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OBSERVATIONS OF COOPERATIVE POND FISHING BY THE BAYAKA AND BANTU PEOPLE IN THE FLOODED FOREST OF THE NORTHERN REPUBLIC OF CONGO

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ABSTRACT The subsistence techniques of the Congo Basin peoples are diverse and well-adapted to local ecological and socio-cultural contexts. Besides well-known fishing techniques using dams, nets, barriers, or poison, the BaYaka and Bantu in the northern Republic of Congo use ponds dug by humans, called *mosongo*. In the flooded forest, the ponds function as fish traps when fish seek refuge there at the end of the dry season. In March 2020, the authors conducted participant observation and interviews with the BaYaka and Bantu who engaged in pond fishing. Some *mosongo* were inherited from and managed by informants' grandmothers or mothers. Generally, the Bantu fisher-farmers visit this area once a year to make money with the catch from pond fishing. As in a variety of foraging activities, the Bantu recruit the BaYaka for labor and compensate them with some fish. Much surplus catch is sold in markets. For the BaYaka, pond fishing was one of their important seasonal subsistence activities. Yet, the BaYaka also sold surplus fish to the Bantu. This report provides additional evidence for the diversity in subsistence techniques in the Congo Basin, and reaffirms the importance of inter-ethnic relationships in the subsistence strategies in this region.

Key Words: Fishing technique; Flooded forest; *Mosongo*; Congo Basin; Inter-ethnic relationship.

INTRODUCTION

The northern Congo Basin is inhabited by the largest contemporary population of mobile foragers on Earth (Verdu et al., 2009). These Congo Basin forest foragers live in the world's second largest contiguous lowland tropical rainforest (Olivero et al., 2016). Far from being homogenous, this terrain varies in its ecological diversity across the vast region that the foragers occupy (Lewis, 2005; Olivero et al., 2016), and is therefore an ideal place to investigate diversity in the local cultural adaptations among these peoples. For example, Hewlett (1996) described the cultural and economic diversity among the different ethno-linguistic forager groups. However, microscale variation in subsistence practices found among the localized sub-populations has received little attention despite what it can tell us about the spatial and time scales of human adaptation and flexibility in the region.

The BaYaka are a group of several populations of Congo Basin forest foragers living in the northern Republic of Congo and Southwestern Central African Republic, including those referred to as the Aka (e.g., Bahuchet, 1985; Hewlett, 1996), Mbendjele (e.g., Lewis, 2008), BaYaka (e.g., Salali et al., 2016; Boyette et al., 2020), or Mbendjele-BaYaka (e.g., Sonoda et al., 2018; Jang et al., 2019). The BaYaka practice a wide range of subsistence activities from hunting and gathering, to fishing, farming, day laboring and trading. Some groups rely less on traditional collective hunting in terms of subsistence, but for those who still actively do, much variation in hunting strategy has been observed according to region. Hewlett (1996) described the different hunting techniques among the well-documented four pygmy groups, the Mbuti and Efe of the Ituri rainforest in the northeastern Democratic Republic of the

Congo, and the Aka and Baka in the northwestern Congo Basin. In the Ituri rainforest, the Mbuti practice net hunting (Tanno, 1976; Ichikawa, 1983), whereas the Efe engage more in bow-and-arrow hunting (Terashima, 1983). In the northwestern Congo Basin, both the Aka and Baka use snares for hunting (Kitanishi, 1995; Yasuoka, 2014). In addition to this, the Aka predominantly practice net hunting (Bahuchet, 1985; Noss & Hewlett, 2001; Lupo & Schmitt, 2005), whereas the Baka practice collective spear hunting (Bahuchet, 1992). Crucially, it seems that the balance in different techniques vary greatly from place to place even in the same ethno-linguistic forager group. For example, in the Motaba River region of the Likouala province of the northernwestern Republic of Congo where the authors focus here, the BaYaka in Linganga-Makaou along the upper Motaba River were observed to have practiced net hunting within the last 30 years (Kitanishi, 1995). However, net hunting was not observed in nearby villages along the lower Motaba River, and no BaYaka family owned nets during our prior five years of fieldwork.

Foragers and agriculturalists in the Congo Basin are also well known for their diverse fishing techniques using dams, barriers, hooks and lines, nets, and poison (Oishi, 2005; 2016). Regional differences in fishing activities have also been reported. For instance, Kitanishi (1995) observed the BaYaka of Linganga-Makaou to fish infrequently. In contrast, fishing is reported to continue today as one of the most important subsistence activities of the BaYaka living along the lower Motaba River as well as during the time of this study (Kitanishi, 1995; Komatsu, 1998). In this region, the BaYaka use a variety of fishing methods to complement their protein intake (Komatsu, 1998). They seasonally practice collective fishing by damming a part of a stream and bailing water from it (dam fishing), using fish-poison extracted from plants (poison fishing), setting nets perpendicularly to river shores (net fishing), or constructing a barrier in small streams in the forests (barrier fishing), as well as individually go fishing with hook-and-line. In addition, the BaYaka in the flooded forest to the south-east of the Motaba and Ibenga Rivers were reported to frequently and systematically fish in the swamps (Kitanishi, 1995). The prominence of fishing among the subsistence strategies in this area and the diversity of technologies involved attests to the peoples' fine-tuned cultural adaptations to the complex ecosystem.

This paper focused on the pond fishing technique in the flooded forest, called *mosongo*, practiced by the BaYaka and Bantu populations in the northern Republic of Congo. The term, *mosongo*, refers to artificial fish ponds which can be either one large pond or several deep ponds connected to one another. Pond fishing is a collective fishing method in the floodplain that consists of scooping out the water from the ponds at the end of the dry season and capturing fish that have sought refuge there. This method has been observed in other parts of the floodplain in the Congo Basin including Cameroon (Carrière, 2003; Dounias, 2011), the Democratic Republic of Congo (Van Leynseele, 1979; Harms, 1989; 1999) and the Republic of Congo. In the Republic of Congo, a few Bantu ethnic groups in the Cuvette region were observed to practice pond fishing (Comptour et al., 2016). Yet it has not been reported previously in the Likouala region of the northern Republic of Congo. This paper details pond fishing in this region within the framework of inter-ethnic relations between the BaYaka and the non-BaYaka peoples who cooperate in a range of foraging activities.

There is a closely woven history of diverse and complex relationships between the BaYaka and Bantu peoples who inhabit the Congo Basin (Bahuchet & Guillaume, 1982; Joiris, 2003; Lewis, 2005). For example, the BaYaka use some of the products from their daily foraging activities not only to consume on their own but also to exchange with the non-BaYaka villagers (Kitanishi, 1994). Subsistence techniques used by the BaYaka have diverse origins and some are adopted from the local non-BaYaka agriculturalists, typically Bantu groups in the same region (Bahuchet, 2014). For instance, the net hunting widely known as an Aka

hunting technique originated with the Bantu (Bahuchet, 1987). Conversely, bow-and-arrow hunting which once appeared to be unique to the Efe is now shared by all the Sudanic language speaking populations of that region (Bahuchet, 2014). Thus, the history of subsistence technology appears to be one of exchange across all the populations of the Congo Basin. A few studies have also explored the inter-ethnic relations during dam fishing expeditions in the dry season when the BaYaka and their Bantu neighbors share seasonal fishing camps (Hanawa, 2004; Oishi, 2010; 2016). The social tensions accumulated in the villages due to imbalance in exchange seemed to ease when both groups stayed in fishing camps and cooperated in dam fishing, probably due to reciprocal benefits (Hanawa, 2004; Oishi, 2010; 2016).

This paper shows that pond fishing activities observed in the lower Motaba River region reveal certain features of the local inter-ethnic relations that helps add to the deeper understanding of forager-farmer relationships in the Congo Basin. We conclude that any analysis of the BaYaka subsistence behaviors and practices must acknowledge the diverse and dynamic influences from the non-BaYaka interlocutors on spatial use and foraging decision making.

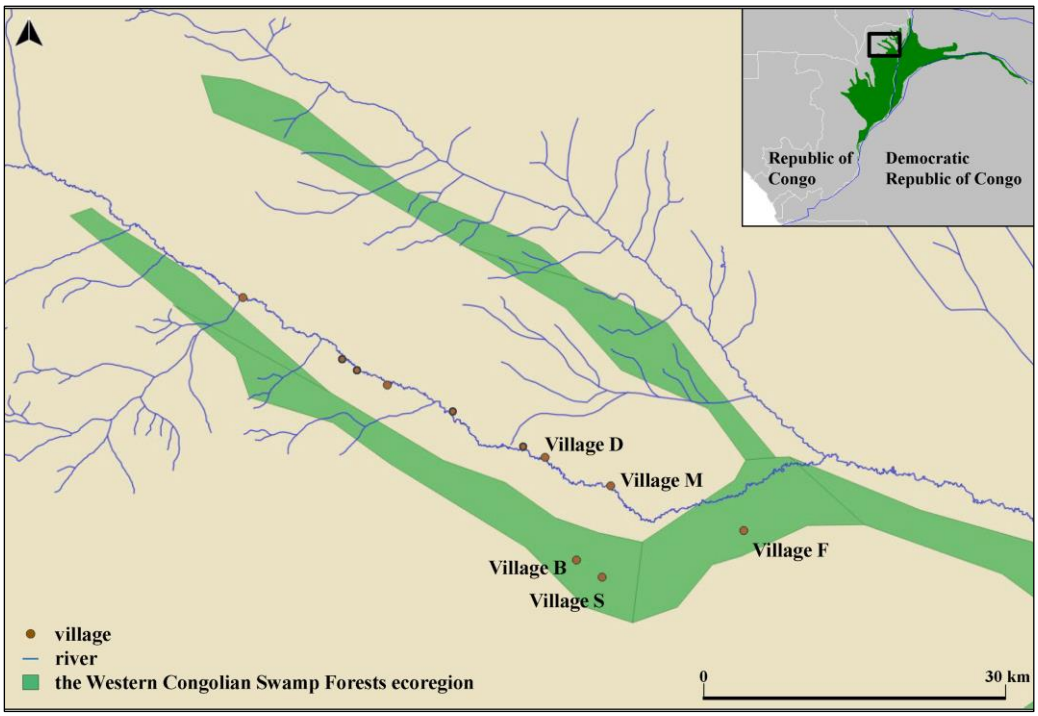

Fig. 1. The study area in the Motaba River region in the Likouala department of the Republic of the Congo. Points represent villages along Motaba River mentioned in the paper. Shaded polygon represents a part of the Western Congolian Swamp Forests ecoregion. The shaded region in the map inset shows the entire ecoregion of the Western Congolian Swamp Forests stretching from the eastern Republic of the Congo to the western Democratic Republic of the Congo.

METHODS

The authors conducted a case study with one BaYaka group at the Motaba River region in the department of Likouala of the northwestern Republic of Congo. During the rainy season, the BaYaka stay in a segregated neighborhood in Village M (Fig. 1), occupied by Bandongo fisher-farmers. The BaYaka stay in this Bantu village for two to three months a year, and otherwise stay in their own villages in the forest. Two BaYaka villages, Village S and Village B are located deeper in the forest, about 10 km away from Village M and Motaba River (Fig. 1). Despite the locations of Villages S and B deep in the forest, the BaYaka called S and B, *mboka*, which refers to sedentary villages, and not *lango*, referring to the temporary forest camps for fishing or hunting trips. The BaYaka have mud houses in Villages S and B and cultivate small seasonal crops in slash-and-burn gardens around the villages. The BaYaka informants gave the following two reasons for this choice in having their own villages deep

Table 1. Summary of short questionnaires by six Bantu groups during the two weeks

	Pond owner	Come from	# of Bantu	# of ponds	Heritage	Duration
1	a woman in her 40s	Brazzaville	2 (with her son)	5	her grandmother	one month
	Comments: She spent two days at each *mosongo* that she owned, then left for the market in Village F to sell the smoked fish. Afterwards she returned to Village S and waited for her other family members for the last fishing. She came with the BaYaka from Village F to Village S, but she hired more BaYaka from Villages S and B.					
2	a woman in her 60s	Village M (10 km away from Village S)	3 (with her daughter and son-in-law)	2	grandmother	one month
	Comments: While her son-in-law left for the market in Village F to sell the smoked fish captured in the first *mosongo* in Village S, she conducted her second *mosongo* fishing in Village B.					
3	a woman in her 50s	Village M	2 (with her husband)	3	grandmother	one month
	Comments: After the first fishing trip, they returned to Village M to get more manioc. After a few days, they returned for the second *mosongo* fishing trip.					
4	a woman in her 60s	Village D (15 km away from Village S)	12 (with family, 8 women and 4 men)	2	grandmother	one week
	Comments: The owner left for Village D after she finished fishing in one *mosongo,* but her grandson stayed longer in the forest to fish at the second *mosongo*.					
5	a man in his 20s	Impfondo	1	2	grandmother	one week
	Comments: He hired only one young BaYaka man for labor at a *mosongo* which belongs to his grandmother.					
6	a woman in her 60s	Village M	4 (with her daughters)	2	grandmother	one month
	Comments: She owns a fishing camp with a mud house near Village S.					

in the forest: first, to find space for gardening because suitable lots in the Bantu village had been already taken by Bandongo fisher-farmers, and second, to avoid conflicts with the Bandongo people.

Field research was conducted in Village S from March 3 to 18 in 2020 at the end of the dry season of the year. Village S was occupied by about 120 BaYaka people including children, and two Bantu women who had their gardens nearby. During the survey period, Bantu people from afar visited Village S and/or B for *mosongo* pond fishing. Six Bantu groups came to fish in their own *mosongo* ponds for a total of two weeks. Short informal questions were answered by the BaYaka villagers in S as well as by the Bantu visitors to *mosongo* pond fishing (Table 1). We also joined and observed four fishing events, three events at Bantu-owned *mosongo* and one at a BaYaka-owned *mosongo* (Table 2).

Table 2. Group composition of four pond fishing events

	Pond owner	Total # people	# Bantu	# BaYaka adults	# BaYaka children older than 5 years
1	Bantu woman	≥ 46	3 women	8 women, 5 men	~ 20
2	Bantu woman	≥ 30	1 woman, 1 man	6 women, 5 men	~ 15
3	Bantu man	≥ 50	1 man	15 women, 6 men	~ 30
4	BaYaka woman	17	-	8 women	4 girls, 5 boys

RESULTS

I. The Practice of *Mosongo* Pond Fishing

Previous researchers have described pond fishing as a collective fishing method engaging all members of the community including men, women, and children (Van Leynseele, 1979; Harms, 1989; 1999; Comptour et al., 2016). This was true of our observations as well. In March, the end of the dry season, people start to prepare for pond fishing, checking their *mosongo* ponds as well as recruiting and coordinating people to fish together. The total number of people joining a pond fishing event varied, depending on the pond size and the decision by the pond owner. Group size varied from two adult men up to 50 people including children (Table 2). *Mosongo* ponds varied in size and depth. A *mosongo* can comprise several ponds, ranging from one to eight ponds connected to each other through underground channels. A pond can be deep but small with one meter in diameter and three meters deep, or shallow and large with about 10 m in diameter and 1 m deep. The shallow and large pond resembles a natural lake, but the sharply truncated tree roots at the edge of the pond show that the pond was dug by humans where the roots were cut off to dig it.

Pond fishing is a well-coordinated activity. Depending on the pond size, one or more people enter the pond and scoop out the water using plastic buckets. For a deep but small *mosongo* pond (Fig. 2a), one man enters the pond with the water level reaching the knees, fills up the bucket with water, and passes it to other participants standing outside the pond.

Fig. 2. *Mosongo* fishing in deep but small ponds. Photographs of (a) a deep but small pond, (b) several men scooping out water, (c) women catching fish with a wood stick, and (d) fish caught in one pond (copyright: Haneul Jang).

They then throw out the water on the ground and relay the empty bucket back to the person inside the pond. Two to five men stand outside the pond and cooperate by circulating two or three buckets at a time (Fig. 2b). After all water from the pond is emptied, the man standing inside the pond scoops the mud and fish hiding in the mud into the bucket and passes it to the members outside (Fig. 3a). They throw out the contents of the bucket on the ground and separate the fish, which they beat with wooden sticks. The labor of scooping out the water from the pond is mostly done by adult men, and women and children wait outside to capture fish (Fig. 2c). This process is repeated until all the fish are caught. After finishing with the first pond, the fishing group members move to the next pond which is connected to the first one through an underground channel. One man enters the second pond, but this time he scoops away the water to the first, just emptied pond through the channel (Fig. 3b). This method is efficient, as channeling water to the connected pond requires less movement and thus less energy, compared to lifting a bucket full of water to empty it outside the pond. After emptying the second pond, the process is repeated for the connected third and fourth ponds.

For a shallow and large *mosongo*, several people enter the water together and scoop out the water simultaneously (Fig. 4). People divide the large pond into several parts with dams to scoop out the water. This resembles dam fishing, one of the most frequently performed fishing activities of the BaYaka people, called *ndoka*. *Ndoka* is mainly performed in streams or pools. To retain the upstream water, people first build the main dam using dead tree trunks, branches, and mud from the riverbank. Then the fishing group builds smaller dams downstream and bails out the water between the two dams with buckets or pots. After most

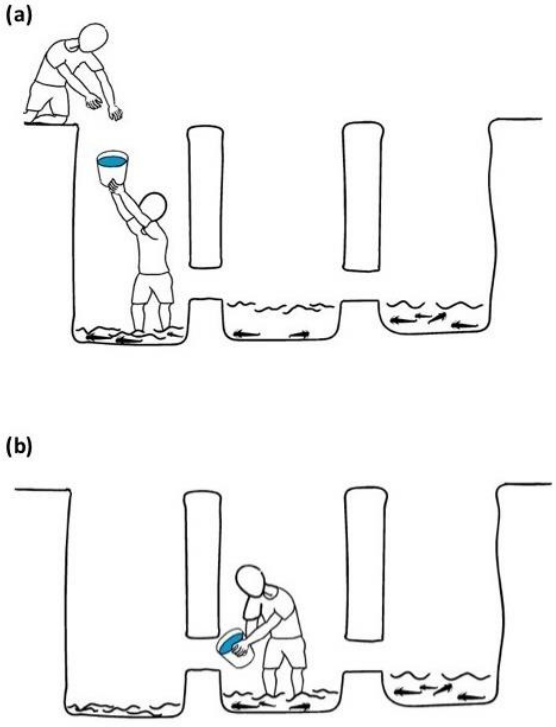

Fig. 3. Illustration of *mosongo* fishing in three deep but small ponds connected through underground channels. (a) One man enters and scoops out the water from the first pond. (b) After all water and fish are scooped out from the first pond, he moves to the second pond and channels the water to the emptied first pond.

of the water is emptied, the group gathers fish manually or with a machete or wooden stick. Moving downstream, the group repeats the whole process of building smaller dams, bailing the water out, and gathering fish. At the end of the fishing expedition, they destroy the main dam and release the water from upstream (Gallois & Duda, 2016). The main differences between *ndoka* and *mosongo* are described in Table 3.

People usually spend one day for a *mosongo*, whether it involves a deep but small multi-pond *mosongo* or one shallow and large *mosongo*, although the labor fluctuates with the size of ponds and the number of people in the fishing party. Catfishes (genus *Clarias*) are the dominant catch from pond fishing. The size of captured catfish varied from 5 cm to 30 cm (Fig. 2d). To preserve gathered fish in the hot and humid weather, the fishing party immediately smokes the captured fish. In the village or by the pond, they construct a wooden smoking table, build a fire under the apparatus, and smoke fish for several hours (Fig. 5).

II. Ecological Dimension of *Mosongo* Pond Fishing

Mosongo ponds are located by the streams in the forest close to the two BaYaka villages, S and B. Crucially, *mosongo* pond fishing seems to occur only there, but not in the vicinity of other villages in the same region along the Motaba River (Fig. 1). The Bantu informants from other villages who visited Villages S and B for pond fishing confirmed that no *mosongo* fishing took place elsewhere, even at the closest Bantu village, M, only 10 km away from S and B. This can be probably explained by ecological reasons, such as differences in

topography and soil composition.

The two BaYaka villages S and B lie in the Western Congolian Swamp Forests ecoregion which stretches from the eastern Republic of Congo to the western Democratic Republic of Congo (WWF, 2001a) (Fig. 1). This ecoregion contains permanently or seasonally flooded swamp forest, flooded grasslands, open wetlands, and river (WWF, 2001a). The region of the two BaYaka villages S and B is located in drier forest areas on slightly raised land and is seasonally inundated with freshwater. In the rainy season, forest streams near Villages S and B are flooded across the region. As the dry season starts, the water level decreases and

Fig. 4. *Mosongo* fishing in a shallow and large pond. Photographs of (a–b) a shallow and large *mosongo* pond, (c–d) people scooping out the water from the pond, (e) people putting mud with fish into the basket, and (f) women separating fish from the mud (copyright: Haneul Jang).

Table 3. Pond fishing and dam fishing in the Motaba River region

	Pond fishing: *Mosongo*	**Dam fishing: *Ndoka***
Season	The end of dry season (Mar–Apr).	During the major dry season.
Modification of nature	The ponds are maintained in a specific location and people revisit the same ponds every year.	Constant changing of landscapes, due to building dams and re-digging.
Group composition	Both genders in all age classes.	In general, the groups are age-mixed but mostly involve women and children.
Productivity	Very productive, as it allows capturing a large catch in a short time. Targets specific fish species, mostly catfish.	Generally low in productivity, capturing smaller fishes, although taking an entire day. Does not target specific fish species.
Ownership	Each pond has its individual owner.	No ownership.

eventually all water in the forest streams dries up at the end of the dry season from February to March. During this period, artificial ponds are the only water source for drinking, cooking and washing, as well as for fishing, unless the villagers go to the Motaba River 10 km away. Under this circumstance, *mosongo* ponds function as an effective fishing trap. When the forest stream water level starts decreasing, fish seek and stay in *mosongo* ponds that hold water for the next two to three months. At the end of the dry season, fishers come to visit these ponds for the trapped fish.

Villages by the upper Motaba River from which most of the Bantu informants came are located not in the ecoregion of the Western Congolian Swamp Forests, but in the northwestern Congolian Lowland Forests (WWF, 2001b) (Fig. 1). This suggests that the upper region of Motaba River may be less influenced by water level changes of the river compared to the area by the villages in flooded swamp forests. The authors observed enough water to enable fishing in forest streams and natural ponds by the upper Motaba River, even at the end of the dry season. In these villages, the Bantu and BaYaka practice barrier fishing and dam fishing in the dry season, but not pond fishing. This may be due to the different soil compositions. Floodplain soils are predominantly heavy clays that can hold water well compared to sandy soils (Rodrigues et al., 2020). In Village S, we indeed observed that *mosongo* ponds consisted of gray-colored clay soils. Soil containing clay is optimum for building fish ponds due to high water retention capacity, and not readily dispersing when wet (Hamarashid et al., 2010), which may have allowed *mosongo* ponds to last over generations. Hence, the differences in soil types may play a key role in the presence of pond fishing activities in this region, but not on the other side of the Motaba River.

III. Social Dimension of *Mosongo* Pond Fishing

1. Ownership of mosongo

The Bantu informants came from diverse regions of the Republic of Congo, not only from close villages along the Motaba River, but also from as far as Brazzaville and Impfondo.

Fig. 5. Photographs of (a) a wooden table to smoke fish, (b) smoking fish on the table, (c) smoked fish, and (d) a basket full of smoked fish ready to be sold in the market (copyright: Haneul Jang).

They reported that their *mosongo* were handed down from one generation to the next. The owner of *mosongo* (*Konja ya mosongo*), usually an elderly woman, would have inherited *mosongo* from her grandmother and mother who lived in the nearby Bantu villages in this region. *Konja ya mosongo* usually own several *mosongo* belonging to their family in the forest near Villages S and B. They fish in the ponds of this area once a year during the dry season (around February–March) and stay in the forest from a week to two months, moving from one *mosongo* to the next and sleeping near their *mosongo*. This, for them, is an annual opportunity to meet families who live in different regions. Thus, pond fishing activities seem to play an important role in social cohesion.

The BaYaka also reported that they owned *mosongo* ponds as well, inherited from grandmothers. However, BaYaka owned ponds are located deeper in the forest further away from their own village. BaYaka informants explained that this was because ponds owned by the Bantu occupied the forest streams nearer to the BaYaka villages, S and B. Hence, ironically, the BaYaka leave their own villages to travel far into the deep forest to fish in their *mosongo* ponds, whereas the Bantu from other villages come to the BaYaka villages for *mosongo* fishing. BaYaka fishing trips vary in duration, ranging from a few days to two months, as do those of the Bantu. The whole family leaves together for fishing trips and stays at fishing camps in the forest. From time to time one or two BaYaka individuals shortly return to Village S to get food such as palm nuts and cassavas, then rejoin their fishing camp.

2. Inter-ethnic relationship during pond fishing

As is common for the Bantu who engaged in forest activities throughout the region, they recruited the BaYaka in Villages S and B to help with labor in pond fishing for which the BaYaka would receive some form of compensation. One or two days before the pond fishing event, the Bantu visited the BaYaka village for the recruitment. At the end of the dry season, a few groups of Bantu people visited S and B for pond fishing. The Bantu pond owners coordinated the dates among themselves to avoid too much overlap, which would decrease the number of BaYaka hands at each *mosongo*. The Bantu informants first recruited a few BaYaka men and women from their villages or the closest Village M to carry baggage, and then recruited more people for fishing from Villages S and B. Pond fishing trips can take from a few days to a month, and thus the Bantu bring supplies, such as a big sack of manioc flour, bedding, clothes, cooking utensils, etc. The Bantu informants reasoned that they recruited the BaYaka porters before approaching Villages S and B, partially to avoid conflict in coordination among other Bantu groups.

The BaYaka could choose whether or not they wanted to join a fishing event. They often discussed among themselves in the early morning to decide who might go to whose *mosongo* on that day. The BaYaka could change their mind and leave for their own pond fishing or for other foraging activities, even if they had already told the Bantu that they would join the event. Once the BaYaka decided to work at a Bantu *mosongo*, they did most of the labor, such as scooping out the water and catching fish, in which the Bantu intermittently participated. The *mosongo* owners directed the procedures. At the end of fishing activity, the *mosongo* owner gave some fish that were caught on that day to each BaYaka individually as compensation for their labor. The BaYaka informants reported that the Bantu did not use other forms of compensation (e.g., cash), only fish, which they usually consumed that evening. After a few continuous days of pond fishing, we observed that the Bantu gave out alcohol and cigarettes before leaving Villages S and B. Exceptionally, in asking the BaYaka men to carry the smoked fish to the market in Mafoueté, seven hours away on foot, the Bantu paid them a small amount of money.

The BaYaka children also voluntarily participated in pond fishing activities at Bantu *mosongo*. However, the Bantu were often not willing to have them along during fishing. This was because if there were too many of them, especially boys, they took fish from the *mosongo* with their spear (*mopandi*) and kept the fish for themselves instead of waiting for allocation later. Children often made a fire nearby to roast and eat fish there or brought the fish back to the village. During the three pond fishing events the authors observed, the Bantu pond owners constantly yelled at young BaYaka children, but if the children contributed much in scooping out the water or capturing fish, they also got their allocation. In contrast, at BaYaka *mosongo* with only the BaYaka, children were free to capture and eat fish on site, no matter whether they aided adults at all. Such different treatment of children reflects the contrasting values in children's autonomy and food sharing norms held by the Bantu and the BaYaka people (Boyette & Lew-Levy, 2019).

Ⅳ. Economic Dimension of *Mosongo* Pond Fishing

As pond fishing is very productive, surplus fish from ponds are sold in local markets. In mid-March every year, a big Bantu village F which is 16 km away from Village S holds a large fish market. Bantu informants reported that selling fish in this market was good business because many people from Brazzaville, Impfondo, Oyo and even the Central African Republic come to buy fish every year. Yet even after the market in Village F was over, more Bantu groups came to Villages S and B for pond fishing. They reported that fish

would be brought to other markets in larger towns such as Impfondo or the capital Brazzaville. For the BaYaka, making money was not the primary reason for pond fishing as they consumed most fish in the following days. However, they also sold smoked fish to the Bantu who visited S and B villages or sold fish on their own at the market in Village F. The BaYaka informants reported that in Village F they could buy supplies such as flashlight batteries or clothes with money from fish sales.

CONCLUSION

Collective pond fishing practiced along the Motaba River shows some similarities with those reported in other areas, such as the inherited ownership of ponds, sale of the surplus fish at markets due to high productivity, and group compositions that include both genders of all ages (Comptour et al., 2016). In addition, the terms related to pond fishing are similar among different ethnic groups inhabiting the Western Congolian Swamp Forests, although the Bantu language subclades differ (Motaba River region: Bantu C-10, but Mossaka region: Bantu C-20 in Guthrie's classification). For example, the term, *kopopa*, refers to the pond fishing practice by both Bandongo and BaYaka peoples in the Motaba River region and is also used by the Likouba ethnic group in the Cuvette region in the middle Republic of Congo (Comptour et al., 2016). Moreover, the term, *mosongo*, referring to a fishing pond in the Motaba River region is also used by the Nunu ethnic group who spoke Bobangi in the Democratic Republic of Congo (Harms, 1989).

The Cuvette region is the lower part of the Western Congolian Swamp Forests where several Bantu ethnic groups live, such as the Likouba, Mboko, and Moye (called Nunu in DRC). There, people practice traditional inland fishing as their main economic activity, and pond fishing used to be one of the widely practiced fishing techniques among the Bantu groups in these flooded areas (Comptour et al., 2016). The authors presume that a few terms regarding pond fishing may have become universal across different ethnic groups in the Cuvette region and spread to the Likouala region in the upper part of the Western Congolian Swamp Forests. Crucially, there has been no literature on pond fishing among the BaYaka. Hence, we suggest that the pond fishing practice originated from the traditional Bantu fishing in the floodplains, which had become prevalent across the Western Congolian Swamp Forests, then spread to the BaYaka population in the Likouala region as well.

There is a notable difference in pond fishing practices in the Motaba River region and the other areas, in terms of the relationship between pond owners and clients. In the Motaba River region, compared to the Cuvette region, the relationship between the pond owners and clients is extended to an inter-ethnic relationship between the BaYaka and Bantu. The established cultural model of BaYaka-Bantu labor exchange is used by both groups during shared work. Specifically, the Bantu expectation is that the BaYaka will do most of the labor at the Bantu *mosongo*, then be compensated with some fish, analogous to the payment made in other subsistence tasks for which the Bantu seek BaYaka labor, including garden clearing and harvesting, hunting, and palm oil pressing. The BaYaka, however, expect that all are free to participate and all will share the outcome of communal labor. Here, we see the origin of our Bantu informant's displeasure that the BaYaka children freely take away fish which the Bantu regard as their property in their pond.

The authors favor a socio-political explanation for the persistence of inter-ethnic relations (Joiris, 2003), and argue that this case study reveals the diverse ways individuals weave together interethnic relations across the cultural and ecological landscape. Joiris (2003) outlined a framework for describing the multiple inter-ethnic relationships maintained by

families and individuals among the Congo Basin foragers and farmers, summarizing the perspectives that researchers have used in explaining the origins of these relationships. We find her socio-political approach the most applicable to our case study, but we offer an expansion to this model. Specifically, Joiris (2003) argued that while most approaches to the Congo-Basin forager-farmer relations emphasized the subordination of the foragers, detailed case studies also revealed the importance of solidarity found in the shared historical struggles during the colonial and ivory/rubber trade periods and today in the form of fictive kinship ties. While we agree that solidarity has been critical to both BaYaka and Bantu history, we argue that the unique history of the BaYaka who have their own *mosongo*, and practice pond fishing on their own, highlights the BaYaka socio-political *agency* in the context of these relationships as well.

As such, the authors agree with Joiris (2003) and Terashima (1986) that, even without cultural agreement on the nature of the relationships (e.g., notions of superiority), fluid and flexible interethnic relationships serve the needs of both groups. Going further, we believe that researchers drawing on historical data have tended to ignore the role of BaYaka agency in seeking out the relationships with the Bantu (e.g., Vansina, 1990; Bahuchet, 2014). Our observations here, while limited, are more in step with observations by Turnbull (1962) and Lewis (2005) that the Mbuti and Mbendjele "hunt" resources in the Bantu villages as they do in the forest. This is to say, the BaYaka in Villages S and B chose to establish their own villages away from the Bantu, dig their own *mosongo* to fish, and sell the catch in the market villages themselves. While we are not sure of the cultural origins of BaYaka *mosongo* fishing, the fact that the only prior reports of *mosongo* were of the Bantu people in other parts of Congo Basin suggests that it is another example of BaYaka flexibly integrating a technique into their own subsistence repertoire (e.g., net-hunting; Hewlett, 1996). Moreover, along with the technique, the BaYaka of Villages S and B embraced the opportunity to extend their social and economic resources through an exchange relationship with the Bantu who come to their *mosongo* near the BaYaka villages.

In conclusion, the authors believe these preliminary observations of *mosongo* pond fishing along Motaba River reflect the micro-scale cultural adaptations to the diverse and complex ecology of the Congo Basin. Additionally, it also highlights the importance of cultural exchange to this continual process of adaptation. The various forms of interethnic cooperation across a broad range of subsistence activities not only lead to exchanges in technology, techniques, and knowledge, but also influence the seasonal movements and use of space, as were demonstrated in the BaYaka choice of village location and the Bantu long-distance travel. Further study of the history and distribution of knowledge of *mosongo* pond fishing among the Motaba BaYaka is needed, but we believe that, in this case and in general, the potential role of other ethnic groups in a people's subsistence decision-making cannot be ignored when studying the foraging peoples in the Congo Basin or elsewhere in the world.

ETHICS STATEMENT The field research on the BaYaka people was conducted under all necessary permissions from the relevant authorities of the Republic of Congo (Ethics Approval Number 079) from the Ministère de la Recherche Scientifique et de l'Innovation Technologique, the Republic of Congo. All study procedures complied with the national laws and regulations of the Republic of Congo, the ethical standards of the Max Planck Institute for Evolutionary Anthropology, and ethical guidelines of the Comité d'Ethique de la Recherche en Sciences de la Santé in Brazzaville. Informed consent was obtained from all informants to record their statements with a voice recorder, take pictures, and academically share this information.

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