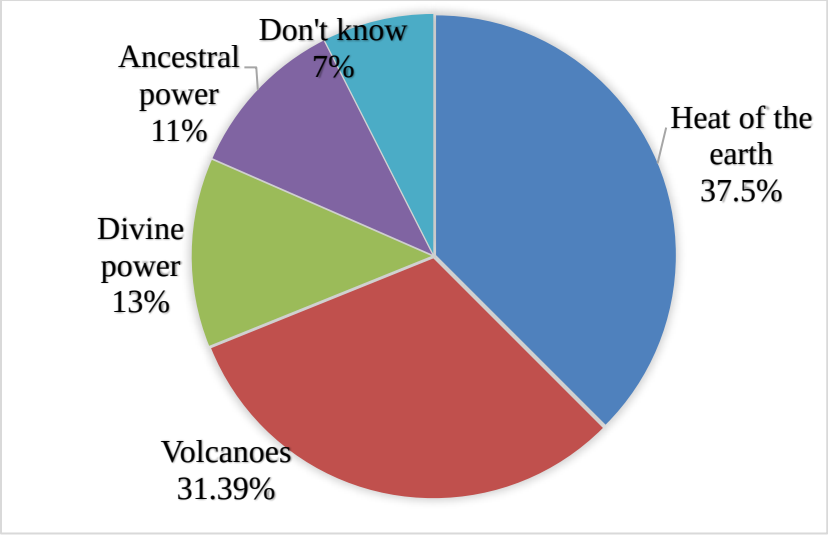

Figure 3: *Responses from respondents on the origin of the heat from the thermal waters of Kaswa/Mahagi.*

The heat of the thermal waters of Kaswa/Mahagi comes from the heat of the earth (thermal gradient) and the volcanoes declared respectively by 37.5% and 31.39% of the respondents. On

the other hand, 12.68% and 10.95% of those interviewed mentioned the divine and ancestral power respectively, while 7.48% declared that they did not know the origin of this heat (Figure 3).

d) Knowledge of the Values Given to the Thermal Waters of Kaswa/Mahagi

Figure 4 shows that 49.05% of those questioned expressed that thermal waters serve as medicine. For 39.18% of respondents, these are hot springs and a hot bath place; 9.29% mention that it is the ancestral place of worship. A small proportion (2.48%) of the respondents expressed that these hot springs relieve bodily discomfort.

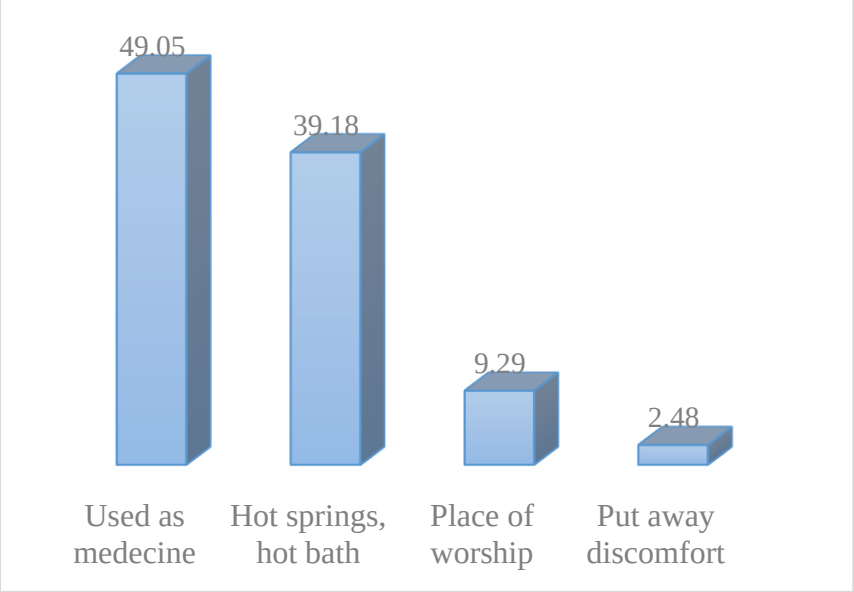

Figure 4. *Perception of indigenous people on the values given to the thermal waters of Kaswa/Mahagi.*

e) Origin of Information

This study shows that information about thermal waters is transmitted over generations, from parents to family members, declared by 52.29% of respondents, friends and acquaintances according to 22.91% of interviewees, fishermen from Kaswa camp and followers of the ancestral cult Lam The Kwaru as affirmed respectively by 9.91% and 12.24% of participants as well as other users who have experienced its virtue according to 2.65% of those questioned.

3.1.3. Population Practices Related to the Use of Thermal Waters

a) Reasons for Frequenting the Thermal Springs

The study reveals that 52% of people interviewed say they use these thermal waters for hot bath, 25.39% of respondents mention that users go there to treat themselves, 14.55% of respondents give the reason of curiosity while 8.05% of interviewees mention the laundry reasons (Figure 5).

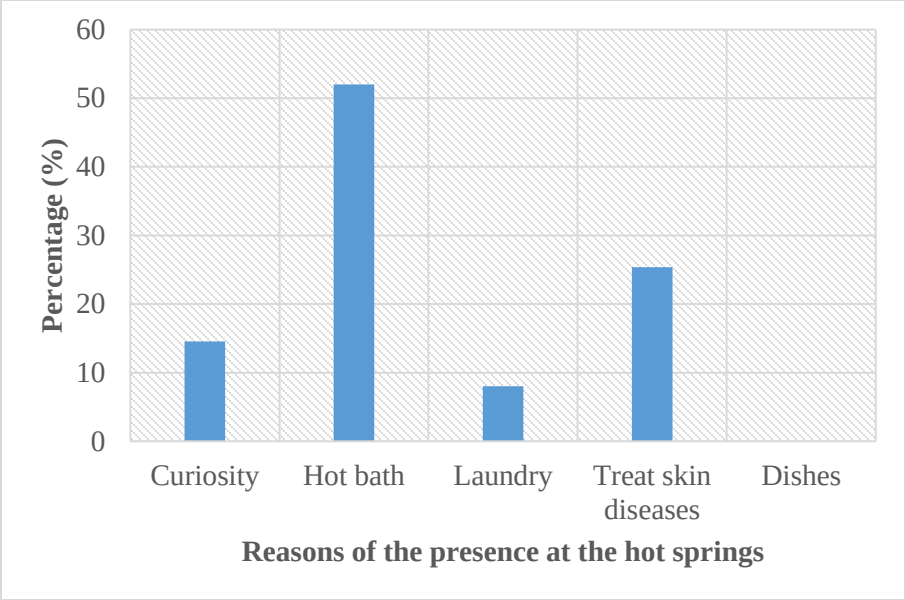

Figure 5. *Distribution of respondents according to the reasons for their presence at the Kaswa/Mahagi thermal springs*

b) Daily Number of People Visiting Thermal Springs

This study also shows that 46.13% of people questioned affirm that more than 100 people visit daily these thermal waters; others declared smaller numbers. Furthermore, 11.76% of respondents have no details on this point (figure 6).

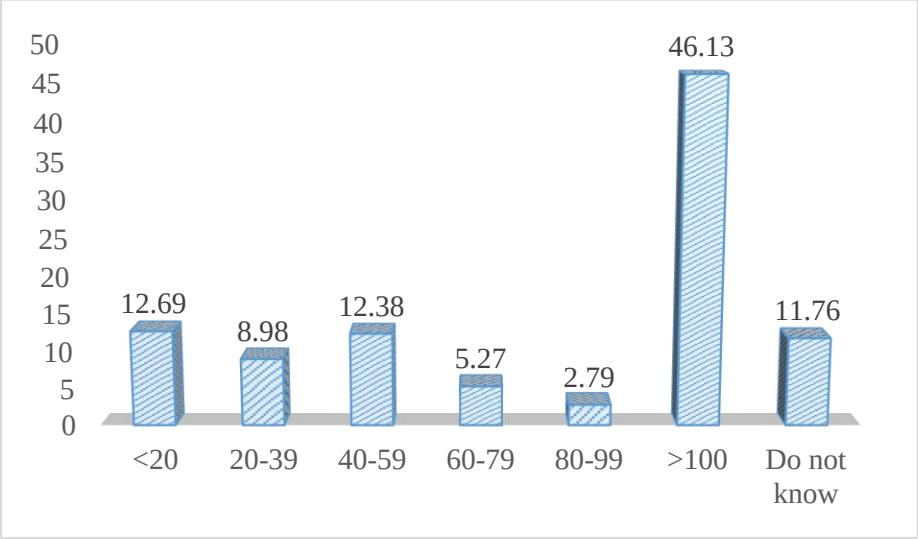

Figure 6. *Daily number of people visiting the Kaswa/Mahagi thermal springs.*

c) Time of Attendance

The majority of respondents (41.16%) mention that users go there when they feel bodily discomfort. 26.63% of respondents declared at any time, other interviewees mentioned attendance in the morning (11.32%), in the evening (14.08%) but also in the middle of the day (6.81%).

Table 2: Distribution of respondents in relation to the time of frequentation of thermal springs by the population.

N°	Time of attendance	Frequency	Percentage (%)
1	Morning	37	11.32
2	Daytime	22	6.81
3	Evening	45	14.08
4	Whenever	86	26.63
5	In case of discomfort	133	41.16
	∑	323	100

d) Dermatological Conditions Treated

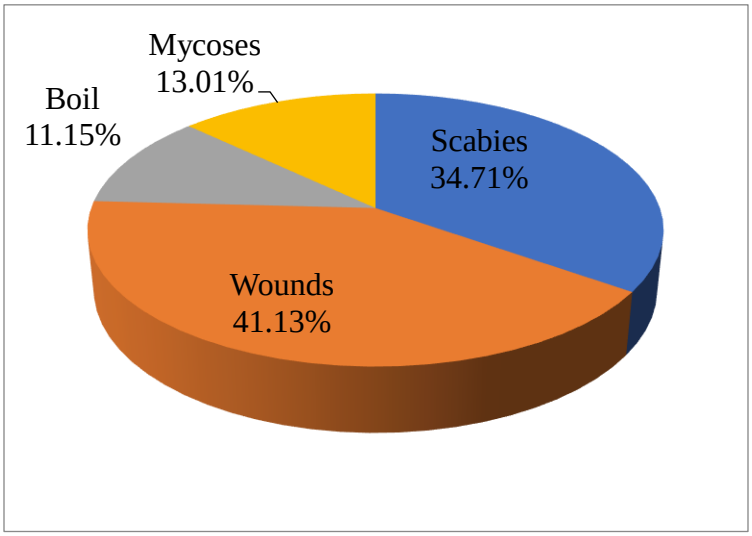

Figure 7: Distribution of respondents in relation to dermatological conditions affected by the thermal waters of Kaswa/Mahagi.

Regarding dermatoses, treatment of wounds was mentioned by 41.13% of respondents, scabies by 34.71% of respondents, while the treatment of fungal infections and boils were mentioned respectively by 13.01% and 11.15% (Figure 7).

e) Method of Treatment

Treatment by bathing was declared by 58.51% of respondents followed by drinking stated by 31.27% of interviewees. Washing the affected part and inhaling the steam was also expressed respectively by 7.43% and 1.86% of respondents (figure 8).

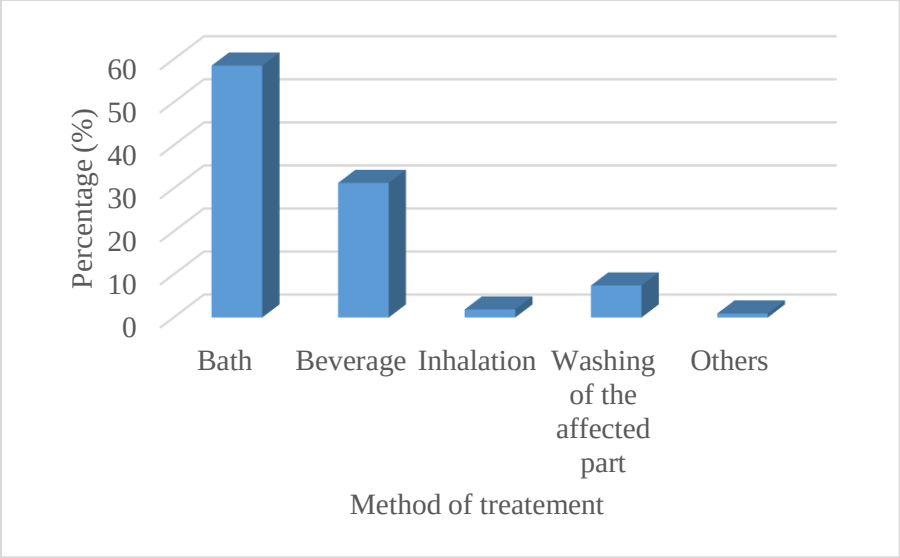

Figure 8: *Method of treatment with the thermal waters of Kaswa/Mahagi according to the respondents.*

f) Healing Profile

The majority of respondents (89.16%) affirm total healing by thermal waters compared to a minority (6.81%) affirming partial healing. Furthermore, 4.03% of people surveyed refrained from giving answers to this question (figure 9).

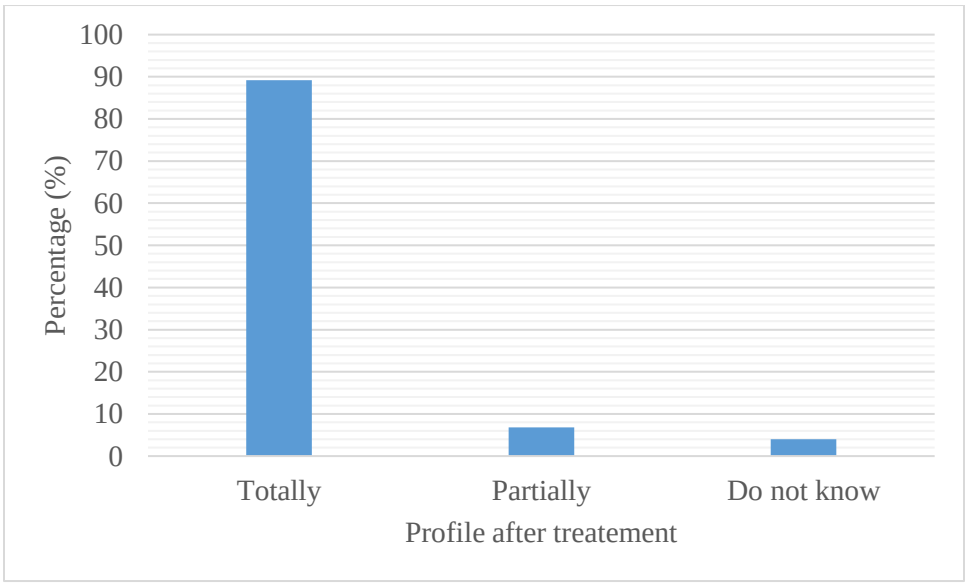

Figure 9: *Healing profile after treatment with Kaswa/Mahagi thermal waters according to the respondents*

3.1.4. Attitudes of the Population Towards the Thermal Waters of Kaswa/Mahagi

Table 3. Some attitudes mentioned by the respondents towards the thermal water of Kaswa/Mahagi

		Frequency (%)		
N°	**Attitudes listed**	**Yes (%)**	**No (%)**	**Don't know**
1	Expression of belief in divinity power	79.88	1.55	13.58
2	Practice of rituals at the sources	87.22	2.91	9.87
3	Springs protection measures	45.20	51.70	3.10
4	Feeling of nuisance	3.00	95.35	1.65

The study shows that 79.88% of people questioned mention the belief in divine manifestation through the thermal spring and 87.22% affirm the practice of rituals of certain groups of people. However, 45.20% of respondents affirm the implementation of measures to protect thermal springs compared to 51.70% declaring the opposite. Finally, no discomfort or nuisance is felt after using these thermal waters according to 95.35% of people questioned.

3.2. Analytical Study

3.2.1. Analysis of knowledge based on determining factors

Table 4: Analysis of knowledge considering the determinants.

Knowledge	*Sex*				*Age*				*Occupation*			
	χ^2_{obs}	$\chi^2_{th.05}$	SS	C	χ^2_{obs}	$\chi^2_{th.05}$	SS	C	χ^2_{obs}	$\chi^2_{th.05}$	SS	C
Meaning of "Avuka"	42.75	3.84	S	0.34	29.10	12.59	S	0.29	39.71	9.49	S	0.33
Origin of heat	6.32	7.81	NS	0.11	6.34	21.03	NS	0.10	62.25	21.03	S	0.50
Values granted	5.30	7.81	NS	0.10	1.36	21.03	NS	0.07	47.39	21.03	S	0.36
User categories	37.29	11.07	S	0.32	17.47	43.77	NS	0.23	78.19	31.41	S	0.46
Information source	28.65	7.81	S	0.28	5.24	21.03	NS	0.29	44.87	21.03	S	0.35

Legend: χ^2_{obs} : Chi-square observed or calculated; $\chi^2_{th.05}$: Theoretical or tabular chi-square at the significance level 0.05 ; SS : statistical significance; S : significant; NS : not significant; C : contingency coefficient.

- **Sex**: knowledge of the origin of heat and the values given to thermal waters was declared practically at the same frequency by men and women, the differences observed being non-significant (χ^2_{obs}=6.33 and 5.30< $\chi^2_{th0.05}$=7.81), which shows the independence of this determinant on theses knowledges. On the other hand, knowledge of the meaning of the indigenous name "Avuka, the category of users and the sources of information differ in the two sexes (P>0.05), thus showing their dependence, the statistical link being weak (C=0.34, 0.32 and 0.28).

- **Age**: only knowledge of the meaning of the indigenous name "Avuka" depends on the age of the respondents, the difference in frequency of declaration being significant (χ^2_{obs}=29.10> $\chi^2_{th0.05}$=12.59).
- **Occupation**: knowledge about the thermal waters of Kaswa/Mahagi differs significantly among the respondents considering their occupations (P>0.05). All knowledge depends on this determinant, the statistical links are between 0.33 and 0.50 (weak and moderate).

3.2.2. Analysis of Practices Based on Determining Factors

Table 5: Analysis of practices according to the determinants**.**

Practice	Sex				Age				Occupation			
	χ^2_{obs}	$\chi^2_{th.05}$	SS	C	χ^2_{obs}	$\chi^2_{th.05}$	SS	C	χ^2_{obs}	$\chi^2_{th.05}$	SS	C
Reasons for attendance	5.22	7.81	NS	0.12	22.09	28.27	NS	0.25	127.2	21.03	S	0.53
Attendance numbers	3.79	5.99	NS	0.11	27.55	28.27	NS	0.28	36.24	21.03	S	0.32
Attendance time	6.31	9.49	NS	0.14	36.63	36.42	S	0.32	62.89	26.3	S	0.41
Dermatoses concerned	4.58	7.81	NS	0.12	26.68	36.2	NS	0.28	31.38	21.03	S	0.30
Processing method	6.48	9.49	NS	0.14	24.25	28.87	NS	0.27	87.84	26.3	S	0.49
Healing profile	8.12	5.99	S	0.27	3.93	21.03	NS	0.11	107.2	15.51	S	0.53

- **Sex**: responses on the recovery profile are dependent on the "sex" variable of the respondents (χ^2_{obs}=8.12>$\chi^2_{th0.05}$=5.99) with a weak statistical link (C=0.27). the other practices are independent of the sex of the respondents (P<0.05).
- **Age**: the time of visiting thermal springs are different (χ^2_{obs} =36.63>$\chi^2_{th0.05}$=36.42) and weakly dependent on the age of the users. The other practices are independent of the age of the users considering the threshold of significsnce α=0.05 (P<0.05).
- **Occupation**: the declaration of the practices listed shows significant differences (P>0.05), therefore dependent on the occupations of the users, the statistical link being weak or moderate.

3.2.3 Analysis of Attitudes Based on Determining Factors

Table 6: Analysis of attitudes according to the determinants

Attitude	Sex				Age				Occupation			
	χ^2_{obs}	$\chi^2_{th.05}$	SS	C	χ^2_{obs}	$\chi^2_{th.05}$	SS	C	χ^2_{obs}	$\chi^2_{th.05}$	SS	C
Belief in the divine	2.47	5.99	NS	0.09	92.98	21.03	S	0.47	92.98	21.03	S	0.54
Practice of rituals	2.51	5.99	NS	0.09	92.98	21.03	S	0.47	130.7	15.51	S	0.56
Source protection	4.87	5.99	NS	0.12	1.65	11.07	NS	0.07	30.47	9.49	S	0.29
Feeling unwell	3.21	5.99	NS	0.10	17.84	21.03	NS	0.23	11.91	15.51	NS	0.19

- **Sex**: the attitudes listed were declared at the same frequencies in both sexes, therefore independent of this variable (P<0.05); the statistical link C varying between 0.09 and 0.12.
- **Age**: The respondents' responses concerning belief in the divine power and presence of rituals differ significantly depending on the age of the respondents (χ^2_{obs}=92.98> $\chi^2_{th0.05}$=21.03) with a moderate statistical link (C=0.47). However, the response to the question of protection of thermal springs and the feeling of discomfort after using the thermal waters were reported

similarly among respondents of different age groups ($\chi^2_{obs}=1.65<\chi^2_{th0.05}=11.07$ and $\chi^2_{obs}=17.84<\chi^2_{th0.05}=21.03$), therefore these attitudes are independent of the age of the interviewees.

- **Occupation**: the answers provided by the people questioned about the discomfort felt after treatment with thermal waters are not significantly different considering their occupations ($\chi^2_{obs}=11.91<\chi^2_{th0.05}=15.51$). The other attitudes depend on the occupations of the respondents, the statistical link being weak or moderate (C=0.29-0.56).

4.0 DISCUSSION

4.1 The Knowledge

This study shows that there is good knowledge among the population about the presence and location of the thermal waters of Kaswa/Mahagi. Various names were attributed by the natives to these thermal waters and the natives know at least one of these names but not necessarily their meanings, except the names which reflected the heat of these waters. Indeed, men, especially the oldest people, had a good knowledge of the meaning of the indigenous name "Avuka", declared by 50.77% of respondents ($\chi^2_{obs.}=29.09>\chi^2th._{0.05}=12.59$, ddl= 6), the dependence link being weak (C=0.29).

Regarding the origin of the heat of the thermal waters of Kaswa/Mahagi, the majority of the population mainly mentioned the influence of the heat of the earth (37.5%) and the volcanic origin (31.39%), the others alluded to divine and ancestral power. This knowledge was independent of the sex and age of the population but depended on their occupations with a moderate link of dependence (C=0.50). Indeed, the heat of thermal waters can come from geothermal gradients or magmatic heat in volcanic regions (UNDP, 2016).

Concerning the value or virtue given to thermal waters by the natives, these thermal waters serve as remedies and constitute a place for hot bathing, affirmed respectively by 49.05% and 39.18% of respondents. These values are known to both women and men in all age groups studied ($P<0.05$) but opinions differed depending on the participants' occupations.

The study also shows that the sources of information about thermal waters are parents or other family members, friends, followers of ancestral worship and fishermen in permanent contact with these thermal waters. Information is transmitted differently and not through formal teaching or training or awareness raising. The sources of information are weakly dependent on the sex and occupations of the respondents (C=0.28 and C=0.35) (table 3).

4.2 Practices

From this study, it appears that the population uses the thermal waters of Kaswa/Mahagi for two main reasons, notably the hot bath to relieve their body fatigue and the treatment of their skin conditions. The dermatoses concerned are mainly wounds and scabies declared by 41.13% and 34.71% of those questioned. The treatment of their fungal infections and boils was mentioned by a minority of respondents, 13.02% and 11.15% respectively (figure 10). The affirmation of this practice was independent of the sex and age of the respondents; however, it varied according to the functions of the respondents. In fact, farmers, fishermen and local leaders made more use of

these practices than civil servants and economic operators. The use for the fight against dermatoses mentioned by the population is justified by the fact that the thermal waters of Kaswa/Mahagi are sulfurous and rich in mineral ions capable of relieving skin conditions (Budju et al., 2023), sulphur having a local anti-inflammatory and immune action and therefore acts on dermatoses (Predmore, 2012).

Regarding the healing profile, the majority of people questioned (89.16%) mentioned the total disappearance of the dermatological condition and muscular discomfort in general. However, a minority representing 6.81% mentioned a partial cure (figure 12). This practice was independent of the age of the people interviewed but dependent on their gender and occupations ($P>0.05$) (Table 5. According to Berthier et al., (2018), thermal waters help improve certain quality of life parameters as well as the level of physical activity.

The treatment is carried out mainly by washing the affected part or by hot bath. The time of use remains variable and depends on the availability of each user. These thermal waters are generally used hot and at the source itself, the number of users or the thermal water lovers daily reaches around a hundred people affirmed by 46.13% of respondents (figure 10). However, this number remains lower than that of the thermal waters of Avène (France) where the daily number of guests can reach around 800 people.

4.3 Attitudes

It emerges from this study that the population demonstrates belief in ancestral and divinity power, through rituals at thermal springs, mentioned respectively by 79.88% of respondents and 87.22%. These rituals are led by the leaders of a local religion called Lam "The Kwaru", using the virtues of these thermal waters. The study shows that the explanations given to this belief and to the different rituals depend on the age ($\chi^2_{obs}=92.98>\chi^2th,_{0.05}=21.03$, ddl=12, C=0.47) and the occupations of the interviewees ($\chi^2_{obs}=130.70> \chi^2th,_{0.05}=15.51$), the dependence link being moderate for both cases (C=0.54 and 56). Indeed, older people, fishermen and followers of ancestral cults had more information on these attitudes compared to other users. These observations are similar to those made by Duriez (2006) in the case of the thermal waters of Greece and other European thermal waters where man has long believed in divine power, with hygienic practices where the health of the body and souls remains always associated.

Concerning the measures to protect these hot springs, opinions are divided because 45.20% of respondents mentioned irregular cleaning around the thermal springs by a follower of the ancestral religion compared to 51.70% declaring the opposite, varying according to the occupations of the people interviewed with a weak dependency link (C=0.29). However, no awareness activities are carried out for the protection of these hot springs affirmed by all the interviewees. Users do not feel any nuisance following the use of these thermal waters as declared by 95.35% of those interviewed. This statement was independent of the sex, age and occupation of the respondents ($p<0.05$).

5.0 CONCLUSION

The aim of this study was to analyse the level of knowledge, attitudes and practices of the Mokambo population regarding the thermal waters of Kaswa/Mahagi. Through an in-depth interview with the communities and in the participatory approach, the results showed that the population shows a certain knowledge acquired by common sense on the origin of heat and has a good knowledge of the values of the thermal waters of Kaswa /Mahagi, which is transmitted by parents to descendants. Practices based on personal hygiene and therapeutic effects on skin conditions are the most developed by the population. These practices are generally carried out by hot bathing in thermal springs but also by simple washing of the affected part. Despite the progress of modern medicine in these environments, traditional spa treatments as well as curiosity at the Kaswa/Mahagi thermal springs still have their place. The attitudes adopted by the population towards these thermal waters remain focused on the belief in ancestral and divine power that the followers express through appropriate rituals bringing together countless people in certain periods at the thermal springs. The results of this study constitute essential basic information for multidisciplinary research to be carried out in order to shed more light on this population which already uses these natural resources and derives many benefits from them.

REFERENCES

Bagalwa, M., Karume, K., Iragi, K., Kubisimbwa, M., Burume, N., Ndahama, N. & Bayongwa, C. (2015). Physico-chemical characterization and identification of indicator plant species of thermal waters of Katana, South Kivu, Democratic Republic of Congo. *Afrique Science,* 11 (5), 406-421.

Bernier, J., Parent, E. & Boreux, J.J. (1999). *Statistics for the environment: Bayesian treatment of uncertainty.* Paris : Tec&Doc.

Budju, L., Ibebeke, I., Sikulisimwa, P. (2023). Hydrogeochemical study of the thermal waters of Kaswa/Mahagi in the North-East of the Democratic Republic of Congo. *Int. J. Biol. Chem. Sci.*, 17 (5), 2089-2101. DOI: 10.4314/ijbcs.v17i5.26

Cressier, P. (2002). Take the waters in Al-Andalus. practice and attendance of the "ḥamma", PUV. *Médiévales*, 43, 41-54.

Duriez A. (2006). Origin and mineralization process of thermal waters in the Mediterranean continental environment: case of the Thermopylae geothermal system (Greece). [Thesis, University of Paris S 11].

Esseqat, H. (2011). R*enewable energies in the Democratic Republic of Congo, UNEP,* 5-45.

Essi, M.J. et Njoya, O. (2013). The KAP (Knowledge, Attitudes, Practices) Survey in Medical Research. *Health Sci. Dis.*14(2), 1-3.

Goutille, F. (2009). *Knowledge, attitudes and practices in risk education: implementing KAP studies.* Handicap International, Lyon.

Guerin, B. M. (2000). Hydrotherapy practices in the cities of Roman Italy. *Urban history:* 123-144.

Kibora, L. (2012). The study of population perceptions and development practices. *APAD Bulletin*, 34-36.

Luse, B. & Makonga, M. (2019). Geochemical Analysis of Lilida geothermal spring, *Bulletin de la société royale des sciences de liège*, 88, 44–55. DOI : http://dx.doi.org/10.25518/0037-9565.8477

Madigan, M. & Martinko, J.J. (2007). Biology of microorganisms (11^{e} edn) (154-156). Paris : PEF.

Mbuluyo, M. & Faidance, M. (2018). Morphostructural map of Kasenyi plain (Ituri – DR Congo). *Geo-Eco-Trop*, 42, 11-18.

Laurencelle, L. (1998). *Theory and techniques of instrumental measurement*. Sainte-Foy : University of Quebec, Press 5.

Omasombo, T. (dir.) (2021). *Ituri. Lands and entities under tension*, Africa Museum Tervuren : Belgique, pp.573-576.

ONUSIDA (2011). *Securing the Future Today. Synthesis of strategic information on HIV and young people.* UNAIDS/JC2112F, Geneva, 112p.

Predmore, B.L., Lefer, D.J. & Gojon, G. (2012). "Antioxid". *Redox Signal*, 17, 119-140.

Seck, I., Fall, I.S., Faye, A. & Ba, O. (2008). Knowledge, attitudes and practices of women on malaria in the rural area of Poponguine., Senegal. *Med Trop*, 68, 629-633.

Schwartz, L. (1998). *Distribution theory*. Hermann, 418 p.

Sparks, P., Guthrie, C. and Shepherd, R. (1997). The dimensional structure of the perceived behavioural control construct. *Journal of Applied Social Psychology*, 27, 418-38.

Tille, Y. (2019). *Sampling theory, 2nd edition: Sampling and estimation in finite populations*. Neuchâtel : Dunod, pp13-24.

UNDP (2016). *Atlas of renewable energies of the Democratic Republic of the Congo (2nd edn)(44-45).* Ministry of the Environment and Sustainable Development, DRC.

WHO (2008). *Advocacy, communication and social mobilization for TB control. A guide to developing knowledge, attitude and practice surveys.* World Health Organization, Geneva.